City of New York

Mayor David N. Dinkins

City Environmental Quality Review

TECHNICAL MANUAL

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CEQR Technical Manual

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F O R E W O R D

New York is a diverse and complex City with a rich and, in some cases, fragile environment. To both protect the environment and afford participants in the City's Environmental Quality Review (CEQR) process a predictable and efficient environmental review, the City has developed the CEQR Technical Manual.

The CEQR Technical Manual was prepared through a consultant contract managed by the Departments of City Planning and Environmental Protection with guidance from the Mayor's Office of Environmental Coordination.

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Chapter 1

PROCEDURES AND DOCUMENTATION

City Environmental Quality Review, or "CEQR," is a process by which agencies of the City of New York review proposed discretionary actions for the purpose of identifying the effects those actions may have on the environment. This part of the CEQR Technical Manual outlines the legal framework of the CEQR process.

This chapter addresses the types of actions subject to CEQR, the selection of the agency primarily responsible for the environmental review of the action, the involvement of other agencies and the public in the review, the determinations and findings that are prerequisites for agency action, and the process for identifying technical areas to be reviewed. It also discusses CEQR's relationship with other approval procedures, such as the Uniform Land Use Review Procedure, and introduces the documentation used in CEQR, including the Environmental Assessment Statement (EAS) and the Environmental Impact Statement (EIS).

This chapter is not a definitive discussion of the legal issues that may be encountered in the CEQR process. The review of a specific project or action by an agency may in many instances require additional research and interpretation. In these cases, it may be useful to consult with legal counsel.

A. Overview of Legislative History

100. NEPA

The concept of an interdisciplinary, comprehensive environmental impact assessment was first introduced when the Congress of the United States of America included it in Section 102(2)(C) of the National Environmental Policy Act of 1969, known as "NEPA." NEPA regulations require all Federal agencies to evaluate the environmental consequences of proposed actions and to consider alternatives.

200. SEQRA

In 1975, New York State's legislature enacted the State Environmental Quality Review Act, known as "SEQRA." This Act requires that all State and local governmental agencies assess environmental effects of discretionary actions, unless such actions fall within certain statutory or regulatory exemptions from the requirements for review, before undertaking, funding or approving the action.

The provisions of SEQRA may be found in Article 8 of the State Environmental Conservation Law (ECL § 8-0101 et seq.). The State Department of Environmental Conservation (DEC) has promulgated extensive regulations that guide the process of review. These regulations are published in Part 617 of 6 New York Codes, Rules and Regulations (6 NYCRR), and are included in the appendix to this Manual. They permit a local government to promulgate its own rules provided they are no less protective of the environment than the State rules. The City of New York has exercised this prerogative by promulgating its own procedures, known as CEQR.

300. CEQR

In 1973, before SEQRA was enacted, the New York City Mayor's Executive Order No. 87, titled "Environmental Review of Major Projects," adapted NEPA to meet the needs of the City. After SEQRA was enacted, New York City revised its procedures in the Mayor's Executive Order No. 91 of 1977, which established CEQR by name. This order centralized most CEQR review functions in the Departments of City Planning and Environmental Protection (DCP and DEP), which served as the City's "co-lead agencies."

In 1989, amendments to the New York City Charter, adopted by referendum, established the Office of Environmental Coordination and authorized the City Planning Commission to establish procedures for the conduct of environmental review by City agencies where review is required by law. The Charter directs that such procedures include (1) the selection of the City agency or agencies that are to be responsible for determining whether an Environmental Impact Statement is required (i.e., the "lead" agency), (2) the participation by the City in reviews involving agencies other than City agencies, and (3) coordination of

environmental review procedures with the Uniform Land Use Review Procedure.

On October 1, 1991, new rules of the City Planning Commission were superimposed on Executive Order No. 91, fundamentally reforming the City's process. The new rules, titled Rules of Procedure, are published in the Rules of the City of New York, Title 62, Chapter 5 (62 RCNY, Chapter 5). The provisions of Executive Order No. 91 are published as an appendix to Chapter 5 of the RCNY and also in Title 43 of the Rules of the City of New York. Both the new rules and the Executive Order are included in the appendix to this Manual.

Instead of centralizing lead agency responsibilities in two agencies, as was the case under Executive Order No. 91, the new rules contain a series of provisions by which the agency responsible for the conduct of environmental review of a given action is to be selected.

The new rules also set forth a public scoping procedure to be followed by the City lead agencies responsible for an action's environmental review, and define in greater detail the responsibilities of the Office of Environmental Coordination (OEC), which assists City lead agencies in fulfilling their environmental responsibilities. Thus, CEQR is New York City's process for implementing SEQRA, while at the same time adapting and refining the State rules to take into account the special circumstances of New York City.

CEQR requirements in general and for specific actions are often defined through decisions of the State courts. This court review is provided for in Article 78 of the New York State Civil Practice Law and Rules. If an agency fails to comply with CEQR in approving or disapproving an action, a court may invalidate that decision. Decisions on Article 78 petitions have established a substantial body of judicial guidance on the scope and requirements of environmental review.

B. CEQR Procedures

The CEQR process requires City agencies to assess, disclose, and mitigate the environmental consequences of their decisions to fund, directly undertake, or approve an action.

Based on an initial evaluation, an agency determines whether an action is subject to environmental review or belongs to a category of actions that are not subject to review. If the action is subject to environmental review, an initial assessment considers a series of technical areas, such as air quality, traffic, and neighborhood character, to determine whether the action may have a significant adverse impact on the environment. If it may, the lead agency must investigate and further consider the potential of the project or action to generate significant adverse environmental impacts; the lead agency must consider alternatives that would avoid or minimize such impacts and measures that would mitigate them.

CEQR includes certain requirements as to how the work of the lead agency in studying effects on the environment is to be documented. CEQR also gives the public a role in the review of the study of environmental effects. The level of detail appropriate for the study of environmental effects, the kind of documentation, and the extent of public involvement will vary depending on the action to be studied and its context. This section describes the procedural steps through which an environmental assessment progresses.

100. Applicability

Actions that are subject to CEQR include proposed actions that are (1) directly undertaken by a City agency, (2) for which the agency provides financial assistance, or (3) for which the agency issues permits or approvals at its discretion. Such actions must involve the exercise of discretion by the agency and may include approvals of construction projects, such as building a bridge, or adoption of regulations, such as a decision to rezone an area. They may be actions initiated by the City or actions proposed by private applicants for approval by City agencies.

Within this group of discretionary actions, some categories of actions may be subject to environmental review and others are not. Thus, the first step in the process of environmental review is to determine whether the action is subject to review. For CEQR purposes, actions are broadly divided into four types, as defined by State law and regulations and listed in the two sections below.

110. ACTIONS NOT SUBJECT TO ENVIRONMENTAL REVIEW

111. Excluded or Exempt Actions

Exempt actions include emergency acts, enforcement proceedings, ministerial actions involving no exercise of discretion, and maintenance or repair with no substantial change to the existing structure or facility. Issuing a building permit when a proposal fully conforms to zoning regulations is an example of a ministerial action. Emergency actions are those that are immediately necessary on a limited and temporary basis

for the protection or preservation of life, health, property, or natural resources; they must be directly related to the emergency and performed to cause the least change practicable. Excluded actions are actions that were begun prior to the effective dates of SEQRA and are grandfathered under certain statutory and regulatory provisions. Actions subject to certain procedures under the Public Service Law are also excluded.

112. Type II Actions

DEC has included in its regulations a list of actions that it has determined will not have a significant effect on the environment (6 NYCRR 617.13). Such actions do not require preparation of an Environmental Impact Statement or an EAS. The State rules permit local agencies to promulgate their own Type II lists, but the City has not yet done so. Because the City has no list, the State list should be referred to. DEC's Type II list is provided in the appendix. Many governmental decisions will fall within the exemption for "routine or continuing agency administration and management, not including new programs or major reordering of priorities." The parameters of this and other Type II categories require careful consideration and, in many instances, some knowledge of judicial decisions on the subject.

120. ACTIONS SUBJECT TO ENVIRONMENTAL REVIEW

121. Type I Actions

Type I actions are defined in the State regulations as "those actions and projects that are more likely to require the preparation of an EIS than unlisted actions" (see below). A Type I action "carries with it a presumption that it is likely [to] have a significant effect on the environment and may require an EIS." Before taking a Type I action, an agency is required to prepare an EAS. Although it is possible to conclude on the basis of an EAS that a Type I action would have no significant impact on the environment, such a determination is less likely than it is for an unlisted action. A list of Type I actions appears in DEC's regulations (6 NYCRR 617.12). The City has a supplementary list, which appears at § 6-15 of Executive Order No. 91. Both are in the appendix.

122. Unlisted Actions

Unlisted actions are all actions that are not excluded or exempt and are not listed as Type I or Type II. For any unlisted action, an Environmental Assessment Statement (EAS) must be prepared.

130. ISSUES OF SEGMENTATION

Defining the scope of the action that is to be the subject of environmental review is one of the preliminary steps in the CEQR process. A project may, for example, involve approvals by more than one agency and funding by yet another agency. If these separate actions were reviewed independently, the combined effects of the total project might be inadequately addressed. SEQRA defines such segmentation as "the division of the environmental review of an action such that various activities or stages are addressed ... as though they were independent, unrelated activities, needing individual determinations of significance."

Although segmentation is permissible in some instances, providing certain conditions are applied, an agency must avoid improper segmentation. This may require expert guidance, particularly for the purpose of understanding judicial decisions that address this issue. One reference for guidance on this issue is the SEQR Handbook, published by DEC, which offers eight criteria that may be considered in determining whether individual agency actions should be considered together:

1. Is there a common purpose or goal for each action?
2. Is there a common reason for each action being completed at about the same time?
3. Is there a common geographic location involved?
4. Do any of the activities being considered contribute toward significant cumulative or synergistic impacts?
5. Are the different actions under the same ownership or control?
6. Is a given action a component of an identifiable overall plan?
7. Can the interrelated phases of various projects not be considered "functionally independent?"
8. Does the approval of one phase or action commit the agency to continuing with other phases?

An example of an action raising segmentation issues is the construction of a highway in phases or sections, where some of the sections would serve no independent purpose until and unless they are joined together with others. Similarly, reconstruction of an existing highway interchange and additional widening of the highway can be so interrelated that the two actions must be examined together.

200. CEQR Rules

210. ESTABLISHING A LEAD AGENCY

As early as possible in an agency's formulation of an action it proposes to undertake, or as soon as an agency receives an application for a funding or approval action, it must determine whether the action is subject to CEQR. If the action is subject to CEQR, a "lead agency" must be determined. State regulations define the "lead agency" as the agency "principally responsible" for carrying out, funding, or approving an action. Under the Rules of Procedure for CEQR, only the lead agency is responsible for determining whether an action, considered in its entirety, requires environmental review. (62 RCNY § 5-05(a)) The other agencies that have jurisdiction to fund, approve, or undertake an action are known as "involved agencies."

The Rules of Procedure for CEQR (62 RCNY § 5-03) provide that where only one City agency is involved in a proposed action, that agency shall be the lead agency for environmental review under CEQR. Where more than one agency is involved, a single lead agency must be selected. An exception is for legislative actions, for which the City Council and the Mayor act as co-lead agencies. The Rules address in detail lead agency selection for a number of City processes, including the enactment of local laws, actions involving franchises and applications for special permits from the Board of Standards and Appeals, among others. The Rules also designate the lead agency for specific actions for which approval by the City Planning Commission is required under the New York City Charter.

Where the Rules of Procedure do not identify a single agency as the lead, the Rules provide criteria by which the involved agencies may choose the most appropriate agency to act as lead for the action. The City's rules also establish a procedure by which the lead agency may be changed; the rules authorize a lead agency to transfer lead agency status to an involved agency, which then becomes the lead agency.

The City's rules governing lead agency selection among City agencies are detailed and cannot be summarized without omitting important provisions. They are best examined in their published form.

If State agencies are involved, the OEC should be consulted for the purpose of deciding whether a City or a State agency should act as lead under the State's regulations. SEQRA rules allow for selection of a City agency as lead when the primary location of the action is local and/or the impacts are primarily of local significance. SEQRA rules also impose a 30-day time limit on lead agency selection when a State agency is involved. If disputes occur among City and State agencies, one of the involved agencies or the applicant (if there is one) may request the Commissioner of DEC to select an agency. After allowing a brief period for involved agency comment on the request, the Commissioner is required to select a lead agency within 12 business days of the date the request was mailed.

If Federal agencies are involved, the OEC should also be contacted so that the Federal review may be coordinated.

The lead agency is responsible for sending notice of its lead agency status and preparing (see below) and distributing the EAS to all other involved agencies. If the lead agency determines on the basis of the EAS that the proposed action may have a significant adverse effect on the environment, the lead agency is also responsible for circulating the scoping documents, draft Environmental Impact Statements (DEISs), Final Environmental Impact Statements (FEISs), and Notices of Determination, Notices of Completion, and Notices of Public Hearings (all of which are discussed below) to the other involved agencies. The lead agency is to make every effort to keep the other involved and interested agencies informed of the progress of the CEQR process for actions within their jurisdiction. Keeping involved agencies informed is important because each involved agency must prepare its own written findings after the FEIS has been completed and before it takes its action. If the involved agency has chosen not to participate in the process, it still must consider the DEIS and FEIS as the basis for its written CEQR findings (see Section 270, below).

Agencies without jurisdiction to fund, approve, or undertake an action, but that wish to participate in the review process because of their specific expertise or concern about the proposed action, are known as "interested agencies." Interested agencies do not prepare written findings based on the EIS.

220. DETERMINATION OF SIGNIFICANCE

221. Preparation of Environmental Assessment Statement

If there is no private applicant, an agency that has determined that it is the appropriate lead begins its assessment of whether the proposed action may have a significant effect on the environment by preparing an Environmental Assessment Statement (EAS). Instructions for completing the EAS appear in the form itself and in the introduction to the EAS Guidebook published

and distributed by the OEC. If there is a private applicant, the applicant prepares Parts I and II of the EAS and submits them to the lead agency for review. The lead agency then reviews Parts I and II and completes Part III and the certification. The EAS and the Guidebook are intended to assist lead agencies and private applicants in identifying the potential effects an action may have on the environment and assessing whether such effects may be significant and adverse.

Apart from serving as a guide to the process of making an initial assessment, the EAS documents an agency's compliance with the initial steps in the CEQR process. It is important that the EAS contain enough information to support the agency's conclusions regarding the potential for significant adverse impacts.

222. *Criteria for Significance*

If the proposed action may reasonably be expected to have any of the following consequences, which appear in Part 617.11 of 6 NYCRR, the action may have a significant effect on the environment:

1. A substantial adverse change in existing air quality, ground or surface water quality or quantity, traffic or noise levels; a substantial increase in solid waste production; a substantial increase in potential for erosion, flooding, leaching, or drainage problems;

2. The removal or destruction of large quantities of vegetation or fauna; substantial interference with the movement of any resident or migratory fish or wildlife species; impacts on a significant habitat area; substantial adverse effects on a threatened or endangered species of animal or plant, or the habitat of such a species; or other significant adverse effects to natural resources;

3. The encouraging or attracting of a large number of people to a place or places for more than a few days, compared with the number of people who would come to such a place absent the action;

4. The creation of a material conflict with a community's current plans or goals as officially approved or adopted;

5. The impairment of the character or quality of important historical, archaeological, architectural, or aesthetic resources, or of existing community or neighborhood character;

6. A major change in the use of either the quantity or type of energy;

7. The creation of a hazard to human health;

8. A substantial change in the use, or intensity of use, of land including agricultural, open space, or recreational resources, or in its capacity to support existing uses;

9. The creation of a material demand for other actions which would result in one of the above consequences;

10. Changes in two or more elements of the environment, no one of which has a significant effect on the environment, but when considered together result in a substantial adverse impact on the environment; or

11. Two or more related actions undertaken, funded, or approved by an agency, none of which has or would have a significant effect on the environment, but when considered cumulatively would meet one or more of the criteria in this section.

In determining whether an action would cause one of the above consequences, the lead agency must consider reasonably related short-term, long-term, and cumulative effects, including simultaneous or subsequent actions that are (a) included in a long-range plan; (b) likely to be undertaken as a result thereof; or (c) dependent thereon.

The significance of any of the above consequences should be assessed in connection with the following: (a) the setting in which the action occurs; (b) the probability that an adverse impact will occur; (c) the duration of the impact; (d) its irreversibility; (e) the geographic scope of the adverse impact; (f) its magnitude; and (g) the number of people affected.

Executive Order 91 contains criteria for determining significance in section 6-06. The City's criteria generally repeat the State's but do not match word-for-word. Differences should not be material, however, because section 5-02(b)(2) of the City's Rules of Procedure provides that the City's Rules and Executive Order 91 shall not be construed to require environmental quality review of an action where such review would not otherwise be required by the State Environmental Quality Review Act and the State's regulations, or to dispense with any such review where it is otherwise required.

223. *Notice of Determination*

Once the EAS has been completed, the lead agency should coordinate with other involved agencies (see

Section 210, above) in making its determination of significance. The EAS and supporting documentation provide the written record that the agency must examine to make its determination.

Based on the EAS, the lead agency must make one of three possible determinations:

- If the lead agency determines that the action will not have a significant adverse effect on the environment, it issues a *Negative Declaration*. This statement describes the action and the reasons for the determination that the action will not have a significant adverse effect on the environment. The issuance of a Negative Declaration constitutes the completion of the CEQR process with respect to the proposed action.

- If the lead agency determines that the action may have a significant effect on the environment but that all such effects can be eliminated or avoided by specific changes in the action or mitigation that can be easily implemented, then the lead agency issues a *Conditional Negative Declaration* (often referred to as a CND). Pursuant to State regulations, CNDs are not permitted for Type I actions or for actions where there is no applicant distinct from the lead agency.

  Conditions that require implementation by another agency must be approved by that agency in advance of issuing the CND. As a matter of practice, a letter of understanding with the implementing agency is usually obtained. (A discussion of mitigation is provided in Section 262, below.)

- If the lead agency determines that the action may have one or more significant adverse impacts, the agency issues a *Positive Declaration*. This notice states that the lead agency has determined that the proposed action may have a significant adverse effect on the environment, and that a Draft Environmental Impact Statement (DEIS) will be prepared. It describes the action and the reasons supporting this determination. The issuance of a Positive Declaration commits the lead agency to preparing a Draft Environmental Impact Statement before it approves, undertakes, or funds its action.

The State rules require the lead agency to give public notice of a CND or a Negative Declaration for a Type I action by publication in the *Environmental Notice Bulletin* published by DEC. The rules provide for a 30-day public comment period. Typically, these public notices are also published in the *City Record*. A Positive Declaration and an intent to prepare an EIS must be published following procedures similar to those for the CND, but no 30-day comment period is required.

Section III of the EAS provides full information on notices of determination; Executive Order No. 91 also provides such guidance. Copies of notices of determination are filed with the New York State Department of Environmental Conservation (DEC) at 50 Wolf Road, Albany, New York 12233-0001. The DEC publishes the notices in the *Environmental Notice Bulletin*, as required by State law. Copies of the notices also must be filed with the OEC, at 52 Chambers Street, New York, New York 10007; the applicant, if any; the appropriate Community Board(s); the regional director of DEC; and all other involved agencies and interested agencies. OEC publishes a listing of notices in the *City Record*.

After CEQR review for the proposed action is complete, the lead agency may institute a monitoring and review process to ensure that any mitigation included as part of a Conditional Negative Declaration is implemented. Examples include making building permits or temporary certificates of occupancy contingent on completion of the mitigation.

230. SCOPING

The City's Rules of Procedure require in section 5-07 that the lead agency conduct a public scoping process for any action for which it has issued a Positive Declaration. Within 15 days after issuing a Positive Declaration, the lead agency must issue a draft scope of work.

The scope of work is a document that identifies in detail all topics to be addressed in the EIS, including the proposed methods for study, possible alternatives to the proposed action, and mitigation measures. The scope describes the proposed action in sufficient detail to allow scoping participants to understand it. It identifies the preferred methods for the analysis.

As appropriate, based on the assessment provided in the EAS, the lead agency may find it useful to target the scoping document to those issues that are likely to or may have the potential for significant adverse impacts. A rationale may be provided for those issues that are excluded because they are not likely to result in significant adverse impacts. By appropriately reducing the scope of the EIS and providing a focused assessment on the issues of concern, this will give the decision-makers and the public a more useful document.

Chapter 3 of this Manual discusses methodologies that may be used to analyze specific impact categories. They have been developed by the expert staffs of various City agencies, working with consultants, and should serve as useful guides to the application of the criteria for determining significance. The lead agency may, however, use other methodologies, but if different methodologies are contemplated, it may be advisable to consult with the OEC.

The list of technical areas for which methodologies are provided in this Manual may serve as a checklist for the initial identification of the issues to be addressed in the EIS. It may be that a project will not require analysis in all of the technical areas. Conversely, the unique character of a given proposed action may require analysis in an area not included in this Manual. The technical areas and issues that are to be considered as appropriate in the scoping process include the following:

- Land use, zoning, and public policy
- Socioeconomic conditions
- Community facilities
- Open space and recreational facilities
- Shadows
- Historic resources
- Urban design/visual resources
- Neighborhood character
- Natural and water resources
- Hazardous materials
- Waterfront revitalization program
- Infrastructure
- Solid waste and sanitation services
- Energy consumption
- Traffic and parking
- Transit and pedestrians
- Air quality
- Noise
- Construction impacts

For each of these topics, the scope indicates whether study is appropriate, and, if it is, the scope defines the study areas and analysis methodologies to be used. DEC also provides a scoping checklist, which is published as an appendix to its SEQRA rules.

After the draft scope is completed, a public scoping meeting must be held. The lead agency must publish notice of the public scoping meeting in the *City Record* and notify other involved agencies of the scoping meeting following the timetable described in Section 290. The notice must indicate that a Draft Environmental Impact Statement will be prepared, request public comment with respect to issues to be addressed in the DEIS, and state that members of the public may inspect copies of the EAS and draft scope from the lead agency or OEC. The notice also must identify the date, time, and place of the scoping meeting; indicate that written comments will be accepted by the lead agency through the 10th day following the meeting; and provide written guidelines for public participation at the scoping meeting.

All involved and interested City agencies, the OEC, the appropriate borough board, community boards that would be affected by the action, any private applicant, and any interested civic or neighborhood groups or individuals may attend the scoping meeting and give comments on the draft scope of work. The lead agency must consider these comments before issuing a final scope of work. This document incorporates, as appropriate, the comments received.

When a lead agency receives substantial new information after issuance of the final scope, it may amend the final scope to reflect such information. The lead should notify all those who received copies of the final scope, including OEC and the other involved agencies, of this change.

240. PREPARATION AND PUBLICATION OF THE DRAFT ENVIRONMENTAL IMPACT STATEMENT

241. Preparation of the DEIS

The next step is the preparation of the Draft Environmental Impact Statement (DEIS). The content and format of an Environmental Impact Statement depend on the nature of the action and the sorts of impacts, alternatives, and mitigation measures that are reasonable in the circumstances. The EIS is intended to enable a decision-maker to understand environmental impacts, and is analytic, not encyclopedic. It is not a repository for all knowledge about a given technical area. Rather, the EIS should cover specific significant environmental impacts that can be reasonably anticipated or have been identified in the scoping process, and explain these in no more detail than is appropriate considering the nature and magnitude of the proposed action and the significance of the potential impacts. Therefore, the level of detail is determined by a rule of reason: how much detail is reasonable to enable the lead and other involved agencies to make informed decisions about the significant adverse environmental impacts of a proposed action and how to avoid or mitigate those impacts to the maximum extent practicable in the circumstances.

Section 6-09 of Executive Order No. 91 prescribes the following contents of an EIS:

1. A description of the proposed action and its environmental setting.
2. A statement of the environmental impacts of the proposed action, including short-term and long-term effects and typical associated environmental effects.
3. An identification of any adverse environmental effects that cannot be avoided should the proposal be implemented.
4. A discussion of the social and economic impacts of the proposed action.
5. A discussion of alternatives to the proposed action and the comparable impacts and effects of such alternatives.
6. An identification of any irreversible and irretrievable commitments of resources that would be involved in the proposed action should it be implemented.
7. A description of mitigation measures proposed to minimize significant adverse environmental impacts.
8. A description of the growth-inducing aspects of the proposed action, where applicable and significant.
9. A discussion of the effects of the proposed action on the use and conservation of energy resources, where applicable and significant.
10. A list of underlying studies, reports or other information obtained and considered in preparing the statement.
11. Such other information as is consistent with the purposes of SEQRA as described in the CEQR Executive Order and the SEQRA Regulations.

SEQRA requires that EISs contain certain information regarding reasonably foreseeable catastrophic impacts and State agency actions in the City's waterfront revitalization program boundaries.

If information about reasonably foreseeable catastrophic impacts is unavailable or uncertain, and such information is essential to an agency's CEQR/SEQRA findings, the EIS would identify the nature and relevance of unavailable or uncertain information; provide a summary of existing credible scientific evidence, if available; and assess the likelihood of occurrence, even if the probability of occurrence is low, and the consequences of the potential impact, using theoretical approaches or research methods generally accepted in the scientific community. The analysis would likely be necessary in the review of such actions as the siting of a hazardous waste treatment facility or liquid natural gas facility. According to the State SEQRA rules, it should not apply in the review of such actions as shopping malls, residential subdivisions, or office facilities.

241.1. Cover Page

The draft EIS must have a cover page, setting forth the following provisions:

1. A statement that it is a Draft EIS.
2. The name or descriptive title of the action.
3. The location and street address, if applicable, of the action.
4. The name and address of the agency that required its preparation, and the name and telephone number of a person at the agency who can provide further information.
5. The names of individuals or organizations that prepared any portion of the EIS.
6. The date (day, month, year) of its acceptance by the agency responsible for its preparation.
7. If the EIS is longer than 10 pages, a table of contents must be provided following the cover sheet.

241.2. Executive Summary

Following the cover page, the EIS typically provides a precise summary that adequately and accurately summarizes the statement. The summary briefly describes the action, its significant adverse environmental impacts, a list of mitigation measures to avoid or reduce significant adverse impacts, alternatives considered, and a listing of matters to be decided (including a listing of each permit or approval).

241.3. Project Description

The draft EIS must fully describe the action and its background, purpose, public need and benefits, including social and economic considerations, the approvals required, and the role of the EIS in the approval process. This section is intended to give the reader and the decision-maker enough broad information to put the action in its full context. Enough information should be provided to allow assessment of the project's impacts in later sections of the EIS. Typically, a project description includes text, graphics, and tables, and defines the project, its plan and form, and its size. If the action involves changes in regulatory controls that affect one or more sites not associated with specific known development, it may be necessary to describe one or more development scenarios to establish what may reasonably be expected to occur.

241.4. *Technical Analyses*

Each technical analysis of the EIS must assess existing conditions, the future absent the proposed action (sometimes referred to as the "no action" or "no build" condition), and the future if the action is implemented. Comparison of the future without and with the action allows the action's increment and impacts to be evaluated. CEQR requires analysis of both the primary and the secondary impacts of an action. Similarly, cumulative impacts, must be identified.

Chapter 3 of this Manual provides assistance in performing these technical analyses, including some possible methodologies. These methodologies are considered appropriate for analysis of CEQR actions, but are not required by CEQR. Other methodologies also exist and may be used if appropriate.

241.5. *Mitigation*

CEQR requires that any significant adverse impacts identified in the EIS be minimized or avoided to the fullest extent practicable, given costs and other factors. Such mitigation measures must be identified in the EIS. In the DEIS, options for mitigation must be recommended and assessed. A range of mitigation can be presented for public review and discussion, without the lead agency having selected one for implementation. Where no mitigation is available, the EIS must disclose the potential for unmitigatible significant adverse impacts.

241.6. *Alternatives*

The State SEQRA rules require that "a description and evaluation of the range of reasonable alternatives to the action" be included in an EIS at a level of detail sufficient to permit a comparative assessment of the alternative discussed. The regulations specify that reasonable alternatives include "the range of reasonable alternatives to the action which are feasible, considering the objectives and capabilities of the project sponsor." (6 NYCRR § 617.14(f)(5)) If the environmental assessment and consideration of alternatives identify a feasible alternative that eliminates or minimizes adverse impacts, the lead agency may want to consider the alternative as the proposed action. SEQRA also requires that the range of reasonable alternatives include the "no-action" alternative. (6 NYCRR § 617.14(f)(5)) More guidance on alternatives that reduce or eliminate impacts in the various technical areas is found in Section 600 of each technical analysis area (Chapter 3), and a general discussion of alternatives is provided in Section 3U.

241.7. *Completion of the DEIS*

For actions proposed by private applicants, a Preliminary Draft Environmental Impact Statement (PDEIS) is prepared by the applicant and submitted to the lead agency. The lead then reviews the PDEIS for adequacy, accuracy, and completeness with respect to the scope of work. If necessary, the lead comments on issues that were not adequately addressed. The applicant can then revise the document accordingly. This review continues until the lead agency determines that the PDEIS is complete and ready for public circulation and comment.

242. *Notice of Completion*

When the lead agency deems the DEIS to be complete, it prepares a *Notice of Completion* in accordance with section 6-10(a) of Executive Order No. 91. This Notice describes the action, its potential impacts and effects and specifies the period of public review and comment. This notice, and the draft EIS, is filed with or distributed to the following:

- Mayor's Office of Environmental Coordination (OEC).
- Commissioner of the New York State Department of Environmental Conservation. The Notice of Completion is filed for publication in the *Environmental Notice Bulletin.*
- Region II Office of the New York State Department of Environmental Conservation at Long Island City, Queens, NY.
- Borough President.
- Lead agency.
- Applicant, if any.
- All involved agencies.
- All persons who have requested the Notice or Draft EIS. In the case of the Draft EIS, the agency may charge a fee to cover copying costs.
- Appropriate community boards and borough boards.
- In the case of actions in the Coastal Zone, the New York State Secretary of State (162 Washington Avenue, Albany, NY 12231).

The DEIS is also available for inspection at the lead agency's office. In addition, a copy is often placed in a local library for public reference.

250. PUBLIC REVIEW

Publication of the DEIS and issuance of the Notice of Completion signal the start of the public review period. During this time the public may review and comment on the DEIS either in writing or at the public hearing, which must be convened for the purpose of receiving such comments. The comment period must extend for a minimum of 30 days.

The lead agency must hold the CEQR public hearing no less than 15 days or more than 60 days after the filing of the DEIS, except when a different hearing date is required as appropriate under another law or regulation. For example, for actions pursuant to the City's Uniform Land Use Review Procedure (ULURP), section 6-10 (c)(4) of CEQR provides that the public hearing conducted by the appropriate community or borough board and/or the City Planning Commission on the ULURP application shall satisfy the hearing requirement under CEQR for the Draft EIS However, the lead agency under CEQR must conduct the CEQR hearing, even if this hearing is held simultaneously with a ULURP hearing. The lead agency must also publish all required notices for the hearing (discussed below). Similarly, the CEQR hearing on an application for an approval from the Board of Standards and Appeals (BSA) may be conducted simultaneously with the hearing on other issues even though the hearing may occur more than 60 days after the filing of the DEIS.

The Notice of Public Hearing may be contained in the Notice of Completion, or the lead agency may publish it as a separate document. In either case, the lead agency must publish a notice of the public hearing in the *City Record*, in the *Environmental Notice Bulletin* published by the New York State Department of Environmental Conservation, and in a general circulation newspaper at least 14 calendar days before the scheduled hearing. If published as a separate document from the Notice of Completion, the Notice of Public Hearing should also be distributed to the same parties who received the Notice of Completion of the DEIS (see Section 242, above).

The public is invited to send written comments to the lead agency, with a minimum of 30 days to comment on issues related to the environmental review. Written comments are accepted for a minimum of 10 days after the hearing (see 6 NYCRR § 617.8(d)(3)). All substantive comments received at the hearing become part of the CEQR record and are typically summarized and responded to in the FEIS.

260. PREPARATION AND PUBLICATION OF FINAL ENVIRONMENTAL IMPACT STATEMENT (FEIS)

261. Preparation of the FEIS

After the close of the public comment period for the DEIS, the lead agency prepares, or causes to be prepared, a Final EIS (FEIS). This document consists of the DEIS, copies or a summary of the substantive comments received at the hearing or in writing during the comment period, and the lead agency's responses. Any revisions, including further studies, made in response to comments are set forth. Revisions of the DEIS are typically indicated by marking the revised text in the FEIS. Where differences of expert opinion over the choice of data or methodology arise, the lead agency may provide a reasoned elaboration of why it selects one approach over another. The responses should be sufficient to show that the lead agency took a hard look at the environmental issues raised. The cover page of the FEIS must indicate that it is the Final EIS.

262. Mitigation

Measures that minimize significant adverse impacts to the maximum extent practicable must be identified in the FEIS. If a range of possible mitigation measures for a given significant impact was presented in the DEIS, the mitigation to be used must be selected and disclosed in the FEIS, and its method of implementation described. Certain mitigation measures that require implementation by or approval from City agencies (such as changes to traffic signal timing, which would be implemented by the New York City Department of Transportation) may be conceptually accepted by that agency before inclusion in the FEIS or findings. In the absence of commitment to mitigation or when no feasible mitigation measures can be identified, the potential for unmitigated or unmitigatible significant adverse impacts must be disclosed.

263. Notice of Completion

Once the lead agency determines that the FEIS is complete, it issues a *Notice of Completion*, describing the FEIS, the action, and how to obtain copies of the FEIS. This notice and a copy of the FEIS are then filed with the same persons who received copies of the Notice of Completion for the DEIS, as well as any new interested agencies that may have participated. In the case of actions in the Coastal Zone, the New York State Secretary of State must also receive a copy of the FEIS.

270. AGENCY FINDINGS

Before the lead agency makes a decision on an action that has been analyzed in an FEIS, it must allow at least 10 days for consideration of the FEIS, pursuant to SEQRA. Then, to demonstrate that the responsible City decision-maker has taken a hard look at the impacts and alternatives or mitigation measures, the lead agency adopts a formal set of written *findings*, drawing its conclusions about the significant adverse environmental impacts of the proposed action and how to avoid or mitigate them. Written, formal findings must be adopted by the responsible decision-makers of the lead agency before the agency may fund, approve, or undertake its action. The findings conclude the CEQR process. This findings document must set forth the following points:

1. The agency has considered the FEIS.
2. All CEQR/SEQRA requirements have been met.
3. Consistent with social, economic, and other essential considerations of State and City policy, from among the reasonable alternatives, the proposed action is one that minimizes or avoids significant adverse environmental effects to the maximum extent practicable, including the effects disclosed in the relevant Environmental Impact Statement.
4. Consistent with social, economic, and other essential considerations, to the maximum extent practicable, adverse environmental effects revealed in the FEIS will be minimized or avoided by incorporating as conditions to the decision those mitigative measures that are identified as practicable.
5. The facts and conclusions in the FEIS relied upon to support the agency's decision and the social, economic, and other factors and standards that formed the basis of its decision.

In addition to the lead agency, all involved agencies must adopt CEQR findings before making final decisions regarding their discretionary actions. Each agency is responsible for adoption of its own findings. Such CEQR findings must be filed with all involved agencies and the applicant, if any, at the time the findings are adopted.

280. ACTION

Once the lead agency gives notice of the adoption of its findings, the CEQR process is concluded and the agency may then take its action, unless additional procedures are required under other laws.

290. TIMETABLE

To guide the CEQR process, the CEQR Rules of Procedure provide timetables for completion of the applicable steps.

Review under CEQR should be undertaken as early as possible in the formulation of a proposal for an action. An agency may, however, conduct environmental, engineering, feasibility, and other studies and preliminary planning and budgetary processes necessary to the formulation of an action without first beginning the CEQR process. (6 NYCRR 617.3(c)) Environmental review must begin before these or any other activities commit the City to engage in or approve an action. Typically, review begins at the stage of early design or, in the case of City projects, at the planning stage. Review also generally begins upon receipt of an application for a permit or other discretionary approval. In the case of public agency projects, an environmental assessment is not required until the specifics of the action are formulated and proposed. The CEQR process must be completed before any action is taken.

Time limits appear in both SEQRA and CEQR. In general, where a time limit establishes a maximum time in which to accomplish a task specified in the rules, such maximum may be extended for the purpose of ensuring a full assessment (see 6 NYCRR 617.3(m)). Also, where City procedures (such as ULURP) require a longer timetable, the CEQR timetables may be extended. Where a time limit is specified as a minimum time period that must expire before the succeeding step in the CEQR process may be taken, as for example, where notice to the public must be given before an action may be taken, the lead agency should follow the prescribed procedure. The time limits are as follows:

1. Establish lead agency: CEQR rules do not specify a maximum time period in which the lead agency should be established. Generally, the maximum period provided in the SEQRA rules of 30 days from the agency's notification of its intent to be lead, except if contested, is followed. (6 NYCRR 617.6(c)) Notice of change in lead agency must be given by the new lead: Maximum of 10 days from transfer. (Rules of Procedure § 5-03(i))
2. Determine significance (Filing of Notice of Determination): If there is a private applicant, maximum of 15 days from notification of completion of the application—EAS and other reasonably necessary information. (Executive Order No. 91, § 6-07(a)) If there is no applicant, as early as possible.

3. Scope: Draft scope to be published in a maximum of 15 days following determination of significance. (Rules of Procedure § 5-07(a))
4. Other scoping time frames: The lead agency must publish notice not less than 30 nor more than 45 days prior to public scoping meeting that a DEIS will be prepared; the lead agency must circulate the draft scope and EAS as provided in the Rules of Procedure not less than 30 days nor more than 45 days prior to public scoping meeting; written comments on the scope may be received up to 10 days after the scoping session; within 30 days after the public scoping meeting, the lead agency shall issue a final scope. (Rules of Procedure 5-07)
5. Prepare Draft Environmental Impact Statement: As needed for studies.
   Determine completeness of the DEIS: The City's rules do not specify a maximum period. Generally, the lead agency follows the State SEQRA rules, which allow 30 days to determine completeness and adequacy of DEIS or to specify reasons for unacceptability. For complex EISs, 60 days is allowed if applicant is notified in the first 30 days. (6 NYCRR 617.8(b))
6. Public comment and hearing: The hearing must be held no less than 15 days and no more than 60 days after the filing of the DEIS. Written comments must be accepted for at least 10 days after the public hearing; the comment period must last at least 30 days. (Executive Order No. 91 § 6-10(c))
7. Prepare Final Environmental Impact Statement, determine completeness, and file Notice of Completion: Maximum of 30 days from the close of the public hearing. (Executive Order No. 91 § 611(a))
8. Consider completed FEIS before making findings and taking action: Minimum of 10 days from filing of Notice of Completion of FEIS. (6 NYCRR 617.9(a))
   Written Findings: The City rules do not specify a maximum period. Generally, for actions involving an applicant the lead agency makes its findings within the maximum of 30 days from Notice of Completion provided in the SEQRA rules. (6 NYCRR 617.9(b))

300. Fees

Pursuant to the Rules of the City of New York (Title 62, Chapter 3, Subchapter A), the City lead agency charges a fee to a private applicant to recover the costs incurred in reviewing the EAS, DEIS, and FEIS of an action that an applicant requests from the agency. The fee is payable upon filing Parts I and II of the EAS with the lead agency (or an agency that could be the lead). The CEQR fees are computed in accordance with 62 RCNY § 3-01, and the schedule of fees is listed in the EAS form.

400. Specialized Environmental Impact Statements

There are two variants on the general pattern of Environmental Impact Statements: the Programmatic or Generic EIS and the Supplemental EIS. Each of these EISs is subject to the same review procedures as other EISs, including a Positive Declaration, scoping, a Draft EIS and Notice of Completion, public review period, a Final EIS and Notice of Completion, and written findings.

410. GENERIC OR PROGRAMMATIC EIS

Generic or Programmatic Environmental Impact Statements are used for broad actions with diffuse but potential significant environmental effects. These include the following types of actions: (1) a pattern of separate actions in the same geographic area that, if considered separately would pose insignificant effects, but taken together have a significant impact; (2) a sequence of actions taken by a single agency that have common or related consequences; (3) separate actions that have generic or common impacts; (4) a program or plan having wide application or restricting the range of future alternative policies or projects. (6 NYCRR 617.15) These sorts of actions can be studied by a Generic Environmental Impact Statement.

The Generic or Programmatic EIS is useful when the details of a specific impact cannot be accurately identified, as no site-specific action has been proposed, but a broad set of further actions is likely to result from the agency's action. The GEIS follows the same format as the EIS for a more specific action, but its content is necessarily broader. Lead agencies should also be aware that further discretionary actions under the program studied in the GEIS will require further review under CEQR. It is possible, however, to tier a subsequent EIS for a site-specific action on the foundation of the Generic or Programmatic EIS. Since the Generic or Programmatic EIS would have established the analysis framework, the subsequent supplemental EIS need only target the specific narrow impacts associated with the subsequent action.

Most comprehensive planning programs, new development programs, promulgation of new regulations, and revisions to such broadly applicable actions, are candidates for a Generic or Programmatic EIS.

420. SUPPLEMENTAL EIS

The Supplemental EIS is a flexible tool in the CEQR process. It is used to supplement, update, or amend a previously prepared and circulated DEIS, FEIS, or Generic EIS. It provides decision-makers, interested agencies, and the public with information about impacts not previously studied.

The Supplemental EIS is used when: (1) changes are proposed for the project that may result in a significant adverse environmental effect not anticipated in the original EIS; (2) newly discovered information arises about significant adverse effects that was not previously analyzed; and (3) a change in circumstances arises that may result in a significant adverse environmental effect not anticipated in the original EIS. In considering the need to prepare a Supplemental EIS, the agency should weigh the importance and relevance of the information, its probable accuracy, and the current state of information in the EIS. (6 NYCRR 617.8(g))

The need for a Supplemental EIS may become apparent after the acceptance of the DEIS and up to the time that agency findings are filed, following the completion of the FEIS. Supplemental EISs may also be prepared after findings have been made if changes are proposed for the project, but before the project is implemented. They are never prepared after the project is implemented. Supplemental findings statements may be necessary.

The scope of the Supplemental EIS is quite narrow. It specifically addresses only those issues that the lead agency determines were not adequately covered before. The Supplemental EIS may be used for changes an applicant proposes to a project already approved following an EIS, or for an approved project's future phase that could not have been studied previously for lack of data or other reasons.

C. CEQR'S Relationship with Other Approval Procedures

100. City Procedures

The CEQR review of actions may require coordination with other City procedures. These are briefly described below.

110. UNIFORM LAND USE REVIEW PROCEDURE (ULURP)

Applications for City actions that must be reviewed pursuant to ULURP are filed with the Department of City Planning. For private applicants, DCP serves as the lead agency in CEQR for projects under ULURP; the Department of City Planning also serves as lead for some other City actions in ULURP (see Section 5-03 of the CEQR Rules for the exceptions). If DCP is not the lead agency in a ULURP action, the lead agency should forward copies of completed CEQR documents and determinations to DCP's Environmental Assessment and Review Division in advance of the requested certification date. ULURP's timetable for decision-making begins once an application is certified as complete. This ULURP certification must be accompanied by a Negative Declaration, a Conditional Negative Declaration, or a DEIS and Notice of Completion. The New York City Charter establishes time periods for each step in the ULURP process. Sections 197-c and 197-d should be consulted for the purpose of coordinating CEQR with ULURP.

Additionally, City actions being considered in ULURP are also considered relative to the City Planning Commission's "Criteria for the Location of City Facilities," and this assessment can be coordinated with the CEQR analyses (see Section 150, below).

120. BOARD OF STANDARDS AND APPEALS

Certain special use permits and variance applications are decided by the Board of Standard and Appeals. Where an appeal is from a discretionary City action that has already complied with the CEQR procedures, the Board acts in a quasi-judicial function and is not subject to CEQR. However, when the application is made to the Board initially, then CEQR applies to such actions and the normal CEQR process is required prior to the Board action.

130. WATERFRONT REVITALIZATION

New York City has adopted a Waterfront Revitalization Program pursuant to the New York State Waterfront Revitalization of Coastal Areas and Inland Waterways Act (Sections 910-921 of the New York State Executive Law). The City Planning Commission serves as the City's Coastal Commission under the Waterfront Revitalization Program. Actions that are subject to ULURP are reviewed by the City Planning Commission in its capacity as the Coastal Commission for their consistency with the Program's 56 policies. Discretionary actions subject to CEQR and occurring within the Waterfront Revitalization Program boundaries are to be reviewed by the lead agency for consistency with the Program's policies. Environmental review of actions involving Federal or State agencies within the Program

boundaries provides for coordination initially through the OEC.

140. EMINENT DOMAIN (CONDEMNATION)

When New York City condemns private property for a public purpose, the decision by a City agency to act by eminent domain is an action subject to CEQR. The New York State Eminent Domain Procedure Law, adopted one year after SEQRA, overlaps with CEQR in requiring that environmental effects be identified. The CEQR public hearing may serve the same purpose as the hearing required under the Eminent Domain Procedure Law, Section 204(B).

150. FAIR SHARE CRITERIA

The City Planning Commission adopted criteria, pursuant to the New York City Charter, to guide the siting of City facilities so as to further the fair distribution of the burdens and benefits associated with such facilities among the communities of the City. The City Planning Commission considers these criteria, referred to as the "Criteria for the Location of City Facilities," in acting on site selection and acquisition proposals subject to ULURP and in the review of City office sites pursuant to section 195 of the Charter. Sponsoring agencies also observe them in actions that do not proceed through ULURP, such as City contracts, facility reductions, and closings. Although the Criteria for the Location of City Facilities and CEQR criteria overlap to some extent and both processes include procedures for the participation of the public, the Criteria for the Location of City Facilities raise different issues and require a different perspective. For example, siting of a facility in an area where similar facilities are located may avoid a neighborhood character impact for CEQR purposes but raise issues as to fair distribution under the Criteria for the Location of City Facilities. Where an action requires both an environmental assessment and a "Fair Share" analysis, an applicant or lead agency may find it helpful or efficient, with respect to the required analyses and procedural steps, to incorporate the "Fair Share" analysis in the CEQR analysis, but this approach is not a requirement of either CEQR or the Criteria for the Location of City Facilities.

200. CEQR-SEQRA Coordination

All State agencies taking actions in New York City must follow SEQRA. When a State agency is an involved agency, SEQRA rules apply to its determinations.

300. CEQR-NEPA Coordination

Federal agencies undertaking actions in New York City must comply with NEPA. The New York SEQRA regulations in Section 617.16 provide for coordination of environmental assessment provisions in New York with those required under NEPA for Federal agencies. The City and Federal decisions on the same project are independent of each other. Thus, a Federal decision not to undertake environmental review or to prepare an EIS does not automatically support or require a similar decision by the City.

NEPA's regulations provide for a process to coordinate the Federal and State and/or City procedures to achieve savings of time and money and to avoid duplicative procedures. These are published as Section 1506.2 of volume 40 the Code of Federal Regulations. Federal agencies must cooperate with City agencies "to the fullest extent possible to reduce duplication between NEPA and State and local requirements," by such means as (1) joint planning processes, (2) joint environmental research and studies, (3) joint public hearings, and (4) joint environmental assessments. Typically, the City agency enters into a written Memorandum of Understanding with the relevant Federal agency to establish the terms of this collaboration. Joint studies, however, cannot oblige each agency to make the same decision. Each must meet its separate CEQR or NEPA and other statutory obligations.

Chapter 2

ESTABLISHING THE ANALYSIS FRAMEWORK

A. Defining the Action for the Environmental Analysis

100. Categories of Actions

CEQR requires all City agencies to determine whether discretionary actions they directly approve, fund, or undertake may significantly affect the environment. There are two broad categories of actions—localized actions, which include site-specific actions and changes in regulatory control for small areas, and generic actions.

110. LOCALIZED ACTIONS

111. Site-Specific Actions

Site-specific actions are those proposed for a specific location; approvals are generally being sought to allow a particular project to proceed. Often, the project is narrowly defined, such as a proposed building that requires height and setback waivers, or a change to the City map for a specific location (e.g., the mapping of a street), or a special permit for a public parking garage, or the granting of a particular franchise. Therefore, the physical characteristics of site-specific actions are usually well-defined. In some cases, however, the physical development or uses permitted by the action may not be synonymous with the proposed project. In these instances, the environmental analysis will identify a reasonable development scenario. This is discussed in 2A, Section 210, below.

112. Changes in Regulatory Controls for Small Areas

Particular projects whose form and shape are controlled by a rezoning or other change in City controls are not considered site-specific, but when the area in question is small, the environmental analysis can be specific and is thus similar to that of a site-specific proposal. A change in regulatory controls for a site or small group of specific sites allows a range of development scenarios to occur. Examples of such changes include:

- Rezoning of a block or several blocks.
- Designation of an urban renewal area, or approval, alteration, or amendment of an urban renewal plan.
- Zoning text amendment(s) or changes to Special Districts affecting a limited number of geographic areas.

This kind of action is proposed most often in two circumstances: (1) as part of the continuing planning process undertaken by a City agency; and (2) as the regulatory framework that allows a particular project to proceed. Even if a particular project is proposed, this type of action usually affects an area larger than that project site. In either case, the action has different environmental implications from site-specific actions: it changes the development potential of a site or sites. If approved, the change in regulations would allow development of a new type, use, form, or density that may not be subject to its own site-specific environmental review.

120. GENERIC ACTIONS

"Generic" actions are programs and plans that have wide application or affect the range of future alternative policies. Usually these actions affect the entire City or an area so large that site-specific description of analysis is not appropriate. Examples of generic actions undertaken in the City include:

- Citywide rezonings.
- Zoning change in many neighborhoods, such as Quality Housing.
- Citywide programs or master plans, such as the Department of Sanitation's master plan for solid waste management, the Department of Environmental Protection's land-based sludge management plan, or the Mayor's Office's plan for transitional housing.
- Text changes to the Zoning Resolution that may affect a wide area.
- 197-a plans.
- Regulatory changes, local legislation, and changes to the City Code.

Some generic actions, such as rezonings, alter the scope of future ministerial actions. Once the generic action is approved, then actions that occur as a consequence of the decision may be as-of-right and would not require further CEQR review. Other generic actions, such as public construction or land acquisition programs, may contemplate future specific actions that are discretionary and do require further CEQR review. In both cases, the generic environmental assessment may be an important planning tool. It allows the agency to identify the range of impacts that could occur and to *build into the plan or program* the appropriate mitigation, thus ensuring that future actions arising from the plan or program do not have the potential for significant impact, whether or not they are subject to further CEQR review. (For more information on generic assessments, see Section 1B.410.)

200. Identifying the Project Characteristics for Analysis

Whatever the proposed action, the first step in its environmental assessment is to define the case to be examined. Without some definition, no predictions can be made as to the action's results. The amount of detail needed to make that prediction depends on the type of action and its expected impacts. The definition also serves to inform all interested and involved persons and agencies about the proposal.

210. LOCALIZED ACTIONS

211. Site-Specific Actions

Because these are generally actions proposed to facilitate particular projects, site-specific actions are usually simplest to define. When the physical development or uses permitted by the action are synonymous with the project, the first step is to present the location and physical dimensions of the project. Generally, the action should be described in some detail, including proposed uses, site plan, design approach, and appearance of the proposed buildings, as appropriate. Depending on the nature of the impacts expected, more detail may be required about certain aspects of the project. For example, projects in historic districts or involving changes to historic buildings would require a more detailed explanation of the proposed architectural features, since an important aspect of the analysis would be any changes to the existing architectural context. Timing and schedule of the project, including construction and operation phases, should also be described.

In some cases, however, the physical development or use permitted by the action differs somewhat from the project. In these instances, a likely, reasonable scenario is chosen for analysis. From the range of possible scenarios that are reasonable and likely on the site, the one with the worst environmental consequences should be chosen for analysis. More information on choosing such a scenario is provided below in 2A, Section 212.

212. Changes in Regulatory Control for Small Areas

Unlike site-specific projects, changes to regulations allow subsequent future projects as yet undefined that may not require a site-specific CEQR review. The environmental assessment must consider the change in development potential for the site(s). Thus, although the physical form of the project is unknown, its potential characteristics must be identified for the analysis. This is done by predicting likely, reasonable scenarios that could result if the approval is granted. From this range of realistic, reasonable scenarios, the one with the worst environmental consequences should be chosen for analysis. This will be referred to as the "reasonable worst-case scenario" throughout this Manual. This way, regardless of which scenario actually occurs, its impacts would be no worse than those considered in its environmental review. It is possible that the worst case could be two different scenarios for two different technical areas: for example, for a commercial zoning proposal, commercial/office use would generate the highest number of trips; residential use would generate demands on local schools and publicly accessible open spaces. In this case, if both scenarios are reasonable, two analysis scenarios should be examined.

When a specific project is part of the proposal, this project should be delineated, but it will not necessarily constitute the worst case for CEQR purposes. Generally, a specific project that requires rezoning can stand as the worst case for environmental assessment under the following circumstances:

- *It is itself the worst case of the range of development scenarios.* As an example, if an applicant seeks a special permit that would allow 50 parking spaces on a site because he/she plans to construct a 50-space parking lot, the action and the reasonable worst case would be the same.

- *Other, more environmentally damaging cases would be permitted under the zoning, but can be shown to be unlikely or infeasible in the circumstances.* Some factors or circumstances that could make a development scenario unlikely or infeasible include site conditions—constraints created by the configuration of the parcel, location of streets, or

subsurface or topographical conditions; market conditions; adjacent uses and conditions, which could affect market perception and demand, particularly if they are incompatible with the proposal; and what type or density of development or activity is typical in the particular area and borough. Take as an example an application in Manhattan for a rezoning from M1-6 to C4-7. Both districts permit office development at an FAR of 10, but the M1-6 district provides for an as-of-right plaza bonus to an FAR of 12, which is not available in the C4-7 designation. In fact, the applicant requires the rezoning to develop a proposed mixed-use, primarily residential building (residential use is not permitted in the M1-6 district). For issues of traffic and air quality, an office building permitted under C4-7 would be the "worst case." However, it is clear that since the office option is now available to the property owner under the current M1-6 zoning (and with 20 percent more floor area), but has not led to such development, full office development under the new zoning is not a *reasonable* scenario. The proposed zoning change would produce new development, but it would have to contain a substantial proportion of residential use to be reasonable in the circumstances. Thus, the other, more environmentally damaging case permitted under the proposed zoning is unlikely by the year the action would be completed in the circumstances and the specific project proposed can stand as the worst case for the environmental assessment.

- *Additional actions or controls would restrict development to the specific project.* These actions might include restrictive declarations, certain special permits, leases or other agreements between the project sponsor and the City, and design and use restrictions under urban renewal plans. For example, if an applicant seeks a large-scale permit that would use less than the maximum floor area permitted by the underlying zoning, but in a different building envelope than the zoning allowed, the large-scale permit would specify the use, floor area, building footprint, bulk, height, and setbacks for each planned building, as well as the location and amount of open space and parking. In this case, the action and the reasonable worst case are the same.

Although the reasonable worst-case scenario is often hypothetical, it must have enough detail to allow analysis, like the site-specific proposals. It must discuss the buildings that could be built on the site in terms of their square footage, use, height, and bulk, and, as above, provide more information if needed for any one technical area. Where specifics are needed for a particular analysis and the reasonable worst-case is hypothetical, determining these specifics should be subject to the same approach as described above. As an example, on a proposal where residential use has been determined to be the reasonable worst case, it may be necessary to estimate the number of apartments. For trip generation in the transportation analysis, since trips are estimated on a per-unit basis, the number of units assumed should be the greatest that could conceivably fit in the hypothetical building and conform to zoning regulations; i.e., many small units would be assumed for the analysis. However, if it is clear that very small units are not the norm in the neighborhood and not likely to be marketable, fewer, larger units can be assumed. For this same project, however, the analysis of impacts on schools would be most conservative if larger apartments were assumed. Two different apartment counts and types that represent points in a reasonable range of scenarios can be assumed for the two different analyses.

220. GENERIC ACTIONS

For generic actions, specific details about the kind of development that might reasonably be expected are often not available, or considering each particular site that could be affected would be redundant or impossible because of the scale of the project. The description of the proposed action focuses on the approval or proposed program that triggers CEQR and its logic and rationale. The description can also include, as appropriate:

- "Typical" cases, i.e., several descriptions similar to those in a localized action for cases that can reasonably typify the conditions and impacts of the entire proposal.
- A discussion of the range of conditions under which the action(s) may take place, so that the full range of impacts can be identified.

B. Identifying Project Purpose and Need

All proposed actions originate in a planning process of some sort and are intended to fulfill certain goals, objectives, or mandates. Often, proposals are designed to meet public policies. Both the EAS and EIS require a statement of the project's purpose and need—the planning impetus behind the proposal. Knowledge of the project's objectives also allows definition of appropriate alternatives to the action.

100. Purpose and Need for Publicly and Privately Sponsored Actions

The purpose, or objectives, of and need for the project should be explained clearly at the beginning of the EAS or EIS. Knowledge of the need for a project, and the goals it is intended to achieve, assists decision-makers in determining whether the project should be approved. This statement of objectives or purpose should be framed in terms of how the action meets public needs and responds to public policies.

Proposals by private applicants can also be framed in terms of how they meet public policies or needs. This approach is particularly appropriate if a site is underused in terms of the public policy that applies to it, and the applicant can demonstrate that the proposal would make the best use of the site while meeting the policies.

200. Project Objectives and Their Role in Defining Alternatives

Defining the project's objectives is also important because it can help define the range of alternatives analyzed in the EIS. The lead agency must consider whether any feasible alternatives to the project, considering the project's goals, can reduce impacts. To warrant consideration, alternatives must be "reasonable," achieve the same or similar objectives of the project sponsor, have relatively the same or reduced impacts, and be implementable in a similar timeframe to that of the project. "Reasonable" alternatives are those that are feasible, regardless of whether the applicant intends to pursue them. (Choosing reasonable alternatives is discussed in Section 3U, below.)

C. Defining Analysis Conditions

Once the action has been defined, its effects on its environmental setting can be considered. Regardless of the documentation required (EIS or EAS), the technical area being assessed, or the complexity of the analysis, it must be conducted in a particular way. For each technical area in which impacts may occur, the assessment includes a description of existing conditions; a prediction of the future, without the action, for the year that the action would be completed; and a prediction of the future for the same year with completion of the action. Comparing the two future scenarios identifies the action's impacts on its environmental setting. For each technical area being assessed, this same framework must be used.

100. Choosing the Analysis Years

CEQR requires analysis of the action's effects on its environmental setting. Because the proposed action, if approved, would take place in the future, the action's environmental setting is not the current environment, but the environment as it would exist at project completion, in the future. Therefore, future conditions must be projected. This prediction is made for a particular year, generally known as the "build year." The build year is the year when the action would be substantially operational, since this is when the action's effects would begin to be felt, and when mitigation of project impacts would have to be in place.

It may be that the build year for a given action is uncertain. This could be the case for some generic actions or for small area rezonings, where the build-out depends on market conditions and other variables. In this case it is prudent to select, from the range of reasonable timing scenarios, the one that represents the worst case environmentally. Often, an earlier year is considered most conservative in terms of air quality. As time passes, older vehicles with poorer or no emission controls drop out of the basic mix of vehicles on the road to be replaced by new cars with strong emission control systems. Therefore, analysis in an earlier year would be most likely to yield the most conservative results. In addition, where impacts requiring mitigation are identified, it is important to be sure that the mitigation will be in place when the project impacts are felt—hence, another reason to select an earlier build year. However, in an area that is expected to see substantial development over the near future, it may be most appropriate to choose a later build year from the reasonable range, so that the analysis can address the increases in traffic and other activities resulting from that development in considering project impacts.

For phased projects, in addition to the final build year, when the entire project is completed, interim build years are also assessed—the first full year after each phase is completed. Large-scale projects to be constructed over a long period, with operation or occupancy of the different elements as they are completed, are also assessed with interim build years. Typically, one interim year is chosen, usually based on an estimate of the year when a critical mass of the anticipated development would be complete or when enough development to produce impacts requiring mitigation would have occurred.

200. Defining the Study Area

For each technical area in which an impact may occur, whether land use, traffic and transportation, or natural resources, a study area must be defined for analysis. This is the geographic area likely to be affected by the proposed action for a given technical area, or the area in which impacts of that type could occur. Appropriate study areas differ depending on the type of impact being analyzed. For visual character, for example, possible impacts generally do not extend beyond the area in which the project can be seen, while for traffic, worsened traffic conditions can occur at intersections some distance away. Often it is appropriate to use primary and secondary study areas: the primary study area is closest to the project site and therefore most likely to be affected; the secondary study area is farther away and receives less detailed scrutiny. Generally, the primary study area is most likely to be more directly affected by the action, and those effects can be predicted with relative certainty, while the secondary study area may experience indirect effects, such as changes to trends. Discussions of each technical area and the methodology for choosing an appropriate study area are provided in Chapter 3. For a given technical area, the same study area is used for the assessment of existing conditions, the future without the project, and the future with the action in place.

300. Existing Conditions

The first step in the analysis of the environmental setting of the project is to describe current conditions. This must be performed for any technical areas (i.e., land use, traffic, noise, etc.) that may be affected by the project. The issues to be discussed are identified initially for an EAS or during the more formal scoping process for an EIS, and differ for different kinds of actions. An analysis does not need to be prepared for technical areas in which the action cannot reasonably be expected to have impacts. For example, for a proposal in central Midtown Manhattan, discussion of coastal policies would not be needed. More information on each technical area and when it must be analyzed is provided in the discussions of technical areas below in Chapter 3.

The assessment of existing conditions establishes a baseline, not against which the project is measured, but from which future conditions can be projected. The prediction of future conditions begins with an assessment of existing conditions because these can be measured, observed, and otherwise tested in the field.

In addition to observations, assessment of existing conditions requires data from other sources (such as the census, for example), and, for some technical areas, use of mathematical computation or modeling. Timeliness of data is also important. Ordinarily, this is not a problem, but can be if the review process becomes elongated because of changes in the proposal or other difficulties encountered during the approval process.

When performing studies of existing conditions, the "reasonable worst-case" conditions are generally selected for examination. For example, for traffic, the periods when the greatest number of new vehicular, pedestrian, and transit trips to and from the site would occur are predicted. This could be on weekdays, 8 to 9 AM and 5 to 6 PM, as at a typical office building; or on a weekend, Saturday 1 to 2 PM, as at a shopping complex. Then, the project impacts are assessed for those peak times, to determine what might be the worst possible effects of the project that might reasonably occur. Sometimes it is appropriate to consider the action's peak periods in combination with the peak background period—for example, if an action's greatest number of trips to and from the site would occur between 8 and 9 AM, and the "rush hour" in the area is from 7 to 8 AM, the action's peak could be considered as if it occurred simultaneously with the area rush hour. In other cases, combining these peaks is *too* conservative and therefore is not reasonable—such as if the action's greatest number of trips would occur between 1 and 2 PM, but the area rush hour occurs from 7 to 8 AM. In that case, the peak hour would be selected based on the most conservative conditions anticipated with the project: if the peak baseline period (7 to 8 AM) is extremely sensitive to even slight changes in traffic, then it would be considered in the analysis; if the peak period for the project (1 to 2 PM) is great enough that a traffic (or air or noise) impact could be reasonably expected, then this period would serve as the peak period for analysis. It is not uncommon in this situation to select *both* periods for analysis, if the specific situation warrants it.

400. Future Without the Proposed Action (No Action Condition): Baseline Condition(s) for Impact Analysis

The existing environmental setting is used to project future conditions without the proposed action. This prediction is made for the year the action would be completed (the "build" year, discussed above under 2C, Section 100, "Choosing the Analysis Years"), using the data about existing conditions together with information about expected future growth and developments. The scenario of the future without the proposed action, often

referred to as the "no action" or "no build" condition, provides a baseline condition against which the incremental changes generated by the project can be evaluated. This sets the context in which to assess impacts. For a phased project, the no action conditions are assessed so that the accumulating increment of the project phases can be disclosed. This means that the no action case does not contain any part of the project. For example, a two-phased project is proposed with build years 5 and 10 years hence. The future without the project/no action condition would present conditions 5 and 10 years in the future always without the project. The no action condition for the second phase would *not* contain the project's first phase.

The future without the project in a generic analysis would be constructed similarly to that of a site-specific project, although it may not be possible to present specific or quantified estimates of changes over wide areas. Emphasis would be on trends and policy. However, the rationale that applies to the concept of the impact analysis—comparing the *future* without the project with the future with it—applies equally to site specific or generic assessments.

For environmental impact statements, the no action condition also appears in the examination of alternatives, since a "no build" or "no action" option must always be available to the decision-maker. The no action alternative compares the significant adverse impacts and benefits of the project to future conditions without the project.

Using existing conditions as a baseline allows the prediction of the future to a certain level of accuracy. All together, the no action analysis takes the existing observed condition and adds to it known or expected changes to arrive at a reasonable estimate of the future. The kind of information that may be factored into a no action scenario includes:

- *Expected development*. For many technical areas, it is important that the no action analysis accurately incorporate known development projects that are likely to be built by the completion date of the proposed action. This includes developments that are under construction, planned, and proposed, collectively termed "no build projects." Sometimes, projections of development on "soft sites" are also appropriate—soft sites are sites where development is not proposed or planned, but can reasonably be expected to occur within the proposal's time frame. Examples of soft sites are properties that are underbuilt with respect to their zoning in areas where development demand is high. Some general indicators of soft sites are sites that are developed to less than 50 percent of their permitted floor area, houses of worship, vacant land, parking lots, gas stations, and one- and two-story freestanding retail. However, each context is different and these general indicators may be less applicable in some areas than others. The no action analysis is *not* equivalent to the maximum development capacity, but to the future development that can reasonably be expected to occur within the proposal's timeframe, given market conditions, development trends in the area, etc.

- *Growth factors*. In addition, no action analyses of some technical areas, such as traffic, can employ a background growth factor to account for a general increase expected in the future. Such growth factors may also be used in the absence of known development proposals. More information on no action analyses for each technical area is found in the technical sections of this Manual.

- *Other expected changes*. No action analyses also must consider any other future changes that will affect the environmental setting, such as changes in technology. For example, an increase in the proportion of vehicles with pollution controls affects carbon monoxide concentrations, and this is accounted for in the air quality analyses. Other examples of changes to be considered include roadway improvements, implementation of recycling, and changes to such City policies as zoning regulations.

Because of the difficulty in precisely predicting the future, the no action assessment can present a range of possibilities and describe the likelihood of their occurrence.

500. Future with the Proposed Action (Build Condition): Probable Impacts Analysis

Finally, the future with the proposed action, also known as the "build" or "action" condition, is assessed and compared with the no action scenario. This assessment is performed for the same technical areas, using the same study areas, as the existing and no action assessments.

510. PREDICTING PROJECT INCREMENTS

For most technical areas, the projection of the Build condition involves predicting the numeric increment that the project would add to the no action

condition—the number of new residents, new vehicle trips, new students in the school system, or additional wastewater flows to a water pollution control plant, for example. For other areas, where quantitative predictions are inappropriate—such as land use or neighborhood character—more qualitative assessments of the action's effects are made by comparing conditions if the action is implemented with the no action condition. Methodologies for predicting this information are set forth in Chapter 3.

520. DETERMINING IMPACT SIGNIFICANCE

The next step is to assess whether those changes caused by the project would constitute significant impacts. Significant impacts are substantial changes in environmental conditions. The impacts discussion can focus on the beneficial as well as adverse impacts of the action; in either case, it uses the no action condition as a basis for comparison.

Many technical areas provide thresholds for what constitutes a significant impact; others require a more judgmental and qualitative assessment. Both qualitative and quantitative information is used, where possible, to determine the likelihood that the impact would occur, the timeframe in which it would occur, and its significance. Where no quantitative thresholds exist, a determination of significance must consider magnitude, duration, geographic scope, number of people affected, and irreversibility.

CEQR requires that each probable impact area be given a "hard look"—that is, the environmental review cannot simply acknowledge that there might be an impact; it must consider the likelihood and significance of that impact. Similarly, the environmental review cannot simply dismiss the likelihood of expected impacts occurring without providing reasoning. On the other hand, the analysis should examine only those impacts deemed likely to occur or reasonably anticipated, rather than assess a checklist of every conceivable impact.

The impacts analysis must consider both direct and indirect environmental effects of an action. (These are sometimes called "primary" and "secondary" effects.) Direct impacts are those that occur as a direct result of a proposed action—for example, demolition of a historic building on the site or increased carbon monoxide levels because of project-generated traffic. Indirect impacts are generally wider-range consequences and include such effects as changes in land use patterns that may result from a new development. The analysis must also consider short- and long-term impacts of the action. Short-term impacts are those that happen immediately as a result of the action; long-term impacts are similar to indirect impacts—effects on the character of the community over the long-run, for example. This discussion is related to that of cumulative impacts, described below.

530. CUMULATIVE IMPACTS

In addition to the two future scenarios—no action and action—that address conditions in the action's build year, the assessment must also consider cumulative impacts, where appropriate. Cumulative impacts are two or more individual effects on the environment that, when taken together, are significant or that compound or increase other environmental effects. Generally, they are the long-term impacts (as described above), of either an individual action or a group of actions.

When cumulative impacts are the result of long-range, generic, or programmatic plans, such as changes to zoning regulations, they are best addressed in generic environmental assessments. These assessments can be used for a number of actions in a given area that may have minor effects if considered singly, but when considered together might have significant effects.

D. Impact Analyses—Methodologies and Documentation

100. Overview and Approach to Impact Analyses

The guidance provided in Chapter 3 sets forth for each technical area specific methods for assessing impacts of a proposed action. Unless it is known from the start that a detailed analysis will be required in a given technical area, the guidance leads the analyst through a series of steps with ascending level of detail, aimed at permitting the lead agency to determine whether the potential for significant impact can be ruled out or confirmed. If at any point, this determination can be made, then the analysis is sufficient. The steps of all CEQR technical analyses apply the same approach, as follows:

- The first step is a simple screen or series of questions aimed at determining whether a given technical area assessment is appropriate for a given proposed action.

- The next step is usually a qualitative or semi-quantitative analysis again aimed at determining whether an impact in the given technical area can be ruled out. These analyses are necessarily

conservative—the rationale being that if the proposed action shows no significant adverse impact using simplified but conservative assumptions, a detailed analysis would only confirm this conclusion.

- If a proposed action appears to have some potential for significant adverse impact based on the first two steps, then a more detailed analysis is undertaken. The purpose of this analysis is to be as realistic as possible in making assumptions, so that an impact is neither over- nor underpredicted, and so that, should mitigation be warranted, appropriate, feasible, and workable measures can be developed. At this analysis level it is always appropriate to gather as much project-specific data as possible; where such data are unavailable (or the effort to gather the information appears unwarranted), reasonable, but conservative, assumptions should be made.

- When the analysis identifies that the action would cause a change in conditions, the next step is to determine whether that change would be (a) adverse and (b) significant. In most technical areas, the beneficial and adverse effects are clear. However, in some, more subjective areas, such as neighborhood character or visual quality, a change can be identified, but its quality—negative or positive—is more difficult to determine. For these cases, the lead agency may carefully consider public policy and public comments in addition to the technical studies in determining whether an impact can be considered beneficial or adverse.

- Determining the significance of an impact can also be very difficult. In technical areas where measures and thresholds can be set, either through analysis or practice (air quality, noise, and traffic are good examples), a significant impact can be identified with relative ease. In many other technical areas, significance is more a question of relativity. For these determinations a series of questions that, if answered in the affirmative signal significance, can be used. The lead agency may consider public policy and public comments in determining the significance of an impact.

- Once it is determined that an impact is adverse and significant, mitigation to reduce or eliminate the impact must be considered. The technical analysis of mitigation must be sufficient to allow the lead agency to understand how effective it will be, what effort will be involved in implementing it, and whether it will produce any new significant impacts of its own. Usually, the level of technical analysis required to identify the impact will suffice for the development and assessment of mitigation. Various options for mitigation of a given impact can be presented in the DEIS; in the FEIS, the lead agency must choose from these options the mitigation measures that reduce the impact to the greatest extent practicable. It is CEQR practice that where mitigation is not available, not practical, not implementable on schedule with the proposed action, requires further discretionary actions, or otherwise cannot be guaranteed, then the lead agency must disclose that the significant adverse impact would be unmitigated.

- Where a potential significant adverse impact has been identified, alternatives to the proposed action to reduce or eliminate that impact should also be considered. (As noted in Chapter 1, above, CEQR alternatives are selected from those that meet project objectives.) The analysis of alternatives in the technical area where a significant adverse impact has been identified should contain enough detail to clearly reveal the reduction in impact and reduction in the need for mitigation.

200. Deciding on the Level of Appropriate Documentation

The descriptions of the technical methodologies below do not address the issue of documentation, i.e., whether an analysis is appropriate for inclusion in an EAS or requires an EIS. A very detailed level of analysis may yield the answer that no potential for a significant adverse impact would arise from a proposed action; in this case, the appropriate documentation would be an EAS with a detailed supplemental analysis. On the other hand, a very simple screen may lead to the same conclusion of no significant impact potential for a particular technical area, while in another technical area a significant adverse impact has been identified, requiring all technical analyses to be documented in an EIS. Given the many technical areas to be considered and the difficulty in determining impact significance, the decision on how to document the analyses and how to proceed in CEQR can be complex. The following offers technical guidance to the lead agency in making its determination of significance and deciding on the form and documentation of CEQR review.

210. ACTIONS FOR WHICH AN EAS ALONE IS APPROPRIATE

For many actions, it will be immediately clear that no significant impacts would occur in any of the

technical areas. These are actions whose characteristics fall below the initial thresholds for determining whether more detailed technical analyses are required. The lead agency can rely on the EAS and issue a Negative Declaration.

More detailed analyses can also be prepared to supplement an EAS, without a subsequent EIS. No EIS would be needed if, for each technical area, screening or detailed analyses show that no significant impact would occur, or that any significant impacts could be easily and fully mitigated. In the latter case, if there is an applicant distinct from the lead agency, the lead agency could issue a Conditional Negative Declaration (CND), as described in Chapter 1, above. For a CND to be appropriate, the EAS must provide enough information about the potential significant impact that the mitigation can be readily determined. Further, the mitigation measures must be easily implemented, practical, and assured. For example, a CND would be appropriate where a significant traffic impact is identified if the impact could be mitigated by a simple retiming of traffic lights or lane restriping, provided that this mitigation is fully defined in the EAS and supporting documentation and the CND and that the agency responsible for implementing the mitigation, in this case the New York City Department of Transportation, has agreed in concept to the mitigation measures; written commitment in principle is often appropriate.

It is also possible to issue a CND in instances where more information is needed to fully define the significant impact and precise mitigation, but where the potential impact is well understood, fully disclosed, and easily mitigated. Examples of these circumstances would include actions requiring the excavation of soils near underground gasoline storage tanks or areas with some potential for archaeological resources. In both cases, the full extent of the impact cannot be known without some site excavation. But also in both cases, the range of possibilities (from no impact to gasoline-contaminated soils or the presence of an archaeological resource) are well known, and the potential significant impact and appropriate mitigation measures can be presented to the decision-maker. If, after removing the tanks on site and testing the soils, gasoline contamination is found, the soils are aired, if possible, to allow the gasoline to evaporate, and retested, or removed from the site and disposed of at a landfill certified to receive such materials. For archaeology, a testing program is developed and approved by the New York City Landmarks Commission; this program is usually implemented by the applicant before the start of construction, during site excavation, and it contains agreements on the length of time for testing and, if resources are found, control of the construction work and the recording, handling, processing, and disposition of artifacts. (More information on these specific examples is provided in Sections 3F and 3J.)

220. ACTIONS FOR WHICH AN EIS IS CLEARLY APPROPRIATE

For actions that may result in significant adverse impacts, a Positive Declaration and EIS would typically be most appropriate, except in those cases where the application of a Conditional Negative Declaration is appropriate (see 210, above). For actions that would result in significant adverse impacts that would require substantial effort to mitigate, it is CEQR practice to disclose the impacts and mitigation measures in an EIS.

230. ACTIONS WHERE AN EIS MAY BE MORE APPROPRIATE THAN AN EAS ALONE

In some cases, the decision whether to move ahead with an EIS is not straightforward and is based on considerable judgment. Some examples are as follows:

- As noted above, there may be times when public review and comment present additional information that affects the lead agency's final determination of whether an impact is adverse or significant. Although, in the end, the lead agency may find that the impact is not significant, an EIS procedure may be most appropriate. After public review, however, the lead agency may issue a Negative Declaration if on the basis of the DEIS and comments made thereon, it determines that the action would not have a significant effect on the environment; no FEIS need be prepared.

- Some proposed actions may require many detailed analyses to determine whether potentially significant adverse impacts might occur. An example of such a case might be a waterfront project with underground gasoline tanks, potential traffic and parking effects, potential school shortages, and a potential contextual effect on a nearby historic resource. Although several of these potential impacts can be found through detailed analysis to be less than significant and the others can be mitigated successfully, the lead agency may find that in combination the issues should be disclosed through an EIS. In this type of situation, it might be appropriate and most efficient to decide on an EIS right from the start.

300. When a Document is Complete

The documents for which the lead agency must determine completeness include the EAS, the scoping document, the DEIS, and the FEIS. In all cases, the document is complete when it contains enough information for the lead agency to proceed to the next step in the CEQR process, as follows:

- *EAS.* The lead agency must make a determination of significance based on the contents of the EAS and supplemental analyses, if necessary. If it is readily apparent that an EIS will be required and a Positive Declaration issued, the lead agency can find the EAS to be complete if it contains a project description; identification of the potential environmental issues arising from the proposed action; and documentation, as appropriate, of those areas where a potentially significant adverse impact is *not* anticipated (if appropriate); and a draft scoping document for the EIS.

  To issue a Negative Declaration or a CND, the technical analyses that support the conclusion must also be complete. These analyses must have been undertaken to a level of detail adequate to determine whether a potential for significant impact does or does not exist. Where a CND is to be issued, the analyses must be appropriate to support the recommendation of mitigation and the assurance that such mitigation will be effective and will be implemented.

- *Scoping Document.* The scoping document is first issued as a draft and undergoes review by involved and interested agencies and the public (see Chapter 1). In general, the scoping document should contain a very clear description of the proposed action(s), with enough detail about the proposal and its surroundings to understand the environmental issues. It should set forth in as much detail as possible appropriate study areas and specific methodologies proposed for analysis in each relevant technical area. To the extent that they are known, alternatives to the proposed action should be identified.

  The scoping document is considered complete when the lead agency is satisfied that the description of the proposed action and relevant methodologies are adequate, and comments from the public and other agencies have been addressed as appropriate (either incorporated into the final scoping document or answered in a back-up memo).

- *DEIS.* The DEIS is called a "draft," but it is really a very comprehensive document. The lead agency finds the DEIS to be complete and issues a Notice of Completion when it meets the following criteria:

  1. The document contains a project description that provides enough information so that the reader can understand the basis for technical analyses that follow.
  2. Project objectives and actions required to implement the project are explained clearly.
  3. For each technical area, an analysis of existing conditions, the future without the project, and project impacts has been undertaken to a level of detail adequate to disclose potential impacts for public discussion. For the DEIS, some specific information required to pinpoint mitigation can be left out if the document presents the range of possible impacts and mitigation for public review. An example of this situation would be when enough is known about a site to estimate a worst-case range of hazardous materials that may be present and the impacts associated with different contaminants, and to describe appropriate mitigation for the possibilities, but physical sampling is not yet complete.
  4. Options for mitigation have been presented and assessed. For the DEIS, a range of mitigation can be presented for public review and discussion, without the lead agency having selected one for implementation.
  5. The no action alternative and alternatives that meet project objectives but reduce impacts have been included and assessed to a level of detail so that they can be appropriately compared to the proposed action.

- *FEIS.* The FEIS is considered complete, and the lead agency issues a Notice of Completion when it meets the following criteria:

  1. The FEIS should contain a summary of all reasonable comments on the DEIS, including a list of the commenters, and responses to those comments. Usually this is included as a separate chapter.
  2. The text, figures, and tables of the FEIS should reflect changes made in response to the public review. Usually, the text, figures, and tables are those of the DEIS, with changed passages marked by marginal lines or symbols, so that the reader can readily see where changes have been made. It is also useful to

provide a foreword to the document summarizing the changes made as a result of public review.

3. Mitigation issues should be resolved to the extent possible. If a range of mitigations has been presented in the DEIS, the mitigation selected by the lead agency should be disclosed in the FEIS and its method of implementation described. Where more information is necessary to determine and assure specific mitigation (as in the hazardous materials example, above), it should be provided. If the additional information cannot be provided (for instance, if access to the site is not available for hazardous materials sampling), then the discussions of the DEIS can stand, but the FEIS must be clear as to any possibilities that mitigation could be impractical or unavailable, so that a potential for an unmitigated impact can be disclosed.

Chapter 3

TECHNICAL GUIDANCE

This chapter provides guidance for the range of technical analyses that may be undertaken in the CEQR process, as follows:

- Land use, zoning, and public policy
- Socioeconomic conditions
- Community facilities and services
- Open space and recreational facilities
- Shadows
- Historic resources
- Urban design and visual resources
- Neighborhood character
- Natural resources
- Hazardous materials
- Waterfront revitalization program
- Infrastructure
- Solid waste and sanitation services
- Energy
- Traffic and parking
- Transit and pedestrians
- Air quality
- Noise
- Construction

For each of these areas, this chapter guides the analyst in assessing the existing and future environmental settings, including defining study areas, evaluating existing conditions, predicting future changes, identifying significant impacts, and developing mitigation measures for any significant adverse impacts. Possible assessment methods are explained for each technical area. These methodologies are considered appropriate for assessment of CEQR actions, but are not required by CEQR. Other methodologies also exist and may be used if appropriate. Applicable regulations and coordination and the location of background information are also described for each technical area. It is important to note that the nature of the proposed action will determine which technical areas require analysis, and even how detailed the analysis for a given technical area should be. This is true regardless of the level of documentation being prepared—whether an EAS alone or an EAS followed by an EIS. The type of documentation does not affect the analysis of technical areas; the project does. For example, an action being examined in an EAS may require full traffic and air quality studies in order to determine potential significant impacts. On the other hand, another action, which requires an EIS because of its potential for significant impact on, say, historic resources, might only require traffic and air quality screening analyses in the EIS.

For those actions requiring an EIS, this chapter also describes the types of alternatives that are typically considered, and describes the EIS summary chapters that help focus the conclusions of the technical studies.

A. Land Use, Zoning, and Public Policy

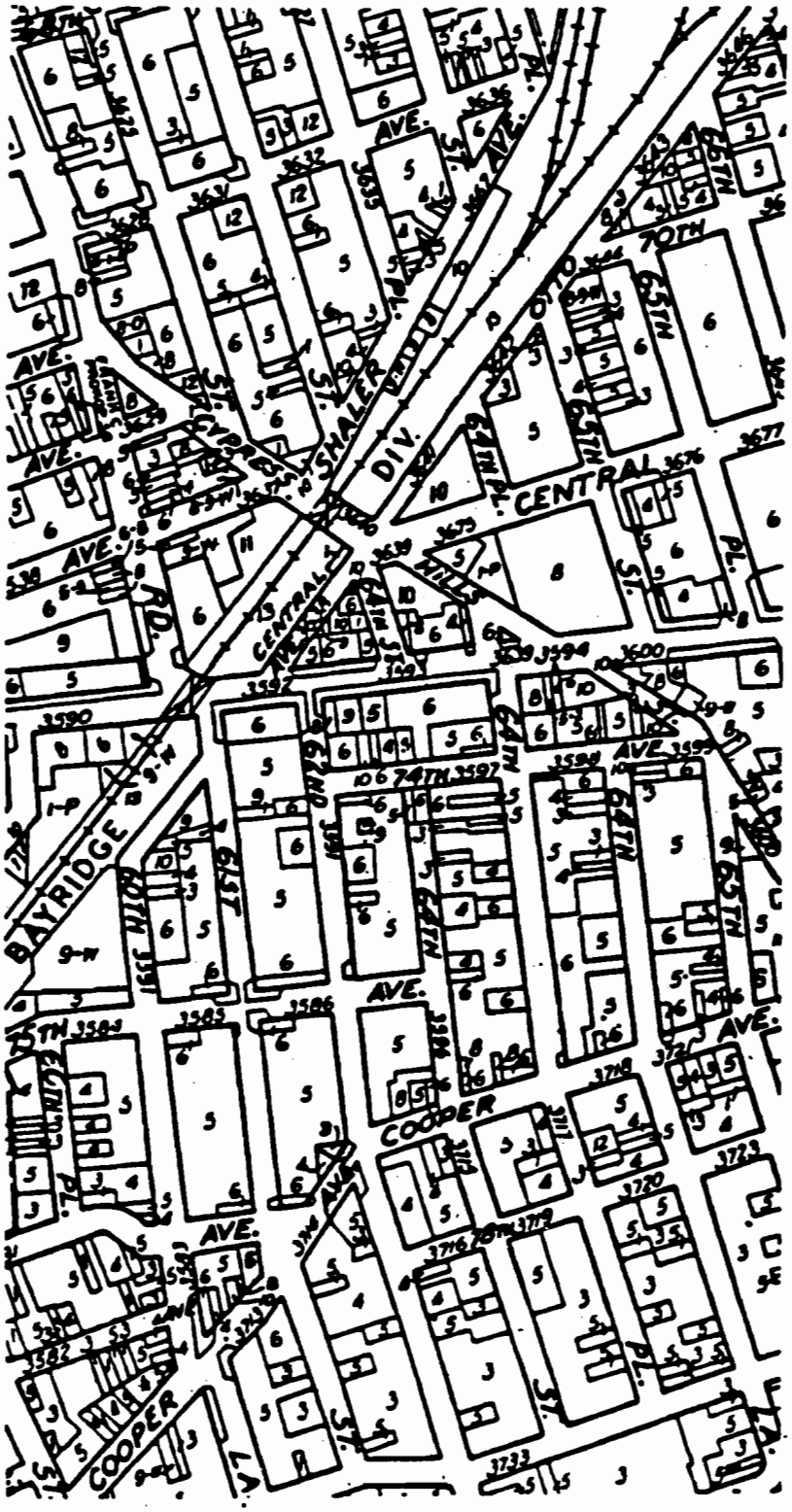
Under CEQR, a land use analysis characterizes the uses and development trends in the area that may be affected by a proposed action and then is used by the lead agency to determine whether a proposed action is compatible with or may affect those conditions. Similarly, the analysis considers the action's compliance with and effect on the area's zoning and other applicable public policies. Even when there is little potential for an action to be inconsistent with or affect land use, zoning, or public policy, a description of these issues is usually appropriate, to establish conditions and provide information needed for other technical areas.

100. Definitions

110. LAND USE

Land use refers to the activity that is occurring on land and within the structures that occupy it. Types of uses include residential, retail, commercial, industrial, vacant land, and parks. The Department of City Planning's Land Use maps illustrate such land use types as the following: vacant land, used automobile lot, farm, licensed junk yard, accessory or licensed parking lot, park and outdoor recreation, residential (including one-family detached, one-family attached, two-family, walk-up multiple dwelling, and elevator multiple dwelling), commercial and retail, office, light industry, warehouse and storage yard, automotive storage and service, heavy industry, transportation, and public and private institutions (including public, private, and parochial schools; and municipal, state, federal, voluntary, and proprietary hospitals). Figure 3A-1 shows a portion of a DCP Land Use map. Depending on the action in question, land uses can be aggregated into less-detailed groupings

Figure 3A-1
Sample from City Land Use Map



3618 Tax Block Number

Open-Land Uses

- 1 Vacant Land
- 1-A Used Automobile Lot
- 1-F Farm
- 1-J Licensed Junk Yard
- 1-P Accessory Parking Lot
- 1-P Licensed Parking Lot
- 2 Park and Outdoor Recreation

Residential Uses

- 3 One-Family Detached
- 4 One-Family Attached
- 5 Two-Family
- 6 Walk-Up Multiple
- 7 Elevator Multiple
- -H Hotel (shown with "6" or "7")

Non-Residential Uses

- Ground-Floor Retail
- 8 Commercial and Retail
- 8-O Office
- 9 Light Industry
- 8-W Warehouse and Storage Yard
- 10 Automobile Storage and Service
- 11 Heavy Industry
- 12-P Public School
- 12-NP Private and Parochial School
- 12-HM Municipal Hospital
- 12-H State or Federal Hospital
- 12-HV Voluntary Hospital
- 12-HP Proprietary Hospital
- 13 Transportation
- 14 Paper Street
- 15 Legally Closed Street Physically Open
- 7-10 Predominant Use is Followed by Subordinate Uses

for analysis, or other uses (a subset of heavy industry, for example) can be added.

120. ZONING AND PUBLIC POLICY

121. Zoning

New York City's Zoning Resolution controls the use, density, and bulk of development within the entire City. The Zoning Resolution is divided into two parts: zoning text and zoning maps. The text establishes zoning districts and sets forth the regulations governing land use and development. The maps show the locations of the zoning districts. Figure 3A-2 shows an example of the zoning maps.

The City is divided into three basic zoning districts: residential (R), commercial (C), and manufacturing (M). The three basic categories are further subdivided into lower-, medium-, and higher-density residential, commercial, and manufacturing districts, and into "standard" and "contextual" districts.

There are 10 standard residential districts in New York City—R1 through R10. The numbers refer to the permitted density (R1 having the lowest density, R10 the highest) and certain other controls such as required parking. A second letter or number (e.g. R1-1, R8B) signifies additional controls in certain districts. Contextual districts are generally identified with the suffix A, B, X, or 1. These districts are termed contextual because they maintain the familiar built form and character of the existing community while providing appropriate development opportunities.

There are eight basic commercial districts, two (C1 and C2 districts) designed to serve local needs; one (C4) for shopping centers outside the central business district; two (C5 and C6 districts) for the central business districts that embrace the office, retail, and commercial functions that serve the city and region; and three (C3, C7, and C8 districts) designed for special purposes (waterfront activity, large commercial amusement parks, and heavy repair services). The Zoning Resolution also contains a set of commercial contextual zones that have been designed for mapping in commercial districts that are substantially residential in character. Generally, commercial zones identified on the zoning maps with the suffix A, B, or X are contextual.

Manufacturing activities are grouped into three districts—M1, M2, and M3. All of these districts incorporate performance standards that establish limits on the amount and types of industrial nuisances that may be created. In general, the more noxious uses are restricted to M3 districts, but they may be permitted in M1 and M2 districts if they comply with the performance standards of those districts.

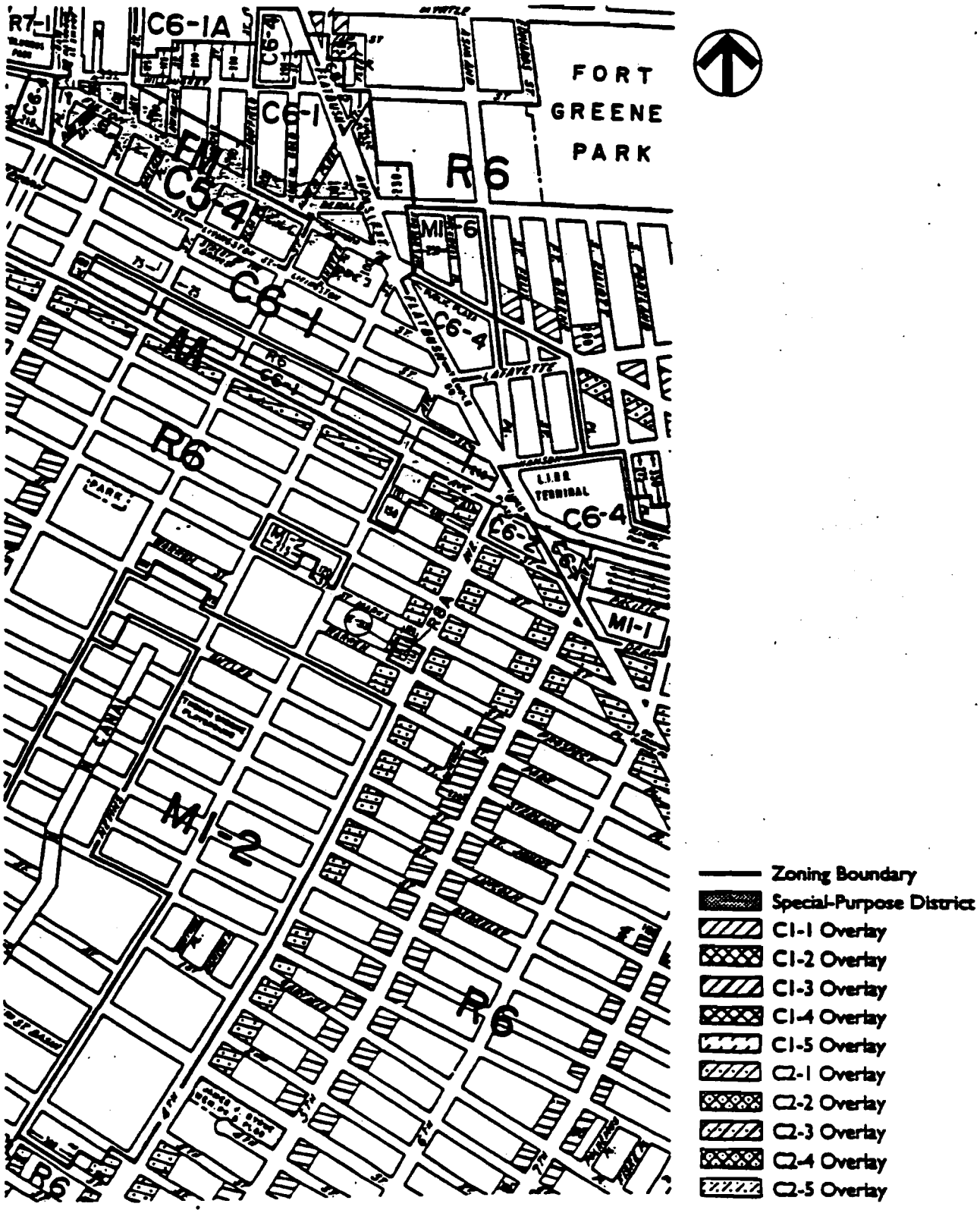
Development within residential, commercial, and manufacturing districts is regulated by use, bulk, and parking regulations. Each zoning district regulates permitted uses; the size (bulk) of the building in relation to the size of the lot; the required open space for residential uses on the lot, or the maximum amount of building coverage allowed on the lot; the number of dwelling units or zoning rooms permitted on the lot; the distance between the building and the street; the distance between the building and the lot line; the amount of parking required; and other requirements applicable to specific residential, commercial, or manufacturing activities.

The uses permitted in each of the zoning districts are defined in one or more of 18 use groups set forth in the Zoning Resolution. The uses listed in each use group have common functional or nuisance characteristics. The use groups start with residential and institutional uses (Use Groups 1-4) and work their way up the nuisance scale from local retail and service uses (Use Groups 5-9) to regional shopping centers (Use Groups 10-12), waterfront/recreation uses (Use Groups 13-15), heavy automotive service (Use Group 16), and industrial uses (Use Groups 17 and 18). The zoning text identifies which use groups are permitted in each zoning district.

122. Public Policy

Other recognized public policies also describe the intended use of an area of particular site(s) in the City. These include Urban Renewal Plans, 197a Plans, In-Place Industrial Parks, the New York City Comprehensive Waterfront Plan, Waterfront Revitalization Program, the Criteria for the Location of City Facilities ("Fair Share" criteria), Solid Waste Management Plan, Business Improvement Districts, City Maps, the New York City Landmarks Law, and reports prepared by the Department of City Planning, City Planning Commission, and Board of Standards and Appeals, among other public documents and reports. Some of these policies have regulatory status; others are discussion documents that describe general goals. These documents may change over time to reflect the evolving needs of the City, as determined by appointed and elected officials and the public. They can help define the existing and future context of the land use and zoning of an area.

Figure 3A-2
Sample from City Zoning Resolution Map



200. Determining Whether a Land Use or Zoning Assessment is Appropriate

210. LAND USE

A basic description of land use and zoning and the policies that govern them is usually provided for all actions, regardless of their anticipated effects. This information is essential for conducting the other environmental analyses and provides a baseline for determining whether detailed analysis is appropriate.

A detailed assessment of land use is appropriate if the action would result in a significant change in land use or would substantially affect regulation or policies governing land use, or if analyses requiring land use information are being performed in any other technical area. Examples of actions that may affect land use or land use policy include zoning map or text changes, zoning special permits, Board of Standards and Appeals (BSA) variances or special permits, site selections (selection of sites for public facilities), creation or modification of an urban renewal plan, major concessions, franchises, land dispositions or acquisitions, and park mapping actions. Examples of technical analyses requiring land use information include socioeconomic conditions, neighborhood character, traffic and transportation, air quality, noise, infrastructure, and hazardous materials.

220. ZONING AND PUBLIC POLICY

221. Zoning

An assessment of zoning is typically performed in conjunction with a land use analysis, since zoning is one of the key elements in understanding whether and where land uses might change as the result of a proposed action. Zoning assessments are also performed when the action would change the zoning on the site or result in the loss of a particular use, or if detailed analyses requiring zoning information are being performed in any other technical area. Examples of discretionary actions that may affect zoning include zoning map changes, zoning text changes, zoning special permits, BSA variances or special permits, and park mapping actions.

222. Public Policy

Similarly to zoning, some assessment of public policy accompanies a land use assessment, since such policies may help determine whether or where land uses might change as the result of a proposed action. Also, actions that would substantially affect land use regulation or policy controlling land use, or are located within areas governed by such public policies require an analysis of public policy. Examples include creation or modification of Urban Renewal Plans, and actions that are within areas covered by the City's Waterfront Revitalization Program. In addition, some actions may affect other specific public planning efforts by changing land use in the area.

300. Assessment Methods

Land use patterns are formed by various actions of public policy in concert with market forces for development. A change in land use on a single site is usually not enough to constitute a significant land use impact, although such a change could create impacts in other technical areas, such as traffic. In this case, it is generally enough to characterize the land use changes associated with the proposed action to a level of detail sufficient to provide information to other technical areas requiring it.

Changes in land use across a broader area, either because the action directly affects many sites or because the site-specific change is important enough to lead to changes in land use patterns over a wider area, generally require an analysis detailed enough to determine whether and where these changes might occur and whether such changes are significant and adverse. An action affecting the market forces that shape development (see "Socioeconomic Conditions," Section 3B) can also change land use; in this situation, a more detailed assessment of land use is also appropriate.

Although the proposed action may be important enough to potentially affect land use over a broader area, the characteristics of the affected area are also critical in determining impact significance. If, for example, a proposed action would be of a type generally expected to promote residential development in an area, but the surrounding area does not contain any underutilized sites zoned for residential use, the likelihood of redevelopment for a new use would be diminished. In short, the potential for land use change depends as much on conditions in the affected area as on the proposed action itself.

The geographic area to be assessed and the categories of land use and level of detail by which they and zoning/public policies are studied depend on the nature of the proposed action and the characteristics of the surrounding area. The assessment usually begins with selection of a study area.

310. STUDY AREA

311. Land Use

The appropriate study area for land use is related to the type and size of action being proposed and the location and neighborhood context of the area that could be affected by the action. For example, a single 20-story office building in Manhattan would likely have fewer potential land use impacts, and require a very different (smaller) study area, than the same building in Staten Island or Queens. Unless the action covers a substantial physical area or is a generic action, the study area should generally include at least the project site and the area within 400 feet of the site's boundaries. A proposed action's immediate effects on an area of this size can be predicted with some certainty. When other, more indirect effects may also occur, a larger study area should be used. Typically, such secondary impacts can occur within a radius of ¼- to ½-mile from the site of a proposed action.

These general boundaries can be modified, as appropriate, to include any additional areas that would be affected by the action, exclude areas that would not be, or reflect the actual context of the area. For example, if a ¼-mile radius from the project site is chosen as the general study area boundary but that boundary would cut off portions of a block that is clearly part of the neighborhood, the study area can be expanded to include those portions. The study area does not have to be regular in shape. Such geographical and physical features as bodies of water, significant changes in topography, wide roads, and railroad easements often define neighborhood boundaries and therefore can be appropriate for the delineation of study area boundaries.

Sometimes even larger study areas may be appropriate, such as for actions that generate new truck trips along a specific route. In that example, the study area might include the blockfaces along the truck routes. The land use analysis would consider whether the additional truck traffic would in any way affect the surrounding uses. It should be noted, however, that using an inappropriately large study area can dilute or obscure an action's effects, particularly when those effects are localized in nature.

When determining the size of the land use study area, the requirements of the other technical areas that will be analyzed should also be considered. In the truck route example above, the noise and vibration analyses would typically require information on the land uses along the truck route. In such cases, the land use study area can accommodate the required technical analysis study area so that data collection can be coordinated.

For areawide or programmatic actions, since the extent of physical and geographic areas affected by these kinds of actions is large, it may be appropriate to provide prototypical assumptions or groupings of information instead of lot-by-lot descriptions typical of site-specific actions. Development projections or a development scenario would determine the appropriate study area boundaries (see Section 2A for more information on the development scenario).

312. Zoning and Public Policy

The study area for zoning and public policy is generally the same as that used for land use (see Section 311, above). For actions that could affect the regulations governing an urban renewal area, the entire urban renewal area should be included within the study area.

320. ANALYSIS TECHNIQUES

321. Land Use

After picking an appropriate study area, the land use assessment compares several steps: determine the level of detail and types of information appropriate for the assessment; survey the area; check the survey data against available maps and other sources; characterize existing land use patterns and trends in the area; estimate future land use conditions without the action; and assess future conditions with the action. As described in Section 100, above, zoning and public policy can help to define an area's land use; these are discussed below in Section 322.

321.1. Level of Detail and Types of Information

As noted above in Section 300, the extent to which the study area is examined depends on the issues associated with the action and the needs of other technical areas.

Issues Associated with the Action. In determining the extent and type of information to be assessed, based on the issues associated with the action, consider the following:

- If the action is not expected to generate significant land use impacts, the characterization of the study area for informational purposes should include general categories of land use (e.g., residential, commercial, industrial, transportation, institutional, etc.), adding whatever information may be

required for other technical analyses (see discussion below). Consideration of compliance and conformance with zoning in the study area may also be appropriate (see Section 322, below).

- If the action is expected to encourage development in the surrounding area of the same use as associated with the action, the land use study should include some detail on that use and the land zoned for that use and potentially available for redevelopment in the study area. Take, for example, an action that would introduce substantial residential use on a commercially zoned site that had previously been in lower-density commercial use near a residential area (say, a movie theater). The land use analysis would:

  1. Consider all general categories of land use, but would focus in detail on existing patterns and density of residential use.
  2. Examine recent trends, particularly those that indicate activity (or lack of activity) with regard to residential use.
  3. Identify other similarly zoned sites, particularly those that are underutilized for residential use.
  4. Determine whether any other public policy might affect the potential for land use change.

- If the action would introduce a substantial new use into a neighborhood, the land use study should focus on the potential for the action to initiate a trend that would change land use patterns, and the compatibility of that use with the surrounding area. Take, for example, a residential building on a previously commercial site on the edge of a mixed-use commercial and industrial area. The land use analysis would:

  1. Consider all general categories of land use, but focus on the following: the use of the proposed action (residential in this case); the uses in the adjacent mixed-use commercial and industrial area; uses that traditionally support residential use, such as schools, parks, local neighborhood retail, etc.
  2. Examine recent trends (and consult the socioeconomic conditions analysis, Section 3B), particularly those that indicate activity (or lack of activity) in the mixed-use commercial and industrial area.
  3. Identify other similarly zoned sites (if any), particularly those that are underutilized for residential use.
  4. Determine whether any other public policy might affect the potential for land use change.

- If an action would introduce a land use prevalent in the area, but at a different (usually higher) density. The action might change residential land use density, which would lead, over time, to the addition of other uses that support residential uses. The land use study would:

  1. Consider all general categories of land use, but focus on the following: residential density; presence, location, and composition of uses that support residential use; and any other uses likely to increase in density as a result of the proposed action.
  2. Identify properties or areas that could be developed for higher-density uses. These include appropriately zoned, larger tracts of land either undeveloped or lightly developed; groups of houses with the potential for assemblage; and locations well-served by transportation within the area served by the new sewer line.

- If the action would introduce a development large enough to alter socioeconomic trends in the study area, so that upgrading, conversion, and/or redevelopment could change land use patterns as well. An example would be an urban renewal plan, which would remove uses that created blight and develop an underutilized area with a major, dense, mixed-use project with residential, office, and retail uses. The land use analysis would:

  1. Coordinate with the socioeconomic conditions analysis to identify those types of uses most subject to change from the project.
  2. Consider all general land uses, with focus on those uses whose property values or occupants are most subject to socioeconomic change. These uses are generally those that are similar to those proposed in the action; they may also include uses that support the uses proposed in the action. If, in the example, retail use were not included in the action, its presence in the area would still be important, if the socioeconomic analysis found that increased worker and residential population from the action would lead to demand for increased retail services.
  3. Identify those sites and properties that are underutilized, based on current zoning and market conditions.
  4. Consider any public policy that would affect the targeted land uses.

- If the action would result in the elimination of permitted land use(s), consider whether it would make existing and no action development substantially nonconforming. An example would be a zoning action that would eliminate certain use groups that are currently permitted in the affected area. If a number of existing uses were among the proposed excluded uses, further analysis would be conducted, as follows:

  1. Considering all general categories of land use, identify the extent (percentage or aggregate) to which the use proposed to be excluded characterizes the study area.
  2. Consider recent development trends and determine what is likely to occur in the absence of the action.
  3. Determine whether the proposed exclusion of uses would result in substantial nonconformance and/or new development that would be inconsistent with existing uses.

Issues Associated with Other Technical Areas. In determining the types of information and level of detail appropriate when providing information for other technical areas, consider the following:

- Some technical areas may require the identification of land uses that are particularly sensitive to changes in environmental conditions, such as noise levels or air pollutant emissions from manufacturing facilities. The sensitive uses generally include housing, hospitals, schools, and parks. Often, land use investigations associated with this type of technical area coordination include consideration of whether the study area includes any sensitive uses with the potential to be affected by any action-related changes in air pollution or noise. This may include such tasks as:

  1. Identifying sensitive uses adjacent to routes to be taken by traffic generated as a result of the proposed action; this will help locate receptor sites for the noise and air quality analyses.
  2. If the use generated by the action itself would be sensitive or potentially subject to environmental conditions in the surrounding area, it may be appropriate to identify uses in the surrounding area that support such conditions. This may include an inventory of all industrial uses within 400 feet of the project site to check for possible air pollution emissions from manufacturing facilities or locations of hazardous materials that could migrate onto the proposed project site; or identification of uses that may be noise or vibration sources affecting the site.

- If the action would likely affect demand for one or more community facilities (as defined in Section 3C.100), such facilities should be identified in the land use study.

321.2. Data Collection

The extent and type of data to be collected depend on the action proposed and the area potentially affected. Typically, field surveys are conducted for the site and surrounding area. When larger study areas are used, particularly for generic or programmatic actions, secondary data can be helpful.

Field Survey. Surveys of the land uses in the study area are performed through field visits. These can be made on foot or in a vehicle, depending on the size of the area and the level of detail required.

The entire study area—every street and every block—should be surveyed. The analyst should note the uses in the area, using such categories as residential, commercial, manufacturing, institutional, parks, or vacant land. More descriptive definitions can also be used: residential uses can be further categorized according to building types and form—detached, semi-detached, single-family, multifamily; commercial uses can be described as retail, office, etc.; and manufacturing can be identified as light or heavy use. It is sometimes difficult to discern the uses in a particular building—for example, residential apartments in converted manufacturing buildings. When there is some doubt as to a building's use, the analyst should look for visible signs, such as smoke being emitted from a stack, or mailboxes or buzzers with tenants' names, curtains in windows, etc. Consideration of compliance and conformance with zoning in the study area may also be appropriate (see Section 322, below).

Available Documentation. The information gathered in the field survey can be compared to available data sources to fill in missing details and verify questionable material. In some cases, particularly for generic or programmatic actions, the assessment can rely largely on secondary data, with spot field checks conducted to verify these data. Most useful are the Department of City Planning's land use maps, which depict the uses throughout the City; and the Sanborn Insurance maps, Fire Insurance underwriters' maps, or other similar maps, which provide more detailed, building-by-building information. It is often appropriate to use field survey data to complement maps and other secondary data, to ensure that information is accurate and current.

Other useful documentation includes various publications compiled by the Department of City Planning and other City agencies, such as the New York City Housing Authority, and publications prepared by real estate services (see Section 730).

321.3. Characterizing the Uses in the Study Area

Based on the information gathered through field survey and available documentation, describe in text the land use in the study area. This description should focus on land use patterns, relationships, and trends. It is sometimes appropriate to describe the development history of an area to understand the area's development trends. The amount of detail required in the land use discussion will depend on the action's potential for impacts and on the size of the study area. For example, if the action would alter the types and ranges of mixed-use development, it may be appropriate to describe the land use in sufficient detail to understand the relationships and character of the existing mixed-use development. For a small study area, such as a ¼-mile radius, uses are often described in detail for every lot. For larger study areas, more general descriptions can often be used, because an action's effect on a larger area may be more general than specific.

The land use assessment should also include maps of the uses in the area, detailed as appropriate to the study in question. The boundaries of the study area and of the project site or area of the proposed action should be clearly delineated on these maps as well. See Figure 3A-3 for an example of such a land use map.

321.4. Future No Action Condition

The future no action condition analyzes land use and development projects, initiatives, and proposals that are expected to be completed by the action's build year (see Section 2C for more detail on the no action scenario and the build year). The scenario that is assessed in all the other technical areas is usually established in the land use analysis.

In the assessment of no action conditions, compile a list of all the proposals that can reasonably be expected to be completed, given market conditions, existing trends, and other constraints and incentives (including zoning and public policy—see Section 322, below), by the build year. Information about future projects can be obtained from the appropriate borough office at the Department of City Planning, and from various real estate publications. Then, based on this inventory, describe the land use conditions that would exist in the build year. Depending on the anticipated impacts of the action in question (see existing conditions discussion, above) this assessment should address anticipated changes in land use and land use patterns and identify expected trends. Conditions in the future without the action can affect potential effects of that action as understood from an assessment of existing conditions. For example, development may be already proposed for underutilized sites identified in the existing conditions analysis; a review of proposed development may reveal an ongoing trend or acceleration of that trend that may outweigh an action's influence on land use trends.

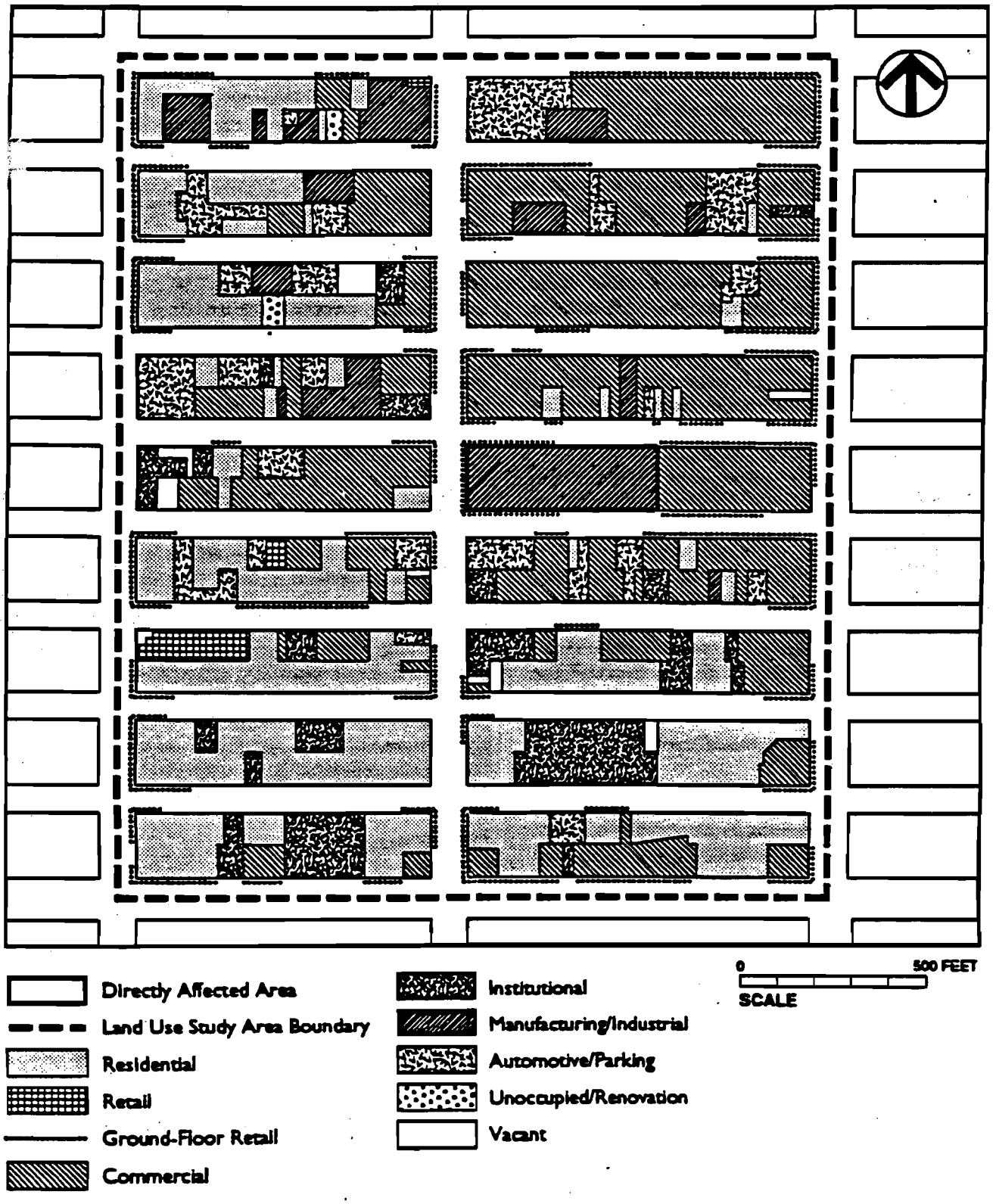
321.5. Future Action Condition

The proposed action's effects on land use on the site of the action and in the study area are analyzed in the future action condition. First, the assessment should simply consider the direct effects of the action: what use(s) would the proposed action create on the project site, and would that use be different from the use that would otherwise be located on the site in the build year. The analysis should then focus on the action's compatibility and consistency with surrounding uses as they would exist in the future without the action. Finally, the analysis should determine whether the action would have the ability to generate land use change in the study area. This analysis addresses the interplay between the proposed action in its particular location and conditions in the surrounding area. As described in more detail in Section 321.1, above, the key conditions most often include the size, use, and other special characteristics of the development expected with the proposed action, and the current and anticipated land use trends, linkages among land uses, presence (or absence) of underutilized properties appropriately zoned for the expected new use, and zoning or other public policies in the area that promote, permit, or forbid development of the expected new use.

322. Zoning and Public Policy

As the discussion of land use makes clear, issues of zoning and public policy are important to all land use analyses. At a minimum, understanding zoning and public policy helps the analyst frame future land use conditions. But more often, an understanding of zoning and public policy is key to understanding the nature and extent of land use impacts. Beyond its relationship to the land use analysis, the subject of zoning and public policy can arise itself. This occurs when the action involves a change in zoning or public policy, seeks approval under special provisions of the zoning resolution, or seeks relief from zoning through application to the Board of Standards and Appeals.

Figure 3A-3
Example of a Land Use Map



322.1. Existing Conditions

The analysis of existing conditions for zoning should describe the zoning districts in the study area. The zoning districts are found in the maps provided as part of the New York City Zoning Resolution. Then, key elements of those zoning districts can be described. These elements can include maximum permitted Floor Area Ratio (FAR) by district, building envelope/setback/height requirements, minimum open space ratio, streetwall lengths, side yard depths, and minimum parking requirements.

The level of detail provided for this section usually depends on the action being proposed. If a zoning map or text change is proposed, more detail, specifically related to the zoning elements that would be changed, is generally provided. In addition, based on the information gathered in the land use survey, uses in the study area that do not comply with the existing zoning can be described, if appropriate. As discussed in Section 321.1, above, the assessment of existing zoning may include identification of sites that are (or are not) protected through zoning from conversion or redevelopment to a different use.

Typically, in addition to text, the study area's zoning districts are indicated graphically on a map that clearly delineates the boundaries of the study area and of the site of the proposed action.

The discussion of existing conditions also includes public policies, formal plans, and published reports that pertain to the study area, as appropriate. These are addressed for two reasons. First, it is important to know whether a proposed action may conflict with a public policy or detract from a formal public plan. Second, public policies and plans serve a similar function to zoning, in that they may offer protection from or promote land use change in an area. Depending on the issue for a given action, then, such policies and plans are identified and assessed as they are relevant to potential land use change.

322.2. Future No Action Condition

The future no action condition sets the background for public policy affecting land use in the action's build year, assuming that the action does not go forward. This condition includes zoning changes and future plans and policies announced by public entities, or released plans that would go into effect by the build year. Information on plans and proposals is available through the Department of City Planning, which decides many issues of public policy and keeps track of proposals affecting land use, and may also be available from other City, State, or Federal agencies that are undertaking planning in the study area. The assessment of the future no action condition should continue the focus on relevant issues and/or support the land use analysis as established in the existing conditions analysis.

322.3. Future Action Condition

This analysis should focus on any changes to the zoning regulations or zoning maps, and on the action's compatibility with surrounding zoning districts. For example, if the action would result in the elimination of manufacturing zones, this may be important to note, particularly in areas of the City that support active manufacturing uses. The proposed action's effect on existing and planned public policies and initiatives should be considered, and its consistency with any applicable policies should be addressed.

400. Determining Impact Significance

410. LAND USE

The analyses described in Section 300, above, identify land use changes anticipated with a proposed action. Many land use changes may be significant, but not adverse. For example, development of a large vacant site would constitute a significant land use change on that site and perhaps in the surrounding area, but if the site had been vacant and neglected, this change might be considered beneficial. The approach to determining whether land use changes are significant and adverse is as follows:

- If the proposed action would directly displace a land use and such a loss would adversely affect surrounding land uses, this displacement may be considered a significant adverse impact (see Section 3B, "Socioeconomic Conditions").

- In general, if an action would generate a land use that would be incompatible with surrounding uses, such a change may be considered significant and adverse if:

  1. The new land use or new site occupants would interfere with the proper functioning of the affected use or of land use patterns in the area. One example could be a residential use adjacent to a manufacturing area (other than M1, which is appropriate near residences); this kind of juxtaposition of land uses could eventually restrict industrial operations for reasons, say, of public safety. Conversely, a new heavy manufacturing use near a residential area might

diminish the quality of residential use because of noise or air pollution, for example.
2. The effect to land uses would be inconsistent with public policy.
3. The incompatible use would adversely alter neighborhood character (as determined in the neighborhood character analysis described in Section 3H, below).

- In general, if an action is expected to alter land uses in the surrounding area and the anticipated change is substantial, that change is usually considered significant, but not necessarily adverse. The change may be considered adverse if:

1. The use changes would not be compatible with other uses in the area.
2. The use changes would not be compatible with public land use policy.
3. The new development would increase density in the area, and such density does not conform to public policy and plans for the area.
4. The new development would increase density in the area, and such density can be shown to overtax the capacity of the study area to support it.
5. The use changes would accelerate existing and anticipated trends in development for the area that lead to adverse socioeconomic impacts (this would be determined in coordination with the socioeconomic conditions analysis described in Section 3B, below).

In many cases, land use changes do not result in significant adverse land use impacts, but they can cause significant adverse impacts in other technical areas. A typical example is of an office building proposed for a densely developed commercial area. This land use change would not be significant; however, the workers and visitors coming to and from the building might create significant traffic, transit, or pedestrian impacts. The potential to create significant impacts in other technical areas should not necessarily be confused with a land use impact.

420. *ZONING AND OTHER PUBLIC POLICY*

For zoning and public policy, the approach to determining whether land use changes are significant and adverse is as follows:

- The action would create land uses or structures that substantially do not conform to or comply with underlying zoning. An example would be rezoning of several blocks from manufacturing to commercial use; such a change might permit development of desired residential uses, say, on vacant or underutilized sites in the area, but it would turn existing manufacturing uses into nonconforming uses and might render their structures nonconforming, as well. Such an impact would be adverse; it would also be significant if it involved a substantial number of uses or if it conflicted with another public policy (e.g., an in-place industrial park) to protect those uses.

- The action would create a land use or would itself conflict with public policies and plans for the site or surrounding area.

- The action would result in significant material changes to existing regulations or policy. For example, this could include a proposed bulk variance within a special district that is in conflict with the goals and built form within the special district.

500. Developing Mitigation

Mitigation for potential significant adverse land use, zoning, or public policy impacts could include the following types of measures, as appropriate:

- Establish a buffer between the new, incompatible land use and its surroundings.

- Where an action on a particular site might lead to an incompatible or otherwise significantly adverse land use, develop terms and conditions for appropriate regulatory controls, such as the special permit (if there is one) or subject the action to a restrictive declaration limiting such a use (if it is a private applicant) or include language requiring the protective restrictions in leases, urban renewal plans, or other agreements (if it is a public action). It should be noted that, for zoning actions, restrictive declarations are not preferred by the Department of City Planning.

- If a zoning text change is proposed, the text language could be modified to mitigate potential impacts. (However, substantial changes to the proposed action would typically be considered alternatives.)

600. Developing Alternatives

Alternatives that reduce or eliminate land use or zoning/public policy impacts can include the following:

- Alternative site configuration, to separate conflicting uses as much as possible.

- Alteration of the zoning proposal, or inclusion of provisions, to reduce non-conformance of uses and structures.

- Alternative site(s) for the action, particularly for public actions.

- Alternative uses that eliminate or reduce land use impacts.

- Alternative development proposals, such as actions that do not require modifications to the zoning (often called "as-of-right" alternatives).

700. Regulations and Coordination

710. REGULATIONS AND STANDARDS

The New York City Zoning Resolution is the underlying regulation for land use in the City. Additionally, different parts of the City may also be affected by various other public policies, such as the Waterfront Revitalization Plan. There are no standards for the analysis of land use, zoning, or public policy impacts.

720. APPLICABLE COORDINATION

If any public policies would apply to the proposed action, or the area affected by the proposed action, coordination with the responsible agency is advised. Some examples of the agencies and their respective policies are as follows:

- New York City Department of Housing Preservation and Development (HPD)—Urban Renewal Plans

- Economic Development Corporation—In-Place Industrial Parks

- New York City Department of City Planning—New York City Comprehensive Waterfront Plan, 197a Plans

- Agencies such as the New York City Departments of Transportation, Environmental Protection, Sanitation, or Parks and Recreation, the Police and Fire Departments, or the Board of Education, that may propose capital projects affecting land use.

This coordination is important to avoid the potential for conflicting policies if overlapping plans are intended for a site or area. By coordinating the proposed action with the relevant agencies, provisions to accommodate potentially conflicting goals can be worked out and made to be part of the action and assessed accordingly.

730. LOCATION OF INFORMATION

- New York City Department of City Planning
  22 Reade Street
  New York, NY 10007

  —Map Sales:
  Land Use Maps
  Zoning Resolution
  197a Plans
  Planning Reports
  Waterfront Revitalization Program

  —Housing, Economic and Infrastructure Planning:
  Housing Reports
  Economic and Industry Reports

  —Computer Information Services:
  MISLAND Data (MISLAND files are data bases of developed properties, identified by tax block and lot number. The date of the structure, types of use, number of stories, City or private ownership are identified.)
  Sanborn Maps available for viewing (Also available in DCP's library located in the basement at 22 Reade Street.)

  —Calendar Officer:
  City Planning Commission Reports

  —Zoning and Urban Design:
  Zoning text changes, recently adopted and under consideration

  —Waterfront Division:
  Waterfront Studies
  State and Federal Coastal Zone Requirements

  —Technical Review:
  ULURP applications and approvals
  Zoning and Street Maps
  Urban Renewal Area Designation and Plans

  —Environmental Assessment and Review Division:
  CEQR applications, approved and pending

- Department of City Planning, Borough Offices:
  Planning Reports
  Planning Initiatives

  —Manhattan
  Two Lafayette Street
  New York, NY 10007

  —Staten Island
  56 Bay Street
  Staten Island, NY 10301

  —Queens
  29-27 41st Avenue
  Queens, NY 11101

  —Brooklyn
  16 Court Street
  Brooklyn, NY 11241

  —Bronx
  One Fordham Plaza
  Bronx, NY 10458

- Mayor's Office of Environmental Coordination
  52 Chambers Street
  New York, NY 10007
  CEQR Documents since 10/1/91

- Economic Development Corporation
  Planning Division
  110 William Street
  New York, NY 10038
  Development Projects
  Economic and Development Plans

- Department of Housing
  Preservation and Development
  100 Gold Street
  New York, NY 10038
  Urban Renewal Plans
  Urban Renewal Area Designations
  Relocation Reports
  Disposition Agreements

  —Director, Manhattan Planning

  —Director, Bronx Planning

  —Director, Queens/Staten Island Planning

  —Director, Brooklyn Planning

- Buildings Department
  Building Permits
  Certificates of Occupancy

  —Manhattan
  60 Hudson Street
  New York, NY 10013

  —Brooklyn
  Municipal Building
  210 Joralemon Street
  Brooklyn, NY 11201

  —Bronx
  1932 Arthur Avenue
  Bronx, NY 10457

  —Queens
  126-06 Queens Boulevard
  Kew Gardens, NY 11415

  —Staten Island
  Borough Hall
  Staten Island, NY 10301

- Board of Standards and Appeals
  161 Sixth Avenue
  New York, NY 10013
  BSA Special Permits
  BSA Reports

B. Socioeconomic Conditions

Socioeconomic impacts may occur when an action would directly or indirectly change population, housing stock, or economic activities in an area. In some cases, these changes can be substantial but not adverse. In other cases, these changes may be beneficial to some groups and adverse to others. The purpose of a socioeconomic assessment is to disclose changes that would be created by the action and identify whether they rise to the level of significance.

100. Definitions

The socioeconomic character of an area is defined in terms of its *population and housing* and its *economic activities*. The assessment of socioeconomic conditions usually distinguishes between the socioeconomic conditions of area residents and socioeconomic conditions of area businesses. However, actions affect either or both of these segments in the same ways: they may directly displace residents or businesses; or they may alter one or more of the underlying forces that shape socioeconomic conditions in an area and thus indirectly displace residents or businesses. The elements of the two basic subareas included in socioeconomic conditions and the processes that change them are described in Sections 110, 120, and 130 below.

Although socioeconomic changes in and of themselves may not result in impacts under CEQR, they are disclosed if those changes would affect land use and population patterns or community character. Usually, economic changes alone need not be assessed; however, in some cases their inclusion in CEQR review may be appropriate, particularly if a major industry would be affected or if an objective of an action is to create economic change. These types of assessment are also defined below in Section 140.

110. POPULATION AND HOUSING

Population and housing assessments focus on the residents of an area and their housing conditions. Depending on the type of action and the area that could be affected, a profile of residential population would include some or all of the following characteristics: total numbers, sex, age, family status, household size, income, poverty status, education, occupation, car ownership, place of work, and mode of work-trip travel.

The housing profile typically characterizes the type and condition of the housing stock, units per structure, owner-occupied or rental, vacancy rates, and housing costs and values. Housing can also be characterized as associated with the income level of its occupants (e.g., low-, moderate-, or high-income housing). As appropriate, SRO units, group quarters, or shelters are also included. Regulations that protect tenants' continued occupancy and the availability of housing subsidies are identified and disclosed where residential displacement is a possibility.

120. ECONOMIC ACTIVITIES: BUSINESS AND EMPLOYMENT

Economic activities that characterize an area generally include the businesses and institutions operating there and the employment associated with these operations. Depending on the action in question, those people who are served by the businesses and institutions can also be considered in the assessment. Also, if there are groups of businesses that are dependent on the goods and services of businesses that are likely to be affected by the action, it may be appropriate to consider the effects to those businesses as well.

The businesses can be classified as commercial (including office-based services, retailing, transient hotels, and other business activities typically found in urban commercial districts) or industrial (including manufacturing, construction, wholesale trade, warehousing, transportation, communications, and public utilities—activities typically found in manufacturing districts). Institutions are also included in socioeconomic analyses, because often they employ large numbers of workers, support directly a number of related businesses, and bring to an area large numbers of their "clientele," such as students or medical patients and their families, who can form a customer base for local commercial businesses. Such institutions include schools, hospitals, community centers, government centers, and other like facilities with a charitable, governmental, public health, or educational purpose.

Specific industries or institutions within these broader groups may typify an area, such as the garment center in midtown Manhattan, the government and courts center in Downtown Brooklyn, or the concentration of hospitals and health care facilities in the east 60s in Manhattan.

130. DIRECT AND INDIRECT DISPLACEMENT

Direct displacement (sometimes called primary displacement) is the involuntary displacement of residents or businesses from the site of (or a site directly affected by) a proposed action. Examples include: proposed redevelopment of a currently occupied site for new uses or structures; or a proposed easement or right-of-way

that would take a portion of a parcel and thus render it unfit for its current use. Since the occupants of a particular site and the extent of displacement are usually known, the disclosure of direct displacement focuses on specific businesses and employment, and a known number of residents and workers.

Indirect displacement (also known as secondary displacement) is the involuntary displacement of residents, businesses, or employees that results from a change in socioeconomic conditions created by the proposed action. Examples include: rising rents in an area that result from a new concentration of higher-income housing introduced by a proposed action and force out lower-income residents; a similar turnover of industrial to higher-paying commercial tenancies spurred by the introduction of a successful office project in the area; or the flight from a neighborhood that can occur if a proposed action creates conditions that break down the community (such as a highway dividing the area in two, etc.). The assessment of indirect displacement usually identifies the size and type of groups of residents, businesses, institutions, or employees affected. The assessment of indirect displacement assumes that the mechanisms for such displacement are legal.

140. INDUSTRY ASSESSMENTS

An action may not displace but may affect the operation of a major industry or commercial operation in the City. In these cases, the lead agency may choose to assess the economic impacts of the action on the industry in question.

200. Determining Whether a Socioeconomic Assessment is Appropriate

A socioeconomic assessment should be conducted if an action may be reasonably expected to create substantial socioeconomic changes within the area affected by the action that would not be expected to occur absent the action. The following are circumstances that would typically require a socioeconomic assessment:

- The action would directly displace residential population so that the socioeconomic profile of the neighborhood would be substantially altered.

- The action would directly displace substantial numbers of businesses or employees; or if it would directly displace a business or institution that is unusually important as follows: it has a critical social or economic role in the community and unusual difficulty in relocating successfully; it is of a type or in a location that makes it the subject of other regulations or publicly adopted plans aimed at its preservation; it serves a population uniquely dependent on its services in its present location; or it is particularly important to neighborhood character. If any of these possibilities cannot be ruled out, an assessment should be undertaken.

- The action would result in substantial new development that is markedly different from existing uses, development, and activities within the neighborhood. Such an action could lead to indirect displacement. Typically, projects that are small to moderate in size would not have significant socioeconomic effects unless they are likely to generate socioeconomic conditions that are very different from existing conditions in the area. Residential development of 200 units or less or commercial development of 200,000 square feet or less would typically not result in significant socioeconomic impacts.

- Notwithstanding the above, the action may affect conditions in the real estate market not only on the site anticipated to be developed, but in a larger area. When this possibility cannot be ruled out, an assessment may need to be undertaken to address indirect displacement. These actions can include those that would raise or lower property values in the surrounding area.

- If the action may adversely affect economic conditions in a specific industry. An example would be the proposal to increase the number of New York City taxi operating licenses. The CEQR review for that proposal addressed its potential impact on business conditions in the taxi industry.

300. Assessment Methods

The geographic area and socioeconomic conditions to be assessed and the methods and level of detail by which they are studied depend on the nature of the proposed action. Answering the questions posed in Section 200, above, will help the lead agency identify those issues of socioeconomic assessment that apply to the action under consideration. It may be that not all of the answers to the questions in Section 200 are evident without some further study; in this case, a preliminary assessment (see Section 320, below) can be conducted, or it may be clear from the start that a proposed action will require extensive socioeconomic analysis; in this case a preliminary assessment is not required and the lead agency can go directly to a detailed assessment. In

either case, the assessment usually begins with selection of a study area. After the preliminary assessment or as a result of a detailed assessment the study area may be enlarged or diminished, but in most cases a geographic area of study is essential to begin work.

310. STUDY AREA DEFINITION

Typically, the socioeconomic study area boundaries are similar to those of the land use study area, as described in Section 3A.310, above. It will encompass the project site and adjacent area within 400 feet, a quarter-mile, or a half-mile, depending on project size and area characteristics. When the data to be used include geographic units, such as census tracts or zip-code areas, it may be appropriate to adjust the study area to make its boundaries contiguous with those of the data sets.

Some actions may result in direct or indirect effects that are either beyond the half-mile boundary or are such that typical site-specific study areas are not appropriate. For example, a proposal for a retail use, if it is large enough, may change shopping patterns in a trade area that extends well beyond the typical half-mile. As an example, depending on the types of goods to be sold, the study area could comprise all shopping strips within a three-mile radius of the site. In short, there is no established "area" for all socioeconomic analyses. A study area(s) should be developed that reflects the areas likely to be affected by the action. Programmatic actions may result in socioeconomic changes that would affect numerous locations throughout the City. In these cases, multiple or prototypical study areas may be appropriate. Other programmatic actions, as in the taxi case described above, may affect the City as a whole.

320. PRELIMINARY ASSESSMENT

It may not be possible to answer the questions set forth in Section 200 without gathering some data and making at least a preliminary assessment. This task addresses those socioeconomic conditions that could be affected by the proposed action. For example, if an action may affect employment patterns, the preliminary assessment would focus a greater level of detail in describing and assessing economic activities and employment profile than other socioeconomic components. The approach of the analyses presented below is to learn enough about the effects of the proposed action either to rule out the possibility of significant impact or to determine that more detailed analysis will be required to resolve the question.

321. Direct (or Primary) Displacement

In most cases, direct displacement would not constitute a significant adverse impact under CEQR. Nevertheless, it is still important to disclose the type and extent of such displacement.

321.1. Residential Displacement

Direct residential displacement is not in and of itself an impact under CEQR. Where a public agency is undertaking the action or where tenants are protected by rent control, rent stabilization, or other public programs, relocation benefits are available, and no significant adverse impact would occur. Impacts of residential displacement could occur if the numbers and types of people being displaced would be enough to alter neighborhood character and perhaps lead to indirect displacement of remaining residents. An example would be an urban renewal project, such as Lincoln Square in the 1950's, which eliminated a low-income neighborhood and replaced it with a more affluent population. The preliminary assessment therefore seeks to determine the socioeconomic profile of those residents who would be displaced and compare it to the profile of the affected area. It would compare and contrast the profile of the displaced residents with that of the study area population (see Section 110, above, for the factors that characterize a population and housing profile). Determine whether: 1) the profile of the displaced residents is similar or markedly different from that of the overall study area; 2) the displaced population represents a substantial or significant portion of the population within the study area; and 3) the action would result in a loss of this population group within the neighborhood. Sources of information to use in this assessment include the U.S. Census, newspaper advertisements for housing rentals and sales, and discussions with local realtors. This analysis typically distinguishes between renters and owner occupants and assesses the extent of government regulations and programs that afford renters some level of protection or assistance.

321.2. Business and Institutional Displacement

At a minimum, the type and extent of businesses and workers to be directly displaced by an action are disclosed, independent of whether there would or would not be a significant displacement impact. To determine the potential for significant displacement, the following circumstances are considered:

- If the business or institution in question has substantial economic value to the City or regional area and it can only be relocated with great difficulty or not at all.

- If a category of businesses or institutions is the subject of other regulations or publicly adopted plans to preserve, enhance, or otherwise protect it. An example would be an industry in Long Island City's In Place Industrial Park that is being replaced by a different use.

- If the business or institution defines or contributes substantially to a defining element of neighborhood character.

- If a substantial number of businesses or employees would be displaced that collectively define the character of the neighborhood. An example would be the electronic district in lower Manhattan that was displaced in the late 1960's by development of the World Trade Center.

The assessment of a business's economic value and relocation requirements considers: 1) its products and services; 2) its locational needs, particularly whether those needs can be satisfied at other locations; and 3) potential effects on business or consumers of losing the displaced business as a product or service. Using land use information (see Section 3A, "Land Use, Zoning, and Public Policy," above), socioeconomic profiles, and other factors as described in Section 3H, "Neighborhood Character," the displaced business(es) or institution(s) are assessed for their role in defining neighborhood character. Data regarding existing conditions can be obtained from both the State of New York Department of Labor and the Department of City Planning's Housing, Economic and Infrastructure Planning Division.

If none of the items listed above would occur, then there is no need for a detailed assessment. If the answer to one or more of the questions is either "yes" or "possibly," then a detailed assessment is appropriate.

322. *Indirect Displacement*

322.1. *Indirect Residential Displacement*

In most cases, the issue for indirect displacement of residential population is that an action would increase property values and thus rents throughout the study area, making it difficult for some existing residents to afford their homes. The direct effects of the action that can lead to such indirect changes include the following:

- It would add substantial new population with different socioeconomic characteristics compared to the size and character of the existing population.

- It would directly displace uses or properties that have had a "blighting" effect on property values in the area.

- It would directly displace enough of one or more components of the population to alter the socioeconomic composition of the study area.

- It would introduce a substantial amount of a more costly type of housing compared to existing housing and housing expected to be built in the study area by the time the action is implemented.

- It would introduce a "critical mass" of non-residential uses (for example, a large office complex), such that the surrounding area becomes more attractive as a residential neighborhood complex.

- It would introduce a land use that could have a similar indirect effect if it is large enough or prominent enough or combines with other like uses to create a critical mass large enough to offset positive trends in the study area, to impede efforts to attract investment to the area, or to create a climate for disinvestment.

In all cases, the potential for indirect displacement depends not only on characteristics of the proposed action, but on the characteristics of the study area. Usually, the characteristics of the proposed action are clear; the objective of the preliminary assessment, then, is to gather enough information about conditions in the study area so that the *relative* effect of the change can be better understood. Such information includes the following (information on population and housing can be obtained from the U.S. Census of Population and Housing, which is available for 1990 and all preceding decades):

- Total population and number of housing units in census tracts in the study area, so that the action's addition can be expressed as a percent increase over existing conditions.

- Median household income and other indicators of economic conditions of residents, such as percent of persons living below the poverty level, etc.

- Housing value and median contract rent, which can be compared to the levels expected to be introduced by the action.

- Vacancy rate, and percent of units that are renter-occupied.

- Presence of any unique or predominant population groups. Often, this information is evident from a windshield survey of the neighborhood. More precise data can be obtained by comparing the proportion of these groups to the proportion for the borough and the City as a whole.

- Presence of populations particularly vulnerable to economic changes. These typically low-income residents include occupants of lower-rent housing or single-room occupancy (SRO) units. For the preliminary assessment, census data on income and renters in structures containing fewer than six units can be used, supplemented with available information on land use, the presence of subsidized housing, and other factors. If the source of data indicates that these populations *may* be present, a detailed assessment may be required to confirm the situation (see Section 332.1, below).

- Development trends in the area. The ability of the action to influence development trends depends, in part, on the type and extent of the existing trends. A survey of the neighborhood will reveal the presence or absence of development or upgrading activities in the area. Discussions with DCP borough office staff and real estate brokers in the area will help to identify both specific projects already proposed and general trends. A comparison of recent census data with that from past decades can also be a good indication of trends.

If an examination of the characteristics of the proposed action compared with conditions in the study area clearly shows that the action's effects would not be significant in the context of existing conditions and future trends, then a detailed assessment is not required. If the significance of the action's effects is unclear after a preliminary assessment, then a more detailed assessment should be undertaken.

322.2. *Indirect Business and Institutional Displacement*

Like the analysis of direct displacement, the analysis of business and institutional indirect displacement includes only those businesses or institutions meeting the criteria set forth in Section 321.2, above. Such indirect displacement is typically only an issue if it affects land use or population patterns or community character. In most cases, the issue for indirect displacement of businesses or institutions is that an action would increase property values and thus rents throughout the study area, making it difficult for some categories of businesses to remain in the area. An action can lead to such indirect changes if:

- It introduces enough of a new economic activity to alter existing economic patterns. The example of an action that leads to a concentration of office use in a previously industrial area might, under appropriate conditions, cause indirect displacement of industrial businesses with office-related businesses in the surrounding area.

- It adds to the concentration of a particular sector of the local economy enough to alter or accelerate an ongoing trend to alter existing economic patterns. Examples include the office concentration cited above, if it is not a new use, which would affect patterns in the surrounding area, or the addition of a regional supermarket to a shopping area that could alter regional shopping patterns as well as economic conditions in the surrounding area.

- It directly displaces uses or properties that have had a "blighting" effect on commercial property values in the area, leading to rises in commercial rents.

- It directly displaces uses of any type that directly support businesses in the area or bring people to the area that form a customer base for local businesses.

- It directly or indirectly displaces residents, workers, or visitors who form the customer base of existing businesses in the area.

- It introduces a land use that could have a similar indirect effect, through the *lowering* of property values if it is large enough or prominent enough or combines with other like uses to create a critical mass large enough to offset positive trends in the study area, to impede efforts to attract investment to the area, or to create a climate for disinvestment.

As with residential displacement, since the characteristics of the proposed action are usually known, the objective of the preliminary assessment is to characterize the area to be affected. Economic information is not as readily available as population and housing data, but some useful information can be gathered easily and is appropriate for preliminary analysis, as follows:

- *Conditions and trends in employment and businesses.* Such information is available for zip codes in the area from the New York State Department of Labor. Although a zip code area rarely conforms precisely to an action-specific socioeconomic

study area, the information will allow for an understanding of the composition of businesses in the area, by type, and existing trends.

- *Physical and economic conditions.* It is also advisable to observe the area first-hand during the peak business times. The level of activity, condition of buildings, and presence (or absence) of vacant properties are all indicators of economic conditions. The size and type of existing buildings is also an indicator of the possibility for use change; for example, if existing industrial buildings are too small or awkwardly configured for office use, the possibility for indirect displacement of the businesses that occupy them are diminished.

- *Existing conditions and trends in real estate values and rents.* Discussions with real estate brokers in the area will help form an understanding of trends in commercial sales and rents in the area. Depending on the industry in question, trade journals also provide information on conditions and trends. It can also be useful to check the commercial real estate section of local newspapers to gain an understanding of space availability and cost.

- *Zoning and other regulatory controls.* Information on zoning and public policy is readily available (see Section 3A.730, above). It may be possible to rule out displacement if the surrounding area is protected through zoning regulation or other regulations and laws. An example is a proposed action that is large enough to induce new residential development, but is surrounded by zoning districts that do not permit residential use or do not permit it at the scale required for new investment.

- *Presence of categories of vulnerable businesses/institutions or employment.* It may be possible, through observation and discussions with brokers and other professionals, to identify categories of businesses, institutions, and types of employment in the area that are vulnerable to significant changes in real estate market conditions.

- *Land use and transportation service.* Observation of land uses and the street and transit systems in the area can reveal the relationships among the businesses and institutions in the area and other uses and systems that support them. For example, an action would result in development of a mixed-use, market-rate residential and retail project that can be expected to provide impetus for raising rents in the area. Observations reveal a sizable concentration of industrial buildings that are large enough for office use. However, if those buildings are not convenient to a subway, and the surrounding area does not offer the opportunity for development of support uses, there may not be a market for the space at the higher rent levels associated with office use.

- *Underlying conditions and trends in the City's economy.* Such information may be helpful in determining future changes with and without the proposed action.

Using the information cited above, it will be possible to better understand not only the potential for the proposed action to foster a change in socioeconomic conditions, but the potential for the surrounding or affected area to undergo such a change. If the preliminary assessment does not clearly show that the potential for indirect displacement is insignificant or if it is not enough to clearly define the potential significant indirect displacement so that appropriate mitigation can be studied, a more detailed assessment is appropriate.

323. Adverse Effects on Specific Industries

It may be possible that a given action could affect the operation and viability of a specific industry, not necessarily tied to a specific location. An example would be new regulations that prohibit or restrict the use of certain processes that are critical to certain industries. If the following questions cannot be answered with a clear "no," then a detailed investigation is appropriate:

- Would the action significantly affect business conditions in any industry or any category of businesses within or outside the study area?

- Would the action indirectly substantially reduce employment or impair the economic viability in the industry or category of businesses?

330. DETAILED ANALYSIS TECHNIQUES

If it has been determined that a socioeconomic impact may be likely or cannot be ruled out based on the preliminary assessment, a detailed analysis is conducted. The analyses aim to describe existing and anticipated future conditions to a level necessary for an understanding of the relationship of the proposed action to such conditions, to assess the change that the action would have on these conditions, and to identify any changes that would be significant and potentially adverse. The discussions of information and analyses set forth below offer guidance, some or all of which will be useful for a range of actions. Since it is not possible

to anticipate *all* actions that might affect socioeconomic conditions, it may be that some proposed actions require more or different information and analyses than are suggested here. In all cases, however, the analysis should allow the lead agency to understand the potential for and extent of a significant adverse impact to a level that will allow appropriate mitigation to be considered. If specific information is not available, it may be necessary to make assumptions. As described in Chapter 2, these assumptions should reflect the worst case of the range of conditions that can *reasonably* be anticipated.

331. Direct Displacement

331.1. Direct Residential Displacement

Existing Conditions. The detailed assessment of residential displacement focuses on the socioeconomic profile of the residents that would be displaced as it relates to the population profile and patterns of the neighborhood. If the preliminary assessment (see 321.1, above) identifies (or cannot rule out) a potential problem, the detailed assessment is the next step in fully defining that problem. The following tasks may be appropriate:

- The first step is to rely on secondary data as available to determine the population profile of the residents to be displaced from the site(s). Primary data, including field visits and/or interviews, can be used to supplement secondary data in defining the displaced population. Population parameters to be considered typically include household size and income, and age. Other parameters may be used as appropriate if they are an important or common defining element of the population to be displaced.

- The next step is to define the population profile and patterns within the study area or neighborhood. This can be done by using U.S. Census data. The profile of the displaced population is compared to the neighborhood population profile. The distribution of each characteristic within the displaced population is compared to the distribution in the study area population. If the displaced population contains a disproportionate amount of one category of residents (for example, low-income households or elderly persons), the analysis examines whether the potential loss of these population segments would affect the basic mix throughout the study area. Using the example, if the low-income households to be displaced represent the majority of such households in the study area, a potential neighborhood character impact could occur if these households could not be relocated within the study area.

- Next, the prevailing trends in vacancies and rental and sale prices of units on-site and within the neighborhood are identified. This information serves three purposes: 1) to identify the potential for the types of residents to be displaced to be relocated within the study area; 2) to determine whether the type of housing to be displaced is a defining element of neighborhood character; and 3) to ascertain whether the removal of the housing on-site could contribute to, accelerate, or create an indirect displacement trend. For example, if the housing to be directly displaced is of a type and cost that is limited in amount in the neighborhood, it is unlikely that the displaced tenants would be able to relocate in the study area. In this case, however, it is also unlikely that the housing to be displaced would constitute a defining element of neighborhood character or that its displacement would in itself accelerate or begin an indirect displacement trend. Sources for data on housing prices and trends include the *U.S. Census of Population and Housing*, real estate reference services, and local realtors.

Future No Action Condition. For the project's build year, assess conditions related to demographic characteristics of the study area or neighborhood. Relevant information might include: if the housing stock in the area is expected to expand or decrease; if the number of residents on the site is expected to increase or decrease; if rents are expected to increase or remain stable; if population and land use changes are expected; if any other relocation is anticipated; if the tenants' conditions would change (e.g., rent increases, family size increase). This information may be obtained through the interviews above, through interviews with real estate brokers or persons expert in local conditions, and through coordination with the land use analysis (see Section 3A.330) and neighborhood character analysis (see Section 3H.320). The conclusions of the existing conditions analysis are then revised to include relevant information about the future no action condition.

Future Action Condition. The analysis of future action conditions considers the effects of the action in concert with no action trends and conditions. If it is determined from the preliminary or detailed assessment that the population to be displaced represents a sizable proportion of the future study area population (generally greater than 5 percent) *and* that population with a similar profile would not be able to relocate within the neighborhood, then the issue of a potential change in neighborhood character is addressed as described in Section 3H. If the number of units to be displaced is

substantial *and* the loss of the existing residential population or the types of units being demolished would result in a significant change in the socioeconomic profile or housing character of the study area, a potential significant adverse impact may occur.

331.2. Direct Business and Institutional Displacement

Existing Conditions. Like residential displacement, the detailed assessment of direct business or institutional displacement focuses on the specific conditions that describe the businesses or institutions to be displaced and the characteristics of the study area related to the displacement. If the preliminary assessment (see 321.2, above) identifies (or cannot rule out) a potential concern, the detailed assessment is the next step in fully defining that issue. One or more of the following tasks may be appropriate:

- Describe the operational and financial characteristics of the business or institution to be displaced. Also describe the products, markets, and employment characteristics. Describe the effects of this business or institution on the City's economy. Information on retail sales can be obtained from the U.S. Department of Commerce, Census of Retail Trade, County Business Patterns. Other sources of information can be obtained from the Department of City Planning's Housing, Economic and Infrastructure Planning Division or business libraries, such as the Brooklyn Business Library and the New York Public Library.

- Determine whether the business or institution to be displaced is a defining element of the character of the study area or neighborhood. For example, would the action displace a marina and ship repair yard that are central to the active waterfront that defines the character of the neighborhood?

- Determine whether the business or institution to be displaced has an important or substantial economic value to the City. Describe what economic value it has and the effects of its products and services. Describe locational needs, if any.

- Assess whether the business or institution would be able to relocate in the study area or elsewhere in the City. This assessment is based on a comparison of the products, services, and locational needs of the business or institution with the consumer base and available properties in the study area.

Future No Action Condition. For the project's build year, assess conditions related to the site and the study area in the future. Relevant information may include: any changes in the uses on-site; if the available commercial or industrial space in the area is expected to expand or decrease; if rents are expected to increase or remain stable; if the tenants' conditions would change (e.g., rent increases, lease expiration, etc.). This information is obtained from persons expert in the local conditions, through interviews with real estate brokers, and through coordination with the land use analysis (see Section 3A.330, above). The conclusions of the existing conditions analysis are then revised to include relevant information about the future no action condition.

Future Action Condition. Describe the likely effects on the businesses or institutions being displaced, and on the character of the study area, as relevant. This analysis is based largely on the analysis of existing conditions, adjusted to account for future trends that would occur absent the action. The identification of impacts depends on whether the business or institution is a defining element of neighborhood character, whether it is important to the City economy, and whether it could be relocated within the study area or elsewhere in the City. If the business or institution has been found to be defining and not likely to relocate in the study area, then an assessment of the effect of the loss on neighborhood character, particularly in terms of land use and population patterns, is performed (see also Section 3H, "Neighborhood Character"). If the business or institution could not be relocated within the City and it is important to the City's economy, there may be a significant adverse impact.

332. Indirect Displacement

332.1. Indirect Residential Displacement

The approach to the detailed assessment of indirect residential displacement is similar to that of the preliminary assessment (Section 322.1, above), but requires more in-depth analysis of census information and can include extensive field surveys, as well. The objective of the analysis is to characterize existing conditions of residents and housing in order to identify populations that may be vulnerable to displacement ("populations at risk"), to assess current and future socioeconomic trends in the area that may affect these populations, and to examine the effects of the proposed action on prevailing socioeconomic trends and, thus, its impact on the identified populations at risk.

Existing Conditions. Depending on the proposed action in question, characterizing existing conditions in a study area will include examination of census data and may require consideration of additional data sources,

interviews, surveys, and field work. A narrative is provided describing population characteristics and trends over time. Major indicators of growth and decline in the total population or specific age groups or other subcomponents are described, as appropriate. It is helpful to consider what statistical parameters are most appropriate in describing population characteristics. In some cases averages are more reflective of the population; in other cases a median is a better indicator. For example, the average household size in an area that contains a range of household sizes, with a few households that are substantially larger than the vast majority, would not appropriately describe the typical household. In this case, the median would be more useful in describing household size. In addition, it is often helpful to break down income levels into groupings that are commonly used in the City to define income levels. For example, the City has identified specific income levels for low, moderate, and middle income. These typically change annually based on inflation and other economic factors. The following is a reasonably comprehensive list of information that may be required for the analysis.

- *Population profile.* These data are found primarily in the U.S. Census:

  1. Total population by census tract, for the study area, for the borough, and for the City. To understand trends, it is useful to include data from the most recent census and from the previous decade. If there is reason to believe that longer-term trends should be assessed, then the data from the most recent census and the previous two decades can be presented.
  2. Household information (total households, household size, individuals) by census tract, study area, borough, and City.
  3. Age. The median age and age groupings in an area may be useful in defining the population profile.
  4. Economic status. Income and poverty status, in combination with other characteristics and trends noted in items 1-3, above, may help to define vulnerable populations. It may be helpful to examine median household income, the distribution of income (e.g., do all households have incomes close to the median or are there sizable segments with incomes much lower or much higher than the median), and proportion of individuals living below the poverty level.
  5. Labor force characteristics are typically not necessary, but may be used as appropriate. Available information includes the percentage of the population in the labor force, workers per household, and occupation. This information may be useful to further characterize the population, particularly if the area shows an increase in working-age people or if an examination of economic status indicates that unemployment may be high. Occupation may also identify residents who may work in the area.

- *Housing profile.* These data are found in the U.S. Census, in DCP's MISLAND files, from agencies owning or operating housing in the area, and through survey, as indicated below:

  1. Housing units. The U.S. Census provides information on numbers of housing units, their size, occupancy (by renters or owners), and size of structures in which the units are located. As with population information, it is useful to compare census tracts within the study area, the total study area, the borough, and the City, to understand the particular conditions of the study area. Trends in housing can also be obtained by comparing the most recent census with the previous one or two decades. Where there is reason to suspect that the latest census data are out of date, annual information on new housing units can be obtained from DCP's MISLAND file.
  2. Housing value and rent. The U.S. Census provides information on median housing value and median contract rent. This information reflects the range of rents for units of different sizes and ages, and for occupants who may have moved in recently or lived in their units for a long time. To understand current trends, this information can be supplemented by discussions with real estate brokers and examination of current apartment listings. The key for this analysis is to establish market-rate prices, and understand the extent to which the site of the action and/or the study area differ or conform to these trends. Housing sales are recorded and available through various real estate publications.
  3. Cooperatives and condominium conversions. In some neighborhoods the conversion of units to cooperatives or condominiums is an indication of upgrading trends. Information is available through various real estate publications.
  4. Single-room occupancy hotels (SROs). If there is reason to believe that a sizable population in the study area resides in SROs, it may be appropriate to inventory these hotels and estimate their residential population. This can be done using the MISLAND multiple dwelling

file in conjunction with a field survey, interviews with managers or even desk clerks, and observing the people entering and exiting the building.

5. Housing status. The rent levels of many of the housing units in the City are controlled through several mechanisms: rent control, which applies to units that are located in buildings built before 1947 with three or more units and that have been occupied by the same tenant since 1971; rent stabilization, which sets the rent of units in buildings of six units or more that were built before 1974 or that have received tax abatements or exemptions under one of several City programs; direct public subsidies to the landlord through such means as rent subsidy payments, low-interest mortgages, and/or partial real estate tax exemptions; and public ownership. The City's MISLAND data base, IPIS property management data base, and Housing Data Base for Public and Publicly-Assisted Housing can provide information on publicly subsidized or publicly owned housing units. The privately held rental units not subject to rent control or rent stabilization are estimated from census data. The census presents the number of rental units (and population) in structures of one and two units, three and four units, five to nine units, and so on. Those units in buildings of five or fewer units can be assumed not to be subject to rent stabilization. It is also conservatively assumed that none of these units are subject to rent control, either. Based on the study area in question, the analyst should make a reasonable estimate of how many units and residents in the five- to nine-unit category are in five-unit structures and add these to the two lower categories to estimate the number of units and population unprotected by rent stabilization.

- *Identify population currently at risk of displacement.* Using some or all of the information listed above, or any other information that would be relevant, the analyst can identify the general location and size of the population at risk of displacement. These would be people living in privately held units unprotected by rent control or rent stabilization, whose incomes or poverty status indicate that they could not support substantial rent increases.

Future No Action Condition. Since impacts of the proposed action are assessed in relation to the future without the action, it is necessary to project existing conditions to the build year for the action. The objective is to identify, as appropriate, the trends affecting rents and displacement that may be in effect in the future without the action. This analysis includes the following:

- Identification of other actions and developments proposed, approved, or under construction in the area (see "Land Use, Zoning, and Public Policy," Section 3A).
- Identification of anticipated population changes, if any.
- Based on recent and current trends in the area, assessment of future trends and conditions.
- Consideration of economic trends within the City.

Future Action Condition. If the proposed action may introduce a trend or accelerate a trend of changing socioeconomic conditions *and* if the study area contains population at risk, then it can be concluded that the action would have an indirect displacement impact. Understanding the action's potential to introduce or accelerate a socioeconomic trend is a function of the size of the development resulting from the action compared to the study area and the type of action (does it introduce a new use or activity that can change socioeconomic conditions in the study area).

The size of the action can be measured in terms of its square footage or number of housing units, or its population and housing profile in relation to that of the study area. This involves estimating the project's population characteristics, particularly including size, age, and income, and comparing these conditions in the future without the action. Generally, if the proposed action would increase the population in the study area by less than 5 percent, it would not be large enough to affect socioeconomic trends significantly.

The type of action is assessed in relation to future land uses or activities without the action (this information is available from the land use analysis—Section 3A), and to expected future socioeconomic conditions (no action conditions). An example of an action that, by its difference from the surrounding area, could affect or introduce a new socioeconomic trend would be a large, mixed-use or commercial project, perhaps as part of an urban renewal area, that would be built near a lower-rise, lower-income residential area. Usually, this

type of situation also requires a relatively large development to affect or introduce a trend.

332.2. *Indirect Business and Institutional Displacement*

As noted under the preliminary analysis of business and institutional displacement (Section 322.2), indirect displacement may result from an action that would increase property values and thus increase rents for potentially vulnerable category of businesses. Such displacement can be of concern when it would result in changes to land use or population patterns or community character, or when it would displace businesses that meet the criteria set forth in Section 321.2, above. The assessment approach varies depending on the particular indirect displacement issue identified in the preliminary assessment.

Increases in Property Values and Rents. Whatever the actual cause (e.g., the introduction of new economic activity or new population groups, the removal of blighting uses) the assessment of indirect displacement depends on developing an understanding of which sectors of an area's economic base may be most vulnerable to indirect displacement.

Existing Conditions—The first step is to develop a profile of the study area to determine whether it includes any potentially vulnerable category of businesses or institutions.

- Economic profile. Some or all of the following tasks may be applied to construct an economic profile of the study area. Some of these tasks may have been performed as part of the preliminary assessment (see Section 322.2, above), but are repeated here to illustrate the completeness of this profile.

  1. If the area is large enough, gather zip code employment data available from the New York State Department of Labor. This will provide a picture of an area's employment base by key industry sector and, through the use of multi-year data, trends in employment.
  2. Determine whether any relevant studies have already been conducted that can provide relevant, current data. In certain areas, such as Long Island City, comprehensive studies are available from public agencies. The most likely sources of data are the Department of City Planning and the Economic Development Corporation. Local community boards may also have appropriate data.
  3. Generally, to supplement secondary data as appropriate, an up-to-date profile may be developed by collecting primary data. This may include conducting a building-by-building field survey of the relevant area. The survey should focus on the number and types of firms; indicators, if any, of recent trends (e.g., are there already signs of change or disinvestment); and available space, as well as real estate brokers active in the area. Real estate brokers are often excellent sources of trends in tenancy and rental and sale prices for space and whether there are special relationships among the activities of the area's businesses.
  4. The survey data and other data gathered can also be supplemented through interviews with other relevant public officials (e.g., particular industry specialists), trade associations, local development corporations, and/or merchant associations. In some instances, interviews with selected businesses identified in the field survey can be used to gain important insights into trade areas, customer base, unusual linkages, relocation possibilities, etc.
  5. Identify trends and conditions in the underlying economy.

- Regulatory protections. Determine how existing regulations and laws may affect possible shifts in the economic base of the area.

- Determine whether land use, building stock, transportation, and other services required to support the potentially displaced economic activity exist in the study area. This is undertaken first by identifying the elements necessary and then by coordinating with the land use analysis or other appropriate technical area.

- Identify categories of businesses or institutions at risk. Using the information gathered, characterize the existing economic profile, focusing on categories of businesses and institutions that could be vulnerable to displacement if property values and rents were to rise. Assess this likelihood given public policy and other factors that affect economic conditions in the area.

Future No Action Condition—For the project's build year, determine whether any factors would emerge that would affect the underlying economic base of the target area. This may include the influences of specific development projects, the enactment or expiration of relevant regulations and laws, and an assessment of underlying trends as identified above and in the land

use analysis (see Section 3A, above). The conclusions of the existing conditions analysis are then revised to include relevant information about the future no action condition.

Future Action Condition—The assessment of existing and future no action conditions will provide a picture of the local economic base, changes that have occurred over the years, and changes, if any, that can be expected in the future. Qualitatively assess, based on historical patterns of development in comparable neighborhoods and the strength of the underlying trends, whether and under what conditions the action would stimulate changes that would raise either property values or rents and, if so, whether this would make existing categories of tenants vulnerable to displacement.

Competition. Occasionally, development activity may create uses that compete with existing businesses. An example typical in New York City is the development of new shopping facilities that attract sales from existing stores. While these competitive economic impacts do not necessarily generate environmental concerns, where they have the potential to affect neighborhood character by affecting the viability of neighborhood shopping areas they become an environmental concern. This analysis is closely coordinated with neighborhood character studies (see Section 3H).

Existing Conditions—The analysis of the potential effects of competition varies depending on the nature, size, and location of the proposed action. For the development of a shopping center, the following steps may be appropriate.

- Determine the primary trade area for the proposed anchor stores. The primary trade area is the area from which the bulk of the store's sales are likely to be derived. The trade area can be expressed in either mileage (e.g., a 1½- to 2-mile radius from a site is a typical primary study area for a large supermarket; a larger trade area would be typical for a department store) or travel time.

- Develop a profile of the retail environment within the trade area. This will require locating key retail concentrations within the trade area; creating, usually through field surveys, an inventory of their retail uses; and, through visual observation or through discussions with local realtors, development corporations, or merchant associations, developing an understanding of recent trends and overall conditions. If there is no appreciable overlap between the proposed uses and the existing retail base within a trade area, no additional information or analysis is needed. However, in most cases, substantial overlap between the proposed uses and existing retailers is likely (particularly when the proposed anchor is a large supermarket), thereby necessitating further analysis. This would require the following additional subtasks:

1. Through data available from the census and from the U.S. Department of Commerce, develop a profile of the shoppers within the primary trade area. This profile should include information on total population, households, income and expenditure potential for relevant retail goods, and, if relevant, auto ownership.
2. Profile stores that are most potentially competitive with project anchors. In the case where the shopping center would be anchored by a supermarket, this profile should include the location, size, characteristics (e.g., availability of parking, hours of operation), and sales volume of trade area supermarkets. These data can be collected through field observations (for availability of parking and hours of observation); detailed real estate atlases, such as Sanborn maps (for size); and from standard references, such as *The Dollars and Cents of Shopping Centers*, published by the Urban Land Institute (for estimated sales volume). The number of other food stores should also be identified though, because of their sheer number, a detailed profile may not be necessary. Where there are other anchors, similar procedures can be followed. Key competitors can be identified and profiled.
3. The expenditure profile developed in item 1 and the sales generated by key anchors developed in item 2 can be compared to determine whether the trade area is currently saturated with retail uses (not usually the case in New York City) or whether there is likely to be an outflow of sales from the trade area. This assessment will be based on the percentage of available sales currently derived by existing stores (the capture rate) and the residue of dollars left unspent.

Future No Action Condition—For the project's build year, determine whether any factors would emerge that would affect conditions within the trade area. These may include projected increases in population that would provide a stronger base of shoppers, other projected retail developments, or anticipated store closings or rising incomes.

Future Action Condition—Add the proposed action to the baseline established in the future no action conditions. For a proposed shopping center, the future action conditions analysis could consist of the following tasks:

- Project the sales volume for the anchor tenants. This would be based on the size of the store and on industry standards for sales derived from the Urban Land Institute's *Dollars and Cents of Shopping Centers* or another appropriate source.

- Compare the project sales volume with the dollars available within the trade area (derived from the existing conditions analysis). If the action would substantially raise the capture rate within the trade area, it may have the potential to affect competitive stores throughout the trade area. Depending on specific characteristics, effects on stores closest to the site could also occur even when there are still substantial unspent dollars within the trade area.

- Assess impacts on local shopping areas. If the proposed anchor stores have the potential to affect the operations of competitive stores located on neighborhood commercial strips and if these competitive stores are the anchor stores on neighborhood commercial strips, there would be a potential for neighborhood character impacts. The number and variety of the proposed non-anchor stores could accentuate the potential for impacts.

333. Adverse Effects on Specific Industries

333.1. Existing Conditions

The key to understanding potential impacts on specific industries is to develop an understanding of the relationship between the proposed action and the potentially vulnerable business(es). This may require field observation and interviews with select local businesses. For non-location-specific actions, such as changes in regulations for particular industries, it is important to understand the relationship between the processes intended for regulation and the operation of the businesses. Again, this may require either special research or interviews with potentially affected businesses.

331.2. Future No Action Condition

Determine any factors that would affect the future operations of vulnerable businesses identified in the analysis of existing conditions. For example, it may be possible that technological advances may phase out the types of processes proposed for regulation.

331.3. Future Action Condition

Potential effects can range from changes in operations that may be of little overall consequence to the individual businesses, changes that may add costs but would not cause displacement or relocation, or changes that would result in displacement or relocation. For example, for changes in regulations that affect the basic processes conducted by a business, the analysis could consider whether that process is critical for the operation of the business, whether there are acceptable substitutes that would not materially affect the operations of the businesses, and whether relocation to other areas with less stringent regulations would be a more viable option. In some cases, the action may directly or indirectly affect businesses that support or interact with other businesses or industries in the area, which would then be secondarily affected. If there is potential for these businesses to be affected, they should be described and analyzed.

400. Determining Impact Significance

410. DIRECT DISPLACEMENT

411. Residential Displacement

Impacts of direct residential displacement are usually considered significant if they would contribute to a change in neighborhood character. In these cases, mitigation would be considered.

412. Business and Institutional Displacement

For businesses and institutions with the characteristics listed in Section 321.2, above, a situation in which such a business or institution would be displaced by the action and could not relocate into suitable space according to its reasonable locational needs may be considered a significant adverse impact warranting consideration of mitigation.

420. INDIRECT DISPLACEMENT

421. Residential Displacement

Generally, if a proposed action would trigger or accelerate a socioeconomic change that would affect a population at risk or if it would accelerate such a trend enough to affect neighborhood character, the impact would be considered significant and adverse, and mitigation should be considered. The basis for this conclusion is that the households or individuals would be displaced by legal means. They would not be likely to receive any relocation assistance, and, given the trend created or accelerated by the proposed action, they

would not be likely to find comparable replacement housing in their neighborhood.

422. Business and Institutional Displacement

Generally, if a proposed action would trigger a socioeconomic change that would affect a category of business or institution with the characteristics set forth in Section 321.2, the impact would be considered significant and adverse, and mitigation should be considered. The basis for this conclusion is that the businesses would be displaced by legal means and would therefore be powerless to prevent their displacement. They would not be likely to receive any relocation assistance, and, given the trend created or accelerated by the proposed action, they would not be likely to find comparable replacement space in their market area.

430. EFFECTS ON SPECIFIC INDUSTRIES

An impact of an action that would measurably diminish the viability of a specific industry that has substantial economic value to the City's economy is considered significant and adverse, requiring consideration of mitigation.

500. Developing Mitigation

510. DIRECT DISPLACEMENT

511. Residential Displacement

For significant impacts on neighborhood character that result from direct residential displacement, mitigation would consist of relocation of the displaced residents within the neighborhood. Measures could include provision of relocation assistance or additional relocation assistance, including lump sum payments, payment of moving expenses, payment of brokers' fees, payment of redecorating expenses. When direct displacement would cause a significant impact, the mitigation could also be to replace affordable units elsewhere in the study area to offset the effects of the action. The extent of mitigation may be limited by overall project feasibility. In such cases, an unmitigated impact is identified.

512. Business and Institutional Displacement

Mitigation for business and institutional displacement is similar to residential mitigation, but the opportunities can be more limited, depending on the problem. Measures include helping to seek out and acquire replacement space; provision of relocation assistance, including lump sum payments, payment of moving expenses, payment of brokers' fees, payment for improvements to the space (if the new landlord is not providing for improvements). The extent of mitigation may be limited by overall project feasibility. In such cases, an unmitigated impact is identified.

520. INDIRECT DISPLACEMENT

521. Residential Displacement

Similar to the mitigation for direct residential displacement discussed above, for significant impacts on neighborhood character that result from indirect residential displacement, mitigation would consist of relocation of the displaced residents within the neighborhood or providing new housing elsewhere in the study area to offset the effects of the action. Mitigation measures for indirect residential displacement can include: providing appropriate, comparable space as part of the project, either on-site or off-site but within a reasonable distance of the current location of the units that would be displaced; contributions to tenant advocacy groups; or enacting laws and regulations to prevent indirect displacement from occurring. If this mitigation would require other discretionary actions that may not be approved concurrently with the proposed action, the environmental assessment would disclose that there may be an unmitigated adverse impact if the mitigation is not approved.

When the action is a land use that would lead to disinvestment in the neighborhood, resulting in residential displacement, mitigation can include enhanced amenities or increased public services to be included as part of the action.

522. Business and Institutional Displacement

Mitigation measures for indirect displacement of businesses and institutions can include enactment of regulations and policy. (If this mitigation would require other discretionary actions that may not be approved concurrently with the proposed action, the environmental assessment would disclose that there may be an unmitigated adverse impact if the mitigation is not approved.) In some cases, it may be possible for a project sponsor to acquire and preserve space in, say, industrial use, or guarantee rent levels over a specified time period. For adverse impacts on local commercial streets, mitigation can include contributions to fund local commercial revitalization efforts. For example, funds that enhance the streetscape along a commercial strip may encourage patrons to continue shopping there, despite increasing competition.

When the action is a land use that would lead to disinvestment in the neighborhood, resulting in displacement of businesses or institutions, mitigation can in-

clude enhanced amenities or increased public services to be included as part of the action.

530. EFFECTS ON SPECIFIC INDUSTRIES

For specific industries affected by changes in regulations, mitigation can include financial compensation through tax reductions or public expenditures, or lifting of other regulations. If this mitigation would require other discretionary actions that may not be approved concurrently with the proposed action, the environmental assessment would disclose that there may be an unmitigated adverse impact if the mitigation is not approved.

600. Developing Alternatives

610. DIRECT DISPLACEMENT

611. Residential Displacement

Usually, for an action that would result in significant impacts because of direct displacement of residences, an alternative site should be considered that would not displace any residences. If those residences occupy only a portion of the project site, a smaller project or an alternative configuration that avoided them could also be considered. Other alternatives could include an action that included appropriate housing units.

612. Business and Institutional Displacement

Similarly, for actions that would result in significant impacts because of direct displacement of businesses, alternative sites should be considered that would not displace any businesses. If those businesses occupy only a portion of the project site, a smaller project or an alternative configuration that avoided them could also be considered.

620. INDIRECT DISPLACEMENT

621. Residential Displacement

For residential projects, alternatives that avoid indirect residential displacement would include a different housing mix as part of the project—for example, including more large units to accommodate the families to be displaced, or including more affordable units that could replace those to be affected in the study area. A different mix of uses, or less intense uses, can also be considered. In some cases, particularly public actions, different sites should be considered.

622. Business and Institutional Displacement

Where indirect displacement of businesses or institutions is at issue, alternatives are similar to those for indirect residential displacement: altered mix of uses, perhaps to include some space for uses to be indirectly displaced; less intense uses; or, if appropriate, an alternative site.

630. EFFECTS ON SPECIFIC INDUSTRIES

It is difficult to be specific as to alternatives in the case of impacts on specific industries, since the cases are so disparate. If regulations are the action, a change to regulations or their timing may be an appropriate alternative. Other alternatives depend on the specific circumstances of each action.

700. Regulations and Coordination

710. REGULATIONS AND STANDARDS

711. Regulations Affecting Residents

As discussed above, residential tenants are afforded protection against displacement through State rent regulations, regulations guiding the conversion of rental units to co-operatives or condominiums, and provisions against the harassment of tenants. For those being displaced by a City action or from a property owned or managed by the City, relocation benefits are provided. These regulations are summarized below.

711.1. Rent Regulation

The New York State Department of Housing and Community Renewal (DHCR) administers both rent control and rent stabilization, two programs aimed at regulating the rents paid by tenants. Rent control covers tenants in rental buildings constructed prior to February 1947 who moved in prior to July 1971. Rent stabilization generally applies to buildings with six or more units constructed before 1974 or receiving benefits of a tax abatement program. Rent adjustments for rent-controlled apartments are made based on a determination of a maximum base rent, i.e., the rent that would be required to operate the unit under prevailing cost conditions and to provide the owner an 8.5 percent return on the equalized assessed value of the building. Rents in controlled units may be adjusted to account for increases in heating fuel costs.

Rent stabilization also applies to single room occupancy (SRO) dwellings in buildings constructed before July 1, 1969 with six or more units and renting for less than $350.00 per month or $88.00 per week on May

31, 1968. Current annual rent increases allowed for permanent SRO tenants are limited to 2.0 percent.

HPD administers the Senior Citizen Rent Increase Exemption Program (SCRIE), which regulates rents for tenants 62 years old and over whose household income is $15,000 or less. For these tenants, annual rent payments cannot exceed 30 percent of annual income.

711.2. Co-op and Condominium Conversion

The conversion of rental units to co-ops or condominiums was a strong phenomenon of New York City's real estate market during the 1980's. Two routes to conversion are possible—eviction plans, which require the approval of 51 percent of the tenants in the building and which allow for the eviction of tenants who do not purchase their apartments once the conversion plan has been declared effective; and non-eviction plans, which require the approval of only 15 percent of the tenants and which do not allow the eviction of tenants who do not purchase their units. Disabled persons and senior citizens are protected from eviction regardless of the kind of plan offered, their income level, or the length of residency in the building. Since virtually all offering plans in New York City over the past five years have been non-eviction plans, co-op and condominium conversion activity does not pose a strong displacement threat to tenants.

711.3. Additional Protection for SRO Tenants

Since residents of SRO units have at times been subject to displacement (see section below), it should be noted that there are other provisions in the law (also administered by DHCR), other than rent stabilization, which provide an added degree of protection to SRO tenants. These cover the following: the provision of basic services, such as heat, hot water, janitorial services, maintenance of locks and security devices, repairs and maintenance and painting; and evictions, including those required as a result of plans for demolition. In the case of demolition, the owner is responsible for the relocation of tenants to suitable housing at the same or lower regulated rent in a closely proximate area and for paying moving expenses.

711.4. Anti-Harassment Provisions

Despite the protection afforded tenants under rent control and rent stabilization, tenants can be forced out of their apartments through illegal activities, such as harassment by landlords. Both HPD and DHCR administer measures against harassment that, in the more severe cases, provide very strong penalties for persons found guilty of harassment and illegal eviction. With regard to SRO dwellings, no plans for demolition or alteration can be approved by the Commissioner of Buildings unless the Commissioner of HPD either has certified that there has been no harassment of lawful occupants within the 36-month period prior to the date of submission of an application for certification of no harassment or has issued a waiver of such certification.

711.5. Relocation Assistance for Direct Residential Displacement

If a City action results in the acquisition of properties containing residential tenants, HPD will offer relocation assistance to site occupants in compliance with City and State law. For those who are to be displaced under an Urban Renewal Plan, relocation will comply with all applicable laws and regulations including, but not limited to, Section 505 (4)(e) of the Urban Renewal Law. If Federal funding is involved, HPD will provide benefits and services under the provisions of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (42 U.S.C. 4601), as amended ("Uniform Relocation Act"). If feasible, HPD will relocate families and individuals to be displaced into "decent, safe, and sanitary dwellings, which are or will be provided [on-site] or in other areas not generally less desirable in regard to public utilities and public and commercial facilities, at rents or prices within the financial means of such families or individuals, and reasonably accessible to their places of employment."

712. Regulations Affecting Businesses

Regulations, such as rent regulations, to prevent involuntary, indirect displacement, are not available to businesses. However, the City does offer incentives and payments in selected areas to help offset economic trends that may displace certain types of businesses. Eligible categories of businesses thus receive some measure of protection against economic displacement. In addition, businesses directly displaced by City actions may receive benefits and services under State and Federal law, as applicable.

712.1. City Commercial and Industrial Programs and Incentives

The City offers a number of programs and incentives to commercial and industrial businesses designed to help retain and expand such businesses at their current locations or in New York City. Most of the programs and incentives are administered by the New York City Economic Development Corporation (EDC). Information on these programs can be obtained from EDC and is summarized below.

Tax Reduction Programs. The City offers a variety of tax-reduction programs to commercial and industrial businesses, as follows.

- *Industrial and Commercial Incentive Program (ICIP).* This program offers 12- or 22-year tax abatements for the significant renovation of older commercial or industrial buildings. For commercial buildings, the timing and conditions of the abatement depend on the location of the building in the City. Locations outside of the central business district receive the most favorable terms. Industrial renovations receive the maximum benefit regardless of location, and industrial buildings are also exempt from tax increases that result from reassessing the property at its higher market value.

- *Relocation Employment Assistance Program (REAP).* If a firm is moving from the area south of 96th Street in Manhattan to an location north of 96th Street or in any of the other boroughs, it can receive a 12-year, $500-per-employee annual credit applied against the City's general corporation tax, unincorporated business tax, or financial corporation tax.

- *Commercial Rent Tax Reduction.* Businesses located north of 96th Street in Manhattan or in the four other boroughs are automatically eligible for a permanent 30 percent reduction in commercial rent tax.

- *Economic Development Zones.* If an industry expands or relocates within one of four state-designated EDZs, it can receive substantial tax incentives and utility discounts, including wage tax credits, sales tax credits, utility reductions, land tax abatement, and real property tax exemptions.

Relocation Assistance. Eligible manufacturers, warehousers, and distributors that relocate within the City can receive financial assistance from the Business Relocation Assistance Corporation (BRAC) and through EDC's Real Estate Services. BRAC makes payments to defray moving costs when residential conversion displaces such businesses that are being displaced from one of 11 targeted areas in the City. Moving grants are also given to eligible firms moving within the City for any reason under the Retention and Relocation Program, the Relocation Intra-Borough Program, or the Relocation Plus Productivity Matching Grant program. EDC will assist eligible relocating industries with services, including planning and feasibility studies, financial analyses, guidance through approval processes, location of relocation space, etc.

Energy Cost Savings Programs. The City, Con Edison, and Brooklyn Union Gas offer a number of programs to reduce the costs of electricity and gas usage for eligible businesses.

Financing Assistance. Businesses that move or expand in the City can be eligible for one or more financing programs, including low-cost, tax-exempt bond financing through the Industrial Development Agency (IDA); loans from the New York City Micro Loan Program, New York City Small Business Reserve Fund; or New York City Direct Loan.

712.2. Relocation Assistance for Direct Business Displacement

As described in 711.5, "Relocation Assistance for Direct Residential Displacement," if a City action results in the acquisition of commercial properties, HPD will relocate site occupants in compliance with State law. Businesses displaced under an Urban Renewal Plan will be relocated in accordance with all applicable laws and regulations, including, but not limited to, the State's Urban Renewal Law. If Federal funding is involved, site occupants will receive benefits and services in compliance with the Uniform Relocation Act.

720. APPLICABLE COORDINATION

Socioeconomic conditions analyses often use information gathered for other assessments of other technical areas. Similarly, data gathered for the socioeconomic analyses can be useful for other technical areas. Therefore, the lead agency should coordinate communication between the different technical analyses.

In addition, coordination with government agencies may be required when their polices apply to the proposed action. These can include the New York State Division of Housing and Community Renewal, which administers rent regulations, and the New York State Attorney General's Office, which regulates cooperative and condominium offering plans.

730. LOCATION OF INFORMATION

731. Census of Population and Housing

- New York City Department of City Planning (DCP)
  Housing, Economic, and Infrastructure Planning Division
  Population Division
  22 Reade Street
  New York, NY 10007

- U.S. Department of Commerce
  Bureau of the Census
  26 Federal Plaza
  New York, NY 10278

732. Other Population, Economic, and Land Use Data

- MISLAND. Data base for land use, housing, demographics, and assessed values.
  Source: DCP, Planning Support and Computer Service

- Housing Data Base for Public and Publicly-Assisted Housing (1982); Housing Data Base Updated (1985).
  Source: DCP, Housing, Economic, and Infrastructure Planning Division

- *Annual Report on Social Indicators*. Provides summary data for the City, and, where available, for boroughs and community districts.
  Source: DCP, Housing, Economic, and Infrastructure Planning Division

- *Comprehensive Housing Affordability Strategy*, published annually. Provides information on specific programs and on available funding for government-assisted housing.
  Source: DCP, Housing, Economic, and Infrastructure Planning Division

- *New Housing in New York City*. Annual reports and data base for new housing completions.
  Source: DCP, Housing, Economic, and Infrastructure Planning Division

- Employment and unemployment data, number of firms and total payroll.
  Source: New York State Department of Labor
  One Main Street
  Brooklyn, NY 11201

- Economic data bases maintained by DCP, Housing, Economic and Infrastructure Planning Division, as follows:

  1. *ES202 (Covered Employment) Data*. Employment, annual payroll, average annual pay per employee, and number of establishment data for New York City, each borough, and the United States. Data are tabulated at the industry division, 2-digit, and 3-digit SIC levels. Recent data are available by year; some historical data (from 1960's and 1970's) also available.

  2. *Economic Census Data*. Census of Manufacturing, Census of Wholesale Trade, Census of Retail Trade, Census of Selected Services for 1963, 1977, and 1987. The data are for New York City, each borough, and the United States, and include number of establishments, employment, annual payroll, average annual (and hourly for manufacturing) pay per employee, *and* a measure of value of output (sales, receipts, value added).

  3. *Bureau of Economic Analysis Data*. The Bureau of Economic Analysis CA5 Local Area Employment series, 1969 to most recent year, by industry division and type (wage and salary, self-employed, etc.) for New York City, each borough, the metropolitan area, and the United States. Data are for those working in New York City.

     The Bureau of Economic Analysis CA25 Local Area Personal Income series, 1969 to most recent year, by industry division and type (wages and salaries, transfer payments, dividends interest, and rent, etc.), for New York City, each borough, the metropolitan area, and the United States. Includes overall per capita income as well as the sources of aggregate income. Data are for New York City residents in some cases, and those working in New York in other cases.

  4. *Current Employment Survey (Non-Agricultural Data)*. Annual average employment data. New York City and United States at the industry division level, 1958-present.

     Current employment survey annual average employment data. New York City, the metropolitan area (by PMSA), the Northeast (and each component state), and the United States at the industry division level, 1983 to present. New York City and the United States at the 2-digit SIC level, as far back as the 1987 SIC change will allow.

     Monthly current employment survey employment estimates for New York City, 1987 to the present. Data are for total employment, private, government, and selected 2-digit industries.

- *New Opportunities for a Changing Economy, Citywide Industry Study of Industry Trends, Labor Force, Geographic Atlas, Transportation, Zoning, Technical Reports*. DCP, January 1993.

- IPIS property management data. Inventory of City-owned property.
  Source: Department of General Services
  Division of Real Property
  2 Lafayette Street
  New York, NY 10007

- Real estate publications.

- Information on median income, including *Housing and Vacancy Report, New York City*, 1987. Prepared by Michael A. Stegman for HPD, April 1988.
  Source: DCP and
  New York City Department of Housing Preservation and Development
  100 Gold Street
  New York, NY 10038

- *Dollars and Cents of Shopping Centers*, published by the Urban Land Institute.

- Assessed values and tax rates.
  Source: New York City Department of Finance
  Municipal Building
  New York, NY 10007

- Expenditure potential for retail goods, models for determining the direct and indirect jobs generated by given construction activity.
  Source: U.S. Department of Commerce
  14th Street, NW
  Washington, DC 20230

- Information on relocation assistance.
  Source: New York State Division of Housing and Community Renewal (DHCR)
  Hampton Plaza
  38-40 State Street
  Albany, NY 12207
  and
  New York City Economic Development Corporation (EDC)
  110 William Street
  New York, NY 10038

733. Information on Publicly Subsidized Housing

- HPD

- DHCR

- EDC

- New York State Urban Development Corporation (UDC)
  1515 Broadway
  New York, NY 10036

- New York City Housing Authority
  250 Broadway
  New York, NY 10007

- U.S. Department of Housing and Urban Development (HUD)
  Region II, Regional Office
  26 Federal Plaza
  New York, NY 10278

- Human Resources Administration
  250 Church Street
  New York, NY 10013

C. Community Facilities and Services

Community facilities are public or publicly funded facilities, such as schools, hospitals, libraries, day care centers, and fire and police protection. The CEQR analysis looks at the potential that an action could affect the provision of services provided by those facilities that are public or publicly funded and are available to the community. This generally occurs when a project either physically displaces or alters a community facility, or causes a change in population that could affect the service delivery of a community facility, as might happen if a facility is already overutilized or if a project is large enough to create a demand that would either overtax or not be met by existing services.

100. Definitions

Although many projects include some level of analysis of community facilities, not every environmental assessment examines every community facility. The range of community facilities (or resources) addressed in environmental assessments include the following:

- *Public educational facilities (schools).* Only public schools operated by the New York City Board of Education are analyzed under CEQR. Although these include primary, intermediate, and high schools, this analysis generally relates only to primary and intermediate schools, which serve a local population, and not to high schools, which have a borough- or Citywide population base. Schools are analyzed based on the potential for the project to cause overcrowding (i.e., a deficiency of available seats for a particular age group within the district).

- *Libraries.* Public libraries as analyzed under CEQR are those operated by the public library system, which includes the New York Public Library, the Queens Borough Public Library, and the Brooklyn Public Library. The analysis is concerned with the location of facilities proximate to the project area. The primary purpose of libraries is to provide information services, including written documents, reference materials, audio and visual references, and educational services. The analysis of libraries generally focuses on the resources available to the population of the service area. In some cases, the analysis may also look at special programs as they pertain to the library's utilization rate.

- *Hospitals and other health care facilities.* Hospitals include both public and nonpublic (nonprofit and proprietary) facilities that are available to any member of the community. Hospitals are analyzed based on the number of beds available for the service area population compared with boroughwide statistics on the availability of beds. Hospital utilization is monitored by the Health Systems Agency (HSA) for the New York State Department of Health (DOH); that agency's standard has traditionally served as the basis for analyses under CEQR.

  Other public health facilities, such as public clinics and ambulatory health care facilities, are examined based on their operating capacity (which considers, among other things, the number of physicians, examination rooms, or other facilities) and the potential for the project to add a significant number of new users, resulting in a demand for their services that may exceed those facilities' capacity to provide them.

- *Day care centers.* Publicly financed day care centers, under the auspices of the City's Human Resources Administration (HRA), provide care for the children of income-eligible households. Space for one child in such day care centers is termed a "slot." Day care centers are analyzed for projects that would introduce a substantial number of subsidized residential units, which may affect the availability of slots.

- *Fire protection.* The assessment of impacts on fire protection services relates to fire response time (i.e., the amount of time it would take for fire engines to travel from the nearest fire station to the site of the proposed project or other buildings within the primary service area of that station). For most projects, where warranted, the community facilities analysis involves identifying the local fire stations and obtaining a statement from the Fire Department regarding the local station's ability to service the new development or population. Generally, a more detailed assessment of service delivery is conducted only if a proposed action would affect the physical operations of, or access to and from, a station house.

- *Police protection.* The ability of the police to provide public safety for a new project usually does not warrant a detailed assessment under CEQR. The Police Department independently reviews its staffing levels against a precinct's population, area coverage, crime levels, and other local factors

when assessing its ability to serve the community or need to redeploy services. A more detailed assessment of service delivery is usually only conducted if a proposed action would affect the physical operations of, or access to and from, a precinct house.

Other community facilities such as homeless shelters, jails, community centers, colleges and universities, nursing homes, or religious and cultural facilities are typically analyzed only if the facility itself is the subject of the proposed action or would be physically displaced or altered by the action.

200. Determining Whether a Community Facilities Assessment is Appropriate

Actions that would add fewer than 100 residents or workers to an area generally do not need to consider community facilities. For actions with more than 100 residents or workers, the following guidelines can help determine whether a community facilities assessment is necessary. Because demand for community services generally stems from the introduction of new residents to an area, detailed community facilities analyses are most commonly associated with residential projects. Police and fire protection are often assessed for nonresidential projects, as well.

There are two general circumstances that trigger the need for a community facilities analysis. These relate to potential "direct" and "indirect" effects on a facility.

210. DIRECT EFFECTS

If a project would physically alter a community facility, whether by displacement of the facility or other physical change, this "direct" effect triggers the need to assess the service delivery of the facility and the potential effect that the physical change may have on that service delivery. Temporary direct effects should also be considered (for example, the temporary closing of a facility during a phase of construction). Also, if the action involves the siting or elimination of publicly operated community facilities, the City's Criteria for Location of City Facilities ("Fair Share" criteria), pursuant to section 195 of the City Charter, may be applicable. When consistency with the Fair Share criteria is assessed, this analysis and findings are typically disclosed in the CEQR process.

220. INDIRECT EFFECTS

If a project would add population to an area, that population would have a demand for services and potential "indirect" effects on service delivery. Depending on the size, income characteristics, and age distribution of the new population, there may be effects on public schools, libraries, hospitals or public health care facilities, day care centers, or fire protection facilities.

230. THRESHOLDS FOR PRELIMINARY ANALYSES

The actual analysis of effects on service delivery follows the same basic methodology for both direct and indirect effects—it examines the ability of community facilities to provide services both without and with the proposed action. The potential for the action to create a situation where a type of facility is overutilized (whether it is by displacement of one facility, thereby overtaxing another, or by the addition of new population) is the basis for determination of impact.

In general, the following thresholds can be used to make an initial determination of whether detailed studies are necessary to determine potential impacts.

231. Educational Facilities

Potential impacts on schools may result if there would be insufficient seats available to serve the population. Because it is rare that a project physically displaces an operating school, these impacts result, most often, when a project introduces school-age children to an area.

The basic analysis, therefore, typically begins with a calculation of the additional school-age population that would be introduced by a project. To estimate the student age population of a project, first determine the number of residential units of the project, their size (number of bedrooms), and the targeted income of prospective residents. With this information, use Table 3C-1 to estimate the number of students by primary and intermediate school levels per 100 dwelling units. This table has been developed by the Board of Education and the Department of City Planning to project the number of students by grade level, based on income levels and dwelling unit size. Use of this table may require a conversion of income levels from the project's build year to that used in the chart.

In general, if a project introduces more than 50 school-age children (elementary and intermediate grades), significant impacts on educational facilities

Table 3C-1
Public School Pupil Ratios
(Ratio per 100 Dwelling Units by Grade Level, Income, and Apartment Distribution)

Income	Percentage of Dwelling Units with More than Two Bedrooms																											
	20%				40%				50%				60%				70%				80%				100%			
	P.S.	I.S.	Tot.	H.S.	P.S.	I.S.	Tot.	H.S.	P.S.	I.S.	Tot.	H.S.	P.S.	I.S.	Tot.	H.S.	P.S.	I.S.	Tot.	H.S.	P.S.	I.S.	Tot.	H.S.	P.S.	I.S.	Tot.	H.S.
High	2	1	3	1	5	2	7	1	5	3	8	1	6	5	11	2	7	5	12	2	8	6	14	2	11	7	18	3
Middle and High	5	2	7	1	9	5	14	2	11	6	17	3	13	7	20	5	15	8	23	6	18	9	27	6	23	11	34	7
Middle	11	6	17	2	18	8	26	5	18	8	26	7	23	9	32	8	24	11	35	9	28	13	41	11	33	15	48	13
Moderate and Middle	14	6	20	3	23	9	32	6	26	9	35	7	31	10	41	8	34	13	47	11	39	14	53	11	47	16	63	15
Moderate	18	6	24	3	29	11	40	7	33	11	44	8	39	13	52	9	43	14	57	11	51	15	66	13	62	18	80	16
Low and Moderate	18	7	25	3	31	11	42	7	37	11	48	9	44	14	58	11	49	15	64	13	56	16	72	15	69	19	88	18
Low	19	7	26	5	33	11	44	8	39	13	52	11	46	15	61	11	53	17	70	15	60	18	78	16	74	23	97	19

Income Categories per Family in 1985 Dollars

Low - less than $25,000
Moderate - $25,000 to $34,900
Middle - $35,000 to $59,900
High - $60,000 and over

P.S. K-5 (6)
I.S. (6) 7-9
H.S. 9-12

Board of Education
Division of School Facilities
Department of Needs Assessment
March 20, 1990 and Department of City Planning
Social and Education Planning Division

may occur; further analysis of schools may be appropriate.

232. Libraries

Potential impacts on libraries may result from an increased user population. A noticeable change in service delivery is only likely to occur if a library is displaced or altered, causing people to use another library in the area, or if a project introduces a large resident population (i.e., greater than a 5 percent increase in population served).

First, identify the Community District in which the site(s) of the proposed action is located. Table 3C-2 lists libraries by Community District and the average residential units per library branch. Based on the Community District in which the proposed action would be located and the number of residential units in the project, assess the increase of units per library branch.

If the proposed action would increase the number of residential units served by the local library branch by more than 5 percent, the project may cause significant impacts on library services, indicating the need for further analysis.

233. Hospitals and Public Health Facilities

The Health Systems Agency uses a guideline for planning for hospitals of 3 beds for every 1,000 persons. For very large projects (i.e., those introducing 2,500 or more units) therefore, an analysis of hospital services may be needed. However, hospital impacts are usually not a concern for projects in Manhattan, because of the number of hospitals available in that borough and their tendency to attract patients based on their specialization rather than their geographical location.

Analyses of other health care facilities are generally conducted for projects that introduce new low- or middle-income residents. (Although the New York City Department of Health and the City's Health and Hospitals Corporation—HHC—do not restrict users of health care facilities by income level, these users generally consist of low- to moderate-income families.) If the action would generate greater than 600 low- to moderate-income units, it is likely that there would be increased demand on public health care facilities and further analysis should be conducted.

234. Day Care

Publicly financed day care is provided by HRA for employed families of designated low and moderate income levels. These services are available for children up to the age of 12. Potential impacts on public day care facilities are typically analyzed based on the availability of "slots."

To determine whether an analysis is necessary, it may be useful to estimate the number and age of children below the age of 12 who would be introduced by the action, using the same methodology described above for educational facilities (Section 231, where estimates of the number and age of children that may be expected based on the number and type of units and estimated income levels are presented). Based on the estimated population of the project, estimate the number of children who would fall within the designated income levels shown in the table below. (Public day care is available only to families within these income limits. Additional eligibility requirements relate to the status of the parent or guardian and the child, and include whether all legal caretakers of the child are employed or in college or vocational training; or ill, incapacitated, or teen age; whether the family is homeless or subject to drug or alcohol problems; whether the child has special needs, such as being autistic, emotionally disturbed, learning impaired, handicapped, or visually or speech impaired; or similar conditions. For purposes of this analysis, it may be assumed that all families projected to fall within these income limits would meet the eligibility requirements for public day care.)

Family of 2	$27,430
Family of 3	$29,878
Family of 4	$31,731
Family of 5	$34,477
Family of 6	$37,719

It should be noted that the income levels shown in the above table are determined by the State for day care eligibility, and forwarded to the HRA Agency for Child Development. The State updates these on a periodic basis. The figures above were issued in December 1990, but are current as of the date of the publication of this manual. It is advisable to check with the HRA Agency for Child Development to make certain these are the latest income level limits issued by the State before conducting this analysis.

If the proposed action would result in the addition of 600 low- to moderate-income units (approximately 50 potentially eligible children), a more detailed analysis may be necessary.

235. Fire Protection

The assessment of impacts on fire protection services is generally related to increased or unacceptable

catchment area. For a more detailed discussion of approximating the service area for each library branch, refer to Section 322.2 below.

Individual library branches should be included on the community facilities map.

313. Hospitals and Public Health Care Facilities

Projects are usually served by the nearest hospital. Maps indicating the locations of hospitals are available from the Health Systems Agency. If two or more hospitals are within a similar distance from the project site, they should all be considered in the analysis. The service area of each hospital may extend some distance and be difficult to define.

To determine the nearest public health care center and the appropriate service area, contact with HHC is usually appropriate.

There typically is no specific study area for the analysis of hospitals or public health care facilities, because the analysis focuses instead on the utilization rates (i.e., percentage of beds occupied, on an average annual basis) at those facilities. The study area is the capture area for the facility, which can vary substantially.

Hospitals and public health care facilities should be included on the community facilities map.

314. Day Care Centers

To determine the nearest public day care center and the appropriate service area, contact with HRA is usually appropriate. If two or more day care centers are within similar distances of the proposed action, they should all be considered to serve the project area. It should be noted that there currently are no locational requirements for patrons of the day care centers, and some parent/guardians choose a day care center close to the location of their employment rather than residence. In addition, in many areas there is a very high demand for public day care relative to the available services. Because of these factors, the service areas of these facilities can be quite large and not subject to strict delineation on a map.

315. Fire Protection

The study area for fire protection services is defined by the district mapped by the Fire Department. Contact with the New York City Fire Department may be appropriate to determine the appropriate station houses that would service the project and the service areas of those stations.

The location of the fire station(s) serving the site should be indicated on the community facilities map.

316. Police Protection

The location of the police station serving the site should be indicated on the community facilities map only if it would be physically affected by the proposed action.

320. DETAILED ANALYSIS TECHNIQUES

Detailed community facilities analyses are often conducted for individual facilities that may be affected by a project; for large, residential projects, multiple facilities may need to be analyzed. The following process may be followed in conducting these detailed analyses.

321. Direct Potential Impact

If the proposed action would displace or alter a community facility, the preliminary analysis should document the name and location of the facility as well as the type of facility (i.e., school, clinic, etc., including a description of services) and size of the facility (e.g., 600 seats, 450 beds, etc.) and its hours of operation. Determine the population served by facility (e.g., income level, age groups, residents vs. workers, repeat or one-time users) and the facility's capacity, including excess or deficiency of capacity (e.g., school seats, volumes per capita, beds, etc.). It may be helpful to provide a site plan or floor plan of the facility that shows the nature of the direct impact (such as the amount of land area or portion of a building that would be affected). Based on how the project would change the affected facility, determine the extent to which service would be disrupted or precluded. That disruption in service would place demand on other nearby facilities to absorb the demand. The analysis of that new demand is one of indirect effects, following the methodology described in Section 322.

322. Indirect Potential Impact

The following presents analysis methodologies for assessment of increased demand on community facilities.

322.1. Public School Analysis

Existing Conditions. Identify the primary and intermediate schools serving the study area (i.e., within the school district in which the project would be located) through contact with the Board of Education and Department of City Planning. Provide the following information for each school:

- School identification by number (i.e., P.S. 24) and address;
- Current enrollment;
- Capacity;
- The excess or deficiency of available seats (i.e., utilization); and
- Grades served.

This information may be easier to comprehend when presented in a table.

No Action Condition. Projections for the future without the action are developed by contacting the Board of Education and the Department of City Planning to obtain enrollment projections. (There is a difference in the enrollment projections developed by the Department of City Planning and the Board of Education, due to different modeling assumptions used by each agency. It is advised that the lead agency consult with each of the respective agencies when developing projections for this assessment. If there is a question as to which of the projections to use, it is often best to use the higher of the two projections to provide a level of conservatism for the analysis.)

Information from the demographics and socioeconomic analyses of the environmental assessment, which are more sensitive to recent, major planned projects in the area, may need to be cross-referenced so that consistent projections of population appear throughout the environmental assessment (see Section 3B of this Manual). Socioeconomic data may also include income levels, which are a relevant variable in projecting family size. This information is usually presented in a table similar to the one for the existing conditions scenario.

In addition to capacity and enrollment projections, obtain from the Board of Education or the Department of City Planning's Education Planning Division information on new programs, capital projects, and improvements that are planned in the district, that would be in place under the no action condition and could affect the availability of seats in the schools within the study area.

Action Condition. To estimate the number of primary- and intermediate-level school children who would be generated by a project, follow the procedure set forth in Section 200, above. In addition, if the proposed action would include the construction of new schools, add the seats from those schools into future capacity estimates including all appropriate details (e.g., location, number of seats, grades served, etc.).

Add the projected demand as well as new school seats associated with the proposed action to the no action projections. Calculate the available capacity or resulting deficiency in school seats.

Note that in the event the proposed action would eliminate a school with no replacement, the action condition analysis would allocate those students from the affected facility to nearby schools, and would then focus on the effect on the schools receiving the students. It is recommended that this allocation be made with direct input from the Board of Education.

322.2. Libraries

Existing Conditions. The detailed analysis of libraries includes a description of existing libraries and their information services and user population. A detailed analysis of libraries may be conducted based on population within census tracts in each library's catchment area, as follows:

- Identify libraries in the study area through field surveys and contact with the New York Public Library (in the Bronx, Manhattan, and on Staten Island), Queens Borough Public Library (for Queens), or the Brooklyn Public Library (for Brooklyn).

- Mark the location of nearby library branches on a census tract map and sketch a line midway between facilities to define the approximate service areas of each of the facilities (as was conducted to define study areas). As a result of this exercise, one (or more) libraries should include the site within their service area. Analyze the population served for those libraries.

- Using census data, calculate the total population within the census tracts of the library service area (including the entire population in the census tract, not just the population within the circle of the library service area).

- Contact the library to identify the number of volumes each library has in its collection as well as any special programs, facilities, or collections. The library may also have information as to the population served and its utilization of library services.

- Calculate the ratio of the number of volumes to residents and qualitatively describe special programs and services.

- It also may be useful to obtain from the library its figures for book circulation (books checked out)

per 1,000 people, as an indicator of one element of library services.

- In addition, the analysis may also consider the library facility's assessment of its existing service conditions.

No Action Condition. To determine the future no action conditions, the following steps may be used:

- Estimate the future population for the service area of the library branch studied above. For the census tracts within the service area of a library branch, these projections may be obtained from the Department of City Planning.

- Obtain information from the New York Public Library, Queens Borough Public Library, or Brooklyn Public Library, as appropriate, concerning any planned changes to the branches, including building additions (and the associated addition of volumes), an increase or decrease in volumes, or new programs being planned. Also document the planned continuation or cessation of any special programs, facilities, or collections. Using the management staff at the library branch as a resource, qualitatively discuss the effects of the added (or decreased) population on special programs, facilities, or collections.

- Calculate the number of volumes per population for the no action condition.

- If appropriate, provide the book circulation per 1,000 people based on the library's projection.

- Quantitative or qualitative assessments from the affected library regarding its future service projections may also be appropriate.

Action Condition. Determine the estimated population to be added by the proposed action. Add the future population to that of the no action and determine the action's effects on the library's ability to provide information services to its users. As part of this assessment, it may be appropriate to recalculate the ratio of volumes per population as an indicator of the action's effects on the library. With input from management staff at the library branch, qualitatively discuss the effects of the added population (including the no action and addition) on special programs, facilities, or collections.

Note that in the event the action would eliminate a library branch with no replacement, the analysis would start with a redefinition of service areas of the library branches assuming elimination of the subject library. The service area population would then be recalculated based on the action condition service areas. The analysis would otherwise be the same as cited above.

322.3. Hospitals and Health Services

Existing Conditions. The assessment of hospitals for a detailed analysis looks at each local hospital's utilization rate, in terms of the annual percentage of beds occupied (referred to as the "average daily census") divided by the number of beds, and determines the level of remaining capacity.

Describe each of the hospitals identified in the study area inventory. To assess the average daily census at the particular hospital(s) serving the project site, consider the following information:

- The size of each facility (in number of beds);
- The nature of its services (including specialty services);
- The population it serves (this may be difficult to determine); and
- The percentage of beds occupied, on an annual basis.

For private hospitals this information is usually available from a planning or public information office within the hospital. For New York City hospitals, this information is available from the Health and Hospitals Corporation. The *Health Care Annual*, published by the United Hospital Fund (see Section 730), includes the most recent capacity and average daily census figures for all hospital facilities in New York City, as well as other health facility information. In addition, statistics on individual hospital utilization are available from the Health Systems Agency. HSA maintains records on the number of beds, and average daily census rates, of each hospital. These are available in HSA's publication, *Hospital Profiles*.

For an assessment of public health facilities, identify the nearest public health facilities serving the site and describe the following:

- The name and address of each facility;
- The size of the facility (in terms of doctors on staff, examination rooms, square footage, number of facilities, etc.);
- The nature of services;
- The population it serves (i.e., age group, income level); and
- Its utilization rate, to the extent it can be defined through discussions with the affected facility or

HHC. This will depend on the specific type of facility, and will be measured in patients per doctor per year, examinations per examination room, etc. Also included should be a qualitative discussion of the facility's management staff's assessment of the utilization rate of the facility, in terms of whether it is at capacity, near capacity, below capacity, or well below capacity. Distinctions should be made between available space/facilities and available personnel in this discussion. For example, the facility may be at capacity in terms of personnel, but may have additional space to accommodate additional staff if needed. If the proposed action were to have an impact on this facility, it could make a significant difference as to the nature of potential mitigation to be assessed.

This information is available from the Health and Hospitals Corporation and the directly affected facility.

No Action Condition. To determine the future no action condition for hospitals, follow the procedure outlined below:

- Obtain information from the Health Systems Agency on planned changes to the hospital facilities within the borough and the study area, focusing on the addition of new beds. For hospitals in the immediate study area, also document any planned expansions of existing programs related to the provision of health care services. (This information may also be available by contacting the hospital directly.)

- Based on the general area(s) within which the hospital(s) serving the proposed action are located, estimate a percentage increase in the population of the area served by the hospital. This may be estimated with the assistance of the Department of City Planning, using their projections for population within the generally affected area (i.e., for community districts surrounding the hospital).

- Based on the population increase or decrease expected in the area, first adjust the annual percentage of beds occupied, assuming the same number of beds as under existing conditions. For example, if a hospital had an 85 percent annual percentage of beds occupied under existing conditions and there was a 5 percent increase in the population, the annual percentage of beds occupied would be 89.25 (1.05 [the population, increased by 5 percent] x 85 percent).

- Next, calculate the estimated average daily census by multiplying the annual percentage of beds by the number of beds in the existing condition. For example if the hospital in this example had 200 beds, the average daily census would be 178.5, or 89.25 percent times 200.

- Finally, add any new beds expected by the build year of the proposed action to the existing number of beds, and calculate the estimated annual percent of beds occupied under the no action condition. For example, if 20 new beds were planned in this example, making a total of 220 beds at the hospital, the annual percentage of beds occupied under the no action condition would be 81.4 percent (or 178.5 average daily census divided by 220 beds).

- Described any changes to the annual percent of beds occupied for the no action condition, based on the above analysis. It is recommended that this assessment be discussed with the HSA and modified as appropriate for the description of no action conditions.

Similarly, for public health facilities, obtain information from the Health and Hospitals Corporation on new, expanded, or planned health facilities in the study area that would be expected to be complete by the project build year. Also, use data from the projected population growth rate to determine whether the operating capacity of public health facilities in the study area could be affected by increases in population. Discuss any expected changes to the utilization rate or nature of services to be provided at the potentially affected public health facilities. This assessment should be reviewed with management staff at the potentially affected facility and/or appropriate staff at Health and Hospitals Corporation.

Action Condition. The action condition assessment for hospitals estimates the need for beds that would be generated by the action, and compares that to the remaining capacity at the hospital(s) serving the project site. To perform this assessment, the following procedure can be used:

- Estimate the population that would be added by the proposed action.

- Calculate the demand for hospital beds from the project population (assuming three beds per 1,000 residents) and distribute this demand to the hospital(s) in the study area. Recalculate the percentage

of beds occupied for each of the study area hospitals, by assuming that three beds per 1,000 population would equal the new demand generated by the action. (For purposes of this analysis, it can be assumed the three beds per 1,000 residents would translate into a three-patient increase in the average daily census at the affected hospital, per each 1,000 projected population of the proposed action.)

- Qualitatively assess whether the local hospital(s) would be able to meet the demand of the project. It is recommended that this assessment be discussed with the Health Systems Agency.

It should be noted that if the proposed action would cause the closing of a hospital without providing a replacement, the action analysis above would be modified to shift the average daily census of the affected hospital to adjoining hospitals, and the analysis would focus on these hospitals. Otherwise, the analysis described would be unchanged.

The potential effects of the proposed action's population on public health facilities in the study area are also assessed in terms of its potential impact on utilization levels, as follows:

- Summarize the project's anticipated population distribution by income and by age.

- Estimate average person visits to health facilities and determine the effect this would have on the facilities' utilization rate (i.e., average patient visits per physician within the health facility, examinations per examination room, etc.).

- Specifically discuss whether the added demand on the facility(s) would exceed Health and Hospitals Corporation standards for these facilities. It is recommended that this assessment be made in conjunction with the Health and Hospitals Corporation.

If the proposed action would result in the elimination of a public health facility without its replacement, the action analysis would allocate the demand for services at the affected facility to nearby facilities. The analysis would then focus on those facilities in the same manner as described above. The action condition assessment should also include a discussion of the effects of distance on the delivery of services to the population served by the facility proposed to be closed.

322.4. Day Care

Existing Conditions. Document existing day care facilities within the study area, from field surveys and through contact with HRA, including their location, number of slots (capacity), ages served, and their enrollment (utilization).

No Action Condition. To determine future no action conditions, perform the following steps:

- Contact HRA for an operating history of the potentially affected day care facilities and establish future conditions based on past trends.

- Document any changes planned for day care facilities in the area of the proposed action, including closing or expansion of existing facilities and implementation of new facilities.

- Document expected increases in the population of children under 12 within the eligibility income limitations (summarized from the socioeconomic analysis) as potential additional demand.

- Estimate utilization of the potentially affected day care facility(ies) based on past operating trends and documented demand (usually in the form of waiting lists for each of the facilities). This estimate usually should be made in conjunction with staff from HRA and/or the Department of City Planning's Social Planning and Education Division. It is important to understand that not all guardians of eligible children choose to place their children in public day care facilities. This trend is likely to vary by location, and it is therefore advisable to discuss this with representatives of HRA and/or the Department of City Planning's Social Planning and Education Division.

Action Condition. The action condition analysis compares the number of projected day care-eligible children with the number of available slots estimated in the future no build analysis. To determine the number of day care-eligible children associated with a project, the lead agency may want to consult with HRA and/or the Department of City Planning's Social Planning and Education Division, or use its own judgment based on the income objectives of the project and experience with similar projects. A discussion should be included that documents the outcome of this analysis, in terms of added demand relative to available capacity at the subject public day care center(s).

Note that in the event the proposed action would eliminate a public day care center without a replacement

center, the analysis would allocate the enrollment (and waiting list, if applicable) to the nearest public day care centers. The analysis would then focus on these centers, in terms of overutilization effects.

322.5. Fire Protection

Existing Conditions. Document the location of those stations serving the area in which the proposed action would be located. Other information, such as the type of equipment at those stations, may also be useful. In addition, in some locations, the Fire Department may have other concerns related to response time or access. It may be helpful to contact the Fire Department regarding service issues.

No Action Condition. Contact with the Fire Department may be helpful to document physical changes planned for station houses or equipment additions to the service area for the future no action scenario. In addition, summarize new projects and population that would be added to the service area in the future no action condition.

Action Condition. Contact with the Fire Department is often useful in performing an assessment of the effects of the proposed action. The following information regarding the proposed action will help the Fire Department to assess those effects:

- Location of project site or affected area (address and tax blocks and lots);
- Physical size of the proposed action's land area (square feet);
- Predominant building types expected for action and no action projects;
- Number of residential units;
- New population; and
- Description of uses and activity patterns (from the land use assessment; see Section 3A).

The Fire Department's assessment is then used by the lead agency in making its own assessment of the action's effects.

322.6. Police Protection

Existing Conditions. Document the location of the precinct house serving the area in which the proposed action would be located.

No Action Condition. Contact with the Community Liaison Officer of that precinct of the Police Department may be useful in assessing future no action conditions. Documentation of physical changes planned for station houses or changes to staffing levels expected in the future no action scenario may be appropriate for the assessment. In addition, summarize new projects and population that would be added to the service area in the future no action condition.

Action Condition. Contact with the Police Department is often useful in performing an assessment of the effects of the proposed action. The following information regarding the proposed action will help the Police Department to assess those effects:

- Location of project site or affected area (address and tax blocks and lots);
- Physical size of the proposed action's land area (square feet);
- Predominant building types expected for action and no action projects;
- Number of residential units;
- New population; and
- Description of uses and activity patterns (from the land use assessment).

The Police Department's assessment is then used by the lead agency in making its own assessment of the action's effects.

400. Determining Impact Significance

The determination of whether an impact on a community facility would be significant is made based on whether the people in the area would have adequate service delivery in the future with the project. Generally, the same assessment of service delivery is appropriate whether the potential effects of the action would be direct or indirect. Quantitative criteria for measuring adequacy of service delivery as well as the projected change in service delivery have been developed for this assessment. Generally, if service delivery would deteriorate to unacceptable levels as a result of a substantial (more than 5 percent) increase in population served by a facility, a significant impact could result.

410. SCHOOLS

If the impact assessment finds that proposed action would 1) cause a 5 percent or more increase in the number of students at a particular school, and 2) result in the operation of that school at or above its capacity (i.e., there would be a deficiency of seats), a significant impact may result, warranting consideration of mitigation.

420. LIBRARIES

Generally, if a proposed action would increase the study area population by 5 percent or more over no action levels, it is necessary to document potential excess demand generated by the action for the library's programs and services. This is usually accomplished based on discussions with the library's management staff, focusing on the difference between the action condition analysis and the no action analysis. Based on the projected effects on the library's ability to provide services to its users, such as book volumes per capita ratio and special programs, facilities, or collections, determine whether a significant impact would occur.

Some indications that significant impacts may occur include the following: if the proposed action would 1) cause an increase of more than 5 percent in the population served by the facility, and 2) cause the ratio of volumes per capita to drop substantially at any given library branch. If a significant impact is determined, consideration of mitigation would be warranted.

In the unusual circumstance where a library branch may be displaced, the impact determination would still consider the 5 percent increase in population served by the branch library, but it would focus on this increase and other effects on the adjoining libraries that would absorb the demand.

430. HOSPITALS AND PUBLIC HEALTH FACILITIES

If the action condition analysis indicates that 1) the annual percentage of beds occupied at the hospital(s) serving the site(s) of the proposed action would increase to more than 90 percent, and 2) the demand for hospital beds would be more than 5 percent of that hospital's bed capacity, a significant impact may result, warranting consideration of mitigation.

To determine the potential for a significant impact at public health facilities, assess whether the proposed action would result in an increase of 5 percent in the demand for the elements of the facility operating at or near capacity in the no action condition (i.e., patients per doctor, examinations per examination room, etc.), based on the eligible population of the proposed action. If any of these elements of the facility would be operating over capacity in the action condition, and the proposed action would increase demand for these services by more than 5 percent, a significant impact may result, warranting consideration of mitigation.

440. DAY CARE

If the project would result in 1) a demand for slots greater than remaining capacity of day care center(s), and 2) that demand constitutes an increase of 5 percent or more of the collective capacity of the day care center(s) serving the area of the proposed action, a significant adverse impact may result, warranting consideration of mitigation.

450. FIRE AND POLICE PROTECTION

The Police and Fire Departments can each be contacted for their assessment of the action's effects on their operations. This information can be used in the determination of the potential significant impacts to their operations. It is recommended that a written statement from these departments be obtained regarding their recommendations. The lead agency must then weigh these data and come to its own determination as to significance.

500. Developing Mitigation

Mitigation measures for significant impacts on a community facility in most cases require the commitment from the agency or institution having jurisdiction over the facility. For this reason, early coordination is advised.

In many instances, a commitment to construct a new facility or change an existing facility may not be available by the build year of the proposed action and the unmitigated impact must be disclosed with an analysis of the suggested mitigation and measures that would be taken to implement it.

Following are some examples of mitigation measures for community facilities impacts.

510. SCHOOLS

To mitigate a significant impact that results in the overcrowding of a primary or intermediate school, possible mitigation is to relocate administrative functions to another site, thereby freeing up space for classrooms. Other mitigation measures include the following: making new building space within the buildings associated with the proposed action or elsewhere in the service area of the school available to the Board of Education to lease for early childhood centers (grades K through 2) for primary school impacts. This would free up more seats in the existing elementary schools to accommodate the increased student population; restructuring or reprogramming existing school space within a

district; and adjusting school service area boundaries (provided that does not redistribute students to an even more crowded district). For very large residential projects, construction of a new school may be the most appropriate mitigation. Potential mitigation should be reviewed with the Board of Education to determine its feasibility, particularly when an action by the Board of Education is required to facilitate the mitigation.

520. LIBRARIES

If the proposed action is expected to have a significant impact on libraries within the study area, mitigation should be targeted to alleviate the impact created. For example, if a shortage of book volumes was identified, the following mitigation could be provided: adding volumes if adequate space within the library branch exists; adding building space to accommodate more volumes or more users if that space does not exist; or creating programs to accommodate new users. In some instances, this mitigation is provided through a contribution by the project sponsor to the Public Library System to provide for improvements. To mitigate the significant impact, however, the improvements must occur within the service area of the impacted library.

530. HOSPITALS AND PUBLIC HEALTH FACILITIES

It is generally difficult to verify mitigation for a significant impact on hospital beds within the time frame of review for most proposed actions, because of the lengthy State approval process. A request for the addition of beds to any hospital must be prepared by the hospital. This request is reviewed by the Health Systems Agency and that agency's recommendations are then forwarded to the State Department of Health. If the affected hospital is willing to undertake the application process and funding for the construction of the additional hospital bed space can be identified, it is usually only possible to report this intention within the environmental assessment. Unless the State approval for the added hospital beds can be obtained prior to a decision on the proposed action, the impact must be considered a significant unmitigated impact.

If the project would result in significant operational impacts to other public health care facilities, mitigation would be tailored to the specific type of impact. This could include the provision of additional equipment, examination rooms, additional types of services, or other facilities particular to the operation of the health care facility. For larger projects with lower-income residents, it may be appropriate to discuss mitigation measures with HHC or DOH, such as establishing an ambulatory care facility.

540. DAY CARE

Mitigation for a significant day care impact could include provision of space on-site for a City-operated day care center, or provision of a suitable location off-site within a reasonable distance. In some cases, it may be necessary to provide funds for the expansion of an existing facility to mitigate the impact.

550. FIRE AND POLICE PROTECTION

Mitigation for inadequate police and fire protection as a result of the proposed action could include upgrading existing equipment, acquisition of new equipment, or construction of a new firehouse or police precinct building. Construction of new facilities is typically the responsibility of the Fire or Police Department. Provision of land on-site for a Fire or Police Department facility may be considered appropriate mitigation. Potential mitigation should be reviewed with the Fire and Police Departments to determine its feasibility and appropriateness.

600. Developing Alternatives

Alternatives that would reduce or eliminate significant impacts on community facilities include redesigning or resiting a project to avoid having direct effects on existing facilities, or a smaller project that would result in a smaller population that would not cause a significant adverse impact on the facilities.

700. Regulations and Coordination

710. REGULATIONS AND STANDARDS

There are no specific City, State, or Federal statutory regulations or standards governing the analysis of community facilities.

720. APPLICABLE COORDINATION

Those agencies that operate or have jurisdiction over the affected facilities are best consulted early in the CEQR process. These agencies have the most up-to-date information regarding existing operations and capacity as well as future condition projections of their facilities. It is often appropriate to coordinate with the agency with jurisdiction over the affected facility in the assessment of impacts as well as the development of mitigation. Mitigation would typically require the approval or commitment of the operating agency. At a

minimum, the concurrence of the affected agency on the accuracy of both the impact assessment and the mitigation is recommended.

730. LOCATION OF INFORMATION

Publications, maps, annual reports, and projections are prepared and made available by the agencies and institutions described below.

731. Educational Facilities

Projections for new school-age children and information on existing and planned school facilities:

- Department of City Planning
  Social Planning and Education Division
  22 Reade Street
  New York, NY 10007

- The Board of Education
  Space Planning Unit
  110 Livingston Street
  Brooklyn, NY 11201

732. Libraries

Information requests for library branches should be directed to each of the system's public relations offices:

- New York Public Library (serves the Bronx, Manhattan and Staten Island)
  Office of Public Relations
  8 West 40th Street
  New York, NY 10018

- Queens Borough Public Library
  Office of Public Relations
  89-22 Merrick Boulevard
  Jamaica, NY 11432

- Brooklyn Public Library
  Office of Public Relations
  Grand Army Plaza
  Brooklyn, NY 11238

733. Health Facilities and Hospitals

The Health Systems Agency oversees health facility planning to the City. The HSA maintains records of how many beds are available in each hospital and how many beds will be added or subtracted from each facility.

- Health Systems Agency of New York City, Inc.
  275 Seventh Avenue
  New York, NY 10001

734. Day Care

Information on publicly funded and operated day care centers is available from the Human Resources Administration's Agency for Child Development:

- HRA Agency for Child Development
  Sweeney Building
  30 Main Street
  Brooklyn, NY 11201

735. Fire Protection

The Commissioner's Office of the Fire Department of New York is consulted for information and determination related to fire protection assessment. This office is located at:

250 Livingston Street
Brooklyn, NY 11201

736. Police Protection

The Community Liaison Officer at the local precinct of the New York City Police Department that would serve the site is consulted for information and determination related to police protection assessment.

736. Other Information

- *Community District Needs Statement*: Information on selected facilities by community district.

  Department of City Planning Bookstore
  22 Reade Street
  New York, NY 10007

- *Citywide Statement of Needs*: Information on expansions, relocations, closings, sitings, and new facilities for the next two fiscal years.

  Department of City Planning Bookstore (see above)

- *Gazetteer of City Property* (published annually): Information on all City-owned and City-leased property by Community District.

  Department of City Planning Bookstore (see above).

- District Space Analysis: Information on identification of school regions and districts and their capacity.

  Board of Education (see above).

- Annual Capital Budget and 3-Year Capital Plan: Information on all City facilities.

  Office of Management & Budget
  75 Park Place
  New York, NY 10007

- *Hospital and Ambulatory Programs in New York City*: Information on hospital and outpatient facilities with therapeutic component, by Community District.

  Department of City Planning Bookstore (see above).

- *Residential Facilities in New York City* (published annually): Information on residential facilities, by community district.

  Department of City Planning Bookstore (see above).

- *Health Care Annual*: Information on trends and facilities in New York.

  United Hospital Fund of New York
  55 Fifth Avenue
  New York, NY 10003

- *Hospital Profiles*: Information on number of hospital beds and average daily census per hospital.

  Health Systems Agency
  275 Seventh Avenue
  New York, NY 10001

D. Open Space

100. Definitions

For purposes of this section, open space is defined as publicly or privately owned land that is publicly accessible and has been designated for leisure, play, or sport, or land set aside for the protection and/or enhancement of the natural environment. Under CEQR, an analysis of open space is conducted to determine whether or not a proposed action would have either a direct impact resulting from elimination or alteration of open space or an indirect impact resulting from overtaxing available open space. These analyses focus only on officially designated existing or planned public open space.

Open space may be public or private and may include active and/or passive areas:

- *Public open space*. Only open space that is accessible to the public on a constant and regular basis or for designated daily periods is defined as "public" and analyzed for impacts under CEQR. Public open space may be under government or private jurisdiction and may include, but is not limited to, the following: parks designated by the City, State, and Federal governments; open space designated through regulatory approvals (such as zoning), including large-scale permits that prescribe publicly accessible space, plaza bonuses, etc.; outdoor schoolyards; ball fields; institutional campuses; playgrounds; esplanades; landscaped medians with seating; housing complex grounds; recreational facilities; gardens, if publicly accessible; nature preserves, if publicly accessible; open lawn areas; church yards or cemeteries with seating; beaches; waterfront piers currently used for recreation; etc.

- *Private open space*. This includes open space that is not publicly accessible or is available only to limited users and is not available to the public on a regular or constant basis. It is not included in the quantitative analysis but may be considered in the qualitative assessment of potential open space impacts. For example, private-access fee-charging spaces, such as health clubs, are considered private open spaces. In addition, the following are also considered private and are not included in the definition of public open space: natural areas or wetlands with no public access, streets, arcades, sidewalks, stoops, vacant lots, and front and rear yards. This space is only considered after an assessment of the proposed action's effects on public open space has been completed. If the action is likely to have indirect effects on public open space (such as greater utilization demands), the ability of private open space to influence or alter those effects may be considered.

Open space includes both "active and "passive" areas as described below:

- *Active open space*. Open space that is used for sports, exercise, or active play is classified as "active open space." Active open space consists mainly of recreational facilities, including the following: playground equipment, playing fields (baseball, soccer, football, track), playing courts (basketball, handball, tennis), beach area (swimming, volleyball, frisbee, running), pools, ice skating rinks, esplanades (running, biking, rollerblading, hopscotch, and other active play), multipurpose play area (open lawns and paved areas for active recreation, such as running games, informal ball-playing, skipping rope, etc.), and golf courses, including pitch and putt.

- *Passive open space*. Open space that is used for relaxation, such as sitting or strolling, is classified as "passive." Facilities may include the following: plazas or medians with seating, a percentage of beach areas (sunbathing), picnicking areas, esplanades (sitting, strolling), paths, accessible restricted use lawns, gardens, and church yards or cemeteries with seating.

In many cases open space can be used for active or passive recreation. These include lawns and beaches, which permit both sunbathing and ad hoc ball or frisbee games.

A proposed action's effects on open space may be either direct or indirect. These are defined as follows:

- Direct effects may occur when the proposed action would encroach on or cause a loss of open space. Direct effects may also occur if the facilities within an open space would be so changed that the open space no longer serves the same user population. Limitation of public access and changes in the type and amount of public open space may also be considered direct effects.

  Other direct effects include the imposition of noise, air pollutant emissions, odors, or shadows on public open space. Assessment of these effects is addressed in the relevant technical sections of

the manual and should be referenced for the open space analysis.

- Indirect effects may occur when the population generated by the proposed action overtaxes the capacity of existing open spaces so their service to the existing or future population of the affected area would be substantially or noticeably diminished.

200. Determining Whether an Open Space Assessment is Appropriate

An open space assessment may be necessary if an action could potentially have a direct or indirect effect on open space. A direct impact would physically change, diminish, or eliminate an open space or reduce its utilization or aesthetic value. An indirect impact could result if an action would introduce a substantial new user population that would create or exacerbate an overutilization of open space resources.

Direct effects may not always result in adverse effects to open space. Alterations and changes to parks may be beneficial or may result in beneficial changes to some resources while having an adverse effect on others. In determining whether or not to prepare an open space assessment, consider whether the changes are likely to adversely affect utilization of existing resources or specific user groups of these resources.

210. DIRECT EFFECTS

If a proposed action would have a direct effect on an open space, an assessment of the effects on open space and its users may be appropriate. Direct effects would occur if the action would result in the physical loss of public open space (by encroaching on an open space or displacing an open space); change the use of an open space so that it no longer serves the same user population (e.g., elimination of playground equipment); limit public access to an open space; or cause increased noise or air pollutant emissions, odors, or shadows on public open space that would affect its usefulness.

When the direct effect would be very small, however, so that it would be unlikely to change use of the open space, an assessment may not be needed. For example, a small widening of a roadway within a public park or the loss of a small amount of open space to support infrastructure may not warrant a full open space analysis. When few users or a limited age group of users would be affected, when new and comparable open space would be provided at the same location, or when the proposed alterations to an existing open space would be improvements, creating comparable or better facilities, significant adverse impacts are unlikely and a full assessment may not be needed. A simple comparison of conditions with and without the action and a discussion of the users affected may be adequate. However, most direct effects on open space do require assessment, particularly when there is any ambiguity as to whether the action would reduce the useability of an open space, detract from its aesthetic qualities, or impair its operation, or when more information on users of that open space may be appropriate.

220. INDIRECT EFFECTS

If an action would add population to an area, that population would typically place a demand on existing open space facilities. Indirect effects may occur when the population generated by the proposed action would be sufficient to noticeably diminish the ability of an area's open space to serve the existing or future population. Typically, an assessment is conducted if the proposed action's population is greater than 200 residents or 500 employees, or a similar substantial number of other users (such as the temporary user population that might be introduced by a large shopping area).

300. Assessment Methods

Detailed analyses of open space may be conducted in stages of successively greater detail. In many cases it will be clear that a full, detailed open space analysis is necessary—if the action would displace a highly utilized open space or introduce a large population in an area underserved by open space. In some cases, however, it may be less clear and an initial quantitative assessment may be useful in determining the need for a more detailed analysis of open space. Often, when potential effects from the proposed action are limited, the assessment can be targeted to address only those effects. In any case, the initial step is to define and map a study area.

310. STUDY AREAS AND MAPPING OF EXISTING OPEN SPACE

The open space study area is defined to analyze both the nearby open spaces and the population using those open spaces. It is generally defined by a reasonable walking distance that users would travel to reach local open space and recreation areas—typically a one-half-mile radius for residential users and ¼ mile from commercial projects with a worker population. For actions that would result in mixed-use projects (e.g., residential/commercial buildings), it may be appropriate to analyze two study areas—one for residential users

and another for nonresidential users. However, the boundaries are often adjusted and the study area may be irregularly shaped. The following steps may be used to define an open space study area:

1. Use a legible map of appropriate scale, such as a census tract map or DCP's *Bytes of the Apple* map, as a base map. Locate the site of the proposed action and draw the physical boundary of the area affected by the action.

2. From the boundary of all sites that would be developed as a result of the proposed action, delineate a radius of one-quarter mile for commercial projects or one-half mile for residential projects to create the generalized open space study area boundaries. As noted, it may be appropriate to define two study areas for mixed-use projects—one for residential users and another for commercial users.

3. Identify all census tracts with at least 50 percent of their area within the generalized study area. The study area should include each of those census tracts in their entirety. Exclude all census tracts that have less than 50 percent of their area within the study area.

4. Identify all open spaces within the study area defined in step 3. Field surveys of the study area are usually important to be certain that all appropriate open spaces are included. Determine the acreage for each of the open spaces within the study area as well.

   If an action would displace an open space, or for extremely large sites, the boundary may also need to be adjusted to reflect additional open space resources likely to be affected. For example, if a tot lot would be eliminated under a proposed action, other existing tot lots should be included in the map—even if they are located beyond the one-half-mile radius. If only direct effects from the action are expected, it may be possible to target the assessment to spaces that would be similar to those affected by the action. If the action is programmatic or generic, prototypical sites may have to be chosen for the analysis.

5. Other boundary adjustments may be necessary to account for natural boundaries (ravines, rock outcroppings, water bodies, very steep slopes, wetlands) or built features (depressed highways, canals, railroad rights-of-way, etc.) that preclude access to open spaces within the study area. A written rationale for any adjustment of the boundary should be provided.

320. ANALYSIS TECHNIQUES

If an open space assessment is appropriate (see Section 200, above), the analysis examines the type of open space and user population affected by the proposed action. (For example, a commercial or mixed-use project may introduce a large worker population, which would tend to place demands on passive open space. The analysis would examine in further detail the amount of passive open space available with and without the project to quantify the impact, and hence, the mitigation, more specifically.) Overall, the goal of the open space assessment is to determine the significance of change in the availability of open space relative to the demand from the population, and/or the significance of change in the enjoyment potential of open space affected by the proposed action.

For actions that would have a direct effect on a specific type of open space without introducing a significant new user population, it may be possible to target the assessment. The open space analysis may be targeted toward those open space resources that are similar to the space that would be eliminated or altered by the action. For example, if the direct effects are limited to an open space resource targeted for a certain age group, such as a tot lot for toddlers and preschoolers, the impact assessment may be targeted to assess only that age group and nearby tot lots.

321. Initial Quantitative Assessment

An initial quantitative assessment may be useful if it is not clear whether a full, detailed open space analysis is necessary or whether the open space assessment can be targeted to a particular user group. Because the full, detailed open space analysis includes a great deal of data collection and analysis, this first level of quantitative assessment may be useful in determining the need for a full assessment or in narrowing the focus of that assessment. When it is clear from the outset that the open space assessment can be targeted or that a full open space assessment would be necessary, this level of analysis may not be useful. However, this methodology also may not be useful in addressing direct qualitative changes to open space that could result from an action (such as loss of space for a particular user group, or air pollutant emissions, noise, or shadows that could make a space less useable). In other circumstances—for example, where a study area appears to have a shortfall of open space that would be exacerbated by an action—this first level of quantitative analysis may be useful in

clarifying the degree to which an action would affect open space and the need for further analysis.

The following methodology examines the change in total population relative to total open space in the study area, to determine whether the elimination of open space and/or increase in user population would significantly reduce the amount of available open space for the area's population:

1. Using the study area defined above, calculate total population at the time of the last (most recent) census, as described below. Census data can be obtained from the Department of City Planning, Demographics Division.

   - *Actions that would result in an increase in residential population.* Calculate the residential population of the study area. If the action would occur in an area with a substantial nonresidential population (i.e., employees, visitors, students, etc.), also calculate the nonresidential population of the study area.

   - *Actions that would result in an increase in nonresidential population (i.e., employees, visitors, students, etc.).* Calculate the nonresidential population. If the action would occur in an area with a substantial residential population, also calculate the residential population of the study area.

   - *Actions that would result in an increase in both residential and nonresidential population.* Calculate the residential and nonresidential population of the study area.

2. Calculate total open space in the study area, using the information gathered above (Section 310).

3. Determine the open space ratio in the study area, using the information from steps 1 and 2 as described below. The open space ratio is expressed as the amount of open space acreage per 1,000 user population.

   - *Actions that would result in an increase in residential population.* Calculate the open space ratio for the residential population. If the action would occur in an area with a substantial nonresidential population, also calculate the open space ratio for the nonresidential population of the study area.

   - *Actions that would result in an increase in nonresidential population (i.e., employees, visitors, students, etc.).* Calculate the open space ratio for the nonresidential population. If the action would occur in an area with a substantial residential population, also calculate the open space ratio for the residential population of the study area.

   - *Actions that would result in an increase in both residential and nonresidential population.* Calculate the open space ratio for both the residential and nonresidential populations of the study area.

4. Add the population expected with the proposed action to the total population at the time of the last census (step 1, above).

5. Calculate any changes in the acreage of open space in the future with the action (accounting for increases and/or decreases resulting from the action).

6. Calculate the open space ratio with the action.

If the open space ratio would increase or remain substantially the same with the action in place, no further analysis of open space will likely be appropriate (unless direct, qualitative changes to an open space may occur because of the action).

If the ratio would decrease as a result of the action, the lead agency or applicant should consider the existing open space ratio and the extent to which the action would alter that ratio. For example, a Citywide survey and review of all community districts has indicated that half of the community districts have an open space ratio of 1.5 acres of City parkland per 1,000 residents. Study areas may differ in the type and extent of open space resources as well as in the user population profile. As an optimal planning goal, the City attempts to achieve a ratio of 2.5 acres per 1,000 population for large-scale plans and proposals. However, this goal is often not feasible for many areas of the City and does not constitute an impact threshold. Rather, it is a benchmark that represents an area well served by open spaces.

Studies by the Department of City Planning and the City of San Francisco in the early 1980's have shown that nonresidents, specifically workers, tend to use passive open space. Typically, 0.15 acres of passive open space per 1,000 nonresidents has been found to be adequate.

Decreases in the open space ratio would generally warrant a more detailed analysis under the following conditions:

- If the decrease in the open space ratio would approach or exceed 5 percent, it is generally considered to be a substantial change, warranting more detailed analysis.

- If the study area exhibits a low open space ratio (e.g., below 1.5 acres per 1,000 residents or 0.15 acres of passive space per 1,000 nonresidential users), indicating a shortfall of open space, even a small decrease in that ratio as a result of the action may have an adverse effect.

More detailed analysis of open space effects on residents for most actions will generally be unnecessary if the open space ratio decreases by less than 1 percent. However, the existing open space ratio may be so low that even an open space ratio change of less than 1 percent may result in potential significant open space impacts and should be further assessed. Typically, a 1 percent change should only be considered if open space resources are very scarce (e.g., below 1.5 acres per 1,000 residents) in the study area. For example, the closer the ratio is to 1.5 acres per 1,000 residents (and certainly the more it exceeds this ratio), the greater percentage of change that can be tolerated. This type of assessment is also applicable to the nonresidential population. The more the ratio drops below 0.15 acres of passive space per 1,000 population, the more likely the action is to have an effect on the nonresidential population's use of open space. This assessment may also consider and compare the amount of open space in the study area relative to the community district and the borough to assess the relative shortfall or availability of open space in the study area.

If this analysis suggests the need for additional assessment, the guidelines below may be followed.

322. Detailed Assessment

The detailed open space assessment typically breaks down study area population by age group and details the amounts and quality of various types of open space to assess the availability of particular types of open space for particular age groups. In conducting this assessment, the analysis focuses on where shortfalls in open space exist now or would exist in the future, to identify whether they result from the action and to identify what sort of mitigation would be necessary. Where it is clear from the outset that the action would affect a particular type of open space or particular age group, this detailed assessment may focus on those issues.

322.1. Identify Study Area Population

Determine the population in the study area using the most recent census for all census tracts in the study area as described above in Section 321. Depending on the amount of time that has passed and the level of development that has occurred in the study area since the last census, the study area population data may need to be adjusted to account for increases or decreases in population. Break down the population by age group and list age groups as both total persons and as a percentage of total population in study area, as shown in Table 3D-1.

Table 3D-1

Sample Table for Study Area Age Groups

Age Category	Persons	Percent of Total Population
4 and younger	0,000	0.00%
5-9		
10-14		
15-19		
20-64		
65 and older		

These age groups represent different types of open space users. (For example, the 4-year-old-and-younger age group typically uses tot lots, while the 65-and-over age group may have greater need for such passive resources as benches and walkways.) If it is clear that the area supports a substantial weekday population, such as workers, college students, or tourists, data on the size of such population and the source of this data may be appropriate. Data on daytime worker population can also be obtained from the Department of City Planning. Daytime college population can be determined by contacting administrative officers of colleges and other post-secondary educational institutions in the study area. Visitor population can be estimated using information from visitor attractions and major shopping attractions; this may include daily, weekend, or annual visitor counts and estimates of daily or weekend shoppers.

For an analysis targeting a specific open space and user population, this assessment may be focussed on only that user population comparable to that which would be displaced. For example, if only a tot lot is to be affected by the proposed action, the demographic analysis can focus on the appropriate age group 4 years old and younger.

322.2. Identify and Describe Study Area Open Spaces

Identify and describe open spaces included in the study area. This description may also note any major regional facilities (such as Central Park or Flushing Meadows Corona Park) that may be proximate to the study area boundary. Information about those resources may be obtained from the Department of Parks and Recreation and the Department of City Planning.

Data collection may include field surveys of the open space resources if current secondary data are not readily available. In these cases, it is recommended that information be obtained via at least two site visits, at least one of which is at the peak hour of use and in good weather, supported by information obtained through conversations with community groups and facility operators. (Peak hour varies for different users and open space facilities. Commercial areas tend to have a peak hour at lunch time, noon to 2 PM, when most workers have lunch. Residential neighborhoods often have peak hour on weekends and after school, but verification with park operators and local open space experts may be useful. For example, some schools use parks for recess, and certain facilities in parks can attract users at anytime to create other peak hours.)

In general, the following data are useful in assessing open space conditions in an area; for actions that may affect a specific type of user or specific type of open space, this assessment may be tailored for that group. A sample format for gathering and organizing this information is provided in Table 3D-2.

1. Name and address of each open space facility.

2. Map key number. This ties the description to the map of open spaces described above in Section 310.

   Owner (public/private).

   Acreage.

5. Percent of area (and acreage) devoted to active and to passive uses. Provide estimates based on the facility type and equipment. In general, the following assumptions may be appropriate: esplanades are typically 50 percent active, 50 percent passive; beaches can be considered 20 to 40 percent active, and 60 to 80 percent passive; sitting areas are 100 percent passive; ball fields are 100 percent active; multipurpose play areas are generally all active, unless field surveys confirm limiting conditions. Golf courses, including pitch and putt courses, tend to serve a very limited portion of the population. The assessment may consider that although the golf course may contribute a substantial amount of open space acreage, it may not serve a comparable amount of the study area's active open space needs.

   The lead agency may determine that other percent breakdowns for the affected resources may be more appropriate, based on information as to how these resources actually function.

6. Open space features, types of equipment, facilities, etc. In many cases, the features of an open space area (or lack thereof) may be important in assessing how the open space is currently used, and how it may be used in the future condition. For example, a passive open space area with no seating may not be useful; provision of seating and other attractive features, such as planters, can make that area more useable by both the existing community and new population introduced by a project.

7. The quality of the open space conditions, generally rated as excellent, good, average, or poor. The quality of the open space conditions is important in the assessment of whether or not the open space is actually used or useable. Displacement of a dilapidated and unused open space may not be considered significant; however, improvements to a poorly maintained open space may increase its usefulness and reduce or offset a significant impact. (Significant impacts are discussed in Section 400, below.)

   The following ratings of conditions—which are a summary of *ABCD Rating Guide for Small Parks, Playgrounds, Malls and Sitting Areas*, a publication of New York City Department of Parks and Recreation—can be used, as appropriate, in assessing the quality of open space conditions.

   - *Excellent condition: this open space is in good to excellent shape, is safe, well-maintained, litter-free, and operable.* Examples of indicators of excellent condition include the following. Sidewalks and paved areas are level and smooth, with drains that are intact and functioning normally. Play equipment is present, in safe and usable condition with safety surfaces (that are bouncy and firmly attached) below critical play areas. Comfort station doors and windows are secured and intact. Roof, vents, louvers, and overall structures are sound, intact, and operable. Plumbing, lighting fix-

Table 3D-2
Sample Table Listing Open Spaces

1. Name and address of Facility	2. Map Key #	3. Owner (Public/ Private	4. Acreage	5. Description:		6. Open Space Features: Facility types	7. Facility Conditions (Source)	8. Hours of Access	9. User Groups	10. Utilization Level	11. Factors Affecting Utilization
				Active %	Passive %						

tures, and dispensers are intact and operating. All drinking fountains are working and clean. Benches are sound, attractive, and well-maintained and do not need painting. All fencing is intact. Lawns are less than 5 percent bare, with few weeds. Shrubbery is trimmed. Garbage or litter is absent or widely scattered. None to a minor amount of glass present; no glass in children's play areas.

- *Good condition: this open space is in good shape, is operable, but needs some minor repairs.* For example, sidewalks may have minor cracks or there may be a few missing block pavers. Drains may need maintenance in one to three places but there is no danger to pedestrians. Limited deterioration does not impair use of any facilities, although these conditions may detract from appearance. Playgrounds have no more than 10 to 25 percent of equipment missing, damaged, or needing paint. Comfort stations are locked and secured, but minor damage to windows, jambs, and roof slate/tile may be visible (but does not undermine overall building appearance). At least one drinking fountain is working. Others may need cleaning or require minor repair. All fencing in children's areas is materially intact. In other areas, fencing may be intact and functional, but some access holes may not have been framed. Fencing may need repairs. Around 5 to 25 percent of the lawn is bare but not unsightly; grass is no more than 4 inches high. Shrubbery may be slightly overgrown but not unsightly. Not more than 20 percent of the benches are in need of repair. Garbage and litter are in light amounts and visible, but scattered so that this does not detract from the overall appearance of the facility. There may be light amounts of glass, but not located in playing areas.

- *Average condition: this open space is characterized by equipment that is in less than good shape or does not always operate effectively.* Examples of indicators of average condition follow. Sidewalks and curbs may be broken or damaged; there may be missing block pavers or damaged curbs in 4 to 10 places. Surfaces may be cracked, raised, or sunken in several areas, affecting drainage and/or safe, proper use of the facility, and detracting from the appearance of the site. Perimeter storm drains may be clogged and detract from the appearance and safety of the site. Conditions may limit use of the site. Approximately 25 to 50 percent of the equipment may be missing, damaged, or need painting. The equipment may look ignored and detract from the appearance and may restrict public use. Some 25 to 50 percent of the playground's safety matting may be missing. Comfort stations may have broken windows, doors, and roofs, which undermines the building appearance. Although structurally sound, the buildings may not be secured and may clearly need restoration. Some 21 to 50 percent of the benches may be damaged or vandalized. No drinking fountain on site is operable. The fountain structures may be intact, but have defects that prevent them from operating (excessive flooding, missing button or bubbler, etc.). Fencing may not serve its protective purpose; damaged fencing may have holes large enough for children to crawl through in children's areas. Lawns may be sunken or eroded, or 25 to 50 percent bare or unsightly; most of the lawn may be weeds; the grass may be more than 4 inches high. Up to 50 percent of the shrubbery may be overgrown and poorly maintained. Broken or dead branches may significantly detract from the park's appearance. Litter may be concentrated in several places such as under benches, along fencing. Glass may be found in heavy amounts in concentrated areas.

- *Poor condition: this open space has equipment that is in poor shape or does not operate.* Examples of indicators of open space in poor condition follow. Features of open space may be unattractive, discouraging use. There may be conflicting uses present, and unsafe conditions such as extensive deterioration to curbs and sidewalks (including cracks, crumbling, improper settlement, holes, or protrusions) or poor safety surfacing in the playground. Damage or vandalism may prevent safe and appropriate use of the play equipment. More than 50 percent of the play equipment may be missing, damaged, or need painting; more than 50 percent of the safety matting may be missing. Comfort stations may be extensively damaged, with missing roofing, etc. No drinking fountain is operable; structures or plumbing may be missing. Storm drains may be clogged or damaged and detract from the safety and appearance of the site. Some 5 to 50 percent or more of the benches may be damaged, vandalized or missing. More than

50 percent of fencing is damaged, reducing the usefulness for its intended purposes. More than 50 percent of the lawn may be bare; the existing grass may be very high; and the shrubbery may be overgrown and sloppy. Broken and/or dead branches may predominate the area.

The Department of Parks and Recreation is currently adjusting this rating system to reduce the number of rating categories from those listed above to two—"A" for acceptable and "U" for unacceptable. The ratings from the Department of Parks and Recreation's Inspection Program are defined as follows:

- *A.* Denotes a facility in all-around excellent or generally good condition that requires only continued routine maintenance. A facility may be compromised by several minor problems that may be corrected by either district forces or specialized borough crews. Generally, the A rating covers the A and B rating categories under the former ABCD rating system described above.

- *U.* Denotes a facility where physical deterioration has begun to limit or is discouraging public use, requiring, in most instances, intervention by specialized borough crews or shops forces, and/or the Department's capital construction or other programs. Generally, the U rating covers the C and D rating categories under the former ABCD rating system described above.

8. Hours of operation and access. Many public open spaces, such as school playgrounds or public plazas, are open and accessible only during specified hours. This information is obtained through site visits, where required signage describes the hours of operation; discussions with operators; conversations with building superintendents; or, in the case of public plazas, either the operators or the Manhattan Borough Office of the Department of City Planning.

9. User groups. One assessment of the overall quality of an area's public open space facilities is based on how well those facilities fulfill the recreational needs of each age group. Recreational facilities typically used by different age groups are as follows:

- *Ages 4 and younger.* Typically, children 4 years old or younger use traditional playgrounds that have play equipment for toddlers and preschool children.

- *Ages 5 to 9.* Children ages 5 through 9 use traditional playgrounds with play equipment suitable for school-age children, as well as grassy and hard-surfaced open spaces, which are important for ball playing, running, skipping rope, etc.

- *Ages 10 to 14.* Children ages 10 through 14 use playground equipment, court spaces, little league fields, and ball fields.

- *Ages 15 to 19.* Teenagers' and young adults' needs tend toward court game facilities such as basketball and field sports.

- *Ages 20 to 64.* Adults continue to use court game facilities and fields for sports, as well as more individualized recreation such as rollerblading, biking, and jogging, requiring bike paths, esplanades, and vehicle-free roadways. Adults also gather with families for picnicking, ad-hoc active sports such as frisbee, and recreational activities in which all ages can participate.

- *Ages 65 and over.* Senior citizens engage in active recreation such as handball, tennis, gardening, and swimming, but their primary recreational needs are for passive facilities.

The facility/age worksheet provided in Table 3D-3 can be useful in determining which of the study area's open spaces are appropriate for a given age group. For actions that could affect a specific type of open space or introduce a specific user group, the assessment may be targeted to that group.

In some cases—particularly when an open space would be directly affected—it may be necessary to conduct a user survey to understand more fully the potential impacts on the users of the open space. User surveys may take the form of systematic interviews or observations of the users. These should be conducted when the open space is accessible during the day (e.g., hourly), weekends and weekdays, in good weather, and account for seasonal variations in use of open space. Documentation for surveys typically includes the date, time of day, and weather at the time the survey is taken.

Table 3D-3
Facility/Age Worksheet

Age Appropriate facilities	Typical facilities and space; include any open space associated with Future No Action	Total number within 1/4 mile	Total number within 1/2 mile	Location Key # (Same as Park Key #)	Proposed project related open space	Comments
Toddler facilities: Ages 0 - 4 years	1. Simple play spaces with features such as: sand box, climbing equipment, and seating for caregivers; under 1000 square feet in size.		NA			
	2. Tot lot: a complex of age appropriate play facilities over 1000 square feet with a range of features such as; swings, slides, climbing equipment, water features, sand box and seating for care givers.		NA			
	3. Unstructured play area, grassy or hard surface.		NA			
Active Play facilities appropriate for children 5 to 14 years old.	1. Playground with a range of age appropriate features (swings, climbing equipment, sand and water play) and seating for caregivers.	NA				
	Age size sports facilities such as:	NA				
	2. Fields (turf or hard surfaced) such as Soccer, Softball, Football, Baseball	NA				
	3. Courts such as: Tennis, Handball, Basketball	NA				
	4. Unstructured space (grassy or hard surface)	NA				
Active open space appropriate for teens and adults; Ages 15 and above.	1. Fields, (turf or hard surface such as: Baseball, Softball, Soccer, Football	NA				
	2. Courts such as: Tennis, Handball, Basketball	NA				
	3. Or courts such as Bocci, Shuffleboard, Basketball backboards.	NA				
	4. Jogging and Biking areas (Greenways)	NA				
	5. Unstructured spaces designed for active use.	NA				
	6. Others (Specify	NA				
		NA				
		NA				

Table 3D-3
Facility/Age Worksheet

Age Appropriate facilities	Typical facilities and space; include any open space associated with Future No Action	Total number within 1/4 mile	Total number within 1/2 mile	Location Key # (Same as Park Key #)	Proposed project related open space	Comments
Passive space appropriate for Teens, Adults and Daytime workers	1. Seating Areas		NA			
	2. Game Tables		NA			
	3. Gardens		NA			
	4. Esplanades		NA			
	5. Grassy areas for relaxing or sunbathing		NA			
	6. Plazas		NA			
	7. Other (Specify)		NA			
			NA			
			NA			

- Observation surveys may include the following questions:
  - Who is using the open space?
  - How many are using the open space?
  - What facilities are being used?
  - What facilities are not being used?
  - Is the space adaptable for both active and passive uses?

- Interview surveys may include the following questions:
  - How frequently the user uses the open space during the course of the day, week, month, season?
  - How long do the users stay?
  - What other facilities do the users currently use?
  - Where are the users coming from and how do they get to the facility?
  - What parts of the facility do people use?
  - What attracts or detracts from the use of the open space?

10. Utilization level. The level of use an open space receives—low, moderate, or heavy—is also noted, as follows:

    - Low utilization: 25 percent capacity or less utilization at peak hour. Much of the space, facility, or equipment is available for use.

    - Moderate utilization: 25 to 75 percent capacity utilization at peak hour. Some passive spaces and/or active facilities are available for use.

    - Heavy utilization: 75 percent or greater capacity utilization at peak hours. Few or none of the open space facilities are available for use.

This information is obtained by site visits and by conversations with operators of the open space and with the community's open space experts. Factors that may be important in determining the utilization include the following:

- Benches filled (Rule of Thumb: 3 feet per person) (This is based on Whyte, William H., *The Social Life of Small Urban Spaces*, The Conservation Foundation, Washington D.C., 1980).

- Lines to use equipment or facilities.

- People leaving because it is crowded.

- People leaving before entering because it is too crowded.

- Multiple activities occurring and conflicting with each other.

- Inappropriate age groups using equipment and preempting appropriate age groups (e.g., teenagers using playground equipment, skateboarding in passive areas).

- Litter overflowing (can indicate capacity as well as maintenance management).

- Competition for use of facilities.

11. Other factors affecting utilization. Low utilization is not always an indicator of low demand. Some factors, either permanent or temporary, may create underutilization. These factors are often related to shadows, wind, air and noise quality, safety, and conflicting uses in a multiuse area, as described below. In some cases, a detailed utilization study may be appropriate.

    - *Shadows*. Shadows on sun-sensitive uses, such as botanical or landscape attractions, swimming pools, or benches, can affect use of an open space. This information may be noted during the field survey. If a shadow assessment is being performed for the proposed action (see Section 3E of this Manual), the technical analyses and graphics presented in the shadow section can be considered and referenced in the open space assessment.

    - *Air Quality/Odors*. These can also affect use of an open space. If the action is likely to have a significant air quality/odor impact on open space resources, the technical analyses presented in Section 3Q of this Manual should be referenced and considered in the open space analysis.

    - *Noise*. Excessive noise, including traffic noise, can prohibit specific types of use from an open space. See Section 3R of the Manual for information on noise analyses. If the action is likely to have a significant noise impact on open space resources, the technical analyses presented in Section 3R should be referenced and considered in the open space analysis.

- *Safety*. Poor safety conditions can also deter use. These can be because of design (e.g., equipment with poor spacing), or conditions. Typically, important factors include access, crime, pedestrian safety, and other transportation issues.

322.3. Assess the Adequacy of Open Space

Use the data gathered in the tasks above to provide a brief evaluation of the study area's existing open space conditions relative to the open space needs of the study area users.

First, calculate the existing open space ratio for the study area, using the population and open space acreage data identified in Sections 322.1 and 322.2, above. The open space ratio is expressed as the amount of open space acreage per 1,000 population, and is calculated by dividing the total acres of open space by the population and multiplying by 1,000. This ratio may be tailored to age groups and types of facilities that would be affected by the proposed action. It is also usually appropriate to calculate separate open space ratios for active open space, passive open space, and total open space, based on the information gathered in Section 322.2, above.

Typically, it would be appropriate to provide the following information when calculating the open space ratio:

1. *Actions that would result in an increase in residential population*. Calculate the open space ratio for the residential population:

   - Number of acres of active open space per 1,000 residents;
   - Number of acres of passive open space per 1,000 residents; and
   - Number of acres of total open space per 1,000 residents.

   If the action would occur in an area with a substantial nonresidential population, also calculate the open space ratio for the nonresidential population of the study area:

   - Number of acres of passive open space per 1,000 non-residents.

2. *Actions that would result in an increase in nonresidential population (i.e., employees, visitors, students, etc.)*. Calculate the open space ratio for the nonresidential population:

   - Number of acres of passive open space per 1,000 nonresidents.

   If the action would occur in an area with a substantial residential population, also calculate the open space ratio for the residential population:

   - Number of acres of active open space per 1,000 residents;
   - Number of acres of passive open space per 1,000 residents; and
   - Number of acres of total open space per 1,000 residents.

3. *Actions that would result in an increase in both residential and nonresidential population*. Calculate the open space ratio for the residential and nonresidential populations of the study area:

   - Number of acres of active open space per 1,000 residents;
   - Number of acres of passive open space per 1,000 residents;
   - Number of acres of total open space per 1,000 residents; and
   - Number of acres of passive open space per 1,000 nonresidents.

Second, assess the adequacy of open space.

Typically, for the assessment of both direct and indirect effects, Citywide local norms have been calculated for comparison and analysis. In New York City, existing local area open space ratios vary widely, and 1.5 acres of City parkland per 1,000 residents is the median community district ratio. For large-scale actions (and for planning purposes), the City seeks to attain an optimal planning goal of 2.5 acres per 1,000 residents, if appropriate and feasible. (The City's planning goal is based, in part, on National Recreation and Park Association guidelines from 1.25 to 2.5 acres per 1,000 residents of neighborhood parks within one-half mile, 5 to 8 acres per 1,000 residents of community parks within one to two miles, and 5 to 10 acres per 1,000 residents of regional parks within one-hour drive of urban areas. In addition, the City also consulted open space literature, New York City open space

studies, and the Citywide average of parkland of 3.5 acres per 1,000 residents to develop the 2.5-acre goal.)

For nonresidential populations, specifically worker populations, generally 0.15 acres of passive open space per 1,000 workers represents a reasonable amount of open space resources for that population.

For large-scale actions (and for planning purposes), the City seeks to attain its planning goal of a balance of 80 percent active open space and 20 percent passive open space. Similar to the open space ratio discussed above, this planning standard is not a regulatory standard. Although a typical population mix may call for such a goal, it may not be appropriate or attainable for some areas of the City or for certain populations skewed toward certain age groups. Analyzing the breakdown of open space into the categories of passive and active uses often requires judgment, and for any particular case, typical open space resources may be used very differently.

To assess the adequacy of existing open space within the study area, consider the following factors:

- Is there an adequate open space ratio to population of the study area?
- Do effects of air or noise quality, shadows, or extreme wind conditions cause a decrease in the useability of the open space supply?
- Is the proportion of active and passive open space appropriate for the population and age groups served? Note that for areas in which there is a substantial worker, student, or visitor population, typically there is a need for more passive space resources.
- Other data gathered in Section 322.2, above, including the following: user population by age; fees or other charges; types of facilities available to serve needs of different age groups; the variety of active and passive uses; conditions of facilities; utilization levels; and factors that may encourage or deter use including accessibility of different types of open space (physical location and barriers to access), competing uses, fee or hour restrictions.
- Such other factors as the availability of any major regional facility (e.g., Central Park), the predominant housing type, and the availability of private open space facilities to serve the existing population.

These questions may be evaluated in context with the study area and the neighborhood.

The type of action proposed will also affect the factors considered. Residential projects will typically focus on the appropriateness of an area's open spaces for the different age groups in the study area; commercial projects typically describe the adequacy of available open space for office workers, who may use passive facilities within ¼ mile for sitting, socializing, eating lunch, and strolling. Mixed-use projects should describe the adequacy of available open space for residential as well as commercial workers.

For actions that would have direct effects on specific facilities, this assessment may be focused on only those open spaces that are comparable to those that would be displaced.

322.4. Future No Action Condition

The future no action analysis projects conditions in the study area for the build year without the proposed action, providing a baseline condition against which the impact of the action can be measured. The analysis includes data on projected population as well as recreational facilities/open space facilities built or approved to be constructed by the build year. The same level of analysis provided for the assessment of existing conditions is applied here. The analysis will consider any changes to the following factors expected in the future without the project.

- *Study area population.* Based on the development and population projected for the future build year, estimate the projected population in the study area by age group. Consider changes in daytime population for actions that would increase the nonresidential population.
- *Identify and describe study area open spaces.* Identify any changes to open space anticipated by the future build year. Include new open space and alterations/deletions to existing open space. Also include changes that have been adopted or officially approved by a public agency. This inventory may include projects under construction, *public* open spaces that have been approved as mitigation for other projects, or open spaces that are committed in the Department of Parks and Recreation's Capital Budget. The same information gathered in steps 1 through 11, above, in Section 322.2, will be appropriate for this inventory as well (with the exception of facility conditions, utilization levels, and, possibly, factors influencing utilization levels). If the project may have potential significant

shadow, air quality/odor, or noise impacts on open space resources, these conditions in the future no action condition are analyzed and described.

- *Assess the adequacy of open space.* The purpose of this step is to determine the open space conditions in the future no action condition as it relates to the needs of the number and types of users predicted for the future no action condition. This assessment is performed in the same way as the assessment of existing adequacy, described in Section 322.3, above. This includes calculating the open space ratio for the future no action condition, and qualitatively assessing whether or not the area is sufficiently served by open spaces, given the types of open space and the profile of the study area population.

322.5. Future Action Condition

The future action assessment analyzes conditions in the study area for the build year with the proposed action/project. Both the quantitative and qualitative factors are considered in the assessment to the extent to which the action may affect the existing open space resources and their capacity to serve the study area population.

This assessment typically begins with a brief description of the project, considering how it might affect open space—by displacing or encroaching on open space, introducing a population that would place demands on open space, etc. Then, the analysis is performed using the same methodology as for existing conditions and for future no action conditions, described above. This includes the following.

- *Identify changes to study area population.* This projection will be based on population projections for the proposed action (see Section 3B, "Socioeconomic Conditions") together with future no action conditions determined above. For the project population, provide a breakdown by age, and a description of the estimated daytime population (workers, students, tourists), as appropriate.

- *Identify and describe changes to study area open spaces.* Describe the open space changes from the no action condition, both on site and off site, which would occur as a result of the proposed action. Describe the open space that would be eliminated, altered, created and/or improved as a result of the action.

- *Assess the adequacy of open space.* Calculate the ratio of acres of open space per 1,000 population. Indicate the additional users as a result of the proposed action and assess the adequacy of open space resources to accommodate these users. Note whether the project would provide on-site open space resources in sufficient quantity and quality to serve the needs of its users adequately (offsetting any effect of the anticipated increase in population). This may be private as well as public open space. For example, the zoning requirements for Quality Housing mandate indoor recreational space as well as exterior open space. This space would typically satisfy some of the demand created by such a project.

  If the action is likely to have potential significant shadow, air quality/odor, or noise effects on open space resources, consider those effects as well. Refer to the appropriate technical analyses.

400. Determining Impact Significance

In this step, the level of significance of an action's effects on an area's open spaces is defined, qualitatively and quantitatively. It is generally appropriate for actions to undergo both the quantitative and qualitative evaluation compared with the future no action condition.

410. QUANTITATIVE IMPACT

The proposed action may result in a significant impact on open space in the following circumstances:

- There would be a direct displacement/alteration of existing open space within the study area that has a significant adverse effect on existing users, unless the proposed action would provide a comparable replacement (size, useability, and quality) within the study area (net loss of publicly accessible open space).

- The action would reduce the open space ratio and consequently result in overburdening existing facilities or further exacerbates a deficiency in open space.

When assessing the effects of a change in the open space ratio, consider the balance of passive and active open space resources appropriate to support the affected population. A larger percent of active space is usually preferred, because the physical space requirements for active open space uses are significantly greater. That is, a greater number of passive open space users, such as those sitting on a park bench to enjoy fresh air, can be accommodated within a smaller space. Active open

space users have greater physical space needs for the movement and activity required for active recreation, such as children's play equipment, organized or spontaneous sports such as frisbee or ball playing, hopscotch, or other outdoor exercise.

In assessing the effects of changes in the open space ratio, the active/passive nature of the resources affected should be considered. As noted earlier, for large-scale actions (and for planning purposes), the City seeks to attain a planning goal of a balance of 80 percent active open space and 20 percent passive open space. Although a typical population mix may call for such a goal, it may not be appropriate or attainable for some areas of the city or for certain populations skewed toward certain age groups. Analyzing the breakdown of open space into the categories of passive and active uses often requires judgment, and for any particular case, typical open space resources may be used very differently.

The lead agency should review existing open space norms for the area and the quality of existing open space. Actions that may result in significant quantitative impacts on open space resources are typically further assessed in the qualitative assessment approach (described below) to determine overall significance of the impact.

420. *QUALITATIVE IMPACT*

Identify the type (active or passive), capacity, conditions, and distribution of open space. Determine whether the change in open space conditions and/or utilization results in a substantial change or an adverse effect to open space conditions.

Significance is generally determined according to the following guidelines:

- If the proposed action results in a significant physical impact on existing open space in terms of increasing shadow, noise, air pollutant emissions, or odors compared to the future no action condition, then there is a significant impact requiring mitigation.

- If the proposed action addresses the quantitative open space needs, but causes a qualitative impact compared to the no action condition, then there may be a significant impact on open space, requiring mitigation. This could occur if a specific user group would be affected (such as young children or boccie players), even though the overall open space ratio would be adequate; if certain age groups would be underserved; or there would be conflicts in the utilization of open space as a result of the action.

500. Developing Mitigation

If the proposed action results in significant adverse open space impacts, on site or off site mitigating measures are identified to the greatest extent practicable.

Some ways in which open space impacts may be mitigated are as follows:

- Create new public open space on site of the type needed to serve the proposed population and to offset their impact on existing open space in the study area.

- Create new public open space elsewhere in the study area of a type needed to serve the needs of the added population.

- Improve existing open spaces in the study area to increase their utility, safety, and capacity to meet identified needs in the study area.

600. Developing Alternatives

Alternatives to the proposed action that would avoid significant impacts on open space resources could include a smaller project (creating less demand for open space) or an alternate site (transferring the open space demand to an area with sufficient supply to accommodate the added demand).

Alternatives to the proposed action are analyzed using the methodology described under the future build condition and impacts are compared to those of the proposed action.

700. Regulations and Coordination

710. *REGULATIONS AND STANDARDS*

There are no specific City, State, or Federal statutory regulations or standards governing the analysis of open space. SEQRA (617.11(a)(8)) and the 1977 Mayoral Executive Order 91 both state that a significant impact would occur if an action resulted in "a substantial change in the use, or intensity of use, of land including agricultural, open space or recreational resources, or in its capacity to support existing uses."

720. APPLICABLE COORDINATION

Coordination with other agencies and open space experts may be appropriate for gathering information needed for the CEQR review. In particular, coordination with the New York City Department of Parks and Recreation would be appropriate for proposed actions that occur on parkland or other public open space under its jurisdiction, or require mitigation for significant open space impacts that occur on parkland or other open space under its jurisdiction.

730. LOCATION OF INFORMATION

For gathering open space information, many sources are available to lead agencies and CEQR applicants, including maps, property data, guidelines, reports, documents, files, and base maps on various parks and public open spaces.

Following is a list of agencies and contacts that have relevant information with respect to open space resources and policies.

- New York City Department of Parks and Recreation
  The Arsenal
  830 Fifth Avenue
  New York, NY 10021

  Department of Parks and Recreation, *ABCD Rating Guide for Small Parks, Playgrounds, Malls and Sitting Areas*, City of New York, 1986, as amended.

  Department of Parks and Recreation, *Parkland Sectional Maps*, City of New York, reference material only. Provides delineated parkland on maps.

  Department of Parks and Recreation, *Property Lists*, City of New York, reference material only. Provides name of park, acreage, facilities within park, etc.

  Department of Parks and Recreation, "Property Folders," City of New York, reference material only. Provides real estate, historical, and natural history information.

- New York State Office of Parks, Recreation and Historic Preservation
  915 Broadway
  New York, NY 10010

  Information available on New York State parks in New York City.

  Office of Parks, Recreation and Historic Preservation, *Guide to the Alienation or Conversion of Municipal Parklands*, State of New York, Revised 1990.

- New York City Department of City Planning
  22 Reade Street
  New York, NY 10007

  Demographics Division: 1990 Census and demographic data. Population and age data available by census tract.

  Waterfront and Open Space Division: information on parks and open space programs and policies.

  Book and Map Sales Office
  Hours: 10 am-4 pm, Monday-Friday

  Information on Manhattan plazas.

  Department of City Planning, *Bytes of the Big Apple: Tax Block Base Maps in DXF Format*, City of New York, March 1991.

  Department of City Planning, *Bytes of the Big Apple: Tax Block Base Maps in Illustrator Format*, City of New York, June 1992.

  Department of City Planning, *Bytes of the Big Apple: LION Single Line Street Base Map in MapInfo format*, on diskette, City of New York, March 1992.

  Department of City Planning, *Recreation and Open Space in New York City: Community Districts with Lowest Parkland/Population Ratios*, City of New York, January 1992.

  Abeles Schwartz Associates, Inc., *Open Space and the Future of New York: How to Analyze Community Open Space and Recreational Needs*, The New York City Open Space Task Force, Department of City Planning, City of New York, 1988.

- New York City Department of City Planning
  Manhattan Office
  2 Lafayette Street
  New York, NY 10007

- New York City Economic Development Corporation
  110 William Street
  New York, NY 10038

  Information on the provision of open space in economic development projects.

- New York City Department of Housing Preservation and Development
  100 Gold Street
  New York, NY 10038

  Information on open spaces in housing projects and on interim site improvements.

- New York City Board of Education
  Division of School Facilities
  110 Livingston Street
  Brooklyn, NY 11201

  For public school playgrounds and open space or recreational facilities, requests can be made for square footage of specific sites. For jointly operated playgrounds (JOP's), which are operated by both the Board of Education and the Parks Department, contact the relevant Community School District Office for information on facilities, accessibility, hours of operation, etc.

- New York City Housing Authority
  5 Park Place
  New York, NY 10007

  Information on the provision of open space in Housing Authority projects.

- Department of General Services
  Division of Real Property
  2 Lafayette Street
  New York, NY 10007

  Operation Green Thumb

  Information on the short- and long-term leases of City-owned land for open space uses.

- National Park Service
  U.S. Department of Interior

  Manhattan Site:
  26 Wall Street
  New York, NY 10005

  Gateway National Recreation Area:
  Headquarters, Building 69
  Floyd Bennett Field
  Brooklyn, NY 11234

E. Shadows

100. Definitions

Sun and shadows affect people and their use of open space all day long and all year, although in different ways depending on the season. As the sun travels across the sky during the day, shadows follow a curve on the ground opposite the sun. When the sun rises, shadows fall to the west. As the sun travels across the southern part of the sky throughout the day, shadows move clockwise until they stretch east, as the sun sets in the west. Midday shadows are always shorter than those at other times of the day because the sun is highest in the sky then. Further, because of the tilt of the earth's axis, the angle at which the sun's rays strike the earth varies throughout the year, so that during the summer, the sun is higher in the sky and shadows are shorter than during the winter. Winter shadows, although longest, move the most quickly along their paths (because of the earth's tilt) and do not affect the growing season of outdoor trees and plants.

Under CEQR, a shadow is defined as the circumstance in which a building or other built structure blocks the sun from the land. An adverse shadow impact is considered to occur when the shadow from a proposed project falls on a publicly accessible open space (see Section 3D), historic landscape or other historic resource if the features that make the resource significant depend on sunlight (see Section 3F), or important natural feature (see Section 3I) and adversely affects its use and/or important landscaping and vegetation or, in the case of historic resources, obscures the features or details that make that resource significant. In general, shadows on City streets and sidewalks or on other buildings are not considered significant under CEQR. In addition, shadows occurring within an hour and a half of sunrise or sunset generally are not considered significant under CEQR.

The shade created by trees and other natural features is not considered to be shadow as defined for the impact analysis. Trees cast shade and help cool their immediate environment in the hot summer; deciduous trees allow sun to penetrate to the earth in the cold months, when such warmth is needed. The tree canopy requires sunlight, even when the earth beneath the trees is shaded. Thus, a building that casts a shadow on a tree-shaded environment may create an adverse impact; its shadow is not redundant with tree shade.

200. Determining Whether a Shadow Assessment is Appropriate

The shadow assessment considers actions that result in new shadows long enough to reach a publicly accessible open space (except within an hour and a half of sunrise or sunset). Therefore, a shadow assessment is required only if the action would result in new structures or additions to existing structures (including the addition of rooftop mechanical equipment) and those structures are tall enough for the shadows to reach a park or natural feature.

For any actions that would result in new structures or additions to existing structures, determine whether the structure resulting from the proposed action would be less than 50 feet in height. If so, are there any parks, historic landscapes or other historic resources (see Section 3F), or important natural features adjacent (including across the street) to the site of the proposed action? For actions less than 50 feet tall, no assessment of shadows is generally necessary unless the site is adjacent to a park, historic resource, or important natural feature.

For actions resulting in structures 50 feet high or taller, and for shorter structures adjacent to important features, the following screen may be used. The longest shadow that any structure will cast during the year (except within an hour and a half of sunrise or sunset) is 4.3 times its height. Multiply this factor by the height of the building in question (including all rooftop structures). For example, if the action would result in a building 100 feet tall, its longest shadow would be approximately 430 feet. If there are no parks or publicly accessible open spaces within 430 feet of the project site, generally, no assessment of shadows on such resources is needed. If open space resources are present or if the historic resources analysis has identified a known or potential architectural resource with historically significant features that depend on sunlight, the screening analysis described in Section 310 can be applied as the first step in assessing shadows, to determine the potential for impact and the need for further analysis.

Certain open spaces or sunlight-sensitive architectural resources may not need to be assessed, because their location relative to the location of the project site ensures that no project shadows could fall in the direction of the resources. Generally, this occurs with resources south of a proposed project site. More information is provided in the screening analysis in Section 310.

300. Assessment Methods

For CEQR, the assessment of a project's shadow impacts begins with a preliminary or screening analysis to ascertain whether project shadows might reach any open spaces or sunlight-sensitive architectural resources. If this analysis indicates that they might, then further evaluation is needed. Then, the extent and duration of project shadows and the effect of those shadows on uses and vegetation or on the sunlight-sensitive features of architectural resources are assessed. The results of each of these steps are documented in technical memoranda or the EAS or EIS. The following discussion outlines the approach and framework of the shadow assessment analysis. In many cases, it may be appropriate to use the services of an architect or other professional skilled in use of computer analysis to perform the shadow assessment. Note that anyone undertaking the analysis should use the longitude, latitude, and time information for New York City that are set forth in the tables provided later in this section.

310. SCREENING ANALYSIS

The first step in an examination of a project's shadows is a screening analysis to determine whether the project's shadows would fall on any open spaces at any time of the year, considering not only the height of the proposed structure, but also its location relative to the open space, natural feature, or architectural feature in question. This analysis combines estimates of the area of open space that could be shaded by the project throughout the year and of the longest shadow the project might cast to ascertain whether it would reach the open space or architectural resource. This screening analysis should be completed for all projects that appear to require shadow assessments (see Section 200, above).

1. Begin by choosing a street map, such as one of the Borough Presidents' engineers maps, that contains the project site and all publicly accessible open spaces within the maximum radius a shadow from the project might reach (as described in Section 200, above). If the historic resources analysis has identified any sun-sensitive architectural resources within that radius, denote those on the map as well. Locate north on the map; make sure it is true north, not magnetic north—the maps listed above display true north. Place the map so that true north is vertical (see example on Figure 3E-1).

2. The next step is to determine the *angle* of the project's shadow on each open space or sun-sensitive architectural resource in relation to true north. On the map, draw a line from the point on the building's footprint (or the corner of the project site, if the shape of the building is unknown) that will cast the earliest shadow on each open space or sun-sensitive architectural resource to the point on the open space or architectural resource that will first be in shadow. As explained in Section 100, above, because the sun rises in the east and travels across the southern part of the sky to set in the west, a project's earliest shadows would be cast almost directly westward. Throughout the day, they would shift clockwise (moving northwest, then north, then northeast) until sunset, when they would fall east. Therefore, a project's earliest shadow on an open space or architectural resource would occur in this same pattern, depending on the location of the open space or resource in relation to the project site. A simple method to find the earliest shadow is to begin with a line running due west from the project site. If this line does not meet the open space or architectural resource, rotate the line clockwise until it does. On the example in Figure 3E-2, the earliest shadow on an open space is represented by a line between the southeast corner of the project site and the northwest corner of the open space. Intersect this line with a vertical line (a line drawn true north). This displays the shadow's angle from true north when it enters the open space or reaches the architectural resource. This is referred to as the "entering angle" in this discussion.

   Using the same approach, draw a line from the point on the building's footprint that will cast the latest shadow on the open space or architectural resource to the point in the open space that will last be in shadow. On the example, this is the line between the northwest corner of the site and the southeast corner of the open space. Intersect this line with a vertical line (a line drawn true north) to display the shadow's angle from true north as it leaves the open space or resource. This is the "exiting angle."

   All angles between the two angles obtained above represent the portions of the open space or resource that could be in shadow from the proposed project at some time during the year. In the example, these angles, measured using a protractor, are -6 degrees (a minus sign means that the shadow occurs before approximately noon) and 57 degrees for the entering and exiting shadows, respectively.

Figure II.E-1

Sample Study Area for 200-Foot Building

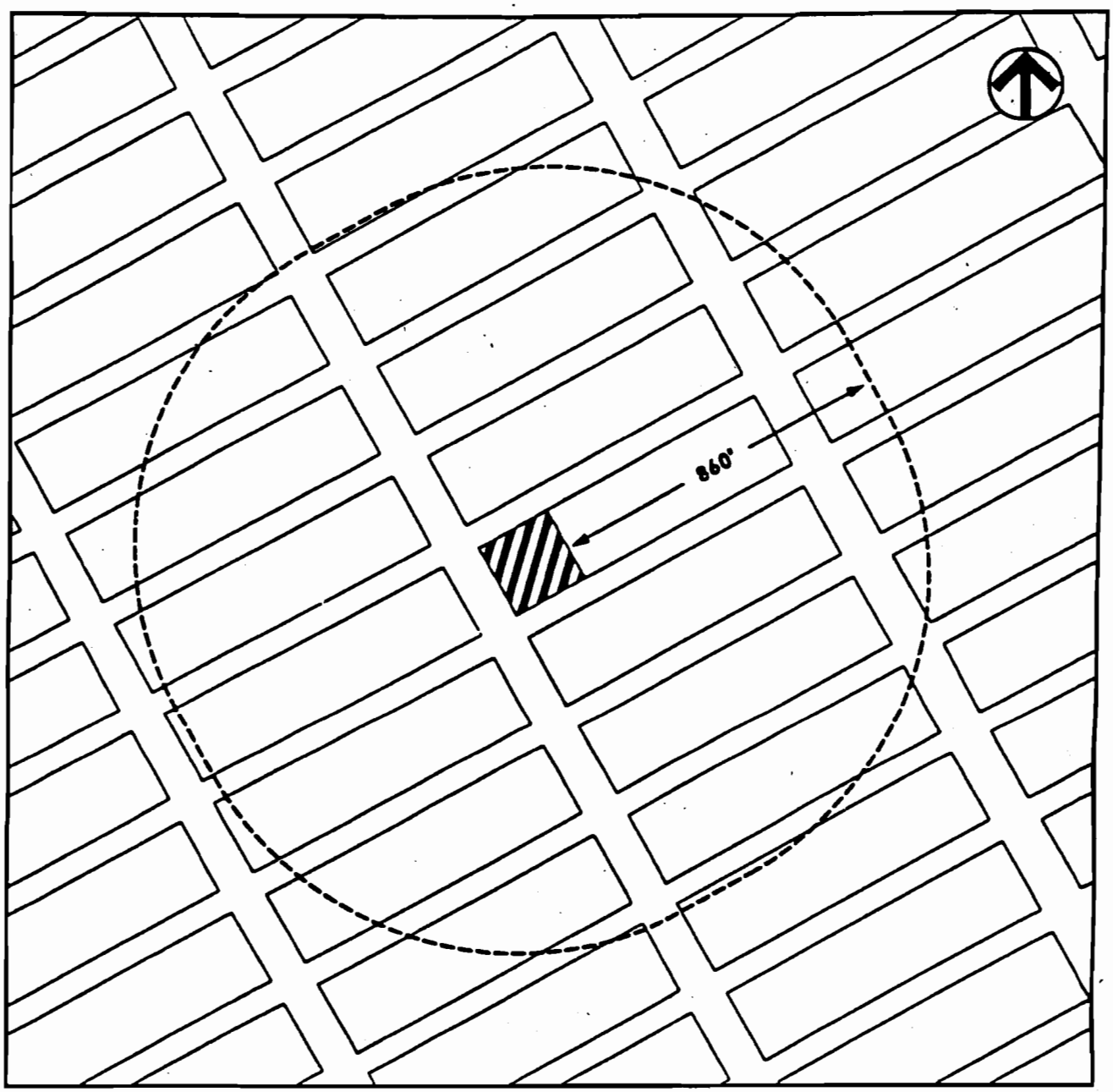
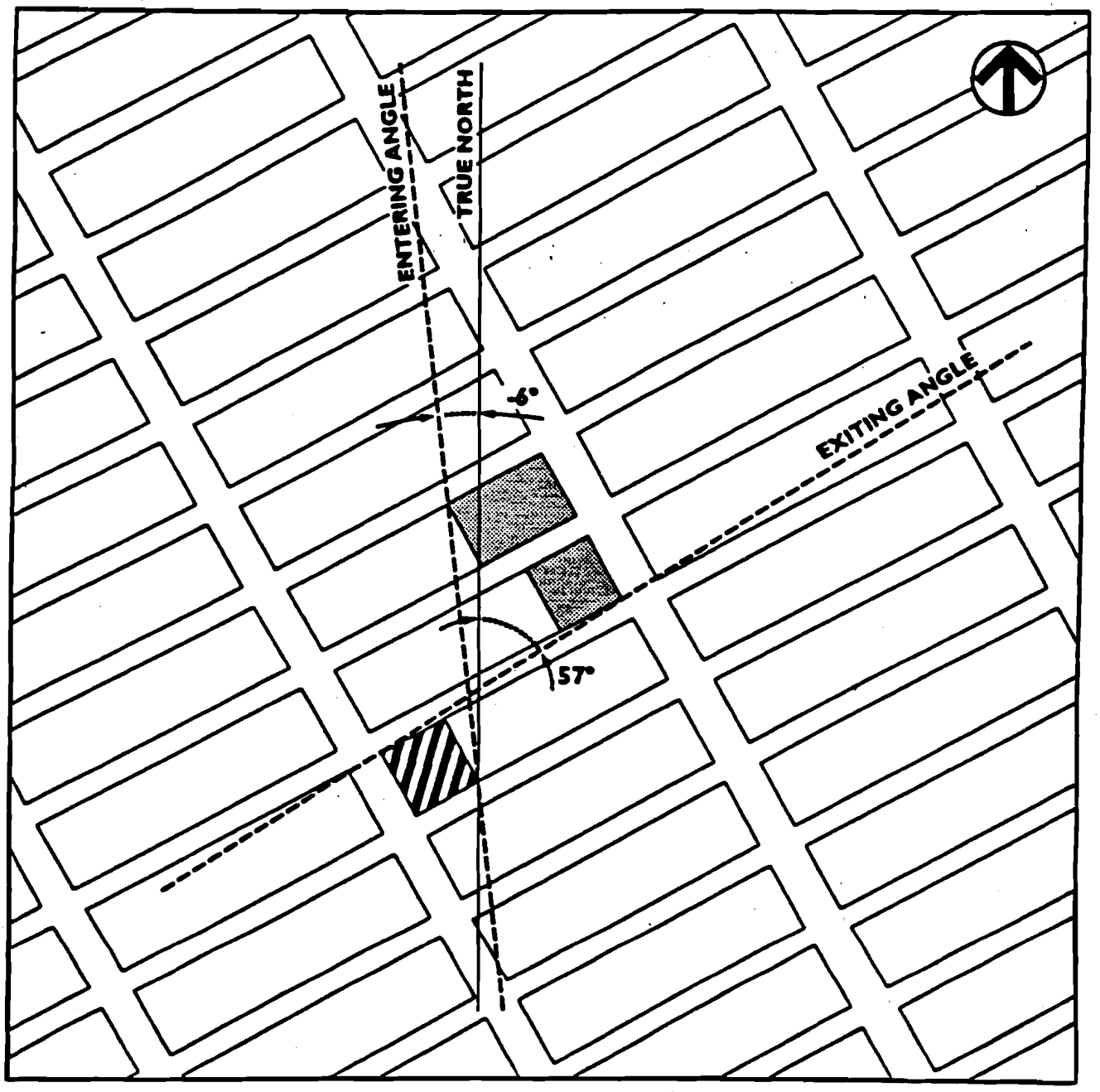


Figure 3E-2

Entering and Exiting Shadow Angles and Distances to Open Space



Proposed Building Site

Park

Entering and Exiting Angle

Extreme Angles: -6°, 57°

Distances at Extreme Angles: 780', 802'

Minimum Distance: 404'

The entering and exiting angles set the limits of shadows that the action would cast on the open space or resource at all times of the year. In the example, these angles, measured using a protractor, are -6 degrees (minus sign means that the shadow occurs in the morning) and 57 degrees. This means that at any angle from -6 degrees to 57 degrees the building could potentially cast a shadow that would reach the open space.

3. Next, consider the project site's location relative to the location of the open space, natural feature, or architectural resource in question. Because of the path that the sun travels across the sky, no shadow can be cast in a triangular area south of any given project site. Therefore, if the open space, natural feature, or architectural resource in question is located in that triangular area, no assessment of shadows is required. In New York City, that is the area between -108 degrees from true north and 108 degrees from true north. In other words, any open space (or portion of an open space) for which shadows cast by the proposed action would have to be at an angle from true north greater than -108 degrees or 108 degrees could never be shaded by the proposed project (see Figure 3E-3). No further analysis is needed for those spaces. Further, if the sun-sensitive feature on an architectural resource is on a facade that faces directly *away* from the proposed project site, no analysis is needed. For example, if the architectural resource is west of the proposed project site, and the sun-sensitive feature is on the west facade of that structure, no shadows from the proposed project could fall on that sun-sensitive face. For all other cases, continue with the remaining steps of the screening analysis.

4. Next, using Table 3E-1, which gives the maximum shadow length factors for all shadow angles, determine the maximum shadow length of the building in question. The longest shadow that any building will cast during the year occurs on December 21st. The maximum shadow length for all angles between -6 and 57 degrees is 4.3 for 42 degrees on December 21st. This means that a 200-foot building, for example, would cast a maximum shadow of 860 feet.

   It may be necessary to adjust this calculation to account for differences in elevation between the building and the park or resource in question. If inspection of available maps shows, for example, that the building site is at an elevation approximately 20 feet higher than the park, that 20 feet is added to the building height in making the calculation. This provides the building height relative to the elevation of the park. With the difference in elevation, the maximum shadow length that could occur would be 946 feet (4.3 times 220)—about 86 feet longer than the shadow for the building at the same elevation as the open space.

5. As shown on Figure 3E-4, the distances between the project site and the open space range from 404 to 802 feet. Therefore, a 200-foot building would cast a shadow reaching the open space at some point in the year, and the next step in the screening is required.

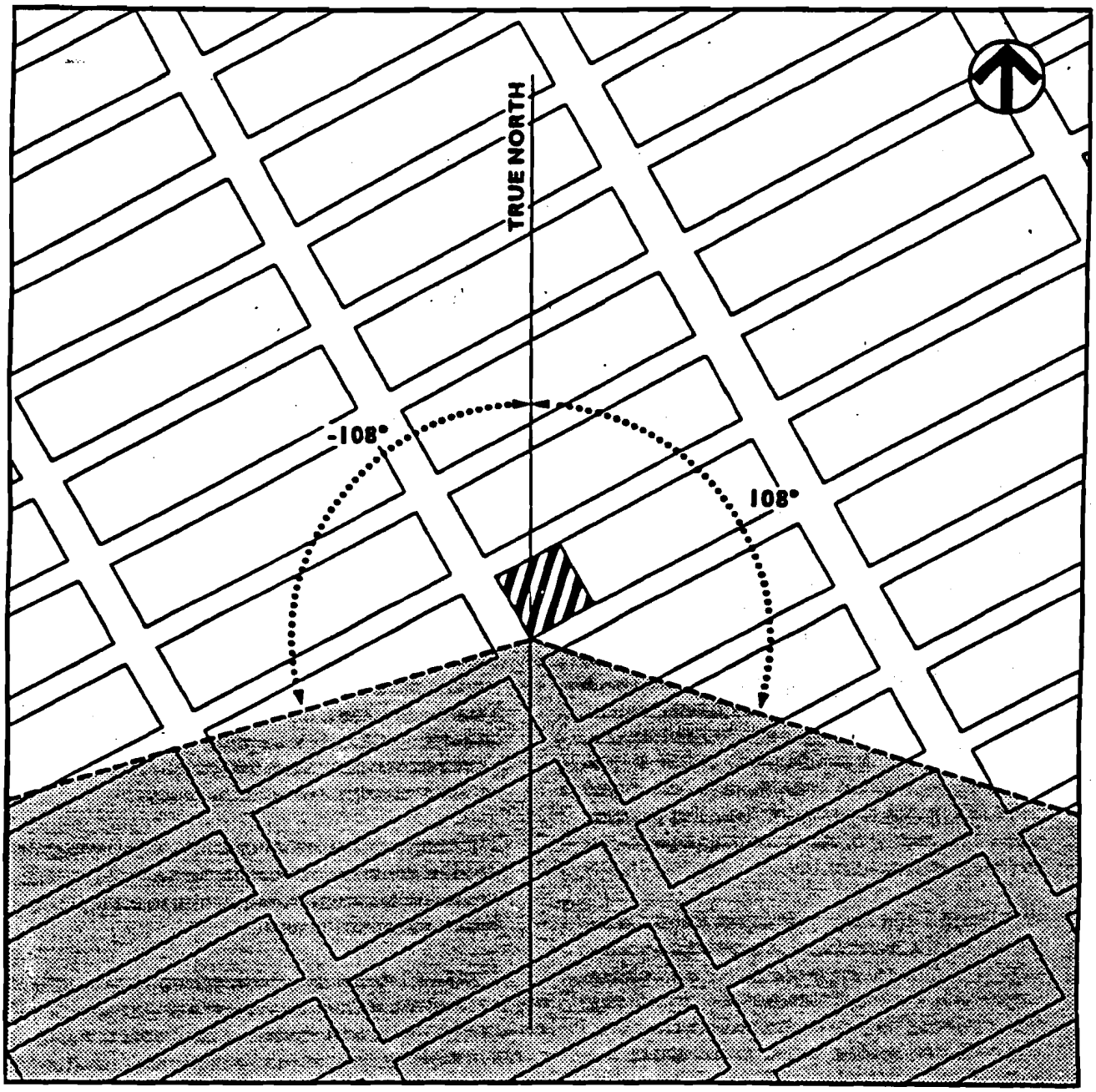
6. The screening analysis also considers the sensitivity of open space to shadow. Facilities such as children's playgrounds and sprinklers, swimming pools, sitting or sunning areas, ballfields and other play areas that are covered with turf do require direct sunlight for some part of the day or at some times of the year. If the open space contains these or like facilities and the project's shadow would reach the open space, then further analysis is required.

   Some open spaces contain facilities that are not sensitive to sunlight. These are usually paved (such as handball or basketball courts), contain no sitting areas, and no vegetation, no unusual or historic plantings, or contain only unusual or historic plantings that are shade tolerant. If the open space contains these types of conditions, then no further analysis would be necessary.

   If the project's shadow would reach the open space and it is not known whether the open space facilities and/or plantings are sensitive to shadows, then further analysis is required.

If steps 1 through 6 above indicate or cannot rule out that shadows from the project would reach a shadow-sensitive public open space or architectural resource at any time during the year, a more detailed shadow analysis is required. This analysis is described in Section 320. If the results of the screening demonstrate that no shadows will reach any shadow-sensitive open spaces or architectural resources, then no further shadow assessment is needed, but the results should be documented in a technical memorandum in the lead agency's files or accompanying the EAS.

Figure 3E-3
Area that Cannot be Shaded by Project

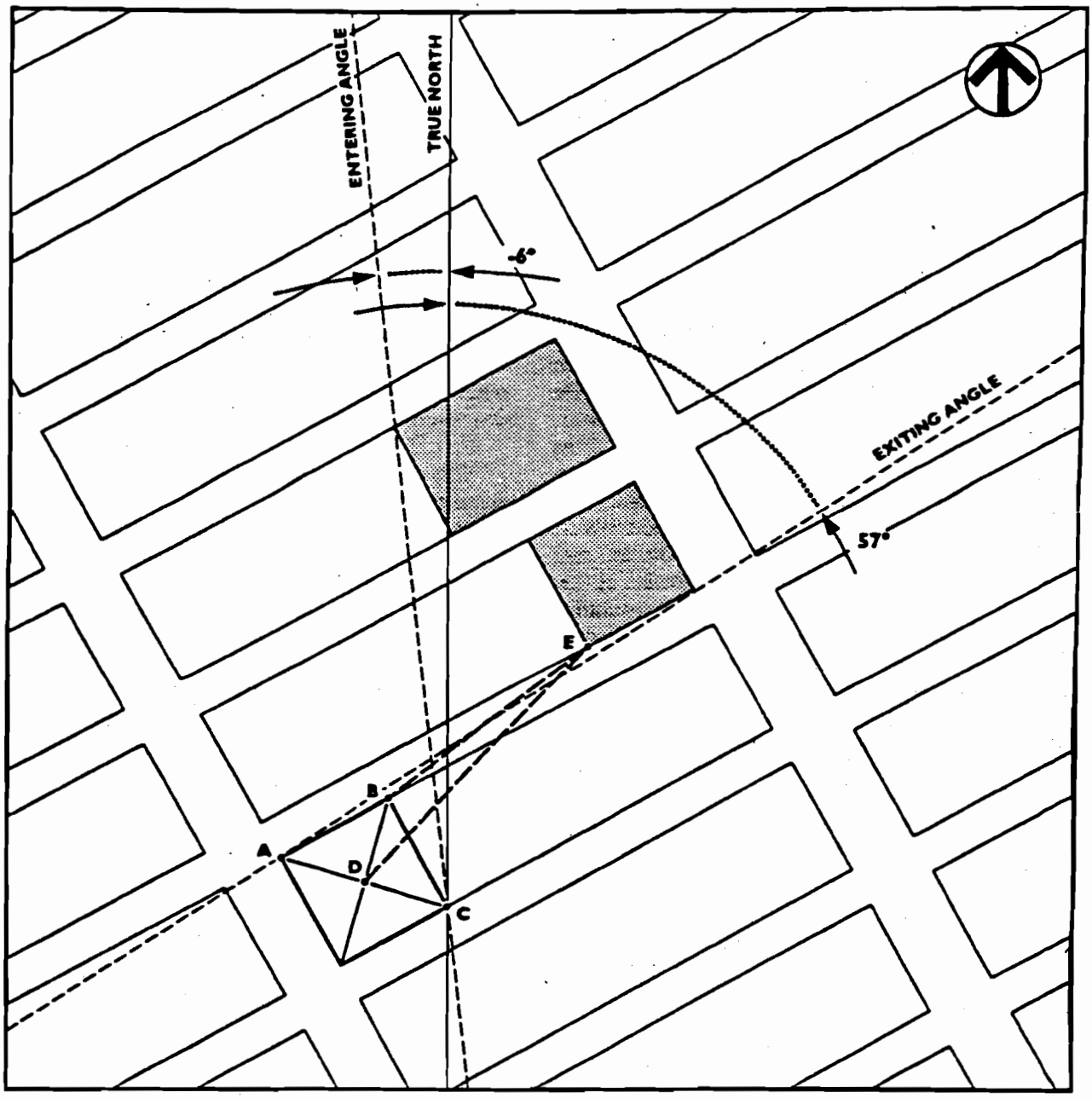


Proposed Building Site

Area in which no Shadows would Fall from the Proposed Building Site

0 500 FEET
SCALE

Figure 3E-4
Angles and Distances to Open Space



Proposed Building Site

Park

Entering and Exiting Angle

Extreme Angles: -6°, 57°

Distances at Extreme Angles: 780', 802'

B-E Angle from True North: 52°

Distance from B to E: 404'

D-E Angle from True North: 43°

Distance from D to E: 523'

0 250 FEET

SCALE

320. DEFINING THE EXTENT AND DURATION OF ADDITIONAL SHADOW ON A PUBLICLY ACCESSIBLE OPEN SPACE, OR NATURAL OR ARCHITECTURAL RESOURCE

The approach to shadow assessment is to define the extent and duration of *additional*, or new, shadow that the proposed action would cast on shadow-sensitive portions of publicly accessible open space(s), natural resorouce(s), or architectural resource(s) during the year, and to understand the effect of that shadow on the sun-sensitive aspects of these resources. Where more than one open space/resource is at issue, where the resource and/or the proposed building have irregular shapes, or where the project site is located in a densely developed area, it may be most efficient to use a computer program to calculate shadows and display them graphically. The following discussion presents five steps in the analysis of shadows: (1) determining the times of year when the project shadow may reach the open space/resource; (2) identifying those areas of the open space/resource that would be sensitive to shadow during the relevant times of year; (3) calculating the project's incremental (given other buildings in the area) shadow on the shadow-sensitive portions of the open space or resource; (4) estimating the duration of the project's incremental shadow on the shadow-sensitive open space or architectural resource; and (5) estimating the relative loss of sunlight from project shadows. The first three steps need not be taken in the order presented. For example, if there is reasonable probability that the facilities or plantings in an open space are not sensitive to shadow, then step 2 could be taken first. Should the work conclude that the open space is not sensitive, then no further study would be required. Similarly, if it appears probable that the project would never cast a shadow on the open space or resource in question because of intervening tall buildings, a step 3 type of analysis can be undertaken first. Should this study conclude that no project shadow would reach the open space or resource, then no further study would be required.

321. When Does the Project Shadow Reach the Open Space, or Natural or Architectural Resource

The first step in defining the extent and duration of project shadows on an open space, natural resource, or architectural resource is to establish the times of the year when the impacts may occur. The months of interest for an open space encompass the growing season (April through October) and December, representing a cold-weather month (and the longest shadow of the year). The analysis should consider three representative times of the growing season—March 21 (or September 21, which is approximately the same), June 21, and a spring or summer day halfway between the solstice and equinoxes (May 6 or August 6). December 21 is also included to demonstrate conditions during winter months; during these times people do use open spaces and rely most heavily on available sunlight for warmth. Project shadows that reach the open space during any of these months could be of concern. As representative of the full range of possible shadows, these months can also be used for assessing shadows on architectural resources.

Shadow analyses as described below should be performed for each of those four representative months of concern in which the project shadow would reach the open space or architectural resource. Although the following discussion assumes a situation in which the project shadow could reach the open space throughout the year, it is not necessary to analyze those months where no shadow from the project would reach the open space or architectural resource.

This analysis begins with a review of the analysis parameters. For example, if the screening or the task described in 322, below, shows that only a limited area of the open space is sensitive to shadow, then you may wish to identify entering and exiting angles focused only on that shadow-sensitive area. This is also true for sun-sensitive features of natural or architectural resources. It is also important to choose the "worst case" for shadows from the building itself. If the proposal contemplates a tower above a base, for example, then the position of the tower on the site would be critical for locating the shadow. If the building would fill the site with high street walls, then it would be prudent to consider the three closest corners of the site in screening for shadows. If the proposal is a rezoning, the analysis should frame a building that complies with the proposed zoning regulations and represents a worst case for shadows. (Generally, where the building is close to an open space or architectural resource, a bulkier building would produce the worst-case shadows. Where the building is farther from the open space or resource a taller tower would constitute a worst case.) Also note that this assessment considers the action's addition compared to the no action condition. If the action would add one story to an existing structure, only the effects of that additional story need be considered.

The example presented here supposes an open space that is entirely shadow-sensitive and a building that rises 640 feet without setback and then slopes back to a pointed, dome-like, symmetrical top at 850 feet. Therefore, the positions on the ground from which to measure the length of the shadow (and distance to the

open space) would be the three leading corners and the center of the site, labeled A, B, C, and D, respectively on Figure 3E-4. As shown on this example, the shortest distance to the open space is a line drawn from B to E, which yields an angle of 52 degrees from true north and measures 404 feet. The shortest distance from the building's tallest point, D, to the open space (at E) is at an angle of 43 degrees from true north and measures 523 feet.

Having identified "worst case" shadow conditions, next consult Table 3E-2, which provides shadow length factors for all shadows angles for each of the four representative months. Consider whether the entering and exiting angles and the angle defining the shortest distance between the building and the open space or resource would cast shadows long enough to reach the open space or resource. Figures 3E-5, 3E-6, 3E-7, and 3E-8 illustrate the shadows that would occur from the 850-foot building example on an open space nearby. As shown in these figures, entering and/or exiting shadows would reach the park on December 21 and March 21. For May 6, the entering and exiting shadows would not reach the open space, but at the shortest point (52 degrees), the shadow angle factor would be 0.68, the length of the shadow would be 0.68 times 640, or 435 feet. This is more than the distance between the site and the park at that point; therefore, the shadow would enter and extend into the park.

In the example, on June 21, no shadow from the building would extend into the open space. The entering and exiting shadows would not reach the open space. The shadow over the shortest distance from the site to the park (B to E) would be 0.46 times 640, or 294 feet (110 feet less than 404 feet). Over the shortest distance from the tallest point to the park (D to E) the shadow would be 0.40 times 850, or 340 feet. This is less than the distance between D and E on the ground (523 feet). Thus, no project shadow would enter the open space on June 21.

An exception to the above is if the entering and exiting angles are greater than 42 degrees; then, no shadows from the project would exist on December 21 for areas beyond 42 degrees. Since the sun rises and sets in the narrowest arc on that day, during the period from an hour and a half after sunrise to an hour and a half before sunset, the shadows lie between -42 and +42 degrees from true north (see Table 3E-2). In this case, pick the date closest to December 21 in which at least one of the entering or exiting angles occurs, and assess winter conditions on that date. If the longest shadow for the building in question does not occur in any of the months between November and February (shadow angle more than 63 degrees), it is not necessary to consider a winter case.

322. Sensitivity of the Publicly Accessible Open Space(s), Natural or Architectural Resource to Increased Shadows from the Project

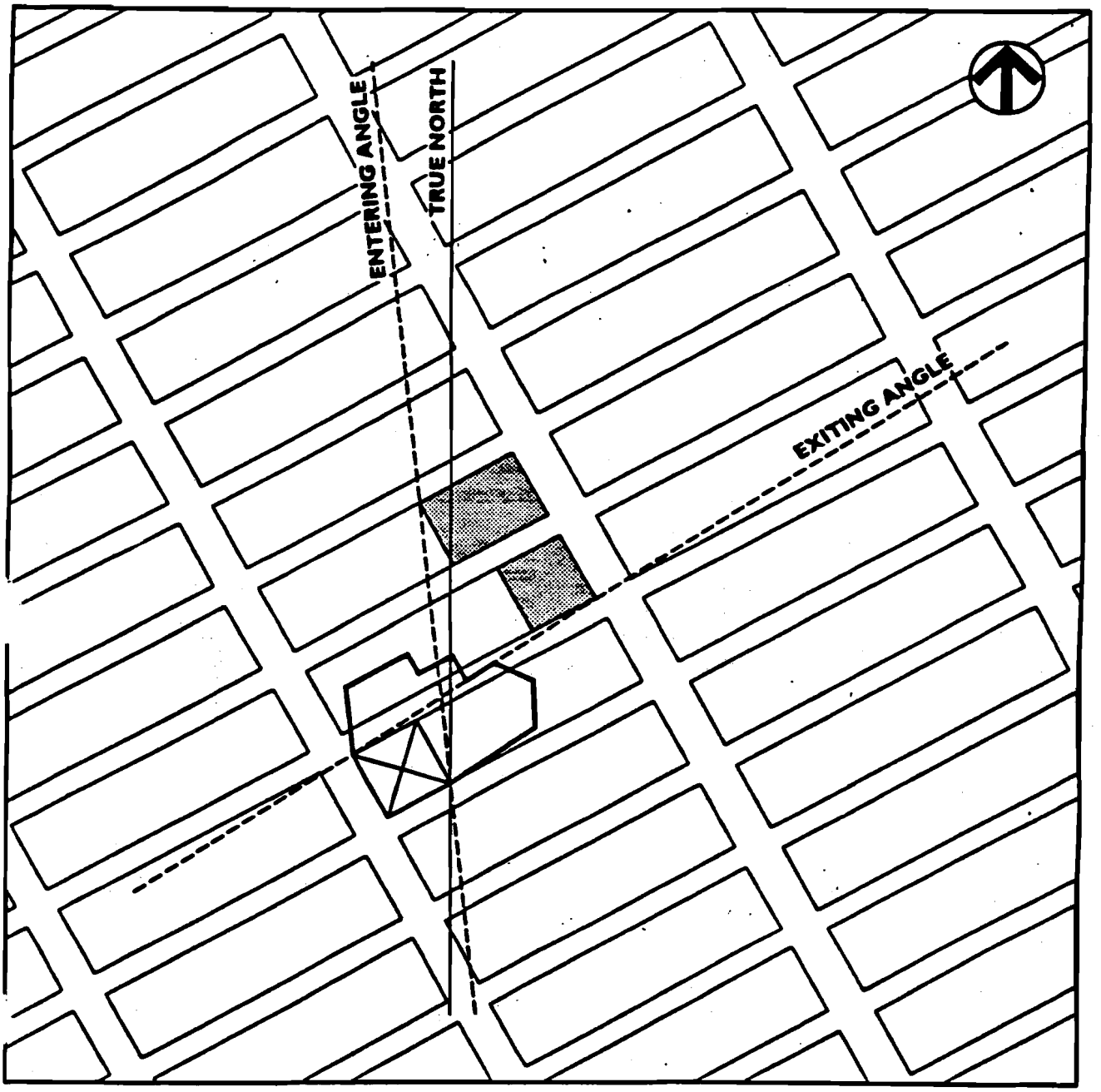
The uses and vegetation in an open space establish its sensitivity to shadows. Uses that rely on sunlight include passive use, such as sitting or sunning, and such activities as gardening, or children's wading pools and sprinklers. Vegetation requiring sunlight includes the tree canopy and flowering plants. Where lawns are actively used, the turf also requires extensive sunlight. For these activities and plants, four to six hours a day of sunlight, particularly in the growing season, is often a minimum requirement. The assessment of an open space's sensitivity to increased shadow thus focuses on identifying its facilities, plantings, and use, and the sunlight requirements for each. The sensitivity of a historic structure to sunlight depends on its design and setting: do the characteristics that make the resource historically significant depend on sunlight? An example would be a structure noted for stained glass windows that are visible only in the sunlight.

It may be advisable to use the services of a recreation planner, landscape architect, or horticulturist to inventory, survey, and assess the sensitivity of the open space to shadow. The analyst should obtain a map of the open space, including its boundary, major facilities, and use patterns. In the area that would be cast in the project's incremental shadow (see Section 323 below), it is also necessary to inventory vegetation, noting species, caliper, height, and age, if possible. If the open space supports activities that rely on sunlight and these would be cast in project shadow, it is also appropriate to survey open space use. This should be done on a sunny day in the spring, summer, or fall, preferably on the weekend or at the time of peak use. Based on this work, the activities, plants, or other facilities in the open space that need sunlight and that may be affected by the project's shadows should be identified. To the extent possible, the acceptable and minimum amounts of daily sunlight required for the plants or activities should be estimated. The analysis then focuses on those uses that depend on sunlight.

323. What Shadow is Attributable to the Proposed Action

To understand the shadow that would be added to an open space or natural or architectural resource by a proposed project, shadows that would exist without the project must also be defined. Other buildings may already cast shadows (or be expected to cast shadows in

Figure 3E-5
Shadows from 850-foot Building: June 21



Proposed Building Site

Park

Entering and Exiting Angle

Extreme Angles: -6°, 57°

Distances at Extreme Angles: 780', 802'

Minimum Distance: 404'

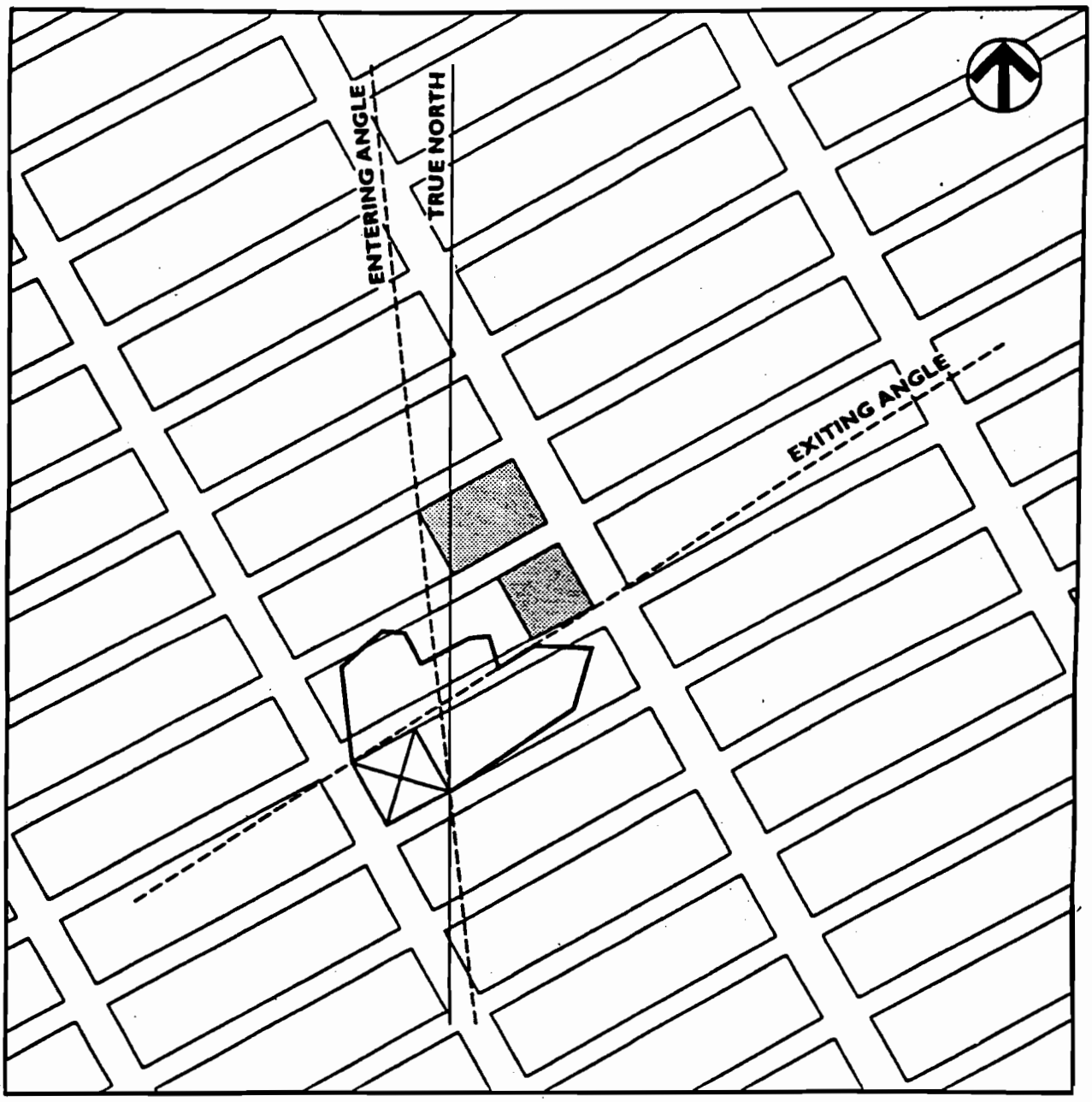
Shadows from Proposed Building:

11:34, 12:29, 13:22

0 500 FEET

SCALE

Figure 3E-6
Shadows from 850-foot Building: May 6



Proposed Building Site

Park

Entering and Exiting Angle

Extreme Angles: -6°, 57°

Distances at Extreme Angles: 780', 802'

Minimum Distance: 404'

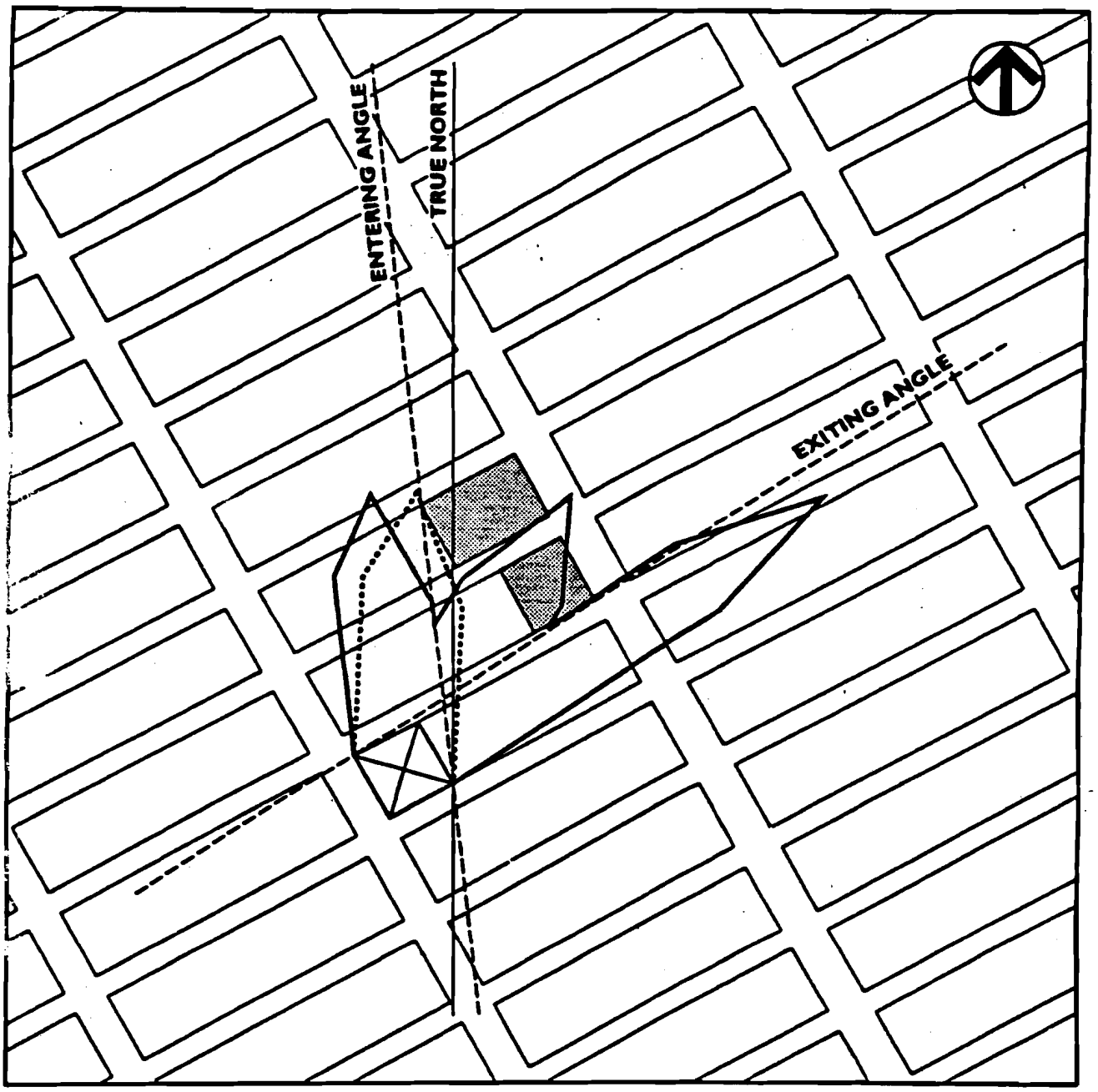
Shadows from Proposed Building:

11:28, 12:40, 13:46

0 500 FEET

SCALE

Figure 3E-7
Shadows from 850-foot Building: March 21



Proposed Building Site

Park

Entering and Exiting Angle

Extreme Angles: -6°, 57°

Distances at Extreme Angles: 780', 802'

Minimum Distance: 404'

Shadows from Proposed Building:

11:25, 13:11, 14:43

11:52

0 800 FEET

SCALE

Figure 3E-8
Shadows from 850-foot Building: December 21

Proposed Building Site

Park

Entering and Exiting Angle

Extreme Angles: -6°, 57°

Distances at Extreme Angles: 780', 802'

Minimum Distance: 404'

Shadows from Proposed Building:

11:13, 14:37

the future) that would eliminate any new shadows cast by the proposed project. The analysis entails calculating and displaying the shadows from all buildings and structures that will be present in both the existing and no action condition between the project site and the open space and that are also located within the two relevant entering and exiting angles from true north (see also explanation in Sections 200 and 320, above). The buildings in the surrounding area should also be considered for unusual circumstances: for example, extremely tall buildings farther from the open space than the project that may cast shadows within the entering and exiting angles. Figure 3E-9 illustrates conditions in which other buildings could intercept or block out shadows from the proposed action. The shadows of interest are those that would occur in the future no action condition, which includes both existing conditions as well as proposed or planned developments (see "Land Use, Zoning, and Public Policy," Section 3A for an explanation). In some cases, it may be appropriate not to include in the future no action condition projects that have not yet received their discretionary approvals, particularly if the project is likely to have greater effects in the absence of that development. Consequently, it may be appropriate to assess existing and no build conditions, to distinguish new shadows attributable to potential new structures.

The analysis is straightforward and requires an accurate map showing the footprints of existing and proposed or planned buildings and structures. The analyst should obtain as accurate data as possible on the heights of each building and its setbacks. This information can be obtained from Fire Insurance Underwriters' maps, building plans, or visual inspection. Entering and exiting shadows are calculated and displayed for each of the four times of year presented in Section 321, above, and on Table 3E-2 (unless the project shadow would not reach the open space or resource during that time, or no uses that depend on sunlight are located there).

The project's shadow effect is the increment beyond shadows that would exist in the existing or no action condition case. Therefore, the project's shadows should be calculated and displayed clearly as an *increment* beyond those existing or no action condition shadows on the publicly accessible open space (see Figures 3E-10 and 3E-11, which illustrate a full and a partially blocked shadow from the 850-foot example building). Note that if the proposed building form is not known, the worst case under the (proposed) zoning for the site should be assumed. When the proposed building would be distant from the open space or architectural resource, the worst case would be the tallest building allowed by zoning; when the proposed building would be nearby, the worst case might be the bulkiest (widest) building permitted. Once this work is complete, if it is clear that the project's shadow increment would occur rarely or would be only marginal, then the project shadow would not have a significant adverse impact on the open space or architectural resource, and no additional analysis is required. If the project's incremental shadow cannot be clearly categorized as marginal, particularly if the open space is known to be sensitive, additional analysis to understand fully the effect of the shadow is required.

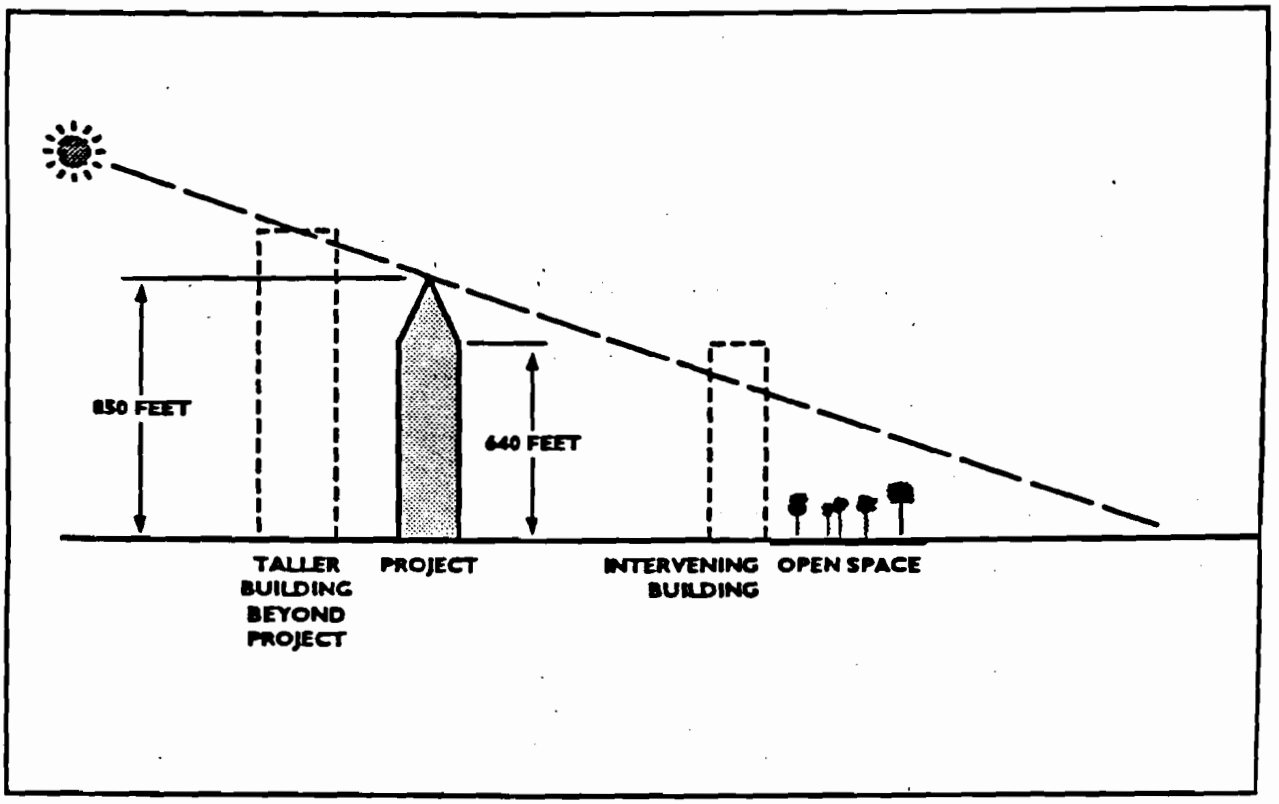
324. *Duration of the Project Shadows*

The length of time that the project shadows stay on the open space or resource depends on the entering and exiting angles from true north and the time of year. As described in Section 100, because of differences in the sun's height in the sky throughout the year, shadows are longer but move more quickly (are of shorter duration) during the winter than during the summer. Using Table 3E-2, it is possible to estimate shadow duration for each of the analysis months. For example, on March 21, the entering angle of -6 degrees would occur at approximately 11:47 am EST, and the exiting angle of 57 degrees would occur at approximately 3:04 pm EST (shown as 15:04 on the table). Thus, for a building tall enough that its shadow reaches an open space at both the entering and exiting angles, the shadow would be on some part of the park for 3 hours and 17 minutes.

If the shadow does not reach the open space or resource at both the entering and exiting angles, then the duration would be less. Using Table 3E-2, it is possible to identify the angle (and thus the time) when the shadow would be long enough to reach and enter the park. In the March 21 example on Figure 3E-7, because of the shape of the hypothetical building's top (it comes to a point), the shadow would not enter the park at the -6 degree angle. A line drawn from the center of the project site (the location of the top of the roof) to the westerly point of the park yields an angle of 3 degrees. Thus, the shadow would enter the park at 12:10 pm EST and exit at 3:04 pm EST for a duration of 2 hours and 54 minutes.

This technique is also used when a shadow would fall on the park for a long time, but on a particularly sensitive portion of it for a shorter time. The inventory undertaken in Section 322 will identify features in the open space of particular concern—such as warm-weather-dependent features like wading pools and sand boxes; benches, which could be affected by a loss of winter sunlight; or vegetation, which could be affected by a

Figure 3E-9
Example Shadow Profile



NOTE: BOTH INTERVENING BUILDINGS AND BUILDINGS BEYOND THE PROJECT SITE MAY CAST SHADOWS THAT ELIMINATE THE PROJECT SHADOW

Figure 3E-10
Incremental Shadows from 850-Foot Building: Example I

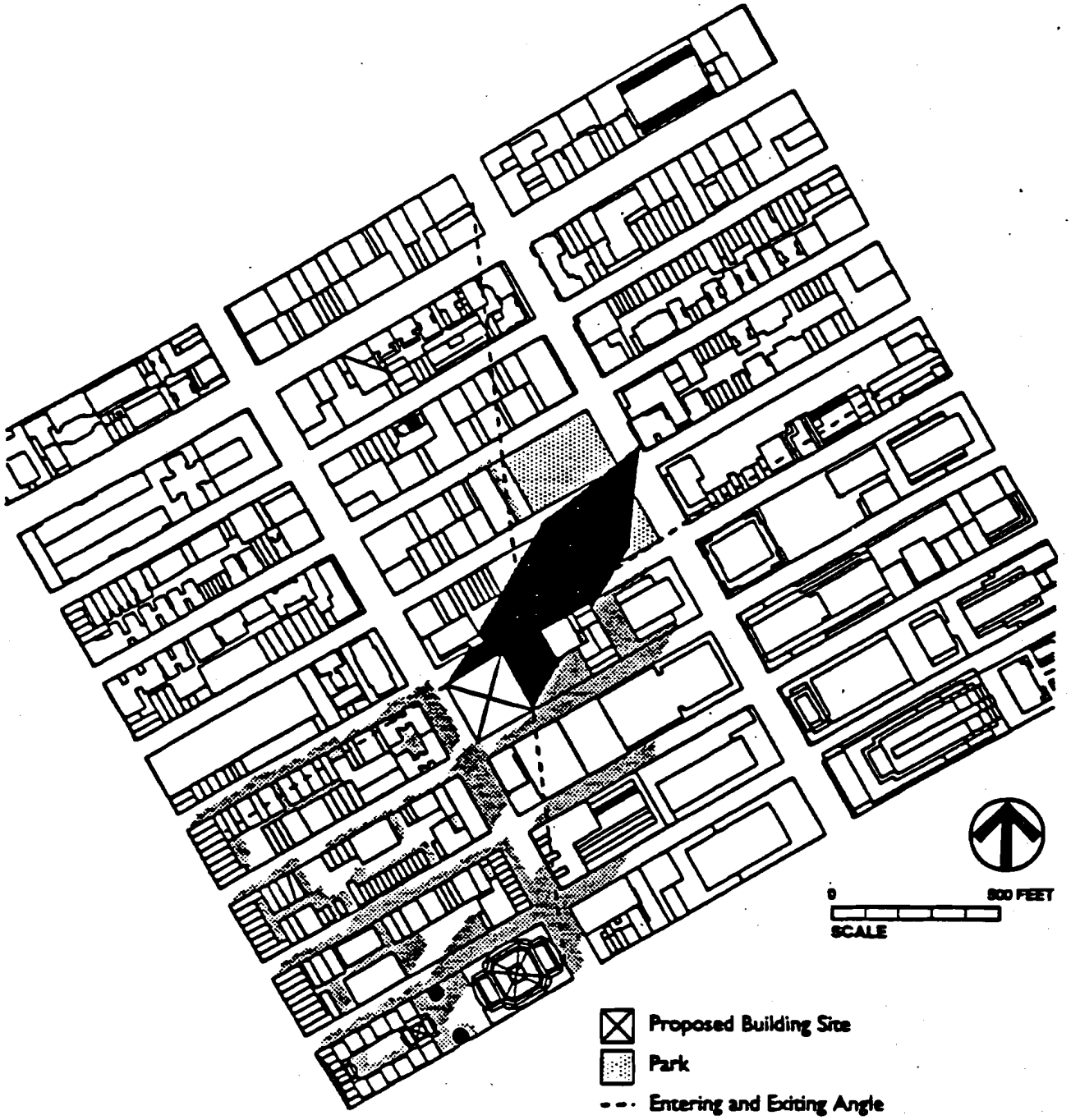
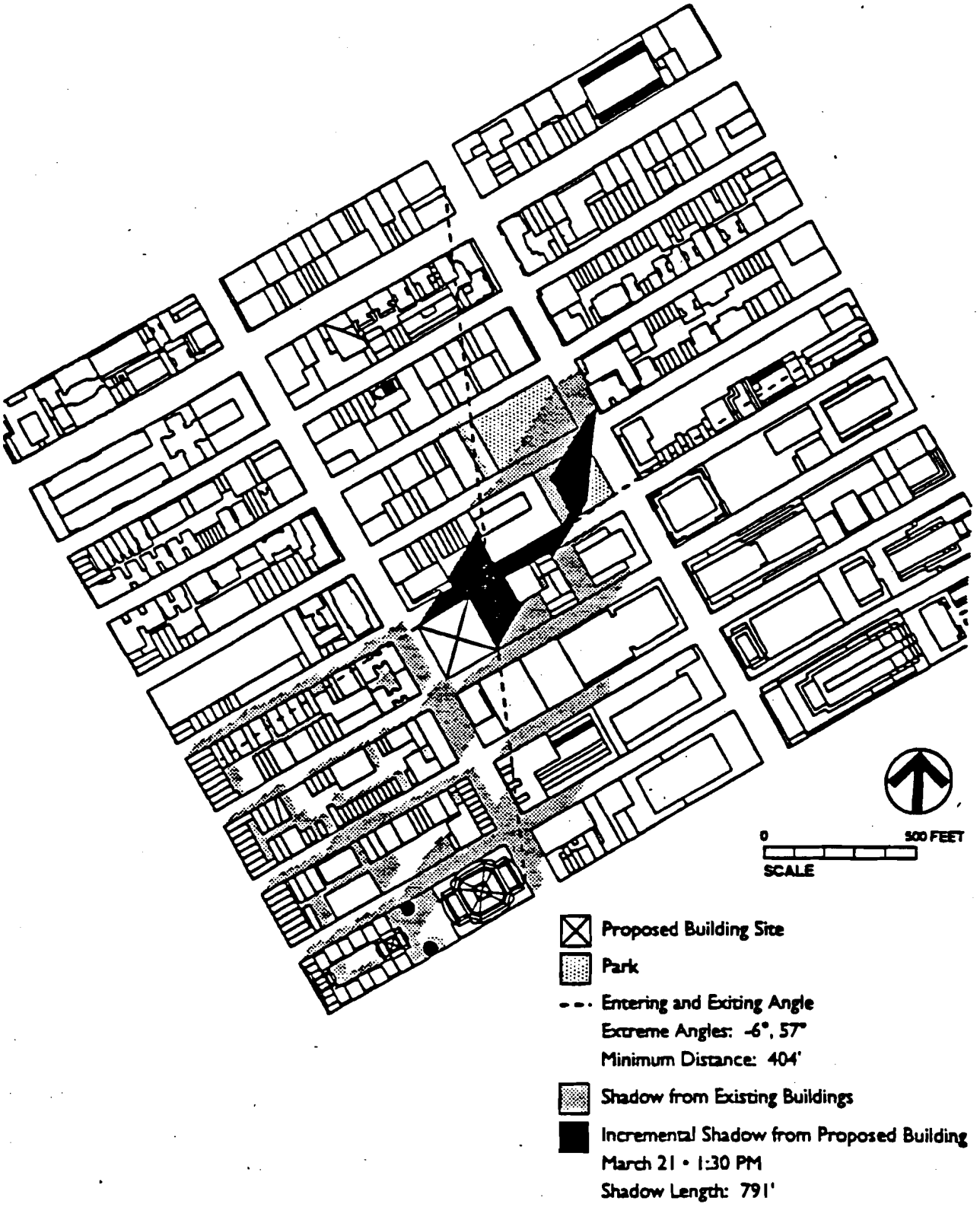


Figure 3E-11
Incremental Shadows from 850-Foot Building: Example 2



loss of sunlight during the growing season. The entering and exiting angles of the building's shadows on the sensitive area are drawn as described in Section 321, so that the shadow length and duration can be computed. Similarly, only shadow duration on the sun-sensitive features of the architectural resource are of concern.

If the duration is very short, for example, no more than 10 minutes at any time of year, the project shadow would not have a significant adverse impact on the open space or resource and no additional analysis is required. With longer shadow durations, it is necessary to assess the sensitivity of the open space or resource to shadows before the severity of project shadow impact can be assessed.

325. *Estimating the Relative Loss of Sunlight from Project Shadows*

Where the incremental shadows from the project on publicly accessible open space fall on uses and plants requiring sunlight, additional analysis is required to assess the loss of sunlight relative to sunlight that would be available without the project. For example, trees, many plants, and many activities can require a minimum of four to six hours of sunlight, particularly between April and October. If the project shadow is estimated to reduce sunlight from eight to seven hours on such a sensitive use, it would probably have no significant impact. If the same project shadow is estimated to reduce sunlight from four to three hours on a sensitive use, this could constitute a significant impact. Thus, it is necessary to estimate shadow patterns on the affected area of the open space or resource throughout the day. The analysis should be undertaken for each of the months where project shadow impacts could be significant. This is different from the estimate of the project's increment (Section 323, above) in that it considers all shadows on the portion of the park or resource affected by the project's shadow throughout the day, even times when the project itself is not casting any shadows on the open space. Therefore, a more detailed analysis is appropriate.

The first step in the analysis includes physical inspection to determine whether the area is in shadow for any appreciable time of the day. If the assessment is being prepared at a time of year that does not include the analysis months, then a physical inspection of the area surrounding the open space or resource and an examination of maps to inventory buildings to the east, south, and west of the open space or architectural resource is appropriate (this is a larger area than was used in Section 323). Since the sun rises and sets north of due east and west during the spring and summer, buildings east/northeast and west/northwest of the open space or resource should also be considered for analysis. The procedure described in Section 200 can be undertaken at this point if the buildings in question are relatively few, and they may be too short or too far from the open space or resource to cast shadows on it. If it is clear that there are other shadows on the affected area of the open space or resource, a full analysis should be undertaken. A simple and accurate way to chart the shadows on the subject is to observe and photograph it on the days of interest; this survey can be undertaken on a sunny day closest in time to the analysis day (if it is cloudy on the analysis day).

If the schedule for the assessment does not permit waiting for the particular days in question, or if development is proposed for the no action condition that would cast shadows on the open space or resource, then an analytical method is used. (In the case where limited future no action development is proposed, the existing shadow can be observed by survey, and the future additional shadow calculated analytically.) Such a methodology can be very complex, and a computer program is probably the best approach. However, the work can be done at the drawing table. This involves establishing entering and exiting angles from true north for each of the buildings casting shadows on the affected area of the open space or resource and defining the extent, timing, and duration of each building's shadow. When the time of each shadow entering and exiting the affected area is ascertained, these can be plotted on one map and the pattern, extent, and duration of combined shadows defined for each representative month of interest.

330. *ANALYSIS PRESENTATION*

Because the shadow analysis can be intricate and is primarily visual, it is important that, in addition to a clear narrative description, the presentation of the analysis include clear graphic representations of the following as appropriate:

- Relationship between the project site and publicly accessible open spaces, natural or architectural resources.
- Calculation of the angles from north for project shadows entering and exiting the open space(s) or affected area of open space, natural or architectural resources.
- Map showing no action condition shadows and the incremental shadows from the project on the open space, natural or architectural resource on a representative day in each relevant month. These graphic depictions should include information similar to that provided in Figures 3E-10 and

3E-11: blocks, lots, streets, parks, building outlines, and significant topographical features, as appropriate. The length and time of the project's shadows should be indicated on each map.

- Photographs of the open space or resource, focusing on elements sensitive to sunlight loss that may be in shadow caused by the proposed project.
- Plan of the open space or resource, locating elements sensitive to sunlight loss.
- Plan of the open space or resource showing composite shadows and the location and duration of sunlight.

400. Determining Impact Significance

In general, a significant shadow impact occurs if the shadow added by the project reduces sunlight on sensitive uses substantially or to unacceptable levels. This includes the following situations:

- Substantial reduction in sunlight where the sensitive use is already subject to substandard sunlight (i.e., less than minimum time necessary for its survival).
- Reduction in sunlight available to a sensitive use from more than to less than the minimum time necessary for its survival.
- Substantial reduction in sunlight to a sun-sensitive use or feature.
- Substantial reduction in the usability of the open space.

Although these situations frame a general guideline to determining impact significance, each case must be considered on its own merits. There may be situations where a very small loss of sunlight is important (for example, in areas where older people sit) or where a comparatively large loss is not significant (for example, where vegetative species are not critical to the character of the open space and its environment and can be easily replaced with more shade-tolerant species). A reduction in sunlight to a sun-sensitive use could be more critical when the use is already subject to substandard sunlight than when it is not. In all cases, the rationale for determining impact significance is presented in the EAS or EIS.

500. Developing Mitigation

Where a significant impact is identified, mitigation must be assessed. Types of mitigation that may be appropriate include relocating facilities within an open space to avoid sunlight loss, relocating or replacing vegetation, undertaking additional maintenance to reduce the likelihood of species loss, or replacement facilities on another nearby site. Where the affected open space is a City park, it is appropriate for the lead agency to coordinate mitigation options with the Department of Parks and Recreation (DPR). The lead agency may wish to coordinate with DPR as an expert agency on open spaces that are not City parks as well.

600. Developing Alternatives

Alternatives that reduce or eliminate shadow impacts include:

- Reorientation of building bulk to avoid shadow increments on sensitive areas of open space or of the natural or architectural resource.
- Reorientation of site plan to include replacement facilities (see also Section 500, above).
- When an open space that would be affected is proposed as part of the action, reorientation of the sun-sensitive features within the open space.

Table 3E-1
Maximum Shadow Length Factor for Each Angle from True North

Angle	Shadow Length Factor*	Dates	Time (Eastern Standard Time)	
0	2.07	12/21	11:53	
1	2.07	12/21	11:49	11:56
2	2.07	12/21	11:45	12:00
3	2.07	12/21	11:41	12:04
4	2.07	12/21	11:37	12:08
5	2.08	12/21	11:33	12:12
6	2.09	12/21	11:29	12:16
7	2.09	12/21	11:25	12:20
8	2.10	12/21	11:21	12:24
9	2.11	12/21	11:17	12:28
10	2.13	12/21	11:13	12:32
11	2.14	12/21	11:09	12:36
12	2.15	12/21	11:05	12:41
13	2.17	12/21	11:01	12:44
14	2.19	12/21	10:57	12:48
15	2.21	12/21	10:53	12:52
16	2.23	12/21	10:49	12:56
17	2.25	12/21	10:45	13:00
18	2.28	12/21	10:41	13:04
19	2.30	12/21	10:37	13:08
20	2.34	12/21	10:32	13:13
21	2.37	12/21	10:28	13:17
22	2.40	12/21	10:24	13:21
23	2.44	12/21	10:22	13:25
24	2.48	12/21	10:15	13:30
25	2.52	12/21	10:11	13:34
26	2.57	12/21	10:07	13:38
27	2.62	12/21	10:02	13:43
28	2.67	12/21	9:58	13:47
29	2.73	12/21	9:54	13:51
30	2.79	12/21	9:49	13:56
31	2.86	12/21	9:45	14:00
32	2.93	12/21	9:40	14:05
33	3.02	12/21	9:35	14:10
34	3.10	12/21	9:31	14:14
35	3.20	12/21	9:26	14:19
36	3.31	12/21	9:21	14:24
37	3.44	12/21	9:16	14:29

Table 3E-1 (Continued)
Maximum Shadow Length Factor for Each Angle from True North

Angle	Shadow Length Factor*	Dates	Time (Eastern Standard Time)	
38	3.55	12/21	9:12	14:33
39	3.69	12/21	9:07	14:38
40	3.85	12/21	9:02	14:43
41	4.02	12/21	8:57	14:48
42	4.27	12/20 12/21 12/22 12/23 12/24 12/25	8:51 8:51 8:52 8:53 8:53 8:54	14:55 14:55 14:56 14:57 14:57 14:58
43	4.27	12/29 1/4	8:54 8:55	15:00 15:07
44	4.19	12/7 1/7	8:41 8:56	14:53 15:08
45	4.19	12/2 1/12	8:35 8:54	14:55 15:14
46	4.10	11/26 1/18	8:29 8:52	14:57 15:20
47	4.04	11/24 1/22	8:28 8:50	14:58 15:26
48	3.99	11/20 1/23	8:24 8:50	15:00 15:26
49	3.96	11/17 1/27	8:19 8:47	15:03 15:31
50	3.92	11/13 1/30	8:14 8:43	15:06 15:35
51	3.84	11/11 2/1	8:13 8:43	15:07 15:37
52	3.84	11/8 2/3	8:08 8:40	15:12 15:40
53	3.77	11/7 2/6	8:08 8:38	15:12 15:42
54	3.78	11/4 2/8	8:04 8:34	15:16 15:46
55	3.72	11/1 2/12	8:00 8:30	15:20 15:50
56	3.66	10/30 2/13	7:59 8:29	15:21 15:51
57	3.65	10/28 2/15	7:56 8:26	15:24 15:54
58	3.62	10/25 2/18	7:52 8:22	15:28 15:58

Table 3E-1 (Continued)
Maximum Shadow Length Factor for Each Angle from True North

Angle	Shadow Length Factor*	Dates	Time (Eastern Standard Time)	
59	3.57	10/24 2/19	7:51 8:22	15:29 15:58
60	3.59	10/22 2/21	7:47 8:18	15:33 16:02
61	3.55	10/19 2/24	7:45 8:13	15:37 16:05
62	3.49	10/18 2/25	7:45 8:13	15:37 16:05
63	3.50	10/16 2/28	7:42 8:09	15:42 16:07
64	3.47	10/14 3/1	7:40 8:06	15:44 16:10
65	3.44	10/11 3/4	7:37 8:02	15:49 16:14
66	3.40	10/10 3/5	7:36 8:01	15:50 16:13
67	3.41	10/8 3/7	7:34 7:57	15:54 16:17
68	3.39	10/5 3/10	7:30 7:52	15:58 16:20
69	3.36	10/4 3/11	7:38 7:51	16:00 16:21
70	3.36	10/2 3/13	7:27 7:48	16:03 16:24
71	3.34	10/1 3/14	7:27 7:46	16:05 16:24
72	3.34	9/29 3/16	7:24 7:43	16:08 16:27
73	3.32	9/26 3/19	7:21 7:39	16:13 16:31
74	3.30	9/25 3/20	7:21 7:37	16:15 16:31
75	3.30	9/23 3/22	7:18 7:33	16:18 16:33
76	3.32	9/22 3/23	7:17 7:31	16:21 16:35
77	3.31	9/19 3/26	7:14 7:25	16:26 16:37
78	3.24	9/17 3/28	7:14 7:24	16:28 16:38
79	3.30	9/16 3/29	7:11 7:21	16:31 16:41

Table 3E-1 (Continued)
Maximum Shadow Length Factor for Each Angle from True North

Angle	Shadow Length Factor*	Dates	Time (Eastern Standard Time)	
80	3.29	9/13 4/1	7:08 7:16	16:36 16:44
81	3.24	9/12 4/2	7:08 7:16	16:36 16:44
82	3.29	9/10 4/4	7:05 7:11	16:41 16:47
83	3.23	9/8 4/6	7:05 7:10	16:43 16:48
84	3.29	9/7 4/7	7:02 7:06	16:46 16:50
85	3.30	9/4 4/10	6:59 7:01	16:51 16:53
86	3.24	9/2 4/12	6:59 7:00	16:53 16:54
87	3.31	9/1 4/13	6:56 6:57	16:56 16:57
88	3.29	8/30 4/15	6:55 6:54	16:59 16:58
89	3.31	8/27 4/18	6:52 6:49	17:04 17:01
90	3.29	8/25 4/19	6:51 6:48	17:05 17:02
91	3.33	8/24 4/21	6:48 6:45	17:08 17:05
92	3.35	8/21 4/24	6:45 6:40	17:13 17:08
93	3.30	8/19 4/26	6:45 6:39	17:15 17:09
94	3.37	8/17 4/27	6:42 6:36	17:18 17:12
95	3.37	8/14 5/1	6:39 6:31	17:23 17:15
96	3.33	8/12 5/3	6:38 6:30	17:24 17:16
97	3.40	8/9 5/4	6:35 6:27	17:29 17:19
98	3.42	8/6 5/8	6:31 6:22	17:33 17:22
99	3.42	8/5 5/10	6:30 6:20	17:34 17:24
100	3.43	8/2 5/14	6:29 6:16	17:35 17:28

Table 3E-1 (Continued)
Maximum Shadow Length Factor for Each Angle from True North

Angle	Shadow Length Factor*	Dates	Time (Eastern Standard Time)	
101	3.42	7/30 5/16	6:25 6:15	17:39 17:29
102	3.48	7/28 5/18	6:22 6:12	17:42 17:32
103	3.52	7/24 5/22	6:18 6:09	17:46 17:37
104	3.56	7/19 5/27	6:14 6:05	17:50 17:41
105	3.53	7/18 5/28	6:14 6:05	17:50 17:41
106	3.59	7/13 6/2	6:10 6:02	17:54 17:46
107	3.63	7/5 6/10	6:04 5:59	17:56 17:51
108	3.61	6/16	6:00	17:54

Note: Negative angles and positive angles of the same value would have similar shadow length factors.
All values are for New York City, City Hall:
Latitude: 40°42'23" north (40.706389°)
Longitude: 74°0'29" west (74.008056°)
All times are Eastern Standard Time. Daylight Savings Time is NOT considered.

* Factor for shadow angle by degree (azimuth) from true north (0°).

Table 3E-2
Shadow Factors and Time of Day for Each Shadow Angle, June 21, May 6, March 21, December 21

Angle	21 June		6 May[a]		21 March[a]		21 December	
	Shadow Length Factor[b]	Eastern Standard Time	Shadow Length Factor[b]	Eastern Standard Time	Shadow Length Factor[b]	Eastern Standard Time	Shadow Length Factor[b]	Eastern Standard Time
-108	3.66	5:57						
-107	3.37	6:04						
-106	3.12	6:11						
-105	2.90	6:17						
-104	2.71	6:24						
-103	2.54	6:31						
-102	2.38	6:38						
-101	2.24	6:45						
-100	2.11	6:51						
-99	2.00	6:58						
-98	1.89	7:05						
-97	1.80	7:11	3.31	6:27				
-96	1.71	7:18	3.07	6:33				
-95	1.63	7:25	2.87	6:40				
-94	1.55	7:31	2.68	6:46				
-93	1.48	7:38	2.52	6:52				
-92	1.42	7:44	2.38	6:59				
-91	1.36	7:51	2.25	7:05				
-90	1.30	7:57	2.13	7:11				
-89	1.25	8:03	2.02	7:17				
-88	1.20	8:09	1.92	7:23				
-87	1.15	8:15	1.84	7:29				
-86	1.11	8:20	1.75	7:35				
-85	1.07	8:26	1.68	7:41				
-84	1.03	8:32	1.61	7:46				
-83	0.99	8:37	1.54	7:52				
-82	0.96	8:42	1.48	7:58				
-81	0.93	8:47	1.43	8:03				
-80	0.90	8:53	1.37	8:09				
-79	0.87	8:57	1.33	8:14				
-78	0.84	9:02	1.28	8:19				
-77	0.82	9:07	1.24	8:24				
-76	0.79	9:12	1.20	8:29				
-75	0.77	9:16	1.16	8:34				
-74	0.75	9:20	1.12	8:39	3.24	7:36		
-73	0.73	9:25	1.09	8:44	3.05	7:41		
-72	0.71	9:29	1.05	8:48	2.88	7:47		
-71	0.69	9:33	1.03	8:53	2.73	7:52		
-70	0.67	9:37	1.00	8:57	2.59	7:57		
-69	0.66	9:41	0.98	9:02	2.47	8:03		
-68	0.64	9:44	0.95	9:06	2.36	8:08		
-67	0.62	9:48	0.93	9:10	2.26	8:13		
-66	0.61	9:51	0.90	9:14	2.17	8:18		
-65	0.59	9:55	0.88	9:18	2.09	8:23		

Table 3E-2 (Continued)

Shadow Factors and Time of Day for Each Shadow Angle, June 21, May 6, March 21, December 21

Angle	21 June		6 May[a]		21 March[a]		21 December	
	Shadow Length Factor[b]	Eastern Standard Time	Shadow Length Factor[b]	Eastern Standard Time	Shadow Length Factor[b]	Eastern Standard Time	Shadow Length Factor[b]	Eastern Standard Time
-64	0.58	9:58	0.86	9:22	2.01	8:28		
-63	0.57	10:01	0.84	9:26	1.94	8:33		
-62	0.55	10:04	0.82	9:30	1.88	8:38		
-61	0.54	10:07	0.81	9:33	1.82	8:42		
-60	0.53	10:10	0.79	9:37	1.76	8:47		
-59	0.52	10:13	0.77	9:40	1.71	8:52		
-58	0.51	10:16	0.76	9:44	1.66	8:56		
-57	0.50	10:19	0.74	9:47	1.61	9:01		
-56	0.49	10:21	0.73	9:50	1.57	9:05		
-55	0.48	10:24	0.72	9:54	1.53	9:09		
-54	0.48	10:27	0.70	9:57	1.49	9:14		
-53	0.47	10:29	0.69	10:00	1.46	9:18		
-52	0.46	10:31	0.68	10:03	1.42	9:22		
-51	0.45	10:34	0.67	10:06	1.39	9:26		
-50	0.45	10:36	0.66	10:09	1.36	9:30		
-49	0.44	10:38	0.65	10:11	1.34	9:34		
-48	0.43	10:41	0.64	10:14	1.31	9:38		
-47	0.43	10:43	0.63	10:17	1.28	9:42		
-46	0.42	10:45	0.62	10:20	1.26	9:45		
-45	0.41	10:47	0.61	10:22	1.24	9:49		
-44	0.41	10:49	0.60	10:25	1.22	9:53		
-43	0.40	10:51	0.59	10:27	1.20	9:56		
-42	0.40	10:53	0.59	10:30	1.18	10:00	4.27	8:51
-41	0.40	10:55	0.58	10:32	1.16	10:03	4.02	8:57
-40	0.39	10:57	0.57	10:35	1.14	10:07	3.85	9:02
-39	0.38	10:59	0.57	10:37	1.13	10:10	3.69	9:07
-38	0.38	11:00	0.56	10:40	1.11	10:14	3.55	9:12
-37	0.38	11:02	0.55	10:42	1.10	10:17	3.42	9:16
-36	0.37	11:04	0.55	10:44	1.08	10:20	3.30	9:21
-35	0.37	11:06	0.54	10:46	1.07	10:24	3.20	9:26
-34	0.37	11:07	0.54	10:49	1.06	10:27	3.10	9:31
-33	0.36	11:09	0.53	10:51	1.04	10:30	3.01	9:35
-32	0.36	11:11	0.53	10:53	1.03	10:33	2.93	9:40
-31	0.35	11:12	0.52	10:55	1.02	10:36	2.86	9:45
-30	0.35	11:14	0.52	10:57	1.01	10:39	2.79	9:49
-29	0.35	11:15	0.51	10:59	1.00	10:42	2.73	9:54
-28	0.35	11:17	0.51	11:01	0.99	10:45	2.67	9:58
-27	0.34	11:19	0.51	11:03	0.98	10:48	2.62	10:02
-26	0.34	11:20	0.50	11:05	0.97	10:51	2.57	10:07
-25	0.34	11:22	0.50	11:07	0.96	10:54	2.52	10:11
-24	0.34	11:23	0.50	11:09	0.96	10:57	2.48	10:15
-23	0.33	11:25	0.49	11:11	0.95	11:00	2.44	10:22
-22	0.33	11:26	0.49	11:13	0.94	11:03	2.40	10:24

Table 3E-2 (Continued)

Shadow Factors and Time of Day for Each Shadow Angle, June 21, May 6, March 21, December 21

Angle	21 June		6 May[a]		21 March[a]		21 December	
	Shadow Length Factor[b]	Eastern Standard Time	Shadow Length Factor[b]	Eastern Standard Time	Shadow Length Factor[b]	Eastern Standard Time	Shadow Length Factor[b]	Eastern Standard Time
-21	0.33	11:27	0.49	11:15	0.94	11:06	2.37	10:28
-20	0.33	11:29	0.48	11:17	0.93	11:09	2.33	10:32
-19	0.33	11:30	0.48	11:19	0.92	11:11	2.30	10:37
-18	0.32	11:32	0.48	11:21	0.92	11:14	2.28	10:41
-17	0.32	11:33	0.48	11:22	0.91	11:17	2.25	10:45
-16	0.32	11:34	0.47	11:24	0.91	11:20	2.23	10:49
-15	0.32	11:36	0.47	11:26	0.90	11:23	2.21	10:53
-14	0.32	11:37	0.47	11:28	0.90	11:25	2.19	10:57
-13	0.32	11:38	0.47	11:30	0.90	11:28	2.17	11:01
-12	0.32	11:40	0.47	11:31	0.89	11:31	2.15	11:05
-11	0.32	11:41	0.47	11:33	0.89	11:33	2.14	11:09
-10	0.32	11:42	0.46	11:35	0.89	11:36	2.13	11:13
-9	0.31	11:44	0.46	11:37	0.88	11:39	2.11	11:17
-8	0.31	11:45	0.46	11:39	0.88	11:41	2.10	11:21
-7	0.31	11:46	0.46	11:40	0.88	11:44	2.09	11:25
-6	0.31	11:48	0.46	11:42	0.88	11:47	2.09	11:29
-5	0.31	11:49	0.46	11:44	0.88	11:49	2.08	11:33
-4	0.31	11:50	0.46	11:46	0.88	11:52	2.07	11:37
-3	0.31	11:52	0.46	11:47	0.87	11:55	2.07	11:41
-2	0.31	11:53	0.46	11:49	0.87	11:57	2.07	11:45
-1	0.31	11:54	0.46	11:51	0.87	12:00	2.07	11:49
0	0.31	11:56	0.46	11:53	0.87	12:03	2.07	11:53
1	0.31	11:57	0.46	11:54	0.87	12:05	2.07	11:56
2	0.31	11:58	0.46	11:56	0.87	12:08	2.07	12:00
3	0.31	11:59	0.46	11:58	0.87	12:10	2.07	12:04
4	0.31	12:01	0.46	11:59	0.88	12:13	2.07	12:08
5	0.31	12:02	0.46	12:01	0.88	12:16	2.08	12:12
6	0.31	12:03	0.46	12:03	0.88	12:18	2.09	12:16
7	0.31	12:05	0.46	12:05	0.88	12:21	2.09	12:20
8	0.31	12:06	0.46	12:06	0.88	12:24	2.10	12:24
9	0.31	12:07	0.46	12:08	0.88	12:27	2.11	12:28
10	0.32	12:09	0.46	12:10	0.89	12:29	2.13	12:32
11	0.32	12:10	0.47	12:12	0.89	12:32	2.14	12:36
12	0.32	12:11	0.47	12:14	0.89	12:34	2.15	12:41
13	0.32	12:13	0.47	12:15	0.90	12:37	2.17	12:44
14	0.32	12:14	0.47	12:17	0.90	12:40	2.19	12:48
15	0.32	12:15	0.47	12:19	0.90	12:42	2.21	12:52
16	0.32	12:17	0.48	12:21	0.91	12:45	2.23	12:56
17	0.32	12:18	0.48	12:23	0.91	12:48	2.25	13:00
18	0.32	12:19	0.48	12:24	0.92	12:51	2.28	13:04
19	0.33	12:21	0.48	12:26	0.93	12:54	2.30	13:08
20	0.33	12:22	0.48	12:28	0.93	12:57	2.34	13:13
21	0.33	12:24	0.49	12:30	0.94	12:59	2.37	13:17

Table 3E-2 (Continued)

Shadow Factors and Time of Day for Each Shadow Angle, June 21, May 6, March 21, December 21

Angle	21 June		6 May[a]		21 March[a]		21 December	
	Shadow Length Factor[b]	Eastern Standard Time	Shadow Length Factor[b]	Eastern Standard Time	Shadow Length Factor[b]	Eastern Standard Time	Shadow Length Factor[b]	Eastern Standard Time
22	0.33	12:25	0.49	12:32	0.94	13:02	2.40	13:21
23	0.33	12:26	0.49	12:34	0.95	13:05	2.43	13:25
24	0.34	12:28	0.50	12:36	0.96	13:08	2.49	13:30
25	0.34	12:29	0.50	12:38	0.97	13:11	2.52	13:34
26	0.34	12:31	0.50	12:40	0.97	13:14	2.56	13:38
27	0.34	12:32	0.51	12:42	0.98	13:17	2.62	13:43
28	0.35	12:34	0.51	12:44	0.99	13:20	2.67	13:47
29	0.35	12:36	0.51	12:46	1.00	13:23	2.71	13:51
30	0.35	12:37	0.52	12:48	1.01	13:26	2.79	13:56
31	0.36	12:39	0.52	12:50	1.02	13:29	2.84	14:00
32	0.36	12:40	0.53	12:52	1.03	13:32	2.93	14:05
33	0.36	12:42	0.53	12:54	1.04	13:35	3.02	14:10
34	0.37	12:44	0.54	12:56	1.05	13:38	3.09	14:14
35	0.37	12:45	0.54	12:59	1.06	13:41	3.20	14:19
36	0.37	12:47	0.55	13:01	1.08	13:45	3.31	14:24
37	0.38	12:49	0.55	13:03	1.10	13:48	3.44	14:29
38	0.38	12:51	0.56	13:05	1.11	13:51	3.52	14:33
39	0.38	12:52	0.57	13:08	1.13	13:55	3.67	14:38
40	0.39	12:54	0.57	13:10	1.14	13:58	3.83	14:43
41	0.39	12:56	0.58	13:13	1.16	14:02	4.00	14:48
42	0.40	12:58	0.59	13:15	1.18	14:05	4.19	14:53
43	0.40	13:00	0.60	13:18	1.20	14:09		
44	0.41	13:02	0.60	13:20	1.21	14:12		
45	0.41	13:04	0.61	13:23	1.24	14:15		
46	0.42	13:06	0.62	13:25	1.26	14:20		
47	0.42	13:08	0.63	13:28	1.28	14:23		
48	0.43	13:10	0.64	13:31	1.31	14:27		
49	0.44	13:13	0.65	13:34	1.33	14:31		
50	0.45	13:15	0.66	13:36	1.36	14:35		
51	0.45	13:17	0.67	13:39	1.39	14:39		
52	0.46	13:20	0.68	13:42	1.42	14:43		
53	0.47	13:22	0.69	13:45	1.45	14:47		
54	0.47	13:24	0.70	13:48	1.49	14:51		
55	0.48	13:27	0.71	13:18	1.54	14:56		
56	0.50	13:30	0.73	13:55	1.57	15:00		
57	0.50	13:32	0.74	13:58	1.61	15:04		
58	0.51	13:35	0.76	14:01	1.66	15:09		
59	0.52	13:38	0.78	14:05	1.70	15:13		
60	0.53	13:41	0.79	14:08	1.76	15:18		
61	0.55	13:44	0.81	14:12	1.83	15:23		
62	0.56	13:47	0.82	14:15	1.87	15:27		
63	0.57	13:50	0.84	14:19	1.94	15:32		
64	0.58	13:53	0.86	14:23	2.02	15:37		

Table 3E-2 (Continued)

Shadow Factors and Time of Day for Each Shadow Angle, June 21, May 6, March 21, December 21

Angle	21 June		6 May[a]		21 March[a]		21 December	
	Shadow Length Factor[b]	Eastern Standard Time	Shadow Length Factor[b]	Eastern Standard Time	Shadow Length Factor[b]	Eastern Standard Time	Shadow Length Factor[b]	Eastern Standard Time
65	0.59	13:56	0.88	14:27	2.09	15:42		
66	0.61	14:00	0.91	14:31	2.18	15:47		
67	0.62	14:03	0.93	14:35	2.27	15:52		
68	0.64	14:07	0.95	14:39	2.36	15:57		
69	0.66	14:11	0.97	14:43	2.46	16:02		
70	0.67	14:14	1.01	14:48	2.62	16:08		
71	0.68	14:18	1.03	14:52	2.73	16:13		
72	0.70	14:22	1.06	14:57	2.86	16:18		
73	0.72	14:26	1.09	15:01	3.06	16:24		
74	0.75	14:31	1.12	15:06	3.22	16:29		
75	0.77	14:35	1.16	15:11				
76	0.79	14:39	1.20	15:16				
77	0.81	14:44	1.24	15:21				
78	0.84	14:49	1.28	15:26				
79	0.87	14:54	1.32	15:31				
80	0.89	14:58	1.37	15:36				
81	0.93	15:04	1.43	15:42				
82	0.96	15:09	1.48	15:47				
83	0.99	15:14	1.55	15:53				
84	1.02	15:19	1.62	15:59				
85	1.07	15:25	1.67	16:04				
86	1.11	15:31	1.75	16:11				
87	1.14	15:36	1.84	16:16				
88	1.19	15:42	1.93	16:22				
89	1.24	15:48	2.02	16:28				
90	1.29	15:54	2.13	16:34				
91	1.36	16:01	2.24	16:40				
92	1.42	16:07	2.36	16:46				
93	1.48	16:13	2.54	16:53				
94	1.56	16:20	2.68	16:59				
95	1.62	16:26	2.84	17:05				
96	1.72	16:33	3.09	17:12				
97	1.79	16:39	3.29	17:18				
98	1.89	16:46						
99	2.01	16:53						
100	2.13	17:00						
101	2.23	17:06						
102	2.37	17:13						
103	2.54	17:20						
104	2.72	17:27						
105	2.92	17:34						
106	3.09	17:40						
107	3.35	17:47						

Table 3E-2 (Continued)

Shadow Factors and Time of Day for Each Shadow Angle, June 21, May 6, March 21, December 21

Angle	21 June		6 May[a]		21 March[a]		21 December	
	Shadow Length Factor[b]	Eastern Standard Time	Shadow Length Factor[b]	Eastern Standard Time	Shadow Length Factor[b]	Eastern Standard Time	Shadow Length Factor[b]	Eastern Standard Time
108	3.65	17:54						
109	4.00	18:01						

Notes: All calculations are for New York City, City Hall.
Latitude: 40°42'23" north (40.706389°)
Longitude: 74°0'29" west (74.008056°)

Times are Eastern Standard times. Daylight Savings Time is NOT considered. To find apparent solar time, add 4 minutes to the clock time. Then, for 21 June, no change; for 6 May, add 3 minutes; for 21 March, subtract 7 minutes; for 21 December, add 3 minutes.

[a] Factors for May 6 and March 21 may be used for August 6 and September 21, respectively.

[b] Factor for shadow length by degree (azimuth) from true north 0°.

F. Historic Resources

100. Definitions

110. HISTORIC RESOURCES

The term "historic resources" encompasses districts, buildings, structures, sites, and objects of historical, aesthetic, cultural, and archaeological importance. For CEQR, this includes:

- Designated New York City Landmarks, Interior Landmarks, Scenic Landmarks, and properties within designated New York City Historic Districts.
- Properties calendared for consideration as one of the above by the New York City Landmarks Preservation Commission (LPC).
- Properties listed on or formally determined eligible for inclusion on the State and/or National Register of Historic Places, or contained within a district listed on or formally determined eligible for the State and/or National Register of Historic Places.
- Properties recommended by the New York State Board for listing on the State and/or National Registers of Historic Places.
- National Historic Landmarks.
- Properties not identified by one of the programs listed above, but that meet their eligibility requirements.

Historic resources include both *architectural* and *archaeological* resources. Architectural resources include historically important buildings, structures, objects, sites, and districts. Archaeological resources typically are physical remains, usually subsurface, of the prehistoric (Native American) and historic periods—such as burial hearths, foundations, artifacts, wells, and privies. Historic landscapes, such as gardens or parks, can also be historic resources. There is some overlap between the two types of historic resources—for example, industrial archaeology examines sites and structures that illustrate developments in industry. These may encompass such properties as bridges, canals, piers, wharves, and railroad transfer bridges that may be wholly or partially visible above ground.

Historic resources can generally be classified as buildings, structures, objects, sites, or districts.

111. Buildings

A building is a structure created to shelter human activity. The historical or architectural value of individual buildings may range from the monumental, such as the American Museum of Natural History, to the modest or unique, such as the Fraunces Tavern block in Lower Manhattan.

112. Structures

A structure is a built work composed of interdependent parts or elements in an organized pattern. The term "structure" is used to distinguish from buildings those functional constructions made for purposes other than shelter. Bridges and other engineering projects are good examples of historic structures. Other examples of historic structures are the carousels in Coney Island or military fortifications, such as Fort William and Fort Jay on Governors Island or the batteries at Fort Wadsworth on Staten Island.

113. Objects

An object is an item of functional, aesthetic, cultural, historical, or scientific value that may be movable but is related to a given environment or setting. The designated sidewalk clocks in Manhattan and Queens, or Native American stone tools are examples of objects.

114. Sites

A site is the location or place where a significant event or sequence of events took place, or the location of an important building or structure, whether now standing, ruined, or vanished, where the location itself possesses historic, cultural, or archaeological value. A site can be important because of its association with significant historic (or prehistoric) events or activities, buildings, structures, objects, or people, or because of its potential to yield information important in prehistory or history. Examples of sites include a Native American habitation site or a battlefield.

115. Districts

A district is a geographically definable area that possesses a significant concentration of associated buildings, structures, objects, or sites, united historically or aesthetically by plan and design or physical development and historical and/or architectural relationships. Although composed of many resources, a district derives its importance from being a unified entity. A district can consist of historic or archaeological resources, as in a grouping of archaeological sites related by their common components. The Central Park West-West 73rd-74th Street Historic District (which is within the larger Upper West Side-Central Park West Historic

District) is an example of a district unified by plan or design. This district reflects the vision of Edward Clark, president of the Singer Sewing Machine Company, and his heirs, who used restrictive covenants governing height and setbacks to create homogeneous residential streetscapes surrounding the monumental buildings that define Central Park West (e.g., New-York Historical Society, the Dakota, American Museum of Natural History). An example of a district notable for its historical and/or architectural relationships is the Brooklyn Heights Historic District, which comprises a concentration of buildings of several styles predating the Civil War, including Federal, Gothic Revival, and Italianate.

120. CRITERIA FOR ELIGIBILITY

The U.S. Secretary of the Interior has established criteria of eligibility for listing on the National Register of Historic Places (Code of Federal Regulations, Title 36, Part 60); New York State and LPC have adopted these criteria for use in identifying significant historic resources for SEQRA and CEQR review. In addition, the criteria for local designation as defined in the New York City Landmarks Law are applicable in assessing historic resources that may be affected by the action.

121. National Register Criteria

To be considered significant and eligible for the National Register, a property must represent a significant part of the history, architecture, archaeology, engineering, or culture of an area, and it must have the characteristics that make it a good representative of properties associated with that aspect of the past. The scope of significance may be local, State, regional, or national. The consideration of whether a property represents an important aspect of an area's history or prehistory is related to its associative values; the consideration of its characteristics is related to its integrity. The National Register's criteria for associative values and measures of integrity are described below. These criteria apply to both archaeological and architectural resources. More guidance on the National Register criteria is provided in the U.S. Department of the Interior's *National Register Bulletin 15: How to Apply the National Register Criteria for Evaluation*, as well as numerous other National Register Bulletins (see Section 730, below).

121.1. Associative Values

The National Register criteria for evaluation identify the values that make a building, structure, object, site, or district significant. To be significant, property must meet at least one of these criteria:

- Be associated with events that have made a significant contribution to the broad patterns of history.
- Be associated with the lives of persons significant in the past.
- Embody distinctive characteristics of a type, period, or method of construction or that represent the work of a master, possess high artistic values, or represent a significant and distinguishable entity whose components may lack individual distinction.
- Have yielded or have the potential to yield information important in prehistory or history.

Thus, significance can range from buildings that are examples of an architectural style, such as the Greek Revival residences in Brooklyn Heights; that are monumental, such as the American Museum of Natural History; or that represent the work of a renowned architect, such as the Bayard Condict Building at 65-69 Bleecker Street in Manhattan, which is the only building in New York City by the well-known architect Louis H. Sullivan. Buildings can also be significant if they are associated with historic events or patterns. For example, the Bowne House in Flushing, Queens, possesses important historical associations because it contains the kitchen wing of the oldest house in Queens, built by John Bowne in 1661 with additions that date to 1680 and 1696. Similarly, Flushing's second oldest house, the Kingland Homestead Museum, which dates to ca. 1774, is an important example of an otherwise lost building tradition, the English vernacular tradition.

121.2. Integrity

To be eligible for the National Register, a property must not only be significant under the four associative criteria for eligibility listed in Section 121, but it also must have integrity. Integrity is the ability of a property to convey its significance. It is defined in the Federal guidelines as "the authenticity of a property's historic identity, evidenced by the survival of physical attributes that existed during the property's historic or prehistoric period." The National Register criteria recognize seven measures that define integrity, as follows:

- *Location*. Location is the place where the historic property was constructed or the place where the historic event occurred. The location of a property, together with its setting (see below), is important in recapturing a sense of history.
- *Setting*. Setting is the physical environment of a historic property. While location refers to the specific place where a property was built or an

event occurred, setting refers to the character of the place in which the property played its historical role. It involves the relationship of the property to its surrounding features (such as topography, vegetation, and other buildings or open spaces).

- *Design*. Design is the combination of elements that create the form, plan, space, structure, and style of a property. It includes such elements as organization of space, proportion, scale, technology, ornamentation, and materials (and thus, massing, pattern of fenestration, textures and colors of surface materials, etc.).

- *Materials*. These are physical elements combined or deposited during a particular period of time and in a particular pattern. A property must retain the key exterior materials dating from the period of its significance. If the property was altered *before* the period that gave it significance, the materials of the alteration rather than the original materials will be important. According to the *Secretary of the Interior's Standards for Rehabilitation* (36 CFR Part 68), significant historic alterations are defined as "changes which may have taken place in the course of time and are evidence of the history and development of a building, structure, or site and its environment. These changes may have acquired significance in their own right and this significance shall be recognized and respected." Consultation with the State Historic Preservation Officer (SHPO) at the New York State Office of Parks, Recreation and Historic Preservation (OPRHP) and LPC would be helpful in determining if significant alterations or additions have occurred.

- *Workmanship*. This is the physical evidence of the crafts of a particular culture or people; the evidence of labor and skill in constructing or altering a resource. Examples of workmanship in historic buildings include tooling, carving, painting, etc.

- *Feeling*. Feeling is the physical characteristics that evoke the aesthetic or historic sense of a particular period of time.

- *Association*. This is the direct link between a historic property and an important historic event or person. Like feeling (above), association requires the presence of physical features that convey this relationship.

To retain integrity, a property will possess at least one and typically several of these aspects. Which of these qualities are important to a particular property depends on why the property is significant. The essential physical features that contribute to a property's significance must continue to be present and visible; the property must retain the identity for which it is significant. For example, a building significant as an example of a particular architectural style must retain the distinctive design characteristics of that style. The measures of integrity relate to the period for which the resource is significant; if the resource was altered, etc., before that period, this will not affect its integrity (see the discussion of significant alterations above).

121.3. Special Considerations

Certain kinds of individual properties are not usually considered for listing on the National Register. These are properties less than 50 years old, religious properties, moved properties, birthplaces and graves, cemeteries, reconstructed properties, and commemorative properties. (Such properties do qualify if they are integral parts of districts that meet the eligibility criteria.) However, these properties can be eligible for the Register in certain circumstances, described below. These "criteria considerations" are found in 36 CFR Part 60. It is important to note that certain kinds of properties are *not* generally excluded from eligibility for designation as New York City Landmarks; the Landmarks Law has different criteria for eligibility from those of the National Register (see Section 122, below). Further, even if a property is not eligible for the National Register for any reason, if it is eligible for designation as a New York City Landmark, the potential for impacts is considered under CEQR.

Although properties typically must be at least 50 years old to be eligible for the National Register, younger properties that are of exceptional importance to a community, state, region, or the nation may still be eligible. The 50-year criterion was created as guidance, to ensure that sufficient time has passed to allow an evaluation of the historical value of a place. Certain properties whose unusual contribution to the development of an area's history, architecture, archaeology, engineering, and/or culture can clearly be demonstrated may be eligible for the National Register even if they are not yet 50 years old. Examples of properties in New York City determined eligible for listing or listed on the National Register before they were 50 years old include the following:

- The Chrysler Building (completed in 1930), which was listed on the Register because it is considered the epitome of "style moderne" architecture.

- The Whitney Museum of American Art (completed in 1966), which is considered exceptionally important as the work of an internationally renown architect (Marcel Breuer), and representative of modern architecture during the 1950's and 1960's.

- The Lever House building (completed in 1952), which is important as one of the first corporate expressions of the International style of architecture in America.

- The Municipal Asphalt Plant (completed in 1944), which was the first successful American use of the parabolic arch form in reinforced concrete.

As discussed below in Section 122, the New York City Landmarks Preservation Commission under the New York City Landmarks Law has jurisdiction to designate properties 30 years of age or older, in whole or in part, on the basis of their architectural, cultural, aesthetic, or historical significance. Any resource(s) that may be eligible for designation as a New York City Landmark or Historic District must be considered in CEQR whether or not it may be eligible for the National Register.

The other kinds of properties typically not eligible for the National Register—cemeteries, birthplaces or graves of historical figures, properties primarily religious in nature, commemorative properties, and moved or reconstructed buildings or structures—will qualify for the Register if they have achieved additional significance, as follows:

- Religious properties deriving primary significance from architectural or artistic distinction or historical importance; cemeteries that derive their primary significance from graves of persons of transcendent importance, from age, from distinctive design features, or from association with historic events. For example, Trinity Church and Graveyard in Manhattan are both listed on the National Register. The church, the third to stand at this site for Trinity Parish, which was formed in 1697, is an outstanding example of Gothic Revival style. The cemeteries antiquity gives it importance, and it forms an integral and historical component of the setting in which the church now stands. A cemetery may also be considered significant if it contains headstones of aesthetic significance, such as headstones inscribed with early death heads or skulls and bones, or important funereal statuary.

  In another example, New York's 18th century African Burial Ground was designated a National Historic Landmark and listed on the National Register based on two criteria of significance: it has the potential to yield information important in history and, because it is associated with exceptionally significant events in United States history, it meets the National Historic Landmarks criteria exception for cemeteries. For burial sites, reference may be made to the U.S. Department of the Interior's *National Register Bulletin 38: Guidelines for Evaluating and Registering Cemeteries and Burial Places*.

- A building or structure removed from its original location but that is significant primarily for architectural value or is the surviving structure most importantly associated with a historic person or event.

- A reconstructed building when accurately executed in a suitable environment and presented in a dignified manner as part of a restoration master plan, and when no other building or structure with the same association has survived.

- A birthplace or grave of a historical figure of outstanding importance if there is no appropriate site or building directly associated with his or her productive life.

- A property primarily commemorative in intent if design, age, tradition, or symbolic value has invested it with its own exceptional significance.

The U.S. Department of the Interior's *National Register Bulletin 15: How to Apply the National Register Criteria for Evaluation* provides more information about these criteria considerations (see Section 730, below).

122. New York City Landmarks Law Criteria

The New York City Landmarks Law establishes criteria for designation of significant cultural resources. That law was established to achieve the following goals, among others:

- Effect and accomplish the protection, enhancement, and perpetuation of such buildings, structures, places, works of art, and objects (collectively termed, "improvements"); landscape features; and districts that represent or reflect elements of the City's cultural, social, economic, political, and architectural history.

- Safeguard the City's historic, aesthetic, and cultural heritage, as embodied and reflected in such improvements, landscape features, and districts.

those sites that are appropriate in size for the expected changes.

- Actions that result in changes that are highly visible and can be perceived from farther than 400 feet *and* could affect the context of historic resources some distance away (e.g., changes to the skyline around Central Park).

320. ANALYSIS TECHNIQUES

321. Archaeological Resources

321.1. Identifying Known Resources

Some archaeological resources have already been identified through City, State, or Federal processes identified above (see Section 110). These are listed on, or have been determined eligible for, the State and/or National Registers of Historic Places; designated New York City Landmarks or Historic Districts or properties calendared for such designation; properties listed on, determined eligible for, or recommended by the New York State Board for listing on the State and/or National Registers; or National Historic Landmarks. In addition, the SHPO, the New York State Museum, and the Landmarks Preservation Commission maintain records of known archaeological sites and areas that are considered likely to contain archaeological resources (these areas are sometimes referred to as archaeologically "sensitive"). (For these sources, see Section 730, below.)

If these sources indicate that a known archaeological site or known sensitive area is located near the project site, this is an indication that the site itself may also contain such resources; this possibility should be explored as described in Section 321.2, below. If these sources indicate that a known site or sensitive area is located on the project site, then further analysis of the action's impact on those archaeological resources must be performed. In addition, whether or not the project site or surrounding area include any known resources, after this evaluation of known archaeological resources is complete, unknown archaeological resources should be considered (see Section 321.2, below).

321.2. Investigating Unknown Resources

The next step in the assessment of archaeological resources is to identify unknown resources that may exist on the site. If documented disturbances on the site exceed depths at which archaeological resources have been found in the immediate vicinity (see 321.1, above), then further investigation will most likely not be necessary. If any part of the site has not been excavated to this depth, analysis continues for that part of the site, as described below. If the extent of disturbance on the site is unknown, analysis continues for the entire site as described below. At this point in the analysis, the lead agency may wish to contact the Landmarks Preservation Commission to determine whether the consideration of archaeological resources on the site is appropriate or can be eliminated.

Appropriate methodologies for identifying potential archaeological resources, based on Federal standards and guidelines—particularly the *Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation, Federal Register*, Vol. 48, No. 190—as well as guidelines appropriate for archaeological work in New York City, are summarized in this section. Use of an archaeologist may be appropriate for this evaluation of unknown archaeological resources.

Typically, the initial analysis of unidentified archaeological resources consists of two parts, often performed simultaneously:

1. A determination of the potential for any prehistoric or historic material remains (artifacts, structures, refuse, etc.) existing on the site of the action. This depends on the site's past uses, as well as whether those remains, if any, would have survived subsequent disturbance by other activities, such as construction of later buildings.

2. An evaluation of the potential significance of any such remains. For this step, the National Register criteria for evaluation (Section 121, above) are applied. Archaeological sites are most likely to be found significant under the fourth criterion—having the potential to yield information important in prehistory or history—but the other criteria may also be applicable.

After this assessment, a site that is found likely to contain significant material remains is considered to be potentially "archaeologically sensitive." The site's actual, rather than potential, sensitivity cannot be ascertained without some testing or excavation. However, in New York City, the initial assessment of a site's archaeological sensitivity is typically made through background or archival research, without excavation. This documentary research phase should be extensive enough to allow the lead agency to evaluate the likelihood that significant resources are located on the site, and then whether these resources would be affected by the proposed action (Section 500, below). Field work (archaeological testing or excavation) is most often not needed until after this initial evaluation of sensitivity and determination of the action's significant impacts.

The following research steps are appropriate to determine the potential sensitivity of a project site.

Determine Past Uses on the Site.

1. Contact the appropriate agencies and other sources to determine whether any known prehistoric archaeological resources are located near the project site (see Section 321.1, above). Presence of other prehistoric resources in the vicinity is used as an indicator of the site's potential sensitivity for prehistoric resources.

2. Determine the original topography of the project site. Early historical maps and documentary sources can be used. This step will help to assess prehistoric and other archaeological historic resources. If the site was once located near a water source, on a well-drained elevated site, or near a wetland, it is more likely to have been utilized by prehistoric, Native American groups. On project sites near the waterfront that are the result of landfilling operations since the 1600's, original land surface may be deeply buried. Additionally, the extent to which the shoreline has altered over the last 14,000 years as a result of climatic changes is also considered.

3. Research the development history of the site, as far back in time as possible. In this way, determine whether the site had any historic uses that may be of archaeological interest (such as 17th, 18th, or 19th century uses). What is of archaeological interest depends on current research issues in New York City, and therefore involves some judgment. This is discussed further in step 5, below. The development history also provides information about more recent uses and the extent to which these uses may have disturbed the site (step 4, below). For this step, historic maps and buildings department records can be helpful, as well as other documentary sources when available.

Determine Disturbance on the Site.

4. If there is evidence of several cycles of construction and demolition, consider whether later construction or demolition episodes disturbed any remains from past uses (identified in step 3). Excavation of late 19th and 20th century building foundations and/or basements, filling, grading, and construction of utility lines may have disturbed earlier, potentially significant archaeological resources. Typically, construction records filed at the Buildings Department are a good source of this information; historic maps can also be useful.

   Determination of the extent to which later land modification activities have affected earlier archaeological resources requires comparing the documented depth of disturbance with the depths at which archaeological resources would be expected. This depth depends on the original topography (step 2, above) and the amounts of filling and alteration that have occurred (step 3). The depths at which archaeological resources from the same period have been found in the vicinity are a good indicator. Depths at which significant archaeological resources have been found in New York City vary, and 17th century remains have been identified below 19th century foundations in Lower Manhattan, so the mere presence of later basements may not have disturbed potentially significant archaeological resources. If documented disturbance clearly exceeds depths at which archaeological resources might be expected, then no further work may be necessary.

   This step can be performed before, after, or simultaneously with step 5, below (determining significance of past uses), depending on which method proves more useful and expedient. For example, if it is clear that no uses with any potential for significance were ever located on the site, there may be no reason to document the disturbance to the site. On the other hand, if it is clear that the locations of past uses have been disturbed, their significance does not need to be examined.

Determine Significance of Past Uses that May Remain.

5. If any past uses of interest are identified during step 3, intensive research can address whether these uses would be likely to result in meaningful archaeological resources: are they activities that have a discernible or physical signature? and do these remains provide information that answers important research questions?

   Significance is a function of whether the resource is likely to contribute to current knowledge of the history of the period in question. Following are some examples of archaeological issues currently of interest in New York City. However, research issues change as the knowledge base increases. (Consultation with LPC is recommended in determining significance of potential resources.)

The New York City Landmarks Law recognizes several types of resources:

- *Landmark.* As set forth in the Landmarks Law, a property eligible for designation as a Landmark is as follows: any improvement (building, structure, place, work of art, and/or object), any part of that is 30 years old or older, that has a special character or special historical or aesthetic interest or value as part of the development, heritage, or cultural characteristics of the City, State, or nation.

- *Interior Landmark.* A property is eligible for designation as an Interior Landmark if it meets the following criteria: it is an interior (the visible surfaces of the interior of an improvement) or part thereof, any part of which is 30 years old or older, and that is customarily open or accessible to the public, or to which the public is customarily invited, and that has a special historical or aesthetic interest or value as part of the development, heritage, or cultural characteristics of the City, State, or nation.

- *Scenic Landmark.* A New York City-owned property is eligible for designation as a Scenic Landmark if it meets the following criteria: it is a landscape feature (any grade, body of water, stream, rock, plant, shrub, tree, path, walkway, road, plaza, fountain, sculpture, or other form of natural or artificial landscaping) or an aggregate of landscape features, any part of which is 30 years old or older, that has or have a special character of special historical or aesthetic interest or value as part of the development, heritage, or cultural characteristics of the City, State, or nation.

- *Historic District.* An area eligible for designation as a Historic District is as follows: any area that contains improvements (buildings, structures, places, works of art, and objects) that have a special character or special historical or aesthetic interest or value; and that represent one or more periods or styles of architecture typical of one or more eras in the history of New York City; and that cause such area, by reason of such factors, to constitute a distinct section of the City.

200. Determining Whether a Historic Resources Assessment is Appropriate

210. ARCHAEOLOGICAL RESOURCES

Archaeological resources usually need to be assessed for actions that would result in any in-ground disturbance. In-ground disturbance is any disturbance to an area not previously excavated, and includes new excavation deeper and/or wider than previous excavation on the same site. Examples of actions that typically require assessment are as follows:

- Above-ground construction resulting in ground disturbance, including construction of temporary roads and access facilities, grading, or landscaping.

- Below-ground construction, such as installation of utilities or excavation, including for footings or piles.

Analysis of archaeological resources is typically not necessary in the following circumstances:

- Actions that would not result in ground disturbance.

- Actions that would result in disturbance only of areas that have already been excavated for other purposes, such as basements, concourses, sunken plazas, etc. If the proposed area to be excavated substantially exceeds the previous disturbance in depth or footprint, archaeological assessment may be appropriate.

For any actions that would result in new ground disturbance (as described above), assessment of both prehistoric and historic archaeological resources is generally appropriate.

220. ARCHITECTURAL RESOURCES

Generally, architectural resources should be assessed if the proposed action would result in any of the following effects, whether or not any known historic resources are located near the site of the action:

- New construction, demolition, or significant physical alteration to *any* building, structure, or object.

- A change in scale, visual prominence, or visual context of any building, structure, or object or landscape feature. Visual prominence is generally the way in which a building, structure, object, or

landscape feature is viewed. For example, a building may be part of an open setting, a tower within a plaza, or conforming or not conforming with the streetwall in terms of its height, footprint, and/or setback. Visual context is the character of the surrounding built or natural environment. This can include the following: the architectural components of an area's buildings (e.g., height, scale, proportion, massing, fenestration, ground-floor configuration, style), streetscapes, skyline, landforms, vegetation, and openness to the sky.

- Construction, including but not limited to, excavating vibration, subsidence, dewatering, and the possibility of falling objects.

- Additions to or significant removal, grading, or replanting of significant historic landscape features.

- Screening or elimination of publicly accessible views.

- Introduction of significant new shadows or significant lengthening of the duration of existing shadows over a historic landscape or on a historic structure if the features that make the structure significant depend on sunlight (for example, stained glass windows that cannot be seen without sunlight).

300. Assessment Methods

For actions that may affect historic resources (see Section 200), the first step in the evaluation of an action's effects on historic resources is to consider what area the action might affect and then identify historic resources—whether officially recognized or eligible for such recognition—within that area. The methods of choosing a study area and identifying and evaluating historic resources within that study area are explained in this section. These generally follow the methods typically used for City, State, and Federal historic resource reviews.

310. STUDY AREAS

311. Archaeological Resources

The study area for archaeological resources from both the prehistoric and historic periods is generally the site of the proposed action. For prehistoric resources, it is also generally appropriate to perform some preliminary research of known archaeological resources in the surrounding area—typically, the area within a half-mile of the site. Similarly, for historic archaeological resources it is often appropriate to perform preliminary research of known archaeological resources in the nearby area, such as on the present-day full tax lot or within the boundaries of the nearest adjacent mapped streets. The data gathered in these examinations of the surrounding area are used to predict the likelihood of archaeological resources existing on the project site itself.

312. Architectural Resources

For architectural resources, the study area is the area in which any resources could be affected by the action. It should be large enough to permit examination of the relationships between the proposed action and the existing historic resources. These relationships are *physical* (e.g., an action may require alteration of a resource or may threaten a resource's structural integrity during construction), *visual* (e.g., an action may alter the streetscape or background context in which a resource is viewed and understood), and *historical* (an action can change the historical context of a resource if it changes its historic character, feeling, or association (see Section 122, above) or the way it is understood by the public; this could occur if a formerly public building, such as a library or recreational facility, became private, or if obvious and tangible links to the resource's history were removed, such as if bustling meat market activity within a building that is historically significant *because* of that association with the meat market were replaced by another activity). Thus, the size of the study area is directly related to the anticipated extent of the action's impacts. For most proposals, a study area defined by the radius of 400 feet from the borders of the project site is adequate. However, study areas of different sizes are sometimes appropriate. If an action facilitates only limited construction visible from few locations, for example, a smaller study area may be appropriate. Examples of situations for which a larger study area may be appropriate include:

- Actions that affect historic districts.

- Actions that involve construction in areas with difficult subsurface conditions (e.g., where dewatering could change the water table over a wider area and affect historic buildings some distance from the project site).

- Actions that result in changes over a larger area (e.g., a large-scale development or an area rezoning). For generic or programmatic actions, it may be appropriate to identify any "soft" sites that may be developed because of the action (see Section 2C.400 for more information on identifying soft sites) and then consider study areas for each of

For prehistoric archaeological resources, research cannot directly determine prehistoric use of the site. Rather, it is used to predict the likelihood of prehistoric use. Any identified potential for prehistoric archaeological resources is considered significant at the initial, research level, since few prehistoric sites have been documented in New York City and the discovery of any intact prehistoric site would be significant.

For archaeological resources of the historic period, archival research can ascertain the history of uses on the site and their potential significance. Examples of uses currently of potential interest from the historic period include:

- Early landfilling techniques (relevant on sites within a few blocks of the current waterfront through much of the City, where filling created new land surfaces in submerged areas).

- Buried derelict ships or hulls (relevant on similar sites to those of landfilling techniques; often incorporated into the landfill as part of the fill-retaining structures).

- Any uses during the 17th and 18th centuries, including colonial and Federalist residences and businesses, and Revolutionary War remains.

- 19th century industries, if the archaeological record is likely to provide information about the industrial process or workers' conditions that is otherwise unavailable.

- 19th century residences or workplaces where deposits containing refuse associated with occupants may be preserved. Such refuse can provide important information on consumer preferences, differential access to consumer goods, diet, and other topics of current research interest. Remains related to house-lot infrastructure, including wells, cisterns, and privies, may have research potential in that they provide information about access to services and public health issues during the period before public utilities were available to residents; such features also often contain significant domestic refuse deposits.

  Residences constructed after City services (water and sewer) were available are generally not considered archaeologically significant. For residences that predate extension of urban services that continued to be used after City water and sewer were available, the archival phase may involve collecting information about the occupants through such sources as early deeds, tax records, and census lists. On the other hand, if the archival phase demonstrates that no potentially significant uses were located on the site, this additional research may not be necessary.

Conclusions About Potential Archaeological Sensitivity of Site. Based on the information provided in steps 1 through 5, above, the lead agency can draw conclusions as to the potential archaeological sensitivity of the site. Consultation with LPC is recommended for this evaluation. If past uses may have left remains on the site that were not later disturbed, and if these remains may be important according to the National Register criteria for eligibility (see Section 120, above), then the site may host significant archaeological resources, or may be archaeologically "sensitive." The locations of potential sensitivity should be pinpointed as much as possible. The effects on those potential resources are then assessed (see Section 420, below).

If no known or potential archaeological resources were identified on the site, consideration of archaeological resources is complete. For actions being evaluated through an Environmental Assessment Statement, a Negative Declaration may be appropriate at this point, if no other issues have been raised in other technical areas. (Chapter 1 of this Technical Manual explains the issuance of Negative Declarations). If resources were identified, the action's effects on those resources must be evaluated (see Section 410, below). This involves considering conditions in the future without the action (321.3, below) and with the action (321.4).

321.3. Future No Action Condition

To assess the future no action condition, consider whether any changes are likely to occur to the existing archaeological resources identified in Sections 321.1 and 321.2. If any archaeological resources—either designated or potential—are identified on the site, any expected changes to the site or surrounding area that would affect those resources should be noted.

321.4. Future Action Condition

The proposed action's effects on any designated or potential archaeological resources identified above in 321.1 and 321.2 are then analyzed in the future action condition. The assessment specifically considers whether the action could result in disturbance or destruction of those archaeological resources.

322. Architectural Resources

322.1. Identifying Known Resources

Designated architectural resources include (1) designated New York City Landmarks, Interior Landmarks, and Scenic Landmarks, and properties within designated New York City Landmark Historic Districts; (2) properties calendared for consideration as one of the above by the New York City Landmarks Preservation Commission; (3) properties listed on or formally determined eligible for inclusion on the State and/or National Register of Historic Places, or contained within a district listed on or formally determined eligible for the State and/or National Register of Historic Places; (5) National Historic Landmarks; and (6) properties recommended by the New York State Board for listing on the State and/or National Registers of Historic Places. The information on listed resources is available from the agencies responsible for their identification or assigned responsibility for maintaining these records: the New York City Landmarks Preservation Commission and the New York State Office of Parks, Recreation and Historic Preservation (see Section 730, below).

If any listed historic resources are located in the study area, then further analysis of the action's impact on these resources must be performed. In addition, whether or not the study area includes any listed resources, after this evaluation of listed historic resources is complete, potential resources should be investigated (see Section 322.2, below).

322.2. Identifying Potential Resources

Any potentially eligible architectural resources that may be affected by the action should be identified. Records and documentation of this effort are prepared for the lead agency's files or for submission to the reviewing agency, if appropriate. As described in Section 100, above, historic resources can be considered significant if they meet the criteria for eligibility to the National Register, established by the U.S. Secretary of the Interior, or criteria for local designation set forth in the New York City Landmarks Law. The National Register criteria address both historic and architectural significance: a property may be associated with significant events or persons, or may be a notable representation of a particular architectural style or the work of an important architect or builder (see Section 121, above). Similarly, the New York City Landmarks Law's criteria include historical, architectural, aesthetic, and cultural value (see Section 122). Usually, architectural resources are identified through a combination of field surveys and documentary research. Efforts to identify potential architectural resources generally follow the *Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation* and the criteria of the New York City Landmarks Law. The National Register and the New York City Landmarks Law criteria are then applied to determine if these potential resources may be eligible for the National Register or for local designation by the Landmarks Preservation Commission. This methodology is summarized below.

The passage of time or changing perceptions of significance may justify reevaluation of properties that were previously determined ineligible for the Register or for designation as City Landmarks or Historic Districts. Usually, identification of potential historic resources requires some knowledge of an area's history, of the broad patterns of historical development in New York City, and of the various architectural styles represented in the City. More information on surveying historic resources and applying the National Register criteria is available in the Federal regulations and in numerous bulletins published by the National Park Service and the Advisory Council on Historic Preservation (see Section 730, below). Consultation with LPC is advised; LPC can assist in making determinations of eligibility on the basis of Federal, State, and local criteria.

Field Survey. The survey for unidentified resources begins with field inspection of the study area, including the project site. During this inspection, structures that appear to have particular cultural, architectural, or historical distinction are identified. This survey can require careful judgment and knowledge about current perceptions of significance and about the history and architecture of New York City. Consultation with LPC or SHPO would be helpful and should be considered.

Research. Research of resources' historical and cultural significance is often needed to supplement visual inspections. Documentary research can be used to gather the information needed to apply the National Register and New York City Landmarks Law criteria to any potential resources in the study area. Research conducted into the development history of the study area before field surveys are performed can help to identify resources in the area; research conducted after surveying can provide information about any specific resources identified. For example, research can be used to ascertain a property's association with important events or persons, or its architect and date of construction. Research is also useful for determining the property's integrity: alterations and changes can be traced through building records, historic maps, and historic photographs.

The information needed to evaluate significance depends on the property's history and reason for significance. In most cases, the following information relating to a property's history is needed:

- Historically significant events and/or patterns of activity associated with the property.
- Periods of time during which the property was in use.
- Specific dates or periods of time when the resource achieved its importance (e.g., date of construction, date of specific event, period of association with an important person, period of an important activity).
- Information about any alterations.
- Historically significant persons associated with the property (e.g., its tenants, visitors, owner).
- Representation of a style, period, or method of construction.
- Persons responsible for the design or construction of the property (e.g., architect, builder).
- Quality of style, design, workmanship, or materials.
- Historically or culturally significant group associated with the property and the nature of its association.
- Information the property has yielded or may be likely to yield.

Documentation. For any properties in the study area that appear to be important, information provided should be sufficient to enable the lead agency or coordinating agencies (LPC and/or SHPO) to make a decision concerning the significance of the resources using the National Register and local criteria. This information should include dates of construction and alteration, for example. In addition to written descriptions, maps indicating the location of the resource(s) and black-and-white photographs of the resources can be helpful.

For all potentially important resources, the date or approximate date of construction, the name of the architect or builder, the architectural style, and the approximate dates of alterations to the resource should be provided, when possible. Depending on the reasons for importance, additional information should also be provided. For historically important resources, this includes any available information about that history, such as important occupants or events. For architecturally important resources, all those design elements that contribute to the building or structure's architectural importance should be noted. For example, for a building that may be a fine representation of the Gothic Revival style, those features for which that style is known—such as pointed gables, steep roof pitch, and board and batten siding—should be documented. Features that may contribute to a resource's value, and therefore should be noted, can include the following:

- Type of structure (e.g., dwelling, church, shop, apartment building, etc.).
- Building placement (detached, row, flush to the street, set back, etc.).
- General characteristics, including overall shape of plan (rectangle, side hall, center hall), number of stories, structural system, number of vertical divisions or bays, construction materials (e.g., brick, stone, poured concrete), wall finish (e.g., kind of bond, coursing, shingle, half-timber), and roof shape.
- Specific features, including location, number, and appearance of porches (e.g., stoops, porte cocheres), windows, doors, chimneys, and dormers.
- Materials of roof, foundation, walls, and other structural features.
- Important exterior decorative elements (facades, lintels, cornices, etc.).
- Interior features that contribute to the character of the building or that may possess significance independent of the value of the exterior of the building.
- Number, type, and location of outbuildings or dependencies.
- Important features of the immediate environment, including proximity to the street or sidewalk, landscaping, and views.

For historic districts, in addition to the information considered for individual resources, other considerations include the qualities that give the district coherence distinct from its surroundings, the boundaries of the district, the individual or groups of buildings that contribute to the character of the district, and the buildings

or structures that detract from or diminish its coherence. Therefore, descriptions of districts can also include the following types of information:

- General description of the natural and manmade elements of the district including structures, buildings, sites, objects, prominent geographical features, density, and landscaping.
- Numbers of buildings, structures, sites, and objects that contribute to the character of the proposed district, and those that do not contribute or may detract from it.
- General description of types, styles, or periods of architecture represented in the district, including scale, proportions, materials, color, decoration, workmanship, design.
- General description of physical relationships of the buildings to each other and to the physical environment, including facade lines, street plans, parks, squares, open spaces, density, landscaping, roof lines, and massing.
- General description of the district during the period or periods during which it achieved significance.
- Current and original uses of buildings and any adaptive uses.
- General description of the existing condition of buildings, restoration or rehabilitation activities, and alterations.
- Qualities that make the district distinct from its surroundings, including intangible characteristics such as socioeconomic or ethnic affiliations of the residents.
- Description of the qualities that give the district its special character or special historical or aesthetic interest or value.
- Description of the period or style of architecture represented by the district.

Conclusions about Unknown Architectural Resources. Based on the information gathered in the steps above, the lead agency can draw conclusions as to whether any previously unidentified architectural resources are located in the study area. A private or non-lead agency applicant can make a preliminary assessment of potential importance, but the final decision is made by the lead agency, usually with assistance from LPC and/or SHPO.

If potential architectural resources are identified, the action's effects on those resources must be assessed (see Section 430, below). This involves considering the no action condition (322.3, below) and conditions with the action (322.4).

If no known or potential resources were identified, the evaluation of architectural resources is complete. For actions being evaluated through an Environmental Assessment Statement, a Negative Declaration may be appropriate at this point (Chapter 1 of this Technical Manual provides more information on Negative Declarations).

322.3. Future No Action Condition

To assess the future no action condition, consider whether any changes are likely to occur to the existing architectural resources identified in Sections 322.1 and 322.2. If any architectural resources—either designated or eligible—were identified in the study area, any expected changes to those resources should be noted. These changes could be physical (e.g., demolition, alteration), visual (e.g., changes to the resource's setting or context), or historical (e.g., change in use that affects its context).

322.4. Future Action Condition

The proposed action's effects on any designated or potential architectural resources identified in 322.1 and 322.2 are then assessed in the future action condition. The analysis should consider the potential for physical and contextual effects on those resources. In the assessment of contextual effects, the appearance of any proposed new structures may be important. More information is provided in Section 420.

400. Determining Impact Significance

Federal regulations, which have become a widely recognized standard, define an adverse effect as the introduction of tangible and intangible elements that compromise or diminish the characteristics for which a resource has been determined significant. Thus, impact assessment is directly related to the proposed action and how it will affect the distinguishing characteristics of any resources identified. The assessment asks two major questions: will there be a physical change to the property or its setting as a result of the proposed action? If so, is the change likely to diminish the qualities of the resource—including non-physical changes, such as context or visual prominence—that make it

important? As explained in Chapter 2 of this Manual, the action's effects should be compared with the future no action conditions to assess impacts. Impacts may result from both temporary (e.g., related to the construction process) and permanent (e.g., related to the long-term or permanent result of the proposed action or construction project) activities. When significant adverse impacts are identified, the lead agency should consult with LPC (for City Landmarks) and/or the SHPO for State or National Register resources. Section 700, below, provides more information on the regulations governing designated resources.

410. ARCHAEOLOGICAL RESOURCES

Significant adverse impacts on archaeological resources are physical—disturbance or destruction—and typically occur as a result of construction activities. If any potential significant archaeological resources were identified on the site of the proposed action (Section 321.2, above), and the action could disturb or destroy those resources in any way, a significant adverse impact would occur. Possible impacts can occur in such circumstances as the following:

- Construction resulting in ground disturbance, including construction of temporary roads and access facilities, grading, landscaping; or
- Below-ground construction, such as excavation or installation of utilities.

The depth of the archaeological resources must be considered in assessing impacts: deeply buried sites are sometimes safe from any impacts. If an action would not have a physical impact on archaeological resources, then no significant adverse impact would occur. No further archaeological work is necessary.

420. ARCHITECTURAL RESOURCES

Some of the types of impacts to architectural resources may include the following:

- Physical destruction, demolition, damage, or alteration or neglect of all or part of a historic property. Such alterations as addition of a new wing to a historic building or replacement of the resource's entrance could result in adverse impacts, for example, depending on the design.
- Changes to the architectural resource that cause it to become a different visual entity, such as a new location, design, materials, or architectural features. An example would be recladding an architectural resource with new brickwork.
- Isolation of the property from or alteration of its setting or visual relationships with the streetscape. This includes changes to the resource's visual prominence so that it no longer conforms to the streetscape in terms of height, footprint, or setback; is no longer part of an open setting; or can no longer be seen as part of a significant view corridor. For example, if all the buildings on a block, including an architectural resource, are 4 stories high, and a proposed action would replace most of those with a 15-story structure, the 4-story architectural resource would no longer conform to the streetscape. Another example would be a proposed action that would result in a new building at the end of a street, so that views of a historic park beyond were blocked.
- Introduction of incompatible visual, audible, or atmospheric elements to a resource's setting. An example would be construction of a noisy highway or factory near a resource noted for its quiet, such as a park.
- Replication of aspects of the resource so as to create a false historical appearance. If a house was built during the Revolutionary War but later underwent extensive alteration, recreation of its 18th century appearance could have an adverse impact on that resource.
- Elimination or screening of publicly accessible views of the resource. For example, if a resource is located along the waterfront and is visible across the water, tall new buildings proposed between the architectural resource and the water that would block views of the resource could result in an adverse impact.
- Construction-related impacts, such as falling objects, vibration (particularly from blasting or pile-driving), dewatering, flooding, subsidence, or collapse. Such impacts could occur to an architectural resource adjacent to a construction site if adequate precautions are not taken.
- Introduction of significant new shadows, or significant lengthening of the duration of existing shadows, over a historic landscape or on a historic structure (if the features that make the resource significant depend on sunlight) to the extent that the architectural details that distinguish that resource as significant are obscured. For example,

if a resource is noted for its stained glass windows, and those windows are only visible in the sunlight, significant blocking of that sunlight could result in a significant adverse impact. (For more information, see Section 3E of this Manual.)

Assessment of the magnitude of the impact is a matter of informed judgment, based on the proposed action and the reasons for which a resource was determined important. Generally, if the action would affect those characteristics that make a resource eligible for the National Register or for New York City designation, this could be a significant adverse impact. Most important are the characteristics of association and integrity, described in Sections 121.1 and 121.2, above.

500. Developing Mitigation

Mitigation measures for historic resources are based on the nature of the impact as well as the significant attributes of the historic resource at risk. They are developed on a case-by-case basis; typical measures are described below. Consultation with LPC and/or SHPO on mitigation when designing mitigation measures is required when significant impacts would occur to architectural or archaeological resources.

510. ARCHAEOLOGICAL RESOURCES

511. Redesign

To mitigate an action's significant adverse impact on potential archaeological resources, the action can be redesigned so that it does not disturb the resources. For example, if potential resources may be located only in one corner of the site, that corner can be left undeveloped. Most often, however, some archaeological testing or excavation will be required to pinpoint the location of the archaeological resources (see Section 512, below).

512. Fieldwork

Often, only the potential for significant prehistoric or historic archaeological resources will have been established for use in determining an action's impacts. Mitigation for significant adverse impacts on these potential resources often calls for excavation in the form of *archaeological testing* to determine whether archaeological resources are, in fact, present. If any such resources are found, archaeological testing can also be used to determine their extent and their significance.

If this testing program indicates that significant resources are present, further measures are required. These are either the avoidance of the resource through redesign (Section 511), or mitigation through data recovery (Section 512.2). For example, if an archaeological site is located at the periphery of the construction area and may be disturbed during construction but not by the project itself, then enclosing the site with temporary fencing and adjustment of the construction program to avoid the site may be sufficient. If avoidance is not feasible, then a *data recovery* program is implemented (Section 512.2).

More detailed documentary research and subsequent investigation, including field research, generally call for specialized expertise. It is recommended that the lead agency consult with staff of the LPC and/or an investigator certified by the Society of Professional Archaeologists (SOPA).

If the preliminary determination of the site's potential sensitivity and the action's potential for significant impact was made through an Environmental Assessment Statement, and if field research is determined to be appropriate mitigation, a Conditional Negative Declaration may be appropriate (Chapter 1 of this Manual provides information about Conditional Negative Declarations) or the action description may be altered, to provide for necessary field research to be conducted concurrently with or subsequent to environmental review, but prior to site disturbance. However, a Conditional Negative Declaration may not be used if the affected resource is designated, calendared for designation, listed on or formally determined eligible for inclusion on the Registers, recommended by the New York State Board for such listing, or a National Historic Landmark (see the discussion of Conditional Negative Declarations and Type I actions in Chapter 1).

512.1. Field Testing

The LPC and/or SHPO is consulted after the completion of the documentary research phase to determine whether there is sufficient evidence to justify another phase of work, namely field work, and to set forth the appropriate scope of the field effort. The level of work may depend on how likely it is that archaeological resources may be on the site. Before initiating any work, a written scope of work is usually reviewed and approved by LPC and/or SHPO. This document establishes the level of effort, research issues, and potential significance. It sets forth how the work will be accomplished and what tests the as-yet unidentified resources should meet to be considered significant. It is typically developed in consultation with and accepted by LPC and/or SHPO.

Depending on the existing conditions as well as the type of resource, different levels of effort may be required. Soil borings supervised and interpreted by a professional archaeologist may be sufficient if deep basements are believed present. If the potential archaeological resources are contained in a relatively open area, then shovel testing within a prescribed grid or pattern of transects may be appropriate. At sites in Lower Manhattan or heavily developed areas, where the resource may be deeply buried, trenching, hand-excavated units, use of heavy machinery, or a combination of any of these techniques may be determined appropriate. In certain cases, monitoring of construction by an archaeologist is sufficient to ascertain whether any resources are present. For sites where only a portion of the archaeological resource would be affected by the proposed action, current thinking calls for treatment of the entire archaeological site located on the project site, because if a portion of a site is destroyed, then the integrity of the entire site is damaged. Therefore, the mitigation should deal with the entire resource located on the project site, regardless of the extent of impact.

Artifacts recovered through these investigations are usually treated according to professional standards (washing, labeling, curation, and analysis) and a professional report is prepared for review by LPC and/or SHPO. Ultimately, the agency makes the determination of significance based on information that has been provided. If this effort results in the identification of a significant archaeological resource, then a mitigation plan is necessary. Frequently, tests of significance are formulated as a series of research questions, similar to those topics used to determine preliminary significance. In other words, a resource is significant only if it has the potential to provide information currently of interest. For example, questions associated with lifeways, diet, and consumer behavior require intact deposits with appropriate domestic artifacts; a privy filled solely with ash and construction debris would not address these questions. If the study concludes that the archaeological resource is not present or is not significant, and if LPC and/or SHPO concurs in the findings, then no further work may be necessary.

512.2. Excavation

When avoidance of the significant archaeological resources is not an option, then a data recovery program becomes the mitigation. When the value or significance of the archaeological resource relates to its potential to provide important information, the adverse effects of the action on the resource are considered mitigated when the information has been recovered through systematic archaeological investigation. The process is similar to that during testing: research and design, which specifies the level of field effort, the research issues, treatment of artifacts that are recovered, and the content of the final report, is established in consultation with LPC. Frequently, a public interpretation component in the form of popular histories or displays is included in the scope. Artifact collections are deposited at appropriate facilities, where they form part of the research materials available to archaeologists and historians of early New York. Repositories should meet standards set forth in Federal guidelines (36 CFR Part 79).

520. ARCHITECTURAL RESOURCES

Possible mitigation measures for significant adverse effects on architectural resources include redesign; adaptive reuse; protective measures, including construction monitoring; and, as a last resort, documentation or relocation.

521 Redesign

This is the preferred mitigation measure for significant impacts on historic resources. Redesign techniques should be devised in consultation with the appropriate consulting agency (LPC and/or SHPO).

521.1. Relocating the Action

This mitigation measure involves avoiding the resource altogether by moving the proposed action away from the resource. When the relocated action will remain close to the architectural resource, this mitigation also calls for sympathetic contextual design of the redesigned project (see the discussion below under Section 521.2).

521.2. Contextual Redesign

When a proposed action will alter the setting of an architectural resource that is not actually physically affected, appropriate mitigation involves redesign of the proposal to be more compatible with the resource. This is a function of the distinguishing characteristics of the resource and the magnitude of impact. Possibilities include rearranging the proposed building's massing so that important views are not blocked or adding design elements that complement or echo the features of the architectural resources. New design should be compatible with the size, scale, color, material, and character of the property, neighborhood, streetwall or environment. Particular attention to fenestration, setbacks, roof lines, and massing of the new structure as well as other aspects of design is advised. The new building should be clearly distinguishable from, although compatible with, the existing historic property.

An example of sympathetic design with an existing architectural resource is Carnegie Hall Tower, designed to be sympathetic to historic Carnegie Hall. The tower, immediately east of the original building, is clad in the same color brick, and through its decorative treatment of the facade, doorways, and fenestration, echoes the organization of the adjacent marquee and grand entrance to the concert hall. Horizontal bands of brick and stucco extend the horizontal lines of the old building to the new, but a very narrow separation distinguishes the old building from the new. The platform of the new building is level with the roofline of the original eight-story hall, and the tower is set back from the street.

522. *Adaptive Reuse*

Redesign can include incorporating the resource into the project rather than demolishing it. This is known as "adaptive reuse." Adaptive reuse is the fitting of new requirements, functions, or uses into an existing historic space. It is acceptable only if it does not affect the structure or character of the historic resource. Successful adaptive reuse projects in New York include the Puck Building on Lafayette Street and Jefferson Market Library in Greenwich Village.

When repairs or alterations are required to the historic resource, distinctive stylistic features should be treated with sensitivity so that the form and integrity of the historic structure is not materially affected by the new construction. Repair of the original is always preferred. When replacement is necessary, the new material should match the material being replaced in composition, design, color, texture, and other visual qualities. Replacement or repair should be accurate duplication of the original, based on evidence (e.g., historic photographs, blueprints) and not on conjectural designs or availability of different architectural elements from other buildings and structures (refer to the *Secretary of the Interior's Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings*, available from the U.S. Department of the Interior, National Park Service, Preservation Assistance Division—see Section 732.2, below).

523. *Construction Protection Plan*

A construction protection plan should be used to protect historic resources that may be affected by construction activities related to a proposed action. The plan should be developed in coordination with the appropriate consulting agency (LPC and/or SHPO) and fulfilled by a foundation and structural engineer. Elements of the plan could include the following:

- Borings and soil reports of the water table establishing composition, stability, and condition;
- Existing foundation and structural condition information and documentation for the historic property;
- Formulation of maximum vibration tolerances based on impact and duration and considerations using accepted engineering standards for old buildings;
- Dewatering procedures, including systematic monitoring and recharging systems;
- Protection from falling objects and party wall exposure; and
- Monitoring during construction using tell-tales, seismographic equipment, and horizontal and lateral movement scales.

Reference should also be made to "New York City Landmarks Preservation Commission Guidelines for Construction Adjacent to a Historic Landmark" (on file with LPC) and "Technical Policy and Procedures Notice No. 10/88, Procedures for the Avoidance of Damage to Historic Structures Resulting from Adjacent Construction" (on file with the New York City Department of Buildings).

524. *Data Recovery*

For actions that involve significant alterations or demolition of historic resources for which other mitigation measures are not feasible, data recovery or recordation of historic structures is the last resort. This measure is not usually considered full mitigation for New York City Landmarks or for properties calendared for consideration as Landmarks. Data recovery mitigation typically requires coordination with LPC and/or SHPO.

Recordation projects typically follow agreed-upon standards, such as those established by the Historic American Buildings Survey (HABS) or Historic American Engineering Record (HAER). This is a documentation program administered by the National Park Service. Recordation projects frequently select this program since it provides a uniform and widely accepted standard for the documentation, monitored by professional staff, and resulting in materials that are then housed at the Library of Congress, where they are accessible to a broad range of researchers. The resulting documentation comprises a verbal description of the interior and exterior of the building(s); a discussion of

the historical development of the resource and its context, including significant alterations to it; measured drawings (e.g., site plan, elevations, interior plans, etc.); and a series of large format black-and-white photographs illustrating the existing structure. Text, drawings, and photographs are submitted on archivally stable materials following a prescribed format. Guidance is obtained from the National Park Service, Mid-Atlantic Regional Office in Philadelphia.

525. Relocating Architectural Resources

This measure is the least preferred of all mitigation measures, and is typically considered when there is no other prudent or feasible alternative, because it can have significant adverse impacts on the resource as well. Relocation can endanger the resource and, by removing it from its original context and setting, can threaten its integrity and the reasons for its significance. As noted earlier, relocated resources are not normally accepted for listing on the National Register. Relocation of historic resources cannot be undertaken without a permit from LPC (for designated New York City Landmarks or properties in Historic Districts) and consultation with SHPO, and/or the Federal Advisory Council on Historic Preservation.

According to guidelines issued by the Federal Advisory Council on Historic Preservation, historic properties that are movable by their nature as a matter of course (e.g., ships or machinery) can normally be moved to avoid project impacts on them without adverse effect, unless their locations themselves have achieved historic or cultural significance, their structural integrity might be impaired by the relocation, or their new location would make them vulnerable to deterioration or damage.

600. Developing Alternatives

610. ARCHAEOLOGICAL RESOURCES

Alternatives that would reduce or avoid impacts on archaeological resources would be those that would allow the archaeological resource to remain in place, undisturbed and undestroyed. Any project alternative that achieved this result would be suitable. Most often, these alternatives include relocation of any proposed excavation or other activity to another part of the site, or to another site all together.

620. ARCHITECTURAL RESOURCES

Alternatives for significant adverse impacts on architectural resources typically involve incorporation of some of the mitigation measures described above. These include relocating the action, or redesigning the project in a more contextual manner. Often, smaller projects or projects redesigned to incorporate different massing, scale, material, or other design characteristics can be appropriate alternatives. Coordination with LPC may be helpful in identifying appropriate alternatives.

700. Regulations and Coordination

710. REGULATIONS AND STANDARDS

711. Federal Regulations

711.1. National Historic Preservation Act of 1966

If the action also falls within Federal jurisdiction (that is, it is Federally funded, licensed, or regulated), then the requirements of the National Historic Preservation Act of 1966, as amended (NHPA), and implemented by procedures set forth in 36 CFR Part 800 (*Protection of Historic Properties*), apply. The NHPA was amended in 1992. *Section 106* of the NHPA requires Federal agencies to take into account the effects of their undertakings, including undertakings they assist or license, on historic properties, and to afford the Advisory Council on Historic Preservation a reasonable opportunity to comment on such undertakings. In addition, *Section 111* of the NHPA mandates that Federal agencies may lease and exchange historic properties and enter into contracts for the management of historic properties only after the agencies determine that the lease, exchange, or management contract will adequately ensure the preservation of the historic property.

711.2. Federal Department of Transportation Act

Other regulations that can apply include Section 4(f) of the Federal Department of Transportation Act of 1966 (DOTA), which applies to transportation projects (usually highways) funded by the Federal Department of Transportation. This law requires the Federal agency responsible for the project to consider whether the project would infringe on publicly owned land or any site of national, State, or local historic significance, as determined by the appropriate officials. Such an infringement can occur only if there is no feasible and prudent alternative and if such program includes all possible planning to minimize harm to such properties.

711.3. Other Federal Laws

In addition to the DOTA, other similar acts dealing with specific modes of transportation also require protection of historic resources unless there is no feasible and prudent alternative and unless all possible minimi-

zation of harm is planned. These include the Airport and Airway Development Act of 1970, the Federal-Aid Highway Act of 1968, and the Urban Mass Transit Act. The Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA), a six-year, $151 billion transportation program, gives States and municipalities a major role in decisions about transportation-related issues, and provides funds for enhancements related to the quality of life, including historic preservation.

In addition to all of the Federal protections described above, archaeological resources are given special protection under the Archaeological Resource Protection Act of 1979. This act regulates the taking of archaeological resources on Federal land. Other Federal protections for archaeological resources are provided by the Historic Sites Act of 1935, the Antiquities Act of 1906, the Archaeological Recovery Act, the National Environmental Policy Act of 1969, the Abandoned Shipwreck Act of 1987, and the Native American Graves Protection and Repatriation Act of 1990.

712. State Regulations

For actions within State jurisdiction (that is, it is funded, licensed, or regulated by a State agency), the governing regulation is Article 14 of the New York State Historic Preservation Act of 1980 (SHPA). This law requires that State agencies must avoid or mitigate any significant adverse impacts on historic properties to the fullest extent practicable, feasible, and prudent. These requirements are the same as those of the State Environmental Quality Review Act, or SEQRA. The SHPA mandates consultation with the State Historic Preservation Officer (see discussion on coordination, below).

713. City Regulations

The New York City Landmarks Law establishes LPC and gives it the authority to designate City Landmarks, Interior Landmarks, Scenic Landmarks, and Historic Districts and to regulate any construction, reconstruction, alteration, or demolition of such Landmarks and Districts. Under the Landmarks Law, no new construction, alteration, reconstruction, or demolition can take place on Landmarks, Landmark sites, or within designated New York City Historic Districts until the LPC has issued a Certificate of No Effect on protected architectural features, Certificate of Appropriateness, or Permit of Minor Work. Actions reviewed under CEQR that physically affect Landmarks or properties within New York City Historic Districts require mandatory review by LPC and, in the case of private properties, approval of LPC.

Both private applicants and public agencies must apply to LPC for any work on designated structures, sites, or structures within historic districts. The LPC issues permits to private applicants and reports to public agencies. No work on these protected resources may proceed prior to the issuance of a Landmarks Preservation Commission permit or report.

720. APPLICABLE COORDINATION

Where designated New York City Landmarks or properties already calendared for designation are involved, the lead agency must coordinate with the LPC. When properties listed on or formally determined eligible for the State and/or National Registers, recommended by the New York State Board for listing on the Registers, or National Historic Landmarks are involved, the lead agency should coordinate with either the LPC or SHPO. It is possible that coordination with both LPC and SHPO may be required (for example, if a property is a New York City Landmark and listed on the State and National Registers). Coordination with the SHPO is also required for actions that fall within State or Federal jurisdiction (see above). The SHPO is responsible for coordination with the Advisory Council on Historic Preservation, as appropriate.

730. LOCATION OF INFORMATION

731. Designated Resources

- New York City Landmarks Preservation Commission
  225 Broadway
  New York, NY 10007
  Files on properties that have been designated New York City Landmarks or listed on the State and National Registers of Historic Places, and on the location of known archaeological sites in the City.

- New York State Office of Parks, Recreation and Historic Preservation
  Historic Preservation Field Service Bureau
  Peebles Island
  Box 189
  Waterford, NY 12188-0189
  Information about properties listed on or determined eligible for listing on the State and/or National Registers of Historic Places.
  State archaeological files.

- New York State Museum
  Office of the State Archaeologist
  University of the State of New York
  Albany, NY 12230
  State archaeological files.

732. Unknown Resources

When a survey is appropriate to identify unknown historic resources, useful sources can include local academic institutions and museums (such as the Museum of the City of New York), historical societies (such as the New-York Historical Society, the Brooklyn Historical Society, the Queens Historical Society, and the Staten Island Historical Society), and the City's public libraries. Both LPC and OPRHP can be consulted as to the likelihood that a site contains archaeological resources. Sources for detailed historical research include historic maps, which can be found at the New York Public Library, 42nd Street Branch, and the libraries and historical societies that have already been listed. Deeds and other land ownership records are housed at the various borough halls; Buildings Department records are also located in each Buildings Department borough office (see Section 3A.730 for addresses). Tax records, 19th century Buildings Department records, and early plans and maps can be found at the Municipal Archives in Manhattan.

732.1. Museums and Historical Societies

- Museum of the City of New York
  Fifth Avenue at 103rd Street
  New York, NY 10029

- New-York Historical Society
  170 Central Park West
  New York, NY 10024

- Bronx County Historical Society
  3309 Bainbridge Avenue
  Bronx, NY 10467

- Brooklyn Historical Society
  128 Pierrepont Street
  Brooklyn, NY 11201

- Queens Historical Society
  143-35 37th Avenue
  Flushing, NY 11354

- Staten Island Historical Society
  441 Clarke Avenue
  Richmondtown, Staten Island, NY 10306

732.2 Other Sources

- Local, community-based preservation groups

732.3 Publications

Publications that can be helpful in evaluating potential historic resources are available from the National Register of Historic Places, National Park Service, U.S. Department of the Interior, P.O. Box 37127, Washington, DC 20013-7127. The *Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation* and the *Secretary of the Interior's Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings* can also be obtained from the National Park Service.

G. Urban Design/Visual Resources

100. Definitions

An area's urban design components and visual resources together comprise the "look" of the neighborhood: the physical appearance, including the sizes and shapes of buildings, their arrangement on blocks, the street pattern, and noteworthy views that give an area a distinctive character. The potential for a project to affect visual character, the urban design and/or the visual resources of an area, is considered in a CEQR analysis.

110. URBAN DESIGN

The urban design characteristics of a neighborhood are composed of the various components in the buildings and streets of the area:

- *Building bulk, use, and type.* Buildings in a neighborhood are usually described by their bulk, use, and type (such as "boxy manufacturing buildings," or "narrow, high-rise commercial buildings"). The concept of bulk is created by the size of a building and the way it is massed on its site. Height, length, and width define a building's size; volume, shape, setbacks, lot coverage, and density define its mass. In describing a building, noting its general use (manufacturing vs. residential, for example) conveys a sense of its appearance, and thus adds to the understanding of its visual and urban design character.

- *Building arrangement.* This term refers to the way that buildings are placed on zoning lots and blocks. They may be attached to one another, as are row houses, or detached and separated by driveways or open uses. Building arrangements can be quite varied or organized in a site plan (such as an institutional campus or a large residential development like Stuyvesant Town).

- *Block form and street pattern.* The shape and arrangement of blocks and surrounding streets may be regular—composed of rectangular blocks, formed by streets intersecting at right angles, as is found throughout much of Manhattan. The rectangular grid may be interrupted by superblocks, such as Lincoln Center, or by a diagonal street, such as Broadway, which crosses Manhattan's regular grid at various points, often creating "bow tie" street patterns, the most famous of which is Times Square. In other areas of the City, the pattern may be defined by irregularly shaped blocks, curving streets, or cul-de-sacs. The block form and street pattern contribute to urban design because they define the flow of activity in an area, set street views, and create the basic format on which building arrangements can be organized. Lincoln Center or Stuyvesant Town could not exist without a superblock pattern; midtown Manhattan's large, regular blocks can and do contain a variety of building sizes, but the small, irregular shapes of blocks in, say, the West Village permit only buildings with relatively small footprints.

- *Streetscape elements.* Most areas include distinctive physical features that make up a streetscape, such as front yards, street trees, curb cuts, street walls (i.e., the "wall" created by the continuous front facade of buildings along the street), street furniture (i.e., items permanently installed on the street, such as street lights, fire hydrants, or newsstands), building entrances, curb cuts, parking lots, fences, stoops, parking ribbons (i.e., the row of parked cars along a street), service entrances visible from the street, etc.

- *Street hierarchy.* Another descriptor for an area's streets is their classification, which convey a sense of width, circulation, and activity. These include expressways, which have limited vehicle access and no at-grade pedestrian crossings (e.g., the Van Wyck Expressway); arterials, which have limited, at-grade crossings (e.g., West Street/Twelfth Avenue in Manhattan); boulevards (such as Eastern Parkway in Brooklyn); collector/distributor streets (such as Flatbush Avenue); and local streets (which include cul-de-sacs).

- *Natural features.* Natural features include vegetation and geologic, topographic, and aquatic features. Rock outcroppings, steep slopes or varied ground elevation, beaches, or wetlands can help define the overall visual character of an area.

120. VISUAL RESOURCES

An area's visual resources are its unique or important public view corridors, vistas, or natural or built features. (For the purposes of a CEQR analysis, this includes only views from public and publicly accessible locations and does not include private residences or places of business.) Visual resources could include views of the waterfront, public parks, landmark structures or districts, or natural resources. Natural resources may be vegetation, topography, and geologic formations; and wetlands, rivers, or other water resources.

200. Determining Whether an Urban Design/Visual Resources Assessment is Appropriate

A detailed assessment of urban design and visual resources is not necessary for many projects. As described below, a preliminary screen looks for whether a project would have substantially different bulk or setbacks than exist in an area and whether substantial new, above-ground construction would occur in an area that has important views, natural resources, or landmark structures.

210. URBAN DESIGN

When a proposed action would result in any of the following conditions, an assessment of urban design is generally appropriate:

- *Buildings*. If the action would result in a building or structures substantially different in height, bulk, form, setbacks, size, scale, use, or arrangement than exists (such as the construction of a tall, slender office tower in a manufacturing area).

- *Streets*. If the action would change block form (such as would occur with the creation of a superblock); or would demap an active street; would map a new street; or would affect the street hierarchy, street wall, curb cuts, pedestrian activity, or other streetscape elements.

220. VISUAL RESOURCES

When an action would result in above-ground development or would change the bulk of new above-ground development (such as with a zoning change) and is proposed in an area that includes significant visual resources, an analysis of visual resources may be appropriate.

300. Assessment Methods

310. STUDY AREAS

Because the land use study area is the area where the action may influence land use patterns and, hence, the built environment, the study area for urban design is generally consistent with that used for the land use analyses.

For visual resources, the designation of specific study areas is less defined. The land use study area may serve as the initial basis for analysis; however, in many cases where significant visual resources exist, it may be appropriate to look beyond the land use study area to encompass views outside of this area (such as from within the area to a visual landmark, such as the Statue of Liberty or Verrazano-Narrows Bridge) or from locations outside the study area into the study area (such as in an instance where there are views to significant visual landmarks within the study area, such as the Williamsburgh Bank in Brooklyn or Trinity Church in lower Manhattan).

320. ANALYSIS TECHNIQUES

321. Determining Characteristics of Visual Quality

Once the study areas have been established, the urban design characteristics and significant visual resources should be described. The following steps may be undertaken in preparing that assessment.

321.1. Gathering Information

Urban Design. The gathering of information is focused on those elements of an area's urban design that may change as a result of the action. For example:

- If an action would result in development of a building substantially different from much of its surroundings (a tall building in a midblock that is usually typified by row housing, for example), then the analysis would focus most detail on the types of buildings in the area and their relationship to overall urban design. An understanding of that relationship may require analysis of block form or street grid, for example, so these elements would be inventoried in some detail, as well.

- If an action would alter the street grid (demap a street, create a superblock, for example), the urban design analysis would focus on the street grid itself, block forms in the area, and building arrangements.

For most localized actions, detailed data are presented for the area in the immediate vicinity of the site affected by the action, and more generalized information is presented for the remainder of the study area. The first step in the analysis is a *field visit*, which is made during a typical day, rather than at odd hours. The observer documents the elements of urban design relevant to the action, describing conditions with the use of maps, field notes, and photographs. (Black and white photographs make the best reproductions in a report.) The analyst then *supplements the information gathered in the field* with data on such features as building heights, footprints, and setbacks, which can be obtained from Fire Insurance Underwriters' maps and

Sanborn maps; and age of buildings, which can be obtained from the Department of Buildings or other secondary sources. The information from field and research sources can include, as relevant:

- Building bulk, height (in stories and feet, as appropriate), setbacks, density.
- Building use, as it relates to visual character.
- Building arrangement (for this information, Sanborn maps may be particularly useful).
- Block form and street pattern, including the shape and arrangement of blocks and surrounding streets. This description notes, as appropriate, whether there are mapped, unbuilt streets in the area; information on which streets are officially mapped is found on the City Map, available for review in the Borough President's office in each borough.
- Streetscape elements should be described, including street furniture, streetwall, front lawns, median strips, stoops, loading docks, etc.
- Street hierarchy may be an important visual factor in some areas—for example, where an expressway divides a neighborhood or where a boulevard is a centerpiece of pedestrian activity, such as Broadway on the upper West Side of Manhattan.

Once the information is gathered, it is assessed, focusing on the relationships among urban design elements that could be affected by the proposed action. The written assessment typically includes illustrations, including maps, photographs, or drawings.

Visual Resources. As with urban design, the focus for visual resources depends on anticipated impacts of the proposed action and on the character of the study area itself. For example, if the action would result in a development that would block a street that gives views of a river, the analysis would focus on that and other view corridors in the area; if the action would result in a development close to and obscuring views of a visually defining (and perhaps historic) structure, the visual resources study would focus on the relationship between the important structure and its surroundings.

A *field visit* is essential to identify and document important visual resources, such as views from the study area as well as distinctive resources within the study area that may be observed from outside the area. Often this field visit is undertaken with the urban design field visit, and the elements of visual resources described in field notes, on maps, and through photographs. The field visit can be supplemented by *documentary research* on the area or feature in question, such as the history of an important natural resource or unusual building. The approach to the gathering of information is as follows:

- The context in which a view is generally observed should be noted, such as a view that is seen by people traveling to and from work (e.g., views of the harbor and the Brooklyn waterfront seen from lower Manhattan) or one that is seen during recreational activity (such as that of lower Manhattan from the promenade in Brooklyn Heights). Note whether there are existing obstructions to these views.
- In addressing a view corridor issue, note whether the view corridor is unique or rare in the study area, or whether there are other, parallel corridors available to the same viewer group.
- If the issue is the potential obscuring or altering the context of a natural or built visual feature, then the analysis should focus on defining in some detail the character of that visual feature. This may include, for a structure, its history, size, shape, location in the neighborhood, unusual materials, or architectural design; if the building is an example of a particular architectural style or the work of a noteworthy architect, this information is also included. The reason for the building's importance as a visual feature is assessed: it may be important because it is taller than the surrounding area (such as a church), or stands at the end of an important street (such as Trinity Church at the end of Wall Street), or sets a particularly fine example of surrounding architectural style, or represents an era gone by, etc. A similar analysis is undertaken for a natural or open space feature: the feature is assessed for its defining visual qualities (such as unique land forms, elevation, unusual vegetation, etc.) and for its importance to the surrounding area.

321.2. Describing the Visual Character

Combined, the data on urban design and visual resources as well as photographs and illustrations are used to describe the visual character of the area. The assessment is organized to focus on key components of the visual character as relevant to the proposed action and organized so as to describe the most prominent visual features first. The previously described urban design characteristics and visual resources can be used to structure this discussion. The description should also

underscore those features that define the visual character of the area and should pay particular attention to the way in which the location of the proposed action fits into the visual character of the area under existing conditions. For example, a vacant lot that is the site of the proposed action may have a blighted, trash-strewn appearance in an otherwise well-kept residential area, or the existing structures on the proposed project site may block views to the waterfront.

322. Future No Action Condition

Using data gathered in the land use study on future actions and proposed projects in the study area, assess whether urban design or visual resources in the study area would change in the future. For example, if a zoning change is planned in the future that would facilitate new types of construction, the assessment of future no action conditions would need to consider how urban design could be affected by the different types or scales of development that could occur. Other no action plans and projects, such as construction of new buildings, or even implementation of a business improvement district, which may add street furniture or median-strip plantings, may also affect both urban design and visual resources.

The description of future no action conditions need not repeat the description of existing conditions. Rather, the no action condition discussion can reference the existing conditions discussion and focus only on changes that would be expected to occur to the urban design and visual resource characteristics of the area, without implementation of the proposed action. Generally, the level of detail of the no action discussion should be greater for the expected no action condition changes closest to the site of the proposed action.

323. Future Action Condition

The description of future action conditions details what the project would look like, how it would fit within the urban design of the area, and whether and how it would affect visual resources of the area. In almost all instances, visual character impacts are related to the physical design of the building(s) (or proposed permissible physical design characteristics) associated with the proposed action. Illustrations are important in communicating the results of this analysis. Such illustrations can include, as appropriate, site plans, renderings, perspective drawings, photographs, and photomontages, in which the development associated with the proposed action is superimposed on a photograph of existing conditions.

In instances where a proposed action does not include a specific development but rather applies to a large area (such as an areawide rezoning action), it is sometimes helpful to frame potential effects within the context of the entire area to be rezoned, through illustrations of a series of conditions that could occur within the area subject to the proposed action. Using this as an example, if the proposed rezoning would allow low lot coverage, higher-rise commercial buildings, and would affect an area that was predominantly industrial with high lot coverage, low-rise buildings at one end of the area and the opposite at the other end of the area, the assessment and illustrations could present both conditions, and then discuss which of the conditions was most applicable to various parts of the area to be rezoned. More possible typical conditions within this area would lead to the need for additional illustrations and text to cover these prototypical conditions. In developing the prototypical illustration for this analysis, the reasonable worst case, proposed permissible building massing in terms of urban design and visual resources in the area should be assumed.

323.1. Urban Design

The future action condition first describes what the project would look like—its height, bulk, setbacks, placement on the block, etc. Even if a project fully complies with existing zoning, its appearance should be described, as conformance with zoning does not necessarily mean the project would conform with the look of the neighborhood. (For example, a district zoned C-4 and C-6 may include buildings that are predominantly older and reach only 6 or 8 stories; a new building complying with zoning may be more than 20 stories in height and would appear dramatically different). Depending on the action itself, the assessment would focus on the relationship of the new development to key urban design elements in the surrounding area, as follows:

- If the action introduces development with different building forms or scale than the prevailing urban design features; if that change is to a very homogenous urban design setting or to one that is already quite varied.

- If the action alters block forms or the street grid; if that change alters the basic organizing format of the urban neighborhood or if the future no action street grid is already quite varied.

- If an action alters the streetscape, by, for example, breaking a street wall or introducing new street furniture and signage; if that change is to a homogenous and consistent streetscape or to one that is characterized by variety.

- If an action alters street hierarchy, for example, an action designed to promote through movement on a street that serves as a boulevard focus for a neighborhood; if that change really introduces a new visual character for the street, or emphasizes a character that is already prevalent.

323.2. *Visual Resources*

The assessment of the impact of the proposed action on visual resources focuses on those visual resources that may be affected by the proposed action. The first step, then, is to describe the proposed action as it relates to such resources, including, as appropriate, proximity, orientation, height, bulk, etc. Then, the change to the resource attributable to the action can be assessed. This would include, as appropriate, the following types of effects:

- If the action blocks, partially or entirely, a view corridor; if that view corridor is rare in the area or one of several; if the viewer group affected is particularly vulnerable to the change in view.

- If the action blocks, partially or entirely, views of a natural or built visual resource; if the views blocked are the ones essential to visual character in the area.

- If the action changes urban design features so that a natural or built visual resource is no longer dominant in an area (for example, if the action's building is taller than the one other tall structure that identifies a neighborhood); if that change in dominance changes the visual identity of the area.

- If the action changes urban design features so that the context of a natural or built visual resource is altered (for example, if the action alters the street grid so that the approach to the resource changes; if the action changes the scale of surrounding buildings so that the context changes; if the action removes lawns or other open areas that serve as a setting for the resource).

400. Determining Impact Significance

The determination of significance is somewhat subjective, as no standards exist for measuring visual character impacts. In general, substantial changes to urban design or views and context of visual resources may be considered significant. Substantial changes in either urban design characteristics or visual resources could result in a significant impact to visual character, which encompasses the two. In making the determination, it is important to consider the "purity" or uniqueness of the no action condition visual character relative to the visual conditions that would be created by the proposed action. For example, in an area having a mix of building forms, scales, and heights, a building associated with the proposed action may be much larger in scale than one of its neighbors, but consistent with other buildings in the immediate area. In such a case, significance would not likely be determined.

Some projects may affect visual character significantly, but not adversely. A project may greatly improve the appearance of an abandoned lot, or create a new, important visual landmark. In these instances, a major new structure that may be larger or have a different appearance than the surrounding area, would not, necessarily, have an adverse impact on visual character.

410. *URBAN DESIGN*

A project may have a significant impact on urban design if it would result in buildings or streets (or would allow for new construction of buildings or streets, as in a zoning change) that would appear considerably different from that in the area as assessed in the no action condition. As noted above, a significant change in urban design is not necessarily an adverse impact; a qualitative judgment must be made to assess this. Some of the key considerations in determining whether such impacts are significant and adverse include the following:

- *Bulk, building type, setbacks.* If the size and mass of the proposed action would be substantially different from that prevailing in the area or anticipated in the future no action condition (e.g., a slender commercial office tower in a low-rise manufacturing area).

- *Building arrangement.* If the proposed action would include a building arrangement that is substantially different from that of the neighborhood so that it would change the characterization of building arrangement in the area (e.g., placement of a large detached building at an angle to the street in an area characterized by attached structures facing the street).

- *Block form and street pattern.* If the action would create a shape and arrangement of blocks and/or surrounding streets that is different from that of the area so that it changes the prevailing form and pattern (e.g., the mapping or demapping of streets in an area where the streets create a regular block pattern).

- *Streetscape elements*. If the proposed action would add to, eliminate, or alter a critical feature of a streetscape (e.g., the introduction of a long, blank wall on a street characterized by active storefronts).

- *Street hierarchy*. If the proposed action would change the street hierarchy in a manner that would substantially visually change the area (e.g., the alteration of a local street to a more active collector street).

- *Land use*. If the action would alter that aspect of land use that defines urban design character (e.g., the replacement of a series of small shops with a single use, such as an office building).

420. VISUAL RESOURCES

A proposed action may significantly and adversely affect visual resources if it would affect the public's ability to view and enjoy those resources. Key considerations in the assessment of significance of an visual resource impact may include the following:

- *Views or vistas*. If the project would significantly and permanently obstruct important views or vistas. Aspects to be considered include whether the obstruction would be seasonal or temporary; how many and what type of viewers would be affected; whether the view is unique or do similar views exist; or whether it can be seen from many other locations.

- *Natural resources*. If the project would result in significant changes to natural features. Aspects to be considered include whether the action would permanently eliminate natural features that are now enjoyed by the community or designated as special resources in the Zoning Resolution; whether the action would obstruct the public's ability to enjoy natural features (by blocking views or access).

- *Historic resources*. If the proposed action would significantly affect the visual enjoyment of an historic resource (e.g., if the construction of a new building would impair the public's ability to view the historic resource or would change the visual context in which the resource is understood). This analysis is undertaken in coordination with the historic resources analysis (Section 3F).

- *Waterfront*. If the proposed action would significantly affect the public's enjoyment of waterfront views. This analysis is undertaken in coordination with the waterfront revitalization analysis (Section 3K).

500. Developing Mitigation

Because significant adverse impacts on visual character relate to projects that physically change a site (or provide an opportunity for a physical change, such as through a rezoning), their appearance, location, placement on the block, effect on the street grid, or alteration of topography etc., mitigation for these impacts looks at changes to these features to make the project visually more in character with the area. Changes to a building's location or major alterations to its size and shape, or a different mapping action would, generally, constitute a different action and are examined under "Alternatives," Section 600, below; minor alterations to the way a building is designed are examined as mitigation.

510. URBAN DESIGN

The way in which mitigation is approached for a significant adverse urban design impact relates to the specific design elements that would cause the impact.

- *Bulk, building type, setbacks*. Minor design changes may be sufficient to make a structure visually compatible with the surrounding area. These changes may be implemented by minor alterations to the building (e.g., reducing height and increasing width without otherwise changing the building's proposed function) or by provision of screening, such as landscaping, if appropriate.

- *Building arrangement*. Minor changes to the proposed site plan may create a building arrangement more compatible with the surrounding area.

- *Block form and street pattern*. There is no mitigation for significant adverse impacts on block form and street pattern. Relief from such impacts would involve substantial design changes to the proposed action and can be sought through project alternatives (see below).

- *Streetscape elements*. Mitigation for impacts related to streetscape elements would involve changing those elements that are incompatible (e.g., elimination of incompatible curb cuts).

- *Street hierarchy*. If an action is found to have a significant adverse impact on the street hierarchy, it may be possible to revise the proposed street system so that it is more compatible with the

surrounding area. This would be true of a project that included the widening of street along the blockfront of a proposed project, to serve as a drop-off area. In the instance where the widened street would have an arterial or boulevard character, joining with streets having a "local" visual character at each end of the widened street, mitigation may include eliminating the proposed street widening and providing for drop-offs within the site boundaries. Such mitigation would have to be closely coordinated with the traffic studies for the proposed action.

- *Land use*. Partial mitigation for visual impacts related to land use changes would be to alter some design elements. In the example of the removal of many storefronts for a single office user, the design could include strategic placement of pedestrian entrances, storefront-type displays to break up a blank street wall, etc.

520. VISUAL RESOURCES

Mitigation for a potential significant adverse impacts on visual resources may include development of alternate viewing areas, or alteration of minor design elements to make the proposed action more compatible with the resource. The major way to reduce or eliminate impacts on visual resources is through design or site configuration alternatives, discussed below.

600. Developing Alternatives

Alternatives that would reduce or eliminate significant adverse impacts on urban design and visual resources may be classified into two major types: those that involve substantial design changes to the proposed action (beyond that appropriate as mitigation), and those involving alternative sites. For visual character impacts, the project alternatives usually include a different physical design that would not result in the same impacts as the action as proposed. These physical changes may include a reduction in size, major alterations to the site plan, changing the orientation of buildings, or alterations to proposed street mappings or demappings.

Alternative site analyses would involve the examination of a different site for the proposed action, which would result in a project more in keeping with the visual character of the alternative site's surrounding area, or one that would not block important view corridors, eliminate important natural areas, etc.

700. Regulations and Coordination

710. REGULATIONS AND STANDARDS

There are no specific City, State, or Federal statutory regulations or standards governing the analysis of visual character.

720. APPLICABLE COORDINATION

721. Urban Design

Coordination with the Department of City Planning may be useful in any urban design assessment, but is only required when the Department of City Planning is an involved agency. This would occur if the project included an action subject to approval by the City Planning Commission.

722. Visual Resources

An impact on public waterfront views may be inconsistent with the Waterfront Revitalization Program (see Section 3K, "Waterfront Revitilization"); and consultation with the Waterfront and Open Space Division of the Department of City Planning is recommended in those circumstances. Similarly, obstructing a view of a landmark (see Section 3F, "Historic Resources") may also be a significant impact; consultation with the Landmarks Preservation Commission is recommended in those instances.

730. LOCATION OF INFORMATION

The Department of City Planning maintains a copy of the Zoning Resolution and Sanborn maps, Fire Insurance Underwriters maps, and tax maps for the entire City. These sources are also available in local public libraries. City Maps are available for viewing in the Borough President's office in each borough and at the Department of City Planning.

H. Neighborhood Character

100. Definition

Neighborhood character is an amalgam of the various elements that give neighborhoods their distinct "personality." These can include land use, urban design, visual resources, historic resources, socioeconomics, traffic, and noise. These technical areas, and whether an action would affect them, are often considered in CEQR, and they are defined and described individually in other sections of the Technical Manual. For neighborhood character, CEQR considers how those elements combine to create the context and feeling of a neighborhood, and how an action would affect that context. Thus, to determine an action's effects on neighborhood character, these contributing elements are considered together.

200. Determining Whether a Neighborhood Character Assessment is Appropriate

An assessment of neighborhood character is generally needed when the action would exceed the preliminary thresholds for neighborhood character, presented below, or when it appears that the action would have moderate effects on several of the elements that contribute to neighborhood character that in combination could have an effect on neighborhood character.

210. *PRELIMINARY THRESHOLDS*

When the proposed action would result in any of the following conditions, an assessment of neighborhood character is generally appropriate.

- *Land use.* When development resulting from the proposed action would conflict with surrounding uses; conflict with land use policy or other public plans for the area; change land use character; or result in a significant land use impact, as determined in that technical analysis.

- *Urban design.* When the proposed action would result in substantially different building bulk, form, size, scale, or arrangement; block form, street pattern, or street hierarchy; streetscape elements, such as streetwall, landscaping, curbcuts, loading docks, and pedestrian activity and circulation; or changes to natural features; or when a significant urban design impact is identified in that technical analysis.

- *Visual resources.* When the proposed action would result in substantial direct changes to a visual feature, such as unique and important public view corridors and vistas, or to public visual access to such a feature.

- *Historic resources.* When the proposed action would result in substantial direct changes to a historic resource or substantial changes to public views of a historic resource; or when a significant impact on historic resources is identified in that technical analysis.

- *Socioeconomic conditions.* When the proposed action would result in substantial direct or indirect displacement or addition of population, employment, or businesses; substantial changes in the character of businesses; substantial differences in population or employment density from the prevailing condition; or a significant socioeconomic conditions impact, as identified in that technical analysis.

- *Traffic.* When an aspect of traffic—such as the amount of traffic or the type of vehicles—contributes to neighborhood character, *and* when the proposed action would result in a change in level of service (LOS) to C or below (see the traffic section of this Manual for details on level of service);
  —Change in traffic patterns;
  —Change in roadway classification (from local to collector, etc.);
  —Change in vehicle mix;
  —Substantial increase in traffic volumes on residential streets; or
  —Significant traffic impact, as identified in that technical analysis.

- *Noise.* When a proposed action would result in significant adverse noise impacts *and* would result in a change in acceptability category (see the discussion in the noise section of this Manual).

220. *COMBINATION OF MODERATE EFFECTS*

Even if an action would fall below the preliminary thresholds for neighborhood character (Section 210, above), it is possible that several moderate changes in the elements that contribute to neighborhood character could lead to a significant impact on neighborhood character. If it appears that this might occur, a neighborhood character analysis may be appropriate. More information on this kind of significant impact is provided in Section 400, below.

300. Assessment Methods

310. STUDY AREA

The study area for neighborhood character is the area that may have its character affected by the proposed action. Often, it is coterminous with the land use study area. Unless the action covers a substantial physical area or is a generic or programmatic action, the study area should generally include at least the project site and the area within 400 feet of the project site boundaries (see discussion of study areas in the land use section in this Manual). These boundaries can be modified, however, as appropriate, to include any additional areas that would be affected by the action, or to exclude areas that would clearly not be affected by the action.

Larger study areas may be appropriate in such circumstances as actions that are large in scale, that are just outside a well-defined neighborhood that they could affect, or those with truck routes or other action-related traffic some distance from the site of the action. An example of an action requiring a larger study area would be an action that would facilitate a new commercial building on the outskirts of a well-defined neighborhood, such as Brooklyn Heights. Even if that neighborhood is outside of the quarter-mile radius generally appropriate as the study area for a new commercial building, including some of Brooklyn Heights in the study area may be warranted if it appears that the new building could affect its character. This could occur, for example, if the new building would be visually inconsistent with and visible from the neighborhood, or if it would generate increased traffic along quiet, residential neighborhood streets.

Smaller study areas may be appropriate when the neighborhood that would be affected would itself be smaller than the typical study area. An example would be a mid-rise (say, 15- to 20-story) building proposed for midblock in a residential part on the Upper West Side in Manhattan, where the midblock portion of the block has a strongly defined low-rise (four- to five-story) residential character that is very different from the ends of the block, where mid-rise buildings with stores on the ground floors front the wide avenues. The proposed building would not affect the character of the end portions of the block, but could affect the midblock portion. Therefore, the study area would focus on the midblock portion of the block. Considering a study area that is too large would dilute the intensity of the effects—in this case, a larger area could make it appear that the action would have no significant impacts.

For generic or programmatic actions that would affect relatively small areas, the affected areas would serve as the study area. When large areas would be affected, the analysis can consider neighborhoods typical of those that would be affected. For example, in its evaluation of the Quality Housing zoning amendments, the City chose 35 neighborhoods representative of the types of neighborhoods that could be affected and studied the rezoning's potential effects on those neighborhoods.

320. ANALYSIS TECHNIQUES

321. Determining Characteristics of Neighborhood Character

After the appropriate study area has been established, the determining characteristics of that neighborhood should be identified. The analyst should determine the neighborhood's overall character, as well as the elements that contribute to and define that character. The steps involved in assessing neighborhood character are described in this section.

321.1. Gathering Information

1. *Field visit.* Generally, the first step is a field visit to observe the neighborhood. Field visits are made during typically active periods rather than at odd hours. The analyst observes such features as the major uses, scale and types of buildings, activity patterns and intensities, and the relationship between traffic, noise, and the character of the streets. Any unusual features or combination of features are identified.

2. *Photographs.* Photos are effective in illustrating a neighborhood's characteristics.

3. *Other available information.* Data gathered for other technical areas of the environmental assessment (such as land use, visual quality, socioeconomics, etc.) are useful in identifying the neighborhood's characteristics.

4. *Interviews.* Interviewing neighborhood residents and workers to learn about the neighborhood is also useful in some cases, but generally is not necessary.

321.2. Describing the Existing Character

Both graphics and text can be used to describe the character of the neighborhood affected by the action. This assessment should be organized to identify those elements that have a major determining role in the character of the neighborhood.

Because a neighborhood's character is the result of the combination of various contributing elements, the description should characterize the salient features of the neighborhood rather than repeating information about each of the contributing technical areas (e.g., land use, socioeconomics, etc.) found elsewhere in the environmental assessment. The discussion should focus on the major characteristics of the neighborhood and how they relate to the area's overall character. The discussion should address all of the various components of neighborhood character, even if changes to only one of these elements have triggered the need for an analysis. Some of these elements will be critical to the character, while others may be only contributing.

For example, the Financial District area of Manhattan is characterized and defined by its tall buildings and narrow, winding streets. The skyscrapers front uniformly onto the street, creating a wall. During much of the day, these streets are crowded with pedestrians. In this neighborhood, the height and form of the buildings, the width of the streets, the block form, and the pedestrian activity are the defining characteristics. Other elements, such as socioeconomic conditions, traffic, and noise, contribute, but are not key features of the Financial District area.

In another area, however, such as suburban Staten Island, the width of the streets and the buildings' positions relative to the street may not be important, but the size and form of its single-family, detached homes, the landscaping, and the quiet and traffic-free streets may be.

Generic or programmatic actions can be assessed similarly. In the evaluation of the Quality Housing zoning amendments described above (Section 310), for each of the 35 representative neighborhoods, the following characteristics were noted: regularity of street grid, building form, site planning, parking, and streetscape. These descriptors were particularly relevant because they were characteristics that could be directly affected by the proposed action. Each neighborhood was also described according to its predominant land use(s): low-rise, residential, medium-density residential, commercial, industrial, or undeveloped.

322. *Future No Action Condition*

Using the information gathered for the other technical areas about expected changes in the future, assess whether and how the character of the neighborhood would change in the future without the proposed action. This analysis focuses on the key elements that contribute to neighborhood character, similar to the analysis of the proposed action, described below in Section 340.

323. *Future Action Condition*

To determine how the proposed action would affect neighborhood character, relative to the no action conditions, the assessment should describe the proposed action in terms of how it would affect the key elements that define the study area's character. For example, if one of the most important aspects of a neighborhood's character is that a street ends in a cul-de-sac, so that the area is very quiet and has very little traffic, note whether the action would change that condition (by continuing the street through, for example). In the example of Manhattan's Financial District, where the height and form of the buildings, narrowness of the streets, and pedestrian activity are the defining characteristics, a tower-on-a plaza design for an office building would change neighborhood character in its vicinity, even if it represented a one-for-one replacement of floor area and use of a more characteristic building. Also, in this case an increase in traffic alone, although it might be a significant traffic impact and require mitigation, would not affect neighborhood character.

Generic or programmatic actions can be assessed in much the same way, with somewhat less detail than site-specific actions' assessments. In some cases, when less detail about the action is available, the assessment will consider the types of circumstances or issues that *could* affect neighborhood character in the study area.

400. Determining Impact Significance

Understanding key elements that define neighborhood character and the relationship among elements forms the basis for determining impact significance. Usually, a significant change to one of the determining elements of neighborhood character will result in a significant impact on neighborhood character. In general, the more uniform and consistent the existing neighborhood context is, the more sensitive it is to change. A neighborhood that has a more varied context can typically tolerate greater changes without experiencing significant impacts.

A significant impact identified in one of the technical areas that can contribute to neighborhood character is *not* automatically equivalent to a significant impact on neighborhood character. Rather, it serves as an indication that neighborhood character should be examined. If that examination determines that one of the defining features of the neighborhood's character would be significantly affected, then a significant impact would occur. For example, a significant traffic impact might occur if an action adds vehicles to an intersection, increasing the delay there. This significant impact would not be an impact on neighborhood character,

however, if traffic is not an important determining characteristic of that neighborhood. Alternatively, a significant impact on neighborhood character could occur because of an increase in traffic on area roadways, even if that increase did *not* constitute a significant traffic impact.

Significant impacts on neighborhood character can also occur even if the proposed action would not have a significant impact on any one defining feature of the area. In these cases, the action may instead have moderate impacts on a number of defining features that cumulatively may result in a significant impact on the neighborhood character. For example, a small commercial strip in a suburban section of Staten Island might be different in land use and in urban design from the area's detached houses with lawns and landscaping, but not significantly; it might add some traffic to the local residential streets, but not a significant amount; and it might increase area noise levels, but not significantly. Altogether, however, the commercial strip could have a significant impact on the neighborhood's character by changing it from a small-scale, quiet residential area to a busier commercial one.

As in other technical areas, significant impacts on neighborhood character can be beneficial or adverse. Because a neighborhood's character is perceived and contextual, this judgment may be more subjective than in other technical areas. For example, a new and modern apartment building in an older neighborhood may be perceived as an improvement by some, but as out of context and adverse by others. The lead agency must make the final decision as to which significant impacts are adverse and require mitigation and may consider comments made during public review in making such a determination (see Chapter 2).

500. Developing Mitigation

Often, the mitigation proposed for significant impacts in the technical areas that contribute to neighborhood character will also mitigate neighborhood character impacts. For example, when a significant traffic impact is predicted and increases in traffic would also significantly affect neighborhood character, measures to mitigate the significant traffic impact may also reduce traffic to levels that are consistent with the neighborhood. Mitigation of urban design impacts will often effectively mitigate related impacts on neighborhood character as well.

Other times, however, mitigation measures may alleviate significant adverse impacts in the other technical areas, but significant impacts on neighborhood character will remain. In the example of significant traffic impacts, above, mitigation measures might reduce the delay at area intersections to acceptable levels, but not the overall effect that increased traffic may have on the character of an area. The number of vehicles might still be high enough to change the character of the streets. Another example is an action that would result in significant adverse socioeconomic impacts related to secondary displacement of neighborhood residents, and a related significant impact on neighborhood character because of the change in the area's population profile. The socioeconomic impacts may be mitigated by finding affordable housing for those residents displaced, but if the residents move outside the neighborhood, the significant impact on the neighborhood's character would still occur.

If the mitigation measures presented for the action's other significant adverse impacts, if any, would not mitigate neighborhood character impacts, other mitigation measures should be identified where feasible. For example, if a signal timing change addresses a traffic impact, but not a related neighborhood character impact, the solution might be deliberate rerouting of project-related traffic to a more suitable street. This solution might be considered even if the diversion causes a new traffic impact (which can be mitigated) but does not affect neighborhood character.

600. Developing Alternatives

Alternatives proposed to avoid impacts in other technical areas of the environmental assessment may also avoid neighborhood character impacts. Similar to mitigation, alternatives proposed in response to impacts in the technical areas of the assessment may not necessarily avoid neighborhood character impacts (see the discussion of mitigation measures in Section 500, above).

Mitigation measures developed specifically to avoid neighborhood character impacts may be incorporated into alternative proposals.

700. Regulations and Coordination

710. REGULATIONS AND STANDARDS

There are no special statutory regulations or standards that control the study of neighborhood character in particular. Regulations and standards for each of the technical areas that can contribute to neighborhood character are discussed in Section 710 of the appropriate Manual sections.

720. APPLICABLE COORDINATION

The neighborhood character section requires considerable coordination among the different technical areas that make up neighborhood character—land use, urban design, visual resources, historic resources, socioeconomics, traffic, and noise. The lead agency will want to be sure that the analysts addressing individual technical areas are aware of the issue of neighborhood character and that the analyst for neighborhood character coordinates with these other disciplines.

730. LOCATION OF INFORMATION

Information related to the elements of neighborhood character is found in the other technical areas of the environmental assessment (see Section 730 of the appropriate technical sections of this Manual).

I. Natural Resources

100. Definitions

For CEQR, a natural resource is defined as plant and animal species and any area capable of providing habitat for plant and animal species or capable of functioning to support environmental systems and maintain the City's environmental balance. Such resources as surface and groundwaters and drainage systems, wetlands, dunes and beaches, grasslands, woodlands, and even landscaped areas, gardens, and built structures used by wildlife may be considered, as appropriate, in a natural resources analysis.

In addition, plant and animal species are also considered natural resources. However, the approach most often used for CEQR is to consider plant and animal species in the context of their environment, or habitat. Then, an action's potential to affect that environment is considered. Of course, those plant and animal species that are known to be threatened, rare, endangered, or otherwise sensitive or worthy of protection are given individual consideration.

110. WATER RESOURCES

New York City is situated on a great, natural, deep-water harbor. Since its founding in the early 1600's, the City has relied on its water resources for a variety of needs, water supply, food source, recreation, and commerce. The role of water resources has evolved over the last four centuries, but these resources are still extremely important to the City's environment.

111. Surface Water Bodies

Surface water bodies are important natural resources; in the City they serve as: (1) recreational resources; (2) resources for shipping and boating; (3) habitat for a wide variety of aquatic life, including finfish and bottom organisms ("benthic organisms"); and (4) in limited cases, for water supply. The City contains a wide variety of water bodies, including the following:

- The Atlantic Ocean, along the south shores of Brooklyn, Queens, and Staten Island.
- The New York Harbor, which is an estuary, subject to tides and the flows of salt water from the ocean and fresh water from the Hudson River; it is divided at the Verrazano Narrows into Upper and Lower New York Bays.
- Long Island Sound, which borders Queens, and is a long and relatively narrow tidal water, separated from the Atlantic Ocean by Long Island (including Queens and Brooklyn).
- Bays, which are enclosed or partially enclosed tidal waterbodies, fed by freshwater streams or rivers with limited outlets to larger bays or the ocean. The City's waterfront contains a number of bays, basins, and coves. Jamaica Bay is the largest and most important as a natural resource; it is an enclosed bay in Brooklyn and Queens, fed by a number of creeks and streams, with an outlet to the Atlantic Ocean. Other bays include Little Neck Bay, Bowery Bay, and Powell's Cove in Queens, and Pelham Bay and Eastchester Bay in the Bronx.
- The East River and Harlem River, which are not rivers, but tidal straits that connect Long Island Sound, the Hudson River and New York Harbor; and Kill Van Kull and Arthur Kill, also tidal straits, which connect Upper and Lower New York Bays around the north and west sides of Staten Island.
- Rivers, the largest of which is the Hudson River, which originates in the Adirondacks and makes its way from there to the New York Harbor. In the City and north to the Tappan Zee Bridge, the Hudson River is actually a tidal estuary. Other rivers include the Bronx River and Hutchinson River in the Bronx. Rivers draw their waters from streams, groundwater, and overland runoff in a large area, referred to as a drainage basin, catchment area, or watershed.
- Streams and kills (the Dutch word for stream), which usually have their headwaters and outlets in a relatively small drainage area (a portion of a borough, for example). Examples of the City's streams and kills include Spring Creek in Brooklyn, and Fresh Kills and Richmond Creek in Staten Island.
- Ponds and lakes, include all non-free-flowing, contained freshwater bodies, either built or naturally occurring. The City's lakes and ponds are found in all five boroughs. Prominent natural ponds include Kissena Lake in Queens, Van Cortlandt Lake in the Bronx, and Brooks and Clove Lakes in Staten Island; built ponds include the Lake in Central Park and other water bodies in Central Park, and Prospect Lake in Prospect Park. The Jerome Park and Central Park reservoirs are

used to store the City's drinking water and regulate its flow to consumers.

112. Groundwater

The water that is contained beneath the surface in various types of soils and rock is groundwater; the geologic systems containing groundwater are called aquifers. Groundwater is usually fresh water and, in the City, it is replenished through rainfall and systems that percolate into the ground. Along the coast, the harbor, and river waterfronts, the tides influence groundwater; in these areas groundwater can be saline or partially (brackish). The importance of groundwater as a resource is: (1) as a source of water supply for population and industry; (2) as a source of water for surface water bodies and wetlands; and (3) as a water source for certain plant species.

Although all five boroughs contain groundwater, the major resources in the City lie beneath Brooklyn, Queens, and Staten Island. There, the major aquifers include the Raritan formation beneath Staten Island, southeastern Brooklyn, and the eastern half of Queens; the Magothy, beneath southern and central Brooklyn, eastern Queens, and Staten Island; and the Jameco, beneath most of Brooklyn and southern Queens. These aquifers lie well below the ground surface and are overlaid by a sediment formation that prevents water migration, and by the Upper Pleistocene layer, which makes up the area's surface soils. The groundwater in the Upper Pleistocene soils—the Upper Glacial aquifer, present in all five boroughs of New York City—is rarely used, because it is highly turbid and often contaminated. Only the aquifers in Brooklyn and Queens are regularly used for water supply; the Jamaica Water Supply Company taps primarily the Magothy Aquifer and serves a portion of southeastern Queens and western Nassau County with potable water. Industries are permitted to install wells for process water, and home owners may drill wells for irrigation, but this is not potable water. In addition to drinking water considerations, groundwater is also a concern because it could serve as a medium for the spread of contamination to other water resources and wetlands.

113. Other Water Resource Systems

As discussed above, a variety of water sources feed the City's water bodies and wetlands (see section 120, below), including other water bodies and groundwater. Critical components of water resources systems are stormwater and the natural and built systems that convey it to a receiving water or wetland resource. Although stormwater is not usually a habitat and does not usually support an ecosystem, it has a powerful effect on conditions in the waters or wetlands to which it flows. In considering water resources and wetlands under CEQR, stormwater is an important element. The following aspects may be of concern, depending on the action in question:

- *Overall drainage system.* The method by which stormwater is conveyed to a receiving water generally falls under the heading, drainage. This refers to the physical configuration of the land that drains towards the water body or wetland, including those elements that determine the volume and velocity of flow for a given rainfall: its slope, soils, vegetative cover, and hard (impervious) surfaces. Drainage also includes any built drainage or stormwater systems, including catch basins, pipes and outfalls, swales, channels, and culverts. The uses and activities that take place in a drainage area and the condition of its vegetation and soils will determine in large measure the quality and quantity of the stormwater that flows to a water body or wetland.

- *Floodwater system or floodplain.* Within the drainage system, an important consideration is that portion of the area that is low enough to hold flood waters during large storms. When the banks of rivers or streams overflow during a storm the wide, flat floodplain spreads the water, reducing its velocity and force; it permits the water to flow more slowly to the stream or river and, in some cases, its vegetation removes pollutants. Thus it is a very important element in protecting water resources. The floodplain has been defined by regulation (see Section 710) and includes the areas that flood during storms of a statistical frequency occurrence of once in 100 years (the 100-year storm) and once in 500 years. These are referred to as zones A and B, respectively, in Federal legislation. The City's administrative code (27-316) restricts uses in the 100-year floodplain (Zone A).

120. WETLAND RESOURCES

Where water and land meet, they form an extremely important type of natural resource called wetlands. Wetlands include the portions of water bodies shallow enough to permit sun to reach the bottom, thus potentially allowing vegetation to take root, and the portions of land that regularly, frequently, or continually contain standing water or water within 6 inches of the surface.

This mixture of land and water can support a particularly rich assortment of plant and animal life, beginning with the microscopic plankton and algae that are the primary generators of food sources and

including worms, slugs, clams, and other bottom organisms; amphibians; reptiles; birds; and mammals. Wetlands serve an important physical function of flood water retention, and they can filter pollutants from these waters. Wetlands are often important to the public for recreation and open space, and to commercial operations as sources of food or other materials. In some areas wetlands also function to permit groundwater or surface water replenishment (also known as "recharge").

Wetlands are sensitive resources, so the upland area adjacent to them is usually included when impacts on wetlands are assessed. The following definitions are grouped into two major wetland types: those containing fresh water and those influenced by tides and salt water.

121. Freshwater Wetlands

Freshwater wetlands are associated with freshwater systems. They can be found adjacent to ponds and streams (often the smaller water bodies themselves are included in the wetland definition) and in low-lying or poorly drained areas. In the City, freshwater wetlands can be found in the coastal zone, quite close but unconnected to a tidal water body, or they can be found perched in an upland environment. (Perched wetlands are those that are over an impenetrable layer so that the water in the wetlands does not feed the groundwater system, but is trapped above it.) The different types of freshwater wetland are referred to by a number of names, including swamps, marshes, bogs, fens, and flats. There are no officially adopted names associated with particular types of wetlands (each agency with jurisdiction over wetlands has its own system of titles and classifications). Wetlands can always be covered in water, or always hold water within a few inches of the surface, or experience times when soils are dry and when soils are inundated; they can be unvegetated, or contain floating or submerged plants, herbaceous (non-woody) plants, or a mixture of herbaceous and woody (trees and shrubs) plants. The "adjacent area" to a freshwater wetland refers to the contiguous upland area the condition of which affects conditions in the wetland, and usually includes the upland area within 100 feet of the wetland. However, based on the relationship of the wetland and its surrounding area, the "adjacent area" could be larger or smaller. Many of the City's freshwater wetlands are in Staten Island, which contains more than 2,000 acres of this resource. These include Mariner's Marsh, in the Port Ivory section; Graniteville Swamp, a swamp forest in the northern part of the island; and Goethals Bridge Pond. Others are in Queens, including in Alley Park. Characteristic plants include buttonbush, willow, sedges, coarse grasses, rushes, reeds, cattails, swamp azalea, and others, depending on whether the wetland is predominantly wet, or vegetated with herbaceous or woody plants.

122. Tidal Wetlands

Tidal wetlands are found in and around the City's tidal water bodies. Since the City has more than 500 miles of tidal waterfront, the opportunity for tidal wetlands is vast. And, despite all of its development, the City still contains a substantial variety of tidal wetlands. Most of these are in Jamaica Bay, and in the inlets and coves that line the shores of northern Queens and southeastern Bronx, particularly at Udall's Cove, Alley Pond Park, and the mouths of the Bronx and Hutchinson Rivers. The adjacent area to a tidal wetland usually includes the upland area within 150 feet of the wetland. As noted in 121 above, however, based on the relationship of the wetland and its surrounding area, the "adjacent area" could be larger or smaller. In general, tidal wetlands can be grouped according to characteristic ecological zones, as follows:

- *Littoral zone.* The littoral zone is that portion of a tidal water that is shallow enough (usually less than 6 feet deep) to let sunlight penetrate to the land on the bottom, thereby permitting the opportunity for a variety of rooted and floating aquatic plants and animals to take hold. Although the richness of the ecological systems in a littoral zone can vary widely, its location at the edge of land makes this zone important for removal of pollutants that come from activities on land and for tidal flood control. The land under water adjacent to nearly all the shoreline in the City is classified as littoral zone by the New York State Department of Environmental Conservation (DEC).

- *Coastal shoals, bars, and flats.* This is the generally unvegetated area along the shore that is covered by water at high tide and exposed (or covered by water of less than 1 foot) at low tide. Like the littoral zone, this area can perform a number of valuable functions and support varied and productive plant and animal life and serve as feeding habitat for wading birds. Coastal shoals, bars, and mudflats are located along Coney Island Creek in Brooklyn; along Pugsley's Creek, the mouth of Westchester Creek, and the many small inlets near Clasons Point in the Bronx; and throughout Jamaica Bay, in Queens, where there are 350 acres of tidal mudflats.

- *Intertidal marsh.* The intertidal marsh is a vegetated area of land subject to inundation by tidal flows every day (the area between the average high and low tides). This and the coastal fresh

marsh tidal wetlands defined below are considered the most biologically productive of all tidal wetlands areas. Since they receive twice-daily tidal flushing, they are effective at cleansing ecosystems and absorbing silt and organic material. In addition, the plankton that flourish here and decomposed organic matter are easily transported to adjacent waters for use in the food chain. Intertidal marsh is suitable for fish spawning, and, where the area is also rocky, it supports encrusting organisms as well. Intertidal marsh is also very effective for flood and hurricane storm protection. The predominant vegetation is low marsh cordgrass. Jamaica Bay includes some 950 acres of intertidal marsh. Other examples of intertidal marsh, often located beside high marsh (see below), are found at Mariner's Marsh on the northern shore of Staten Island in the Port Ivory section; in Flushing Bay, Powell's Cove, and along Jamaica Bay in Queens; and along Pugsley's Creek and the mouth of Westchester Creek, in the Bronx.

- *Coastal fresh marsh.* Coastal fresh marsh is similar to the intertidal marsh, but it is located primarily along the tidal portions of rivers and streams, and so is subject to a greater amount of fresh water. The grasses that typify the coastal fresh marsh are different from those of the intertidal marsh. Like the intertidal marsh, the coastal fresh marsh is biologically productive and effective in flood and storm protection. Plants found here include narrow-leaved cattails, tall cord grasses, and freshwater species such as arrow arum, pickerel weed, and cutgrass. Examples include Lemon Creek, Fresh Kills Creek, and the Mariner's Marsh shoreline near Port Ivory on Staten Island.

- *High marsh or salt meadow.* This is the uppermost tidal wetland zone. It is periodically flooded by spring and storm tides, and is usually dominated by salt hay and spike grasses. Other plants include low vigor, seaside lavender, black grass, chairmaker's rush, marsh elder, and groundsel bush. Because the high marsh receives only occasional tidal flooding, its value for marine food production is somewhat less than the lower-lying marshes. However, it is very important for feeding, resting, and some nesting by birds and amphibians. Also, high marshes are particularly efficient at absorbing silt and organic material; they are also extremely valuable for flood and hurricane and storm control. High marshes cycle nutrients for the benefit of intertidal marshes, near which they are often located. In New York City, the high marshes are found predominantly in the Jamaica Bay area, where there are about 530 acres of high marsh. They are also located along the Port Ivory shoreline on Staten Island; at Flushing Bay and Powell's Cove in Queens; and at Pugsley's Creek and along the Saw Mill Creek in the Bronx.

- *Formerly connected tidal wetlands.* Lowland areas whose connections to tidal waters have been limited by construction of dikes, roads, and other structures, but may still function as productive natural resources. Such wetlands are considered on a case-by-case basis for their value as resources. These wetlands may continue to support the wetland plants established from their previous condition, or they may be infiltrated with common reed (*Phragmites*). Old Place Creek on western Staten Island is an example of a formerly connected wetland. In addition, some areas, such as the Idlewild landfill area in southern Queens, show no surface connection but still contain underground tidal flow. Therefore, landfills at the water's edge often have "inland wetland vegetation."

130. UPLAND RESOURCES

Upland resources include all natural areas that are not water resources or wetlands. In New York City, upland resources are enormously diverse. Although the function, productivity, and value of specific uplands may vary considerably, generally these resources provide wildlife habitat, open space and recreational opportunities, and particular functions such as storm and flood control or wetland protection. With the exceptions of beach, dune and bluffs, upland resources are generally described by their vegetation.

131. Beach, Dunes, and Bluffs

The City contains a variety of coastal uplands associated with its shoreline. Beaches, which can be found all along the City's Atlantic Coast, along the East River and Long Island Sound in the Bronx and Queens, and along southern Staten Island, are major recreational resources. As ecological zones, they are relatively tolerant of public use. There is very little vegetation on the beach itself. Instead, the land is shaped and reshaped by the winds, waves and tides every day. The species that live here tend to be hardy. Birds, amphibians, some reptiles, and small mammals also use the beach for foraging, resting, or as a path from shelter to the water. However, during breeding seasons, public use and the needs of nesting shore birds often conflict. For example, the piping plover, which is an endangered

species, nests on beaches at Arverne, in the Rockaways.

Dunes are recent accumulations of sand formed by sea winds and waves. Although their form is very fragile, they perform an essential function in protecting both the beaches in front of them and land behind them from wave and storm forces. The grasses and beach heather that can grow on dunes, particularly where they face the sea, are just a few species that can live with limited water supply. Their roots form a mat that stabilizes the dune face. The back side of the dune can support a somewhat wider variety of plant life. This ecological zone supports beachgrass, bayberry, and other grasses and shrubby species, but is very intolerant to recreational use or to any kind of construction that alters the dune's shape. Some coastal areas in the City have both primary and secondary dunes; others have just one line of dunes.

Bluffs are steep formations of soft erodible materials, such as clay and sand. Bluffs, like dunes, are particularly effective in protecting against coastal erosion. They absorb wave energy, particularly during storms, and provide sand for the beach and for offshore sandbars and shoals. Also like dunes, the toe, rise, and tops of bluffs are fragile; loss of vegetation will lead to erosion, slumping, and possible destruction of the bluff itself. Bluffs therefore are not suitable for recreation or for development. In considering beaches, dunes, and bluffs, it is important to remember that the system that formed these resources is not static. Sands shift, new dunes are formed, bluffs erode—nowhere are the forces of nature to create or remove land so evident as in these coastal areas. The Atlantic shoreline along the Rockaways and southern Staten Island includes notable expanses of beach with some dunes; the southeast shore of Staten Island features bluffs.

132. Thickets

Thickets are characterized by low, shrubby species such as bayberry, beach plum, sumac, black cherry, poison ivy, and greenbriar. They are found most frequently on dunes, particularly where they face away from the sea, on the toe and tops of bluffs, and on the islands in Jamaica Bay. Like grasslands, the low-lying plant life supports insects, small mammals, snakes and other reptiles, and birds, and provide forage for larger animals and birds.

133. Grasslands

Grasslands are those areas that, in their natural state, do not contain woody species, such as shrubs and trees. In New York City, near the influence of salt spray are maritime grasslands containing those species that can survive in the harsh conditions that strong winds and salt spray create. Predominant plants are hairgrass, switchgrass, bluestem, poverty oat grass, and seaside goldenrod. Grasslands are habitats for small mammals, snakes, insects, and birds. Birds of prey and some larger species forage in grasslands. Grasslands in the City are found predominantly near the beaches and coastal areas, particularly at Breezy Point and on the islands in Jamaica Bay. Grasslands also prevail in areas subject to frequent fires (Blue Heron Park, Staten Island), on serpentine soils (Latourette Park, Staten Island), on landfill soils created with sand dredge spoils (Marine Park, Brooklyn), and on thin mineral soils (Pelham Bay Park, the Bronx).

134. Old Meadow or Fields

Old meadows are created where forests have been cut to accommodate another activity (e.g., agriculture, or building sites that have since been cleared), and then that activity is abandoned. For many years, the fields will support grasses and other low vegetation; eventually, woody species will begin to invade, and a process of foresting the land, called succession, will take over. However, while these fields still offer only low cover for wildlife, they will provide habitats similar to other grasslands and grassy areas.

135. Woodlands and Forests

Before European settlement, nearly all of the City's uplands were forests or woodlands. Typical woodlands were mixed deciduous hardwoods—maples, oaks, and birches, with associated tulip, ash, cherry, and hickory—and stands of conifers, with white pine and hemlock. Much of the forest was destroyed, first by farming and then by urbanization, and no "first growth" woodland remains, except for one small stand, the Hemlock Grove in the New York Botanical Garden. However, second-growth forest stands can be found in the Bronx, Queens, Manhattan, and Staten Island. The oak-chestnut association, located in the central hills of Staten Island, is well known, and some of the stands in and near the New York Botanical Garden in the Bronx and in Inwood Hill Park in Manhattan are extensive, and a developing oak woodland stands at Mott Point in the Rockaways. In addition, a number of tree species (such as plane, stock pine, Norway spruce, European larch, and ginkgo) were brought to the City from Europe and Asia; these are often intermingled with native species in the City's woodlands. Woodlands can offer shelter and feeding for a full range of animal species. This function is also valuable when a woodland is adjacent to a wetland or water resource.

The City also contains barrens, which are intermediate wooded areas characterized by sandy, dry soils, and exposure to sea winds. The sandy soils hold little moisture, and they lack the nutrients that most plants require. However, like the dunes and maritime grasslands described above, these soils can support a particular group of woody species, such as black oak, white oak, chestnut oak, post oak, blackjack oak, and pitch pine. Known as sandy oak barrens, these resources are similar to the Pine Barrens in southern New Jersey. Greenbriar and other thicket species, such as blueberry, hackberry, and huckleberry, are also found in the sandy oak barrens. Small mammals and reptiles, such as turtles, are common in barrens. This habitat is located primarily in the southwest area of Staten Island.

136. Gardens and Other Ornamental Landscaping

The City is dotted with a variety of gardens, landscaped areas, and small parks, as well as larger, landscaped parks like Central Park and Prospect Park, and the many cemeteries in Queens and Brooklyn. Vegetation here is usually not natural, but these areas are nonetheless useful resources for recreation and some bird, small mammal, and insect habitat.

140. BUILT RESOURCES

Over the years, as the City's once natural environment has evolved to one of dense development, the wildlife species have adapted. Today, although the creatures inhabiting the City's resources are nowhere near as abundant and diverse as they once were, a number of species live not only in "natural" areas, but make their habitats on piers, bridges, buildings, and other structures. In addition, a variety of structures have been built to replace some of the environment's natural functions for flood and erosion control. These built resources include the following:

- *Piers and other waterfront structures.* Most of the City's waterfront structures, whether functioning or not, provide habitat for marine species, including plankton; encrusting organisms, such as algae, mussels, and barnacles, which live on the structures and are food sources for creatures higher on the food chain; benthic species such as clams; and fish, including striped bass, winter and summer flounder, American eel, Atlantic herring, white perch, bay anchovy, and many others, depending on the location of the habitat.

- *Old piers, pile fields, and other ruins.* Many waterfront and other structures that have been abandoned are now in active use by a range of wildlife. In addition to the species that use active waterfront structures (see above), the lack of human activity makes the pile fields and old piers attractive to a number of birds, which nest on the piles and forage there. The pile fields and decaying piers, particularly on the Brooklyn and Staten Island waterfronts, are favorite living places for cormorants; at Shooters Island in the Kill Van Kull, hundreds of abandoned marine vessels attract many species of herons, kingfisher, cormorants, and gulls for foraging and, in some cases, nesting; on North Brother Island and Roosevelt Island, ruins of hospital and other public buildings are now the home for bats and snakes, certain birds, and feral animals.

- *Beach protection structures.* Many of the City's beaches are protected by groins, jetties, and breakwaters that break the force of ocean waves and slow the drift of sand. Groins in New York City, such as those at Coney Island and Rockaway, and the abandoned groins along the south shore of Staten Island, are typically stone and timber structures perpendicular to the beach, erected to minimize erosion. Jetties are larger rock structures used to stabilize inlets; Rockaway Inlet is held in position by such jetties. Other protection structures used in the City include small timber wave breaks used to prevent waves and ship wakes from disturbing moored boats in marinas, and breakwaters, which are larger structures, usually constructed of stone, timber cribs, and/or steel, that serve a similar purpose.

- *Flood protection structures.* In several low-lying areas, flood protection structures have been installed. These include tide gates (such as at the mouth of Flushing Creek), weirs (found, for example, along Wolfe's Pond Creek in Staten Island), and pumps (such as in the College Point area along the shores of Flushing Bay).

- *Other structures.* A wide variety of structures in the City may offer habitat to some species. One example is the use that peregrine falcons make of tall buildings and bridge towers. These birds prefer to nest in high places within sight of water. During the 1930's the falcons were plentiful in the City, often nesting on the ledges of skyscrapers. The use of DDT and human interference reduced their numbers greatly in the ensuing decades. Now these birds are enjoying a limited resurgence; they can be found once again on building ledges and other tall structures around the City, such as skyscrapers in Midtown Manhattan and the Marine Parkway Bridge in Brooklyn.

150. SIGNIFICANT, SENSITIVE, OR DESIGNATED RESOURCES

The City, State, and Federal governments have all recognized the value, rarity, and sensitivity of many of the City's natural resources. State and Federal interest is generally focused on the City's coastal areas; the City has recognized a number of coastal and upland areas as being of particular value. Most often, these areas combine several of the natural resources defined above. The following resources are designated significant, sensitive, or worthy of protection. The legal protections for these natural resources are described below in Section 710.

- *Waters.* All of the waters of New York City—both surface and groundwater—are considered important resources and are regulated by the State. This includes tidal and freshwater wetlands, the coastal estuary waters, and all other water resources (see Section 110 above).

- *Jameco and Magothy Aquifers.* Beneath Brooklyn and Queens, these aquifers are designated sole source aquifers (i.e., they are used to supply drinking water) and are thus afforded special protection under the Clean Water Act.

- *Coastal resources.* In New York City, all coastal resources, including beaches, dunes, bluffs, etc., are considered important. These are protected by the State's Coastal Zone Management Program.

- *Gateway National Recreation Area.* This National Park encompasses some 26,200 acres of coastal area, almost all of which (24,500 acres) is in New York City. It includes the following areas:

  1. A stretch of shoreline along southeastern Staten Island (about 1,210 acres, including the Oakwood, New Dorp, Midland, and South Beaches, and Great Kills Park, Miller Field, Fort Wadsworth, and two small islands);
  2. About 1,000 acres at Breezy Point, the western end of the Rockaway peninsula south of Jamaica Bay;
  3. Jamaica Bay, comprising about 4,500 acres (including Floyd Bennett Field; shorelands at Bergen Beach, Plumb Beach, and Dead Horse Bay; the parklands at Canarsie, Frank Charles, and Hamilton Beach Parks; land at Spring Creek Park; the landfills at Pennsylvania and Fountain Avenues; and the waters, lands, marshlands, and islands within Jamaica Bay itself); and
  4. Sandy Hook (about 1,700 acres on a peninsula at the northern end of the New Jersey coastline).

- *Jamaica Bay.* Jamaica Bay is one of the largest coastal wetland ecosystems in New York State, and provides a variety of habitats, including surface waters, tidal wetlands, grasslands, beach, dunes, thickets, and woodlands. Jamaica Bay is used by nesting birds and wintering waterfowl in concentrations of Statewide importance. Many of the islands in Jamaica Bay are important heronries for a variety of heron species. The only population of laughing gulls in the State is also found in Jamaica Bay, as are numerous other gull colonies. The islands and shorelines of Jamaica Bay are used by a variety of reptiles, amphibians, and small reptiles. In addition to these significant wildlife concentrations, Jamaica Bay is a productive area for marine finfish and shellfish. For these reasons, Jamaica Bay has been designated by DEC as a State Significant Fish and Wildlife Habitat (defined below) and a State Critical Environmental Area (as defined in NYCRR 617.2: a geographic area designated by a State or local agency as having exceptional or unique characteristics that make it environmentally important), as part of the Gateway National Recreation Area (see above), and by the U.S. Department of Interior as a National Wildlife Refuge. The exact area encompassed by each of these designations differs, as described below.

  1. Significant Coastal Fish and Wildlife Habitat. About 10,000 acres of the Jamaica Bay area (bordered by the mean high water line along the shorelines, including the fringing tidal marsh and adjacent upland areas) are designated as a significant coastal fish and wildlife habitat.
  2. Critical Environmental Area. All of the mapped tidal wetlands in Jamaica Bay, including the various basins, are designated as a State Critical Environmental Area.
  3. Gateway National Recreation Area. This national recreation area includes all of the islands, marshes, submerged lands, and waters in Jamaica Bay, as well as uplands north of the bay (see above).
  4. Jamaica Bay Wildlife Refuge. Within the Gateway National Recreation Area, approximately 2,500 acres consisting of the water and islands of Jamaica Bay are designated as a national wildlife refuge. This includes uplands and low-lying islands surrounded by salt water, fresh water, and brackish

impoundments, and excludes the community of Broad Channel and certain City rights-of-way, located on the largest island in the bay.

- *Other State significant coastal fish and wildlife habitats.* As part of the New York State Department of State's Significant Coastal Fish and Wildlife Program, the DEC recommends for designation by the Department of State areas it considers significant coastal fish and wildlife habitats. These are habitats that are essential to the survival of a large portion of a particular fish and wildlife population; that support populations of protected species (see below); that support fish and wildlife populations that have significant commercial, recreational, or educational value; and/or that are types not commonly found in the State or region. In New York City, there are 15 designated significant coastal fish and wildlife habitats. In addition to Jamaica Bay, described above, these are as follows:

1. Lemon Creek, Staten Island—A 70-acre area of salt marsh and coastal fresh marsh that is the only undisturbed tidal wetland area on the south shore of Staten Island.
2. Fresh Kills, Staten Island—About 1,000 acres of tidal wetlands on the Arthur Kill, which, although degraded, are valuable habitats for concentrations of fish and wildlife species, and a wintering area for a threatened species (Northern harrier).
3. Prall's Island, Staten Island—An 80-acre, uninhabited island maintained by the New York City Audubon Society as a wildlife refuge. This island is used by large numbers of colonial water birds, including herons, and may be one of the largest heronries in the State.
4. Sawmill Creek Marshes, Staten Island—These marshes, including Chelsea Marsh and Merrell's Marsh in northwestern Staten Island, although greatly affected by human activities, are one of the few locations inhabited by a population of southern leopard frogs.
5. Goethals Bridge Pond, Staten Island—A large shallow freshwater pond and wetland system that is an important feeding area for three major heronries and one of the few known breeding areas in the City for several waterfowl species.
6. Shooters Island, Staten Island—Relatively undisturbed island that is used for nesting by large numbers of colonial water birds, including herons, and contains one of the area's largest heronries.
7. Lower Hudson Reach—The portion of the Hudson River extending 19 miles from Battery Park to Yonkers, including deep water, shallows, piers, and interpier basins. This habitat sustains a diverse community of benthic, planktonic, and pelagic species, and provides important wintering habitat for large numbers of striped bass.
8. North and South Brother Islands, Bronx—Two relatively undisturbed islands that are used for nesting by a large number of colonial water birds, and contain one of the area's largest heronries and one of only two double-crested cormorant colonies in southeastern New York State.
9. Pelham Bay Park Wetlands, Bronx—Two major coastal areas within Pelham Bay Park, including a 475-acre area of high marsh, intertidal marsh, and salt flats; and the lagoon, a 275-acre narrow bay and wetland complex. This area is used as feeding or resting area for a large number of birds.
10. Little Neck Bay, Queens—The open water in the bay, which is of regional significance as one of five major waterfowl wintering areas on the north shore of Long Island, and one of the most significant striped bass nursery areas in the region.
11. Alley Pond Park, Queens—Including salt marsh, tidal flat, and freshwater wetlands, which are used by concentrations of fish and wildlife species, including the Northern harrier, which overwinters here.
12. Udall's Cove, Queens—One of the last undeveloped tidal salt marshes in the northern Queens County and East River area, rare in the county and rare in an ecological subzone in New York.
13. Meadow and Willow Lakes, Queens—Two freshwater lakes and a connecting channel that are one of the largest expanses of fresh water in Queens County.
14. Breezy Point, Queens—The 290-acre westernmost tip of a 10-mile-long barrier beach, including the dune areas and sand beaches. This is the only relatively undeveloped barrier beach in the City, and provides an important habitat for breeding colonies of endangered and threatened shorebird species. (Breezy Point is also part of the Gateway National Recreation Area, described above.)

- In addition to these areas, New York City has recognized certain areas within the City as possessing unique natural features that should be

protected. These are designated through special zoning districts in the City's Zoning Resolution, designed to preserve their natural characteristics, as follows.

1. Special Natural Area District 1—Emerson Hill, Dongan Hills, Todt Hill, Lighthouse Hill, and the central wetlands area of Staten Island. The hills are characterized by steep slopes, rock outcrops, erratic boulders, and ponds, lakes, swamps, creeks, and trees; many of the high and low central wetlands are still in their natural state.
2. Special Natural Area District 2—Riverdale, Spuyten Duyvil, and Fieldston (the Bronx). This area includes a ridge with steep slopes, rock outcrops, ponds, brooks, swampy areas, and mature trees; marshes; and the Hudson River shoreline.
3. Special Natural Area District 3—Shore Acres Area (Staten Island). This area, surrounding and including Shore Acres Pond, is a resting area for migratory and local fowl.
4. Special Fort Totten Natural Area District 4 (Queens). This area protects open areas, historic resources, and natural resources, including the shoreline along Little Neck Bay and Long Island Sound.
5. Special Hillside Preservation District (Staten Island). This district was established to preserve the hilly terrain and unique natural features of Staten Island. Its goals are to reduce hillside erosion, landslides, and excessive stormwater runoff by conserving vegetation and protecting natural terrain; to preserve hillsides with unique aesthetic value; to protect areas of outstanding natural beauty; and to protect neighborhood character.
6. Special South Richmond Development District (Staten Island). Established to guide the development in the southern half of Staten Island, it mandates tree preservation, planting requirements, and controls on changes to topography. It defines a network of open space for preservation in its natural state. An owner of such space is permitted to transfer its development rights to the remainder of his/her property.

- *Wildlife refuges and sanctuaries.* New York City has a number of wildlife refuges and sanctuaries, most located in City parks. In addition to the Jamaica Bay Wildlife Refuge (above), examples of such resources include:

1. Thomas Pell Refuge and Wildlife Sanctuary, in Pelham Bay Park, a 50-acre tidal wetland area.
2. Hunter Island Marine Zoology and Geology Sanctuary, in Pelham Bay Park, with woodlands used by numerous wildlife species.
3. Udall's Cove Wildlife Preserve, in Queens and Nassau County, covering about 90 acres, some 33 of which are in New York City.
4. Clay Pit Ponds State Park Preserve, on Staten Island. This 260-acre park includes ponds, wetlands, woodlands, including sandy oak barrens, and streams. About 70 acres of this preserve were designated a Unique Natural Area under the State Nature and Historical Preservation Trust.
5. William T. Davis Wildlife Refuge, on Staten Island. This 260-acre area includes wetlands around New Springville Creek.
6. High Rock Park Conservation Center, on Staten Island. This hilly 94-acre park rises to 225 feet above sea level.

- In addition to particular areas of the City that are recognized and called out as unique, certain species and habitats are also considered important and worthy of protection, wherever they may occur.

1. Protected species. Both the Federal and State laws designate certain species of plants and animals as protected, because they are rare or in danger of extinction. Certain habitats are also designated as rare. Under Federal law, plant or animal species can be considered endangered or threatened; under State law, animal species can be considered endangered, threatened, or of special concern, and plant species can be endangered, threatened, exploitably vulnerable, or rare. Other species that are not in these categories can also be protected. Protected species that may be found in New York City include such bird species as piping plover, least tern, common tern, northern harrier, peregrine falcon, osprey, Coopers hawk, common barn owl, short-eared owl, least bittern, upland sandpiper, and grasshopper sparrow; reptiles such as diamondback terrapin; amphibians such as southern leopard frogs; and such fish as shortnose sturgeon.
2. New York State Natural Heritage Program. The Natural Heritage program maintains a database of information on rare animals, rare plants, and significant natural communities of New York State. This includes an inventory of all the different ecological communities—

rare and common—that occur in New York State, representing the full array of biological diversity in the State. It also includes an inventory of rare plants, fish, and wildlife in the State, including some that are not currently protected by State law. All of the habitats and species listed in the program are given a ranking indicating their rarity both globally and in the State. Although the Natural Heritage Program rankings do not provide legal protection, they can be used for assessment of an action's impacts on rare species.

200. Determining Whether a Natural Resources Assessment is Appropriate

Two possibilities determine whether an adverse impact on a natural resource might occur, and therefore an assessment may be appropriate: the presence of a natural resource on or near the site of the action; and an action that involves disturbance of that resource. This disturbance can be direct or indirect, as in the following examples:

- Direct permanent disturbance may occur during construction and include such activities as excavation; grading; site clearance or other vegetation removal; cutting; filling; installation of piles, bulkheads, or other waterfront structures; dredging; dewatering; or soil compaction from construction vehicles and equipment.

- Direct permanent disturbances from a proposed action include:

  1. Permanent removal of vegetation.
  2. Filling or regular dredging of a water body or wetlands.
  3. Development of roadways, parking lots, buildings, and other paved surfaces on previously vegetated or unpaved surfaces.
  4. Construction of new marine structures, such as bulkheads, piers, piles, groins, jetties, etc., or floating structures.
  5. Stream channel changes, such as bank stabilization, widening, straightening, etc.
  6. Installation of drainage systems, including sewers, culverts, retaining basins, recharge wells, etc.
  7. Introduction of buildings or structures that cast prolonged shadows on a natural resource, or otherwise alter its microclimate (see also Section 3E, "Shadows").
  8. Introduction of new (particularly non-native) plant or species that could, over time, effectively replace existing species on-site.

- Indirect disturbances occur when the changes on a site can alter conditions in adjacent or nearby resources. Examples include:

  1. Change in drainage patterns that might alter the way in which surface water flows to the resource from the project site.
  2. Change in vegetation and impervious surfaces on the project site that alters the way in which surface and groundwater may reach the adjacent or nearby resource.
  3. Change in the quality or flow of groundwater that currently supports a nearby natural resource.
  4. Change in on-site activities that may bring more people, domestic animals, noise, or light to on-site or nearby resources.
  5. Introduction of new (particularly non-native) plant or animal species on-site that could overtake existing (particularly native) species in nearby resources.
  6. Construction activities, such as those involving dewatering, compaction, site clearance, excavation, or vegetation removal, that alter the flows of surface and groundwater to a resource, or increase erosion and transport of silt and sediments so as to alter the quality of water serving the resource.

Bearing in mind the types of disturbances that a given action may create, if the following are all true for a given action, then no natural resources assessment is necessary:

- The site of the action is substantially devoid of natural resources.

- The site of the action is substantially covered by existing construction, paving, or debris from previous demolition, *or* the site is a small upland resource surrounded by fully built lots.

- The site of the action contains no "built resource" that is known to contain or may be used as a habitat by a protected species as defined in the Federal Endangered Species Act (50 CFR 17) or the State's Environmental Conservation Law (6 NYCRR Parts 182 and 193).

- The site of the action contains no subsurface conditions, the disruption of which might affect the

function or value of an adjacent or nearby natural resource (for more information, see Section 3J, "Hazardous Materials").

- The site of the action contains natural resources as defined in Section 100, above, or important subsurface conditions, but no activity associated with the action would disturb them, either directly or indirectly.

- The site of the action is near natural resources, but no activity associated with the action would disturb them, either directly or indirectly.

- The proposed action involves the disturbance of a natural resource, but that impact has previously been deemed insignificant by a government agency with jurisdiction over that resource and conditions have not changed significantly since the permit was issued. An example would be the repair or replacement in kind of piers, piles, bulkheads, and other waterfront structures. These actions have been classified as environmentally insignificant in the U.S. Army Corps of Engineers' "Nationwide Permit" for such actions (see Section 710, below).

If the action does not meet these conditions or if it is unknown whether the action meets these conditions, then an assessment of natural resources is appropriate.

300. Assessment Methods

The assessment of potential impacts on any natural resources contains three basic elements. These elements are the same, although level of detail may vary for site-specific, areawide, or programmatic (generic) actions. The elements are as follows:

- For existing and future no action conditions, determine the value of the natural resource, as demonstrated by the variety and density of its species; its use for recreation, open space, or commerce; its relationship to neighboring resources and to the overall area ecosystem; or its role in ecosystem cleansing or storm and flood management.

- Examine the environmental systems that support the natural resources in the study area. As described in Section 143, these are most often the water resource systems that transport or retain water to maintain vegetation and provide aquatic habitat. The interrelationships among resources also create environmental support systems, as described in the introduction to the Natural Resources section. In another example, an intertidal wetland flushed twice daily by the tide becomes the source from which vegetative and organic materials are transported to adjacent waters for use in the estuarine food chain.

- Describe fully and in appropriate detail the construction and operational activities associated with the action and analyze their interaction with the resource itself and the environmental systems that support it.

These three elements are interrelated and, therefore, the order in which the analyses are conducted may vary with a particular action. For example, it is often most efficient to evaluate the resource first. This will help set the level of detail required for the analysis of the action and of the underlying elements serving the resource. However, if an assessment is required because the lead agency or applicant is unsure of the extent of disturbance that an action would cause, then part of the third task (describing the project disturbance in detail) would be completed first. If completion of that task identifies the potential for an indirect effect, say, a change in drainage patterns near a running stream, then the second task might be undertaken before the first, as well. Before determining the value of that stream, it might be most prudent to examine the drainage system serving the stream. If the action changes drainage patterns, but this change would be minimal to the surface and ground waters serving the stream, then the action's impact would not be significant and there would be no need for further analysis. However, no matter which of the three tasks comes first, the assessment always begins with selection of a study area. The following discussion addresses the study area, then describes each of the three general tasks listed above—evaluation of the resource; assessment of environmental support systems; and assessment of probable impacts of the action. These sections are followed, in Section 360, with discussions of those issues that may apply specifically to each of the resource types defined in Section 100.

310. STUDY AREA

Determination of the limits of the study area for the assessment of natural resources depends on the potential effects of the action and the resource(s) in question. The study area should include the project site and resources (including adjacent areas, as applicable) that may be affected by activities on the project site. Where a resource is small enough that the proposed action would affect it in its entirety, the study area may encompass the entire resource. An example is a small pond where only a portion of its surface water,

surrounding wetland, and adjacent area lie within the site. Proposed activities may directly affect only those portions of the pond within the site; however, the overall functions or value of the remainder of the pond may also be altered by the activity (for example, loss of minimum area to provide wildlife habitat). To understand impacts on this resource, it may be necessary to assess conditions in the complete aquatic, wetland, and adjacent habitat. If this is the case, then the study area includes the entire pond and related habitats. Similarly, where a small portion of a very large resource (such as Jamaica Bay) is located within the project site, it may not be necessary to include the whole resource; it may be more appropriate to focus on a portion of the resource within and adjacent to the project site, while providing a more general discussion of the larger resource for context.

320. EVALUATE RESOURCES

This task assesses a natural resource to understand its value for one or more of a number of functions—such as recreation, open space, visual quality, wildlife habitat, ecosystem cleansing, groundwater recharge, flood or storm control, or erosion control. This includes learning what qualities are present in the resource (and will be present in the future without the action) and determining which of these are most important for a given function. As with all technical analysis areas, the approach to the analysis is to match the level of detail and effort to the anticipated effect of the action. However, in this technical analysis area, absent any specific information, the resource is usually presumed to be important and valuable. The evaluation either confirms this assumption or shows the extent to which the presumption of value cannot be confirmed. The tasks below outline general approaches to evaluating the City's natural resources. For most of the work outlined below, use of a specialist may be appropriate.

321. Field Reconnaissance

A field reconnaissance of the study area allows the analyst to understand the extent of the resource, the context of its surroundings, and the area where the action will take place. The field visit is the first step in determining the scope of the natural resources assessment. In some cases, evidence gathered in an initial field reconnaissance may successfully support an assessment showing that a resource is of limited value and/or that an action's disturbance would not be significant. A field reconnaissance can include one or more of the following tasks, as appropriate:

1. Identification of major resource or habitat types. An initial reconnaissance may not be sufficient to identify subtle differences within resource types (for example, the distinction between the various types of fresh marshes often requires a number of site visits to determine the marsh's physical characteristics under varying weather conditions and a detailed listing of specific vegetative species). However, the reconnaissance can identify major resource types and locate these on a map (although boundary conditions would be approximate).
2. Initial characterization of resource type and condition. The analyst notes as much as possible in an attempt to characterize the resource(s) in the study area. Important to these observations are date and time of field visit; weather and, if appropriate, tidal stage; general type and approximate size of each resource area; plant and animal species observed; general soil types; presence of wet or poorly drained areas, rock outcrops, steep slopes, and other topographic features; conditions (whether the resources appear disturbed); and use (what types of activities the resource is subject to—such as passive or active recreation, commercial use, or unauthorized uses like dumping or off-road vehicles).
3. Organization of field notes and observations. The field reconnaissance is documented with a field log including the items listed in item 2, above. Photographs (preferably in color) with an accompanying site diagram are important to support the observations.
4. Assessment and conclusions. Based on the observations, the analyst assesses general conditions of natural resources in the study area. If conclusions about the value of a natural resource are clear from the reconnaissance (for example, the vegetated area is highly disturbed and unlikely to offer significant habitat or recreational opportunity—or the resource, such as a dune, is clearly present, clearly undisturbed, and hence clearly highly valuable), then this part of the analysis need go no further. More often, the conclusions of the reconnaissance will serve to focus more detailed study. For example, reconnaissance could reveal that the site is partially forested and could potentially support valuable species that are only observable during specific conditions (for example, herbaceous plants during the growing season; nocturnal animals at night; migrating birds in the spring and fall). This would call for further observation under the appropriate conditions to determine if that species is present. There are also situations where a potentially valuable habitat is seen, but its value cannot be deduced based solely on the site reconnaissance without observations of the larger surrounding area. For example, if the survey

reveals that the site contains a barrens habitat, a wider area would be surveyed to determine the extent of this habitat.

322. *Literature Search and Other Research*

If the field reconnaissance has identified a potentially valuable or sensitive resource, or if the presence in the study area of such a resource is already known (e.g., if it is one of the designated resources listed in Section 150, above), research is useful in helping to assess conditions and make an evaluation. In many cases, a field reconnaissance and appropriate research will be adequate for the assessment of natural resources. The research may include one or more of the following steps:

1. Locate the study area on a U.S. Geological Survey (USGS) topographic map and identify and outline potential natural resource areas. The USGS maps are most useful for the less developed areas of the City.
2. Review documents that identify natural resources of interest in the study area, including any protected species. These resources include those designated resources listed in Section 150, above, as well as any other designated or important resources. Documents to be reviewed would include, as appropriate: the City's *Comprehensive Waterfront Plan*, which identifies particularly valuable habitats in coastal areas; the DEC's maps of regulated freshwater and tidal wetlands; Federal flood hazard area maps; City zoning maps; information on any designated significant coastal fish and wildlife habitats or critical environmental areas; coastal erosion hazard area maps; National Wetland Inventory Maps (prepared by the U.S. Fish and Wildlife Service from aerial photographs as part of the National Wetland Inventory Program, these are maps of all the wetlands of the United States, down to about one-half acre in size), etc. (see Section 730). The State's list of protected fish and wildlife are located in 6 NYCRR, Part 182; the list of protected plants and trees is in 6 NYCRR, Part 193.
3. Review specialized maps, where available. Examples are nautical charts, drainage maps, soil and ground coverage diagrams, and plats of slopes.
4. Review recent aerial photographs or advanced infrared and other photo imaging. These will help in pinpointing the extent of vegetated and wetland areas and will show disturbed areas. However, before examining these photographs, evaluate climatological data to determine whether the photo year had normal or abnormal precipitation within a few months prior to the data of the photograph. If the resource is affected by tides, the stage of the tide when the image was formed will need to be determined from Tide Tables.
5. Review available site-specific information, if any. New York City has many specialized libraries that hold reports and papers, such as theses and dissertations, that can contain valuable local studies. These include the Hudson River Foundation, the library at Queens College, and the United Engineering Library (see Section 730). Specialized computerized data bases, such as the DIALOG information system, can also be used to retrieve reports and publications related to natural resources that may apply to the site. For example, a paper about the Atlantic flyway—a route used by migrating birds that passes over New York City—could identify the avian species that might be expected in a particular area, and how they would use that area. This information could be applied to particular project sites in that area. Previous environmental assessments prepared for other actions can also contain surveys and analyses of the area. Environmental assessments prepared under CEQR can be examined at the offices of OEC or the lead agency; EPA and the U.S. Army Corps of Engineers keep copies of Federal environmental assessments. The National Park Service headquarters for Gateway National Recreation Area has a library of surveys and studies prepared for that National Recreation Area, and the natural resources groups of DEP and the New York City Department of Parks and Recreation keep data on a number of natural resources studies and assessments in the City.
6. Determine the need for further study. If there is enough information available to evaluate the natural resources in the study area in enough detail to determine potential impacts of an action, then there is no need for additional field work. However, if open questions remain, the answers are determined through additional field survey.

323. *Field Surveys*

Field surveys of natural resources may only entail a few days of observation and analysis, or they may require more lengthy observations and sample collection in one or more seasons of the year. In the most complex cases, field surveys can take place in three or four seasons of the year for up to three years. In general, where the issue is the definition of the resource, shorter field surveys are appropriate. The survey is conducted at the times when vegetation can be identified and, if appropriate, during traditionally wet seasons. If the issue involves the presence of organisms with short life cycles and/or known periods of prevalence, sampling at

the appropriate time and place may be adequate. With mammals, reptiles, birds, and finfish, however, it may be necessary to make observations during breeding seasons or at times of migration. The following general steps are considered when planning and implementing a field program:

1. Based on the preliminary reconnaissance, subsequent research, and an understanding of the location and extent of disturbance associated with the proposed action (see 330, below), identify the resource areas of concern on an accurate map, such as a USGS topographic map, a soil survey map, City map, Sanborn map, or map prepared by site engineers.
2. Estimate the size of the area to be studied.
3. Determine as much about the area as possible from the initial field reconnaissance and subsequent research; tentatively map the types of resources and habitats that may be present.
4. Identify areas where previous disturbance has occurred.
5. Based on the potential concerns, select the level of detail required and the methodology for data collection and analysis. The types of data collection and level of detail will depend both on the affected resource and the actions associated with the project. For example, a small new residential building in an already developed community may not call for a detailed natural resources investigation, but the same building proposed in an undeveloped area adjacent to a wildlife refuge or near some other resource might. Actions that facilitate large new developments are more likely to need detailed analysis than those that facilitate single buildings, but again, this depends on the location of the action. Generally for small projects with little ground disturbance, even in sensitive areas, a one-time survey for the affected resources may be sufficient. A three-day, late summer or early summer survey for birds, mammals, insects, and vegetation might provide sufficient information to describe the resources accurately and provide a basis for determining the potential impact the project would have on them. If the project is along the water, several grab samples could be taken to determine the types and numbers of benthic organisms. A grab sample is a single sediment sample, taken in a particular location. For larger projects in or near sensitive resources, described above in Section 150, surveys in the spring, summer, and autumn might be necessary to adequately describe the animal and plant resources. For projects along the water, creel surveys of finfish could be appropriate. Creel surveys, used to assess the diversity and number of fish species present, are taken from a boat using a net or other similar method to catch the fish.

324. Assessment of Data: Existing Conditions

Data collection is not an end unto itself, but the data are used to assess the value, resilience, uniqueness, and function of the resource. From the literature search and field surveys, the natural functions of the resource can be established. Some resources will have multiple functions while others will have only one. A wetland can serve as flood control, water cleansing, groundwater recharge, and specialized habitat for plants and animals. Beaches can serve as erosion protection, as bird breeding and foraging territory, as well as for human recreation. An open site in a densely developed area could serve as a foraging area for certain birds. Natural resources' different functions will be a prime consideration later in assessing how a proposed action would affect the resource.

Some resources are known to be valuable from the start. These are generally those designated resources listed in Section 150, above. However, the designated resources tend to focus primarily on the larger coastal and other wetland areas. There are a number of other, primarily terrestrial resources that do not have designation but are nonetheless very valuable. Some contain rare plant and animal species, as well. In addition, there are resources and species that are valuable or sensitive because they are rare in New York City, although they may be common elsewhere. Therefore, each analysis of existing conditions must consider each resource encountered on its own merits, whether or not its value has already been recognized by others.

A number of factors enter into determining the value of the resource. Two important parameters are species diversity and species abundance. Species diversity is the sum of all species present, and represents the richness and variety of natural resources in the area. Species abundance is the total number of individuals in a species or genus observed. Highly diverse resources are usually valuable because they support many different organisms. A site with low diversity and high abundance of one species usually indicates high disturbance and low value. These sites are often dominated by *Phragmites* (reeds) and purple loosestrife in wet areas, and sumac and tree-of-heaven on uplands. In addition, the size of the area and habitat shape and juxtaposition are important. For wildlife habitat to function, disparate patches need to be linked by corridors of appropriate vegetation cover. Also, round habitat patches possess more interior than linear ones. So, a 2-acre round patch of shrubland may provide more

interior, and hence better habitat for more yellow warblers than a 5-acre narrow rectangle.

Many analysis techniques can be used to establish value. Techniques to assess wetland values, for example, include the Habitat Evaluation Procedure (HEP) or the Wetland Evaluation Technique (WET). However, some analyses, such as methods to compare and assess the value of finfish, are complicated, and scientists disagree on which method to use.

A third factor to assess is the resilience of the habitat and species using the site. Certain sites are highly stressed and are just marginally productive, while other habitats are robust and adaptable. The resilience of the resource is often closely related to its value. A site with high diversity indices is usually resilient. However, a disturbed site dominated by very adaptable plant species can be further disturbed without long-term impact on these types of vegetation (except for disturbance by direct displacement). Generally, resources located well within their tolerance range are resilient. Tolerance range is the ecological range of conditions (temperature, food and water supply, breeding grounds) that supports or can support a particular population. The tolerance range is not usually sharply defined, but populations decrease in size and vitality near the limits. A resource that is at the limit of its tolerance range would tend to migrate if faced with additional demands on its needs.

Based on one or more of these assessment factors, it will be possible to: (1) identify the resource(s) of interest in the study area; (2) locate those resources potentially subject to changes associated with the proposed action; and (3) evaluate resource conditions, specifying, as appropriate, use potential, environmental function, and quality of habitats for flora and fauna.

325. *Future No Action Condition*

It may be that some resources will change from existing conditions to the future no action condition. This will depend on anticipated future development or public works projects (without the action) and, in some cases, expected overall growth. The scenarios for the future no action condition are available from other technical areas, particularly land use, traffic, air quality, noise, and hazardous materials. Also, some resources may improve over time (for example, water quality in New York harbor is expected to gradually improve over time; a beach nourishment program would alter the size and characteristics of a shorefront area). Based on this information, assessment of natural resources is modified to reflect anticipated changes to the environment in the future no action condition. Most often, this will constitute a qualitative discussion. Where another environmental assessment has been completed, it may be appropriate to utilize its conclusions. In some instances, it may be necessary to reassess conditions quantitatively based on anticipated development or expected improvements to the resource.

330. *ASSESS ENVIRONMENTAL SUPPORT SYSTEMS*

A natural resource does not exist alone, but is part of a system from which it gains and gives support. Groundwater feeds surface waters, but the streams and ponds also support the groundwater flow. A system is defined as a larger group of interacting and interdependent elements. An example is soils, topography, vegetation, and streams, which together make up a drainage basin. Another example is grasses, shrubs, trees, and surface water, which are exposed to sun and wind, thus forming an identifiable ecosystem. A number of resources are particularly sensitive to changes in their support systems. These include wetlands, streams and their floodplains, dunes and dune growth, grasslands, interior forest areas, which are particularly rare in New York City, and sandy oak barrens. To understand fully the potential impact of an action on such resources, the systems supporting it are assessed.

An important step in the assessment is choosing the size of the system to analyze. Only the part of the system that is likely to be affected by the action is included. If too much of the system is analyzed, impacts of the action could be obscured by the larger system and appear insignificant. For a stormwater drainage analysis, for example, only the affected downstream and/or upstream portions of the system (stream, wetlands, and slopes) until the watercourse enters a large water body, such as New York Harbor, would be included. For wetlands, generally the adjoining wetland area and the immediately contiguous uplands and water body would be analyzed. For upland habitat, the limit of the system would usually be the area containing similar vegetation. Some examples of systems include the following:

- *Surface drainage.* The most common assessment of environmental support systems is that of potential impacts on runoff, flooding, wetlands, and water bodies from changes in drainage. This analysis is typically performed as follows.

  1. Define the whole drainage basin. For most streams, the overall drainage basin has been

mapped, but the mapping tends to be generalized and not in sufficient detail for environmental impact analyses. Further, construction that has taken place since the mapping may have changed the contours. The U.S. Geological Survey's topographic maps are the base for mapping the drainage basin. Locate the site on the topographic map and determine the direction water flows onto and off of the site. Runoff flows downhill perpendicular to the contours. Stream beds, gullies, ravines, and other watercourses can be identified on the topographic maps where contour lines appear to form a V. These V's point upstream. The drainage basin can be mapped by following the streams up the contours to the high points (divides), and following the contours downstream to the receiving water body.

2. Define the analysis conditions. This depends on the issues of concern. For example, for an assessment of an action's effects on flooding, the analysis would consider how the action could affect flooding during an "analysis" storm. Generally, the assessment focuses on the 1-, 5-, and 10-year storms (storms that have a statistical frequency occurrence of once in 1, 5, or 10 years). It considers whether more areas would be regularly flooded during these storms if the action is implemented. The 100-year flood is also considered for an action to conform with regulations (see Section 710). For assessments of erosion, a short, intense rain storm is analyzed: these storms cause greater erosion than larger storms of longer duration.
3. Determine spatial and functional relationships of the system and the site of the action. This analysis relates how the system as a whole functions, and the site's role in that functioning. Both the location of the site in the system and its size relative to the system are considered. The location of the site has an effect on its value in the functioning of the system. For example, a site along a steep slope above a stream would have more effect on that stream in terms of drainage than a flat site at a distance from the stream. The size of the site relative to the whole system is also important: a large site is normally more important to the overall system than a small site. However, small sites can sometimes be crucial; this can be determined only by a system-specific analysis. As an example, for stream erosion and flooding, a site's characteristics (flat, steep, with wetlands and hydric soils or rock outcrops) are considered in the context of the system's characteristics. A flat, wide site in a steep drainage system could be a valuable flood storage area, but stormwater would pass quickly through a rocky steep site. The rocky steep site, however, could have highly erodible soils that could cause downstream siltation. The current drainage from the site is plotted, and its contribution to the system calculated using standard engineering techniques. The soil types and slopes are analyzed to determine erodibility and the velocity of the flows into the drainage system. Then, the downstream area is examined to determine its size. All sources and volumes of water added to the downstream area are plotted. The point at which the site's contribution becomes minimal is estimated, and at that point the system analysis is ended.

- *Coastal erosion.* The analysis for coastal erosion includes an assessment of winds, waves, fetch (distance over open water), and shoreline configuration, all of which can affect erosion. Two aspects are examined in a coastal erosion analysis: 1) is the site subject to erosion to the degree that property and life could be endangered in the foreseeable future; and 2) will the project increase erosion at other locations. To answer the first question, a design storm (usually the U.S. Army Corps of Engineers 100-year storm) is considered. Such a "design" storm would feature particular wind speeds and other meteorological characteristics. The wave heights and storm surge at the site are calculated with the waves coming from the site's most exposed direction. Based on the energy in the waves and the types of soils at the site, the amount of erosion is calculated and the danger of loss or damage to the property assessed.

  For potential erosion that might be caused at other locations by the action, the dominant direction of sand movement along the beach is determined. The size and location of the site affected by the action are both important in this assessment. For example, a site at the end of a coastal erosion zone would not affect sand movement at downstream sites, but a site at the beginning of the erosion zone would.

- Other examples of environmental support systems that are sometimes assessed are groundwater and vegetative buffers.

340. ASSESS CONDITIONS IN THE FUTURE WITHOUT THE ACTION

As with all technical areas, the impact assessment of natural resources compares the effects of the proposed action to the future without the action. In most natural resources assessments, consideration of a future scenario is limited to the study area (as described in Section 310, above) and the analysis year. However, in two instances the assessment of no build conditions could be expanded, as follows:

- If the evaluation of existing resource conditions relies on a context assessment (see Section 353, below) that includes a larger geographic area (e.g., the borough, City, or region), the future is considered in this context, as well.

- If during evaluation of a natural resource (or group of resources) it is found that, although currently degraded, these resources are improving, the improved condition would be considered as the baseline against which impacts are measured. This analysis might not necessarily be limited to the project's build year. Rather, if appropriate, it would project reasonable expectations of foreseeable conditions for the resource(s) in question. Project impacts would be assessed against these reasonable future conditions.

350. ASSESS PROBABLE IMPACTS OF ACTION

Assessing impacts of an action begins with understanding the extent to which the action will disturb or alter a resource in the short- or long-term. Direct effects are relatively straightforward; indirect effects may require more analysis. Next, the direct or indirect physical effects are assessed as they modify the functioning of the resource. Finally, the effects may also be expressed in the context of the scarcity or abundance of the resource.

351. Effects of the Action

351.1. Direct Effects

Direct effects of an action include the category of activities that intervene directly to alter the condition of a resource. These can include: removal of vegetation; introduction of new landscaping; filling or draining wet areas; stream diversion including channel widening or straightening, culverts, etc.; construction of bulkheads, piers, and other structures in the water; or construction of storm or sewer outfalls. If a proposed building would shade an area or a proposed pier would shade waters currently subject to sunlight, this also constitutes a direct effect. Direct effects also occur during construction, so, for example, the calculation of cleared area includes those areas required for construction activities, even if the long-term plan is to replant these areas. In addition, substantial changes to ambient noise levels could affect noise-sensitive species; if an action, either during construction or operation, may increase noise levels in or near a habitat containing noise-sensitive species, the natural resources analysis should coordinate with the noise analysis for the action.

Usually, the description of direct effects includes calculation of the area to be affected (in square feet or acres, for example), or volume of soils to be removed. It may also entail describing methods and types of construction at a level appropriate to understand the extent of an effect. This means that the proposed activities or assumed development scenario are defined in some detail. Where specifics are not known, a conservative but reasonable assumption is made.

351.2. Indirect Effects

Indirect effects on a given natural resource are those that affect a natural system or another resource that supports the resource under study. As described in Section 200, above, proposed activities that may indirectly affect a resource include changes in drainage patterns, changes in vegetation and impervious surfaces, alterations of groundwater flow or quality, and many construction operations that alter the flow of surface or groundwater to a resource or increase the transport of silt and sediments. In addition, changes to habitats adjacent to a resource may indirectly affect it; for example, loss of a tidal wetland habitat may indirectly affect the quality of the habitat in the adjacent water body; or planting of some ornamental species can threaten nearby natural areas if the introduced species, such as Norway maple or purple loosestrife, seed themselves in and virtually take over an area, reducing species diversity and affecting the habitat of indigenous animal species.

If the action under study may possibly indirectly affect a resource, the assessment attempts to describe and measure the extent of that effect. In some cases, this amounts to nothing more than comparing the proposed landscaping to the surrounding area to determine if it would be a similar habitat. In others, it may be necessary to analyze subsurface geology in a small area to track with some accuracy the flow of groundwater to a wetland and estimate the extent to which the action may alter the volume, quality, or direction of that flow.

352. Effect on the Functioning of a Natural Resource

The evaluation of the natural resources in the study area identifies the functions of a resource (under existing and no action conditions) and the elements that are critical to these functions. For example, groundwater flow may be essential to a particular freshwater wetland; in that wetland, the soft soil and fern-lined stream banks may provide essential habitat to an important reptile. If an action would decrease the groundwater flow to the wetland or somehow compact the soil surrounding it, the water quality and habitat quality may be compromised. In another example, a stand of trees may shade an area, allowing for increased cover and a cool microclimate for small mammals and birds. The loss of the trees would remove a specific habitat. Based on this type of analysis, the assessment of project effects identifies the loss associated with the action and the importance of that loss for the critical functions of the habitat.

A critical facet of the assessment is determining the extent of habitat impairment. As described earlier, resources' resiliency, or ability to accommodate change, are key to the assessment of habitats. The action being analyzed and the resiliency of the resource are compared to determine whether the resource would retain its functions or whether and how much those functions would be impaired by the action. Impairment can range from destruction of the habitat altogether to its partial degradation to minimal impairment. Destruction would include complete elimination of a habitat or removal of a species or a condition (such as regular inundation) essential to its existence. Partial degradation would remove or alter a portion of a resource so that it would continue to have some value as habitat, but its function would be more limited. An example of partial degradation might be to change the size and shape of a woodland area, so the interior habitat, for some species, is effectively diminished, but other species, which are more acclimated to "fringe" habitat, can still flourish. Minimal impairment would include minor or temporary disturbances. The parameters to be examined are physical (e.g., temperature, volume of water, soil types), biological (e.g., diversity, abundance, community structure), and situational (e.g., size, distribution, and shape).

353. Context of a Resource Change

In some cases where an action would remove a measurable amount of habitat or measurably decrease one or more of the functions of a resource, it may be appropriate to assess the severity of the impact by addressing the change in terms of the context of the resource. An action that removes an acre of a habitat that is very abundant throughout the City may be less significant than an action that removes an acre of an extremely scarce habitat. The loss of the trees cited as an example in Section 352, above, may not be significant if substantial areas of similar habitat are found within the general region of the study area. Or, a small loss of the flood-protecting function of a wetland from one action, if it is added to changes anticipated in the future no action condition, may result in a more systemwide loss of flood protection capacity. In considering the context of a resource change, it is always important to remember that many of New York City's resources may be abundant throughout the region or state, but scarce in the City's dense urban environment.

360. ASSESSMENT ISSUES FOR SPECIFIC NATURAL RESOURCES

361. Water Resources

361.1. Surface Water Bodies

The appropriate function and optimum condition of surface water bodies in the City are set by the DEC and appear as water quality standards (see Section 710, below). The DEC sets these goals depending on realistic conditions and actual function of a water body as well as its realistic potential. Surface waters are classified as suitable for some or all of the following functions: water supply, contact recreation, fishing and boating, fish habitat, fish passage. Each classification has a specific set of water quality standards, designed to protect the waters for the designated uses. These standards are expressed as minimum levels of dissolved oxygen that must be present, the acceptable range of pH, maximum coliform levels, and maximum amounts of toxic wastes and deleterious substances. Although these classifications do not necessarily reflect existing conditions, they express public environmental policy for the City's water bodies and, as such, help guide the type and level of analysis of surface water resources.

Fresh surface waters in New York State can be classified as N, AA-Special (AA-S), A-Special (A-S), AA, A, B, C, and D. Class N have the highest standards for water quality; Class D, the lowest. All the fresh surface waters in New York City are Class AA, B, or C. *Class AA* waters are best suited as a source of water supply for drinking, as well as for primary contact recreation (such as swimming), secondary contact recreation (boating), and fishing, and are suitable for fish propagation and survival. The City's reservoirs (Jerome Park and Central Park Reservoirs) are classified AA. *Class B* waters are best suited for primary and secondary contact recreation and fishing, and are

suitable for fish propagation and survival. Examples include the ponds and lakes in Prospect and Central Parks; Wolfe's Pond, Clove Lake, and Willowbrook Lake on Staten Island; and Meadow Lake, Willow Lake, and Kissena Lake in Queens. *Class C* waters are best used for fishing, and can be used for primary and secondary contact recreation; they are also suitable for fish propagation and survival. Huegenot Pond on Staten Island, Mill Creek in Queens, and portions of Tibbetts Brook in the Bronx are Class C.

Saline surface waters can be classified as SA, SB, SC, I, and SD; Class SA have the highest standards for water quality, and Class SD, the lowest. *Class SA* waters are best suited for shell fishing, fishing, primary and secondary contact recreation, and are suitable for fish propagation and survival. Much of the Atlantic Ocean around New York City is classified SA. *Class SB* waters are best used for fishing and primary and secondary contact recreation, and are suitable for fish propagation and survival. Jamaica Bay; much of Lower New York Bay, Raritan Bay, and Long Island Sound near Queens and the Bronx; and the Hudson River alongside the Bronx are Class SB. *Class SC* waters are best used for fishing, and are suitable for fish propagation and survival. The water quality is suitable for primary and secondary contact recreation. Class SC waters in New York City include the tidal portions of Lemon Creek and inland portions of Fresh Kills and its tributaries, on Staten Island. *Class I* waters are best suited for fishing and secondary contact recreation, and are suitable for fish propagation and survival. The East River, Harlem River, and Hudson River from the Battery to the Bronx are Class I. *Class SD* waters are best used for fishing, and are suitable for fish survival. This classification may be given to waters that cannot meet the requirements for primary and secondary contact recreation or fish propagation. Erie Basin, Gowanus Canal, Kill Van Kull, and much of the Arthur Kill are all SD waters.

The Interstate Sanitation Commission, a tri-state regulatory agency, also sets standards for water quality in the City's tidal waters. Its goal is to prevent water pollution and make more areas available for swimming and shellfishing.

Examples of actions that indirectly affect water bodies are listed in 361.3, below. Examples of actions that directly affect surface water bodies and issues for the assessment include:

- An action that adds to the discharges of pollutants to a surface water. Generally, this activity is limited to industrial discharges or sewage treatment plants, both of which are subject to the State Pollutant Discharge Elimination System (SPDES) permitting procedure (see Section 710, below). When water quality is an issue, the analysis can include one or more of the following:

1. Collecting available data on water quality. The New York City Department of Environmental Protection (DEP) and the Interstate Sanitation Commission (ISC) maintain sampling programs in the City's major waterways. EPA and DEC also perform more limited sampling. Parameters for which data may be available include dissolved oxygen (DO), which indicates the level at which fish life can be maintained; biological oxygen demand (BOD), which indicates presence of organic pollution; fecal coliform, which indicates the presence of organisms that spread disease; heavy metals, such as iron, manganese, copper, zinc, and lead, which are indications of industrial pollution; *nutrients*, such as phosphorus or nitrates, which are discharged from wastewater treatment plants and, in excess, allow algal growth that results in a reduction of oxygen levels; suspended solids; turbidity; pH; residual chlorine; and hardness.
2. Where sampling data are not available or where information for smaller areas of a larger water body is required, it may be necessary to take water quality samples. This can range from one-time sampling and testing for the parameters discussed above, to a year-long survey with samples taken at multiple locations. Generally, runoff or drainage from a small residential development into a water body with good tidal flushing would need only one sample. If the runoff is into water with poor tidal flushing (such as Spring Creek), samples at several locations would be needed to characterize the area's water quality. A large development near a sensitive resource would require a full program. To determine the worst-case water quality conditions, sampling should be conducted during the late summer, when water quality, especially dissolved oxygen, is at its lowest. The program should not be conducted after a recent large storm, which would affect the water quality.
3. In some cases, the new pollutants could be expected to affect water quality over a wider area; for these actions, application of a computer-simulated water quality model may be appropriate to assess impacts.

4. For water bodies that contain finfish and other aquatic or amphibian species that are considered significant, the assessment of changes in water quality parameters is also applied to the understanding of the potential for a change in habitat (see discussion in Section 310, above).

- An action, such as the introduction of a new stormwater outfall or construction of a bulkhead, pier, or other waterfront structure, that would disturb a portion of the environment, particularly the bottom. A stormwater outfall could increase the location and velocity of stormwater as it enters the water body, which could scour the bottom of sediments, thus changing the environment for the bottom (benthic) organisms that live there. Placing a new bulkhead or pier could also disturb the bottom, if only during construction, with similar, albeit short-term effects. All of these actions are subject to review and permitting by the State and Federal government (see Section 710) and the stormwater outfall is subject to a SPDES permit. The work required to answer questions about impacts on bottom organisms includes gathering available data from the literature, from sampling undertaken nearby, for example. It may be necessary to obtain samples of bottom sediments and bottom organisms. If so, the bottom sediments are analyzed for grain size, water content, organic matter, and pollutants such as heavy metals and total petroleum hydrocarbons. The benthic survey would include several grab samples in the area. A preservative would be applied to the samples when they are taken, to kill the organisms and prevent their decomposition. Such surveys are normally performed in the spring, when the highest concentration of organisms is more likely. Replicate samples (i.e., more than two) are taken for statistical accuracy. In the laboratory, the benthic species are counted and identified to the species level, where possible. For certain invertebrates, however, it is often impossible to identify to the species level, so higher taxonomic groupings are used. Species abundance and diversity are then calculated and used to characterize the area. Statistical techniques are often used to determine if significant differences exist between samples.

  In rare cases, it may be necessary to assess the impact on finfish and other vertebrates from the bottom sediments if they are suspended in the water. A bioassay test, which determines the potential uptake of pollutants in the sediment by animals, is performed in this case.

- An action, such as maintenance dredging, that would disturb the bottom sediments on a regular basis, altering the composition of the bottom and the volume of suspended solids in the water column. Sediment sampling and bioassay tests are appropriate, so that the effects of dredging on water quality and aquatic life, including the potential release (resuspension) of contaminants into the water, can be assessed. Disposal of dredged materials is also an issue, but this activity is regulated by the Federal government. Generally, dredged materials are disposed of 12 miles at sea in a Federally monitored disposal site. The U.S. Army Corps of Engineers and the EPA review the test data and decide whether the materials can be placed there without causing environmental impact, or whether restrictions are needed. Approximately 10 percent of such dredged materials require restrictions, such as capping with clean materials. Dredged materials from certain locations require special investigations and handling. These include dioxins in the sediments at the convergence of the Kill Van Kull and the Arthur Kill, and the very high pollutant levels in basins with poor or closed circulation, such as the Gowanus Canal and Newtown Creek. Such issues are disclosed in CEQR review; however, compliance with appropriate regulations would ensure appropriate disposal, based on dredge spoil quality, without creating a significant adverse impact.

- An action that would change a physical condition of the water, such as temperature, currents, flow, channel shape, etc. Examples include installation of piers or platforms that permanently shade portions of the water; cooling water discharges, wave curtains for marinas, culverts and channels often included in roadway design, etc. For certain actions, mathematical modeling may be required to determine if circulation may change, leading to an effect on water quality. Several models for the entire New York Harbor are used, and these are appropriate for large-scale actions, such as a large industrial facility, that could have harborwide effects. For smaller actions, generic water circulation models are available that can be used to determine localized changes. The potential impacts from marina wave breaks and new piers can be analyzed by such models.

- An action that would result in the draining or filling of a water body or a portion of a water body. Examples include culverts or channel modifications that direct flow away from a pond; filling to create land (such as Battery Park City) or to

even out a shoreline in creating a bulkhead, etc. These actions affect water circulation and could lead to increased flooding, both off- and on-site. The potential effects on circulation can be analyzed using the models discussed above. Flooding potential can be analyzed using either hand calculations or computer models, depending on the complexity of the situation.

361.2. Groundwater

As described in Section 112, above, the importance of groundwater as a resource is: (1) as a source of water supply for population and industry; (2) as a source of water for surface water bodies and wetlands; and (3) as a water source for certain plant species. Groundwater is therefore a resource unto itself and an important component in environmental systems supporting surface water bodies, wetlands, and some upland habitats.

The DEC sets water quality standards for groundwater based on its potential use. Fresh groundwater is generally classified as having the potential to provide potable water supply. However, in New York City, only a portion of the Jameco and Magothy Aquifers is used for drinking water supply. The Jameco and Magothy Aquifers are designated as sole source aquifers in Brooklyn and Queens and are thus afforded special protection. Most actions would not have an impact on these aquifers unless wells are installed or subsurface waste disposal is part of the action. On Staten Island, the underlying aquifers are used for process water or irrigation supply by private interests, but the aquifers are not considered to be sole source. Although some small water-bearing areas can be found beneath Manhattan and the Bronx, these are not used for drinking water supply. Throughout New York City, the Upper Pleistocene soils contain groundwater, which also feeds surface water bodies. Groundwater quality is of concern for natural resources where it supplies water to sensitive habitats and water bodies. Groundwater quality is particularly important to maintain freshwater wetlands, which are located in Staten Island and Queens. The analysis of groundwater quality is similar to that of surface water quality. Samples are obtained, in this case by establishing a sampling well, and chemical tests are undertaken (see also Section 3J, "Hazardous Materials").

The quantity of groundwater can also be important, because it supplies water to wetlands and surface water bodies during dry periods. In a contrasting example, groundwater is such a small component of the waters of the lower East River that its flow would not be a concern in this case. The analysis of groundwater quantity and flow is geotechnical and involves establishing the characteristics of the aquifer (the material through which the groundwater moves), the direction and rate of flow, and the rate of recharge. Activities that could affect groundwater quality or quantity and the assessment issues associated with these activities include the following:

- *Installation of industrial or residential water supply wells.* The issue in this case is the potential that pumping will alter the flow of groundwater in a specified area, possibly altering flows to another resource. If pumping takes place close enough to a source of contamination, the action could draw pollutants (such as salt) into the aquifer. (More information on potential contamination is provided in Section 3J, "Hazardous Materials.") To assess such potential impacts, several wells would need to be installed, and the water levels recorded. These readings are plotted and drawn as contours to create a piezometric surface, which shows the direction and strength of groundwater flow. If the site is close to a tidal water body, the water levels need to be recorded for an entire tidal cycle to establish the tidal influence on the groundwater flow.

- *Dewatering of a construction site.* This is similar to the installation of wells, in that the activity may alter flow of groundwater in a specified area. However, it is a temporary condition.

- *Removal of vegetation and/or placing an impervious surface on land used for the recharge of groundwater.* This would clearly diminish the replenishment and ultimately the total volume of groundwater available. Usually as a part of site planning, current runoff and runoff with the action in place are calculated. A number of methods can be used to make this estimate, including the "rational method;" TR-20 and TR-55, computerized models developed by the U.S. Department of Agriculture, Soil Conservation Service; and EPA's Storm Water Management Model (SWMM). These methods calculate the volume of runoff, given the volume of rainfall and the area of impermeable surface. They typically use runoff coefficients based on types and areas of different ground surface on the project site. Using this formula and the average annual precipitation (44 inches in New York City), the current recharge and recharge with the action can be calculated. The significance of the change caused by the action can be assessed by comparing the loss or increase in recharge volume to the volume from the recharge area.

- *Installation of groundwater recharge wells or other recharge facilities.* Where increased impervious surfaces are proposed, they are often accompanied by a plan for recharging groundwater through wells. These wells return the precipitation to the groundwater. Generally, the runoff is collected directly from rooftops and other impervious surfaces. Such recharge wells will not function properly unless the distance from the bottom of frozen soil (3 feet in New York City) to the top of the water table is more than 2 feet; therefore the depth to the water table is considered when assessing the wells.

- *Construction of footings, caissons, basements, and other subsurface impediments to groundwater flow.* Deep foundations can occasionally create wet spots and low-level flooding if they impede the flow of groundwater. Near tidal water bodies with fluctuating groundwater levels, the impediment to flow can become noticeable.

- *Introduction of an activity on-site with the potential to contaminate groundwater.* Such activities include industries involved in the transport, processing, storage, or disposal of hazardous or toxic materials. In this case, the assessment first addresses the question of whether groundwater on the site is important for on-site or off-site water supply or resource replenishment. If so, the assessment then considers the existing quality of the groundwater, its flow direction and rate, and the pathways to contamination. The analysis undertaken for hazardous materials is described in Section 3J, "Hazardous Materials."

361.3. Other Water Resource Systems

As defined in Section 113, above, stormwater and the natural and built systems that convey it to a receiving water or wetland resource are critical elements in the condition and value of that resource. The quality of the stormwater and its velocity and volume as it moves across the land all affect the physical and chemical characteristics of water bodies and receiving waters. This in turn is determined by the slope and coverage of the land, the uses on it, the presence of built systems to convey stormwater flows, the types of storms the area is subject to, and the ability of the low-lying floodplains to retain stormwater and diffuse the force of its flows. Other natural phenomena that strongly affect the environment include the action of tides and waves, which shape the land through erosion or accretion of sand and other materials carried in the waters. A proposed action can alter these systems or combine with them for unexpected results. Examples are as follows:

- Actions that would alter the way in which stormwater flows overland or is absorbed to recharge groundwater. These include activities that displace heavier vegetation (such as woodlands) with lighter vegetation (such as lawns) or add impervious surfaces to the land; alter the shape of the land (cut or fill it to build a road, for example); or introduce a built storm drainage system. Any of these actions may increase the amount of rainfall that arrives at a water body or wetland as surface flow; increase the velocity with which it flows; create an earlier and substantially greater "peak" flow to the receiving water; or change the speed and direction of flow. The analysis of such actions includes assessing the area draining to the water body, as described in Section 330, above.

- Changes to the floodplain, including the following: placement of structures in the floodplain that reduce its capacity for flood retention or alter stormwater flow characteristics; removal of vegetation that would otherwise reduce flow velocities and promote recharge; and removal of stream bank vegetation, which may destabilize the stream channel or increase water temperatures. The analysis of the floodplain uses engineering techniques similar to those presented for the assessment of overland runoff. To estimate the potential for increased flooding because of an action, the volume of the floodplain occupied by any buildings facilitated by the action is compared with the total volume of the floodplain. Along the Hudson River, even very large projects would have minimal effect, because of the great volume of the total floodplain area; along small streams, such as Lemon Creek on Staten Island, a small project in the floodplain could cause flooding elsewhere.

362. Wetlands

The City, State, and Federal government all recognize the critical importance of wetlands in the environment. As discussed in Section 710, the DEC and the U.S. Army Corps of Engineers (COE) require permits for certain actions that would involve most wetlands and the areas adjacent to them. The COE has jurisdiction over virtually all freshwater and tidal wetlands. DEC also takes jurisdiction over all tidal wetlands and all freshwater wetlands greater than 12.4 acres; smaller freshwater wetlands may also fall under DEC jurisdiction if they are deemed to be of unusual local importance. The jurisdiction extends beyond the borders of the wetlands. In New York City, DEC requires actions taking place in the contiguous area within 150 feet of a tidal wetland or 100 feet of a freshwater wetland to obtain wetlands permits. Use of these DEC adjacent and

buffer areas is usually appropriate in CEQR analyses of wetlands; however, in some circumstances, it could be appropriate to examine areas larger than 100 and 150 feet. For example, beaches, dunes, or bluffs often border tidal wetlands. It may not be appropriate for the CEQR impact assessment to adhere strictly to a 150-foot adjacent area or to the 10-foot elevation that constitutes DEC's jurisdictional boundary, since effects on dunes or bluffs that are often farther than 150 feet or higher than elevation 10 feet could be overlooked. In all cases, it is essential for the analyst to define the area in which activities could adversely affect the resource.

DEC and COE have established technical procedures for the definition and evaluation of wetlands. Both procedures acknowledge that three elements work together to create and maintain wetlands: wetland hydrology (the movement of water to and through the wetlands that creates saturated conditions for at least one week during the growing season); hydric soils (generally dark, mucky soils with chemical and organic characteristics that reflect the lack of oxygen [anaerobic conditions] from inundation); and hydric vegetation (plants that can germinate and grow in anaerobic soil conditions). The COE technical approach emphasizes determination of soil types in delineating wetlands; DEC stresses identification of vegetation in delineating and characterizing wetlands. (See 6 NYCRR Parts 660-665 for DEC guidance. The COE and EPA have agreed to use the *Corps of Engineers Wetlands Delineation Manual, 1987* for purposes of administering the program under Section 404 of the Clean Water Act. The EPA, the COE, the Soil Conservation Service, and the Fish and Wildlife Service are currently considering revisions to the more recently released *Federal Manual for Identifying and Delineating Jurisdictional Wetlands, 1989.*) In general, the approaches do overlap. However, relying on vegetation identification to delineate wetlands is usually more conservative than relying on soils identification; wetland vegetation is often found growing in soils that are adjacent to wetlands soils but are not classified as such. Therefore, a reliance on vegetation will most often result in the delineation of a larger area as wetlands.

When an action requires permits from both agencies, it may be necessary to assess and identify two different wetland boundary conditions. In this case, the larger of the two areas is identified for use in the CEQR assessment. Actions that might affect wetlands either directly or through changes to their adjacent areas are the same as those discussed above under water resources (Section 361); they fall into the following general categories:

- Any form of draining, dredging, excavation, or removal of soil, mud, sand, shells, gravel or other aggregate, either directly or indirectly.
- Any form of dumping, filling or depositing of any soil, stones, sand, gravel, mud, rubbish, or fill of any kind, either directly or indirectly.
- Erecting any structures or roads, the driving of pilings, or the placing of any other obstructions, whether or not changing the ebb and flow of the water.
- Any form of pollution.
- Any other activity that may substantially alter or impair the natural condition or function of a wetland.

The methods for assessing and evaluating wetlands generally follow the outline presented in Sections 320 and 330, above. In addition, the DEC regulations group freshwater wetlands into four classifications based on their intrinsic value; DEC tidal wetlands regulations also offer insight into the comparative value of such wetlands, as summarized below.

362.1. Freshwater Wetlands Classifications

Part 664.5 of 6 NYCRR lists four wetlands classifications. *Class I* wetlands are the most valuable and may contain any of seven specific characteristics: it is a classic kettlehole bog (a rare ecological association not known to exist in New York City); it is a resident habitat of an endangered or threatened animal species; it contains an endangered or threatened plant species; it supports a diversity of species unusual in the State; it plays a key role in flood prevention in an inhabited area; it is connected to a surface or groundwater drinking water supply; it contains four or more Class II characteristics.

Class II wetlands are identified as containing one of 17 characteristics. The most germane of these for the City are: it is an emergent marsh less than two-thirds covered by purple loosestrife and/or common reed; it contains two or more wetland structural groups (herbaceous, woody, or water); it is adjacent to a tidal wetlands; it is associated with permanent open water; it is adjacent to streams classified C or higher (see Section 361, above); it is a traditional migration habitat of an endangered or threatened animal species or a resident habitat of a vulnerable animal or plant species; it supports a diversity unusual for the City or borough; it has demonstrable archaeological significance; or it is within an urbanized area, is one of the three largest in the City or borough, or is within a publicly owned recreation area.

Because New York City is considered an urbanized area, all freshwater wetlands within it are either Class I or Class II. Consideration of Class III criteria is of interest, however, because the features listed may be of issue in the CEQR assessment. *Class III* wetlands have 15 characteristics, the most relevant of which include: it is a wetland with one of five cover types not listed for Classes I and II (including open water); it is a resident or migration habitat of an animal species vulnerable in the major region of the State in which it is found or is a migration habitat of a vulnerable species in the State; it contains a regionally vulnerable plant species; it receives significant pollution of a type amenable to amelioration by wetlands; it is visible from a major transportation route and serves a valuable aesthetic or open space function; or it is on publicly owned land that is accessible to the public.

Class IV is reserved for wetland areas of little value, including wet meadow that is not associated with other wetlands or coniferous swamp.

362.2. *Tidal Wetlands Evaluation*

Part 661.2 of 6 NYCRR provides a useful reference for understanding the relative value of tidal wetlands. The discussion notes that all tidal wetlands are potentially extremely valuable: "one of the most vital and productive areas of the natural world." Within this overall evaluation, however, intertidal wetlands and coastal fresh marsh are considered the most biologically productive and worthy of the most stringent protections.

Coastal shoals, bars, and flats and littoral zones can vary widely in their value and contribution to productivity. The discussion acknowledges that biological productivity in these wetlands may have been impaired by pollution; such areas contain few benthic organisms and show little primary productivity. Where this has occurred, more activity is acceptable without affecting the other important functioning of these wetlands: for flood and hurricane and storm control. If this type of wetland is so altered that it no longer functions biologically as a tidal wetland, it can be identified and no longer treated as a tidal wetland under the regulations.

High marshes or salt meadows are considered valuable particularly for absorption of silt and organic materials and storm control. Their location near upland makes them important for cleansing ecosystems. They also provide substantial habitat and feeding area for birds, reptiles, and insect populations. In general, however, they are considered slightly less valuable than intertidal wetlands or coastal fresh marsh.

Formerly connected tidal wetlands are variable in their contributions and functioning and are evaluated on a case-by-case basis. They are generally described by whichever of the wetlands categories (intertidal wetlands, high marsh, etc.) they most closely resemble.

363. *Uplands*

Upland habitats in the City are extremely diverse, and issues for their assessment vary widely. All provide habitat for wildlife, and most function to offer scenic if not also recreational opportunities for the public. Some, including beach, dunes, bluffs, and some thickets, are even more important in controlling erosion and protecting the City's shoreline. The discussion below divides uplands into three major groups with similar functions and therefore similar impact issues.

363.1. *Beach, Dunes, Bluffs, and Thickets*

As discussed in Section 130, dunes and bluffs are critical to maintaining the City's beaches and natural shoreline. Thickets are included in this grouping, because most often this low growth takes hold on dunes and bluffs, helping to stabilize them in the face of waves and winds. The beaches themselves absorb wave and storm energy, thus helping to preserve the shoreline. All of these features are protected under DEC's Coastal Erosion Management program (see Section 710). Few types of actions are now permitted in these areas, but they may include the following:

- Construction of walkways, pathways, boardwalks, or stairs over dunes and bluffs to the beach or along the beach.
- Construction of sheds, cabanas, and other small structures to accommodate equipment and activities at or near a beach.
- "Nonmajor" additions to existing structures.

Usually, the disruption caused by these activities is limited. However, it is appropriate to consider such possibilities as loss of vegetation, including plant species that are endangered, threatened, exploitably vulnerable, or rare; reduction or loss of wildlife habitat; effect of increased public use; and compaction of soils or erosion from construction activities. In addition, where substantial development is proposed upland of a beach or dunes or atop a bluff, it is possible that issues of major erosion control protection may arise.

363.2. *Maritime Grasslands and Sandy Oak Barrens*

These two habitats are formed by harsh conditions of dry soils and exposure to sea winds. Both are unusual in the City and may contain indigenous plant and

animal species that are rare or of special concern. Except as listed in Section 150, above, these habitats are afforded no special regulatory protections. However, their fragility makes them susceptible to impact. They cannot tolerate much loss of vegetation; changes in adjacent habitats that act as buffers between these systems and more developed areas can lead to adverse impacts; and changes in drainage can be problematic.

When an action is proposed in or near one of these habitats, a detailed assessment is often appropriate. This may include identifying plant species and delineating the habitat; determining whether any species that are endangered, rare, or of special concern are present; characterizing the "buffer" habitats and their role in protecting the grasslands or barrens; and analyzing drainage patterns serving the habitat(s).

363.3. Old Meadows or Fields, Woodlands, and Gardens

These habitats are usually considered to be common and therefore are not often protected by specific regulation. However, in the City, these areas often support a range of wildlife and plant species and serve one or more important functions—particularly for recreation and open space. For these as well as all other habitats discussed in this section, the CEQR analysis begins by assuming that they are valuable. Using the approach outlined in Sections 320 through 350, above, the resource is characterized according to its vegetation, potential for wildlife habitat, current use, and, as appropriate, the environmental systems that support it. It is then assessed giving consideration to the context of similar habitat in the area, and how the area is used by wildlife. For example, a small park with low shrubs that is located in a densely developed urban area could provide important habitat for nesting birds, but the same park located in a low-density area (such as R1 or R2 zones) would not necessarily be used for nesting.

As another example, in New York City mostly small patches of forest remain, although they are common Statewide. Only a handful of forests, mostly in parks, are large enough to support interior habitat. Thus, a relatively large wooded area, including its buffer—mowed lawn, weedy or shrubby edge, etc.—are important as wildlife habitat and refuge. The survival of forest communities rests on protecting large patches and their buffers, and also on protecting smaller patches that serve as wildlife corridors and seed sources.

364. Built Resources

Where built resources support species that are endangered, rare, or of concern, the resources are considered valuable, and their loss may constitute a potential significant adverse impact. Therefore, the assessment of such resources is focused on determining the extent to which such species may rely on these resources and whether the loss of all or a part of the resource would result in a real loss of habitat, in the context of all such available habitat.

365. Significant, Sensitive, or Designated Resources

Where an action may affect one or more of the resources listed in Section 150, above, a detailed assessment is usually appropriate. This assessment can make use of information that is already available (many of these resources are the subject of ongoing study), but it may also require considerable field work. Before determining the scope of the assessment, it is recommended that the lead agency consult with DEP or with the agency with jurisdiction over the resource.

400. Determining Impact Significance

The approach to determining impact significance takes into account that the City's natural resources are relatively scarce. In general, if a resource has been found to serve one or more of a number of natural or recreational functions and an action would directly or indirectly diminish its size or its capacity to function (as determined in Section 300), the impact is considered to be significant. The following list is not all inclusive, but serves as guidance in considering impact significance. An impact may be significant if the following would be true:

- An action would likely render a water resource unfit for one or more uses for which it is classified.
- An action would, directly or indirectly, be likely to adversely affect a significant, sensitive, or designated resource as listed in Section 150, above.
- An action would likely diminish a resident or migrant habitat for an endangered, threatened, or rare animal species, or a species of special concern.
- An action would likely result in the loss of plant species that are endangered, threatened, rare, or vulnerable.
- An action would likely result in the loss of part or all of a resource that is important because it is large, unusual, or the only one remaining in the area where the action is to take place.
- An action would, either directly or indirectly, be likely to cause a noticeable decrease in a resource's ability to serve one or more of the

following functions: wildlife habitat; food chain support; physical protection (flood protection, e.g.); water supply; pollution removal; recreational use; aesthetic or scenic enhancement; commercial productivity; or microclimate support.
- An action would, either directly or indirectly, be likely to contribute to a cumulative loss of habitat or function.

500. Developing Mitigation

If a significant impact on natural resources is identified, the first step is to try to avoid the impact (see Section 600, below). If this is not possible, significant impacts on or losses of natural resources require consideration of mitigation measures that decrease the impacts or compensate for or restore the lost resource. In general, impacts during construction can be mitigated by specific control measures and restoration of the resource on completion of construction. More permanent impacts, such as loss of vegetation, are less easily mitigated, as discussed below.

510. CONSTRUCTION IMPACT MITIGATION

Mitigation techniques are applied during construction to control erosion and siltation, maintain existing drainage patterns, and avoid activities that unnecessarily cause temporary or permanent damage. Such techniques include:

- Limiting cleared areas to those required for construction and staging only; selection of the least vulnerable areas for clearing to the extent possible.
- Use of silt fences, hay bales, mulches, and other covers to limit areas of soil exposures and stabilize slopes.
- Limiting the use of heavy equipment in areas vulnerable to the effects of compaction.
- Installing temporary drainage systems, including sediment traps, for the duration of construction.
- Limiting the use of chemicals and other potential pollutants for dust control and other construction activities.
- Strict control of the storage, handling, and transport of construction wastes.
- Limiting dewatering to the extent possible; disposing of such waters to maintain the existing drainage system and avoid surface water pollution.
- Limiting construction to periods in which breeding or spawning does not take place.
- Incorporating noise or vibration controls in areas containing noise-sensitive species.
- Avoiding dredging in contaminated areas, using such techniques as silt screens and turbidity dredging methods and restricting dredging to the areas of low current velocity.

520. LONG-TERM MITIGATION

Long-term mitigation techniques for impacts related to vegetation clearance, exposure of slopes, changes in drainage patterns, and loss of habitat include, but are not limited to:

- Revegetation programs and maintenance of ground cover with indigenous species.
- Use of pervious materials (e.g., gravel instead of blacktop) to promote infiltration of stormwater.
- Retention of stormwater on site and its slow recharge to the ground or overland to surface waters.
- Slope and surface protection, such as physical stabilization, or diversion of drainage around steeply sloped areas, grassed swales, or waterways.
- Streambank protection, such as physical stabilization, avoidance of clearing.
- Water pollution controls including sediment traps or basins, drain inlet sediment filters.
- Use of pile foundations instead of regrading.
- Provision of tunnels under roadways for wildlife.
- Provision of enhanced habitats in the remaining area of or near the affected resource.
- Provision of replacement resources; this is used as a last resort, and can include identifying and upgrading existing wetlands or other resources, or reintroducing the resource to an area that could support it.

600. Developing Alternatives

Avoidance of impact on a natural resource is preferable to mitigation. Therefore, alternatives that can avoid or minimize impacts to natural resources and avoid the need for mitigation should be given first consideration. Such alternatives can include different sites as well as changes to project layout, design, and density.

700. Regulations and Coordination

710. REGULATIONS AND STANDARDS

There are myriad Federal, State, and City rules and regulations governing natural resources. These permits are independent of CEQR, and may require their own environmental review. Since many CEQR actions may also be affected by them, applicants and lead agencies will need to be aware of them. Those

most commonly applicable for actions undertaken in New York City are described below.

711. Federal Regulations

- *Section 404 of the Federal Clean Water Act: Dredge and Fill.* Section 404 of the Federal Clean Water Act (33 USC 1344, jointly administered by EPA and the U.S. Army Corps of Engineers, or COE) prohibits the discharge of dredged or fill material into the waters of the U.S. (including wetlands) without a permit from the COE. These activities can be authorized through Nationwide, Regional General, or Individual permits.

  1. Nationwide Permits. Nationwide permits are general permits designed to regulate with little delay certain activities that the COE has already found to have minimal environmental impacts. The 36 Nationwide permits, found at 33 CFR Part 330, are intended to apply throughout the entire country, although DEC has taken exceptions to certain of these permits. Except in a few, specified instances (for example, where a historic resource or endangered species may be affected), written authorization is not necessary for actions covered by these permits. Examples of activities covered under Nationwide permits include maintenance of currently serviceable structures or fill (provided that there is no change in use of these structures); temporary recreational structures; and removal of wrecked, abandoned, or disabled vessels. In New York State, the regulations have been modified by DEC and the Department of State (NYSDOS) to deny or modify conditions related to specific activities to fulfill these agencies' responsibilities under Water Quality Certification (DEC) and Coastal Zone Management (NYSDOS).
  2. Regional General Permits. In addition to the 36 Nationwide permits, the COE has also issued many general permits on a regional, rather than nationwide, basis to authorize minor activities without the need for individual processing.
  3. Individual Permits. Actions that involve activity in the water but that are not covered by Nationwide or Regional General permits require individual permits. Applications for individual permits require extensive documentation, including environmental review under NEPA regulations and discussion of alternatives considered to avoid or minimize significant adverse impacts to wetlands or waters. Mitigation for significant adverse impacts is also required.

- *Section 10 of the Rivers and Harbors Act of 1899 (33 USC 403).* Section 10 requires a permit for construction of structures on or affecting navigable waters of the U.S. For the permit to be issued, the action must not obstruct or alter navigable waters, present a significant adverse effect on the aquatic environment, or result in violations of water quality criteria. As for Section 404 of the Clean Water Act, these activities can be authorized by Nationwide, Regional General, or Individual permits, described above.

- *Section 401 of the Clean Water Act (33 USC 1341).* Section 401 requires a Water Quality Certificate to be issued for all discharge activities within the waters of the U.S. (including wetlands). In New York State, this certificate is issued by DEC. This certification requires evidence that the project will not cause a violation of water quality standards. This certification is required for Individual Permits issued by the COE (see above); it has already been issued for Nationwide and Regional General Permits.

- *Section 402 of the Clean Water Act: National Pollutant Discharge Elimination System (NPDES) Program (33 USC 1342).* Under the NPDES program, any point source discharge and stormwater discharges associated with industrial activities and municipal separate storm sewer systems require a permit. The State of New York is authorized to administer the NPDES program under its own State program (see the discussion of SPDES, below).

- *Flood Insurance Acts.* The National Flood Insurance Act of 1968 (42 USC 4001) and the Flood Disaster Protection Act of 1973 (Public Law 93-234). These acts designate coastal high hazard areas and floodways and make Federal flood insurance available to buildings and structures within those areas that are constructed so as to minimize danger to human lives, in accordance with Federal guidelines.

- *Endangered Species Act.* As part of the 1974 Endangered Species Act (50 CFR 17), several categories of Federal protection were established by the Department of the Interior, Fish and Wildlife Service. Species can be considered endangered (in danger of extinction throughout all or a significant portion of its range) or threatened

(likely to be become endangered within the foreseeable future). Plants and animals listed in the Federal Register as endangered or threatened are protected by Federal law: it is illegal to pick, damage, or destroy any protected plants on property not owned by the individual, or to hunt, import, export, or possess protected animals. The Fish and Wildlife Service also lists candidates for designation as endangered or threatened species. Although listed candidates are not subject to legal protections, their status may be relevant to a CEQR assessment.

712. State Regulations

- *Freshwater Wetlands Protection Program*—Article 24 of the New York State Environmental Conservation Law (ECL); implementing regulations 6 NYCRR, Parts 662-665. To implement the State policy to preserve, protect, and conserve freshwater wetlands, and to regulate the use and development of such wetlands, DEC created the Freshwater Wetlands Protection Program, which protects freshwater wetlands of 12.4 acres or larger. Smaller wetlands can also be protected if the Commissioner of DEC has determined that they have unusual local importance. All of the protected wetlands are identified on maps prepared by the DEC.

  The Freshwater Wetlands Act provides for the regulation of activities in freshwater wetlands and adjacent areas. Adjacent areas are the areas outside the wetlands that extend 100 feet from the wetland boundary. Permits are required for most activities within the wetlands and adjacent areas.

- *Tidal Wetlands Protection Program*—ECL Article 25; 6 NYCRR Parts 660 and 661. To implement the State policy to preserve and protect tidal wetlands, DEC created the Tidal Wetlands Protection Program, which regulates all tidal wetlands identified on maps prepared by the DEC, and adjacent areas. For New York City, adjacent areas generally include the area within 150 feet of the most landward boundary of the tidal wetland, with certain exceptions. Permits are required for most activities within tidal wetlands and adjacent areas.

- *Classification of Waters*—Article 6 of the New York State Public Health Law; 6 NYCRR Part 800. Under this program, the State Water Pollution Control Board adopts and assigns classifications and standards on the basis of the existing or expected best usage of the State's waters.

- *Use and Protection of Waters Program*—Article 15, ECL Title 5; 6 NYCRR Part 608. The Protection of Waters Program regulates the following types of activities:

  1. Disturbance of the bed or banks of a protected stream or other watercourse (those classified as AA, A, B, or C; lower classifications are not regulated under the Protection of Waters Program).
  2. Construction and maintenance of dams or artificial obstructions in or across a natural stream or watercourse.
  3. Excavation and/or filling in navigable waters, including adjacent marshes and wetlands. This includes conducting any activity that may result in any discharge or runoff into navigable waters. Any work in the water, even if undertaken under a Nationwide Permit (see the Federal regulations, above), requires a Protection of Waters permit.

- *State Pollutant Discharge Elimination System (SPDES) Program*—Water Pollution Control Act (ECL Article 17); 6 NYCRR Parts 750-757. The SPDES Program is designed to eliminate the pollution of New York waters and to maintain the highest quality of water possible, consistent with public health and enjoyment of the resource, protection and propagation of fish and wildlife, and industrial development in the State. SPDES permits are required for construction or use of an outlet or discharge pipe (referred to as "point sources") of wastewater discharging into the surface waters or groundwaters of the State; or construction or operation of disposal systems, such as sewage treatment plants.

- *Endangered and Threatened Species Program*—ECL Articles 9 and 11; 6 NYCRR Parts 182 and 193. Similar to the Federal protections, DEC maintains a list of plant and animal species that are protected. Plants and animals listed in 6 NYCRR Parts 182 and 193 are protected by State law: it is illegal to pick, damage, or destroy any protected plants on property not owned by the individual, or to apply any defoliant or herbicide, or carry these plants away without the owner's consent; it is also illegal to hunt, import, export, or possess protected animals.

  Plants are divided into the following categories:

1. Endangered—in danger of extinction within the State and requiring remedial action to prevent such extinction.
2. Threatened—likely to become endangered in the State in the foreseeable future.
3. Exploitably vulnerable—likely to become threatened in a significant part of their range in the State if causal factors continue unchecked.
4. Rare—those with from 20 to 35 extant sites or 3,000 to 5,000 individuals Statewide.

Animals are divided into similar categories:

1. Endangered—in danger of extinction within the State and requiring remedial action to prevent such extinction.
2. Threatened—likely to become endangered in the State in the foreseeable future.
3. Special Concern—Species for which a documented concern exists for their continued welfare in New York. These species do not receive legal protection, however.

- In addition to animal species protected by the State's endangered and threatened species program (above), other species are also fully or partially protected by law. Fully protected species may not be hunted, pursued, or harassed in any way at any time, except by special permit. Partially protected species are hunted in season, with bag limits and using specified procedures.

- *Coastal Management Program (CMP).* The CMP established 44 policies that are applicable to development and use proposals in the State's coastal area, and allowed local municipalities to enact their own waterfront revitalization programs to implement these and other applicable policies. New York City's Waterfront Revitalization Program was established under the CMP (see discussion below).

- *Coastal Erosion Hazard Areas Act*—ECL Article 34; 6 NYCRR Part 505. Under this Act, DEC established a Coastal Erosion Hazards Area, identified on maps. Activities in this area are regulated to minimize or prevent damage or destruction to structures, buildings, property, natural protective features, and other natural resources, and to protect human life. Permits are required for most activities in a designated Coastal Erosion Hazard Area.

- *Flood Hazard Areas*—ECL Article 36; 6 NYCRR Part 500. A permit is required for any development within the Federally designated flood hazard areas.

- *New York Natural Heritage Program.* The Natural Heritage program is intended to identify all natural and artificial ecological communities and rare species that represent the full array of ecological and biotic diversity in New York State. The program focuses on the status and distribution of rare plant and animal species and valuable natural communities because they are most at risk of elimination in the State and globally. All of the habitats and species listed in the program are given a ranking indicating their rarity both globally and in the State. Although the Natural Heritage Program rankings do not provide legal protection, they can be used for assessment of an action's impacts on rare species.

- *Significant Coastal Fish and Wildlife Habitats*—Waterfront Revitalization and Coastal Resources Act (Executive Law of New York, Article 42). Under this program, DEC recommends for designation by the Department of State areas it considers significant coastal fish and wildlife habitats. These are habitats that are essential to the survival of a large portion of a particular fish and wildlife population; that support populations of protected species; that support fish and wildlife populations that have significant commercial, recreational, or educational value; and/or that are types not commonly found in the State or region.

- *Critical Environmental Areas*—6 NYCRR Part 617.4(3). A State or local agency may designate a specific geographic area as having exceptional or unique characteristics that make the area environmentally important. Any unlisted action located in a CEA must be treated as a Type I action under SEQRA and CEQR.

713. New York City Regulations

- *Waterfront Revitalization Program (WRP).* The City's WRP also established a Coastal Zone, within which all discretionary waterfront actions must be reviewed for consistency with coastal zone policies. This is discussed in detail in Section 3K of this Manual.

- *Local Law 33 of 1988.* This law requires that all habitable space be built at an elevation at or above the 100-year flood level.

- *New York City Zoning Resolution.* The Zoning Resolution includes several districts with special

zoning designed to preserve unique natural features. These include the Special Natural Area Districts (Staten Island and the Bronx), the Special Hillsides Preservation District (Staten Island), and the Special South Richmond Development District.

- *197-a Plans and Other Planning Initiatives.* Other plans and public policy can also include regulations to protect natural resources.

714. Public Policies

- *No Net Increase in Nitrogen.* New York, New Jersey, and Connecticut have agreed to keep the level of nitrogen discharged into the waters that affect Long Island Sound at or below 1990 levels, to avoid the negative effects that can result from excess nitrogen. This is important in areas of the Bronx and Queens that border the Sound or the Upper East River, which directly affects the Sound.

720. APPLICABLE COORDINATION

When an action is subject to any of the regulations listed above, coordination with the appropriate regulatory agency will be required.

730. LOCATION OF INFORMATION

31. Regulatory Agencies

- U.S. Army Corps of Engineers
  Department of the Army
  ATTN: Chief, Regulatory Branch
  New York District, Corps of Engineers
  26 Federal Plaza
  New York, NY 10278

- U.S. Environmental Protection Agency—Region 2
  26 Federal Plaza, Room 837
  New York, NY 10278

- U.S. Fish and Wildlife Service
  One Gateway Corner, Suite 700
  Newton Corner, MA 02158
  National Wetlands Inventory
  Endangered Species Program

- National Park Service
  Gateway National Recreation Area
  Headquarters, Building 69, Floyd Bennett Field
  Brooklyn, NY 11234

- National Marine Fisheries Service in New York
  166 Old Country Road
  Riverhead, NY 11901
  For endangered, threatened, special concern marine species.

- New York State Department of Environmental Conservation
  700 Troy-Schenectady Road
  Latham, NY 12110-2400
  Division of Fish and Wildlife, Information Services
  New York Natural Heritage Program
  Significant Habitat Unit

- New York State Department of Environmental Conservation
  Regional Office, Region 2
  Hunters Point Plaza
  47-40 21st Street
  Long Island City, NY 11101

- New York State Department of Environmental Conservation
  Regional Office, Region 1
  SUNY Campus, Building 40
  Stony Brook, NY 11794

- Federal Emergency Management Agency
  26 Federal Plaza
  New York, NY 10278
  Floodplain maps

- New York City Department of Environmental Protection
  59-17 Junction Boulevard
  Elmhurst, Queens, NY 11373

- New York City Department of Parks and Recreation
  The Arsenal, Central Park
  New York, NY 10021

732. Other Sources

- U.S. Department of Agriculture
  Soil Conservation Service
  P.O. Box 2890
  Washington, D.C. 20013
  Information on soil types

- Hudson River Foundation for Environmental Research
  40 West 20th Street
  New York, NY 10011

- Queens College Library
  65-30 Kissena Boulevard
  Flushing, NY 11367

- United Engineering Center
  345 East 47th Street
  New York, NY 10017

- Hagstrom Map and Travel Center
  57 West 43rd Street
  New York, NY 10036
  U.S.G.S. topographical maps, nautical charts

J. Hazardous Materials

100. Definitions

110. HAZARDOUS MATERIALS

For hazardous materials, the goal for CEQR is to determine whether the proposed action could lead to increased exposure of people or the environment to hazardous materials. A hazardous material is any substance that poses a threat to human health or the environment. Substances that can be of concern include, but are not limited to, the following:

- *Heavy metals*. These include lead, cadmium, mercury, arsenic, etc. Used in smelteries, foundries, and metal works, and components in paint, ink, petroleum products, and coal ash, these can be toxic to humans and cause serious physical impairment.

- *Volatile organic compounds (VOCs)*. These include aromatic compounds, such as benzene, toluene, ethylbenzene, and xylene, which are found in petroleum products; and chlorinated compounds, such as tetrachloroethane, which are commonly used as solvents and cleaners. Inhaling vapors can be toxic, and certain concentrations of VOCs can explode or ignite.

- *Semivolatile organic compounds*. These include phenols and other components of creosote and coal tar, as well as polycyclic aromatic hydrocarbons (PAHs). Several PAHs are considered carcinogenic.

- *Methane*. This is generated by decomposing plants and other organic materials. Often found in or near filled areas, methane trapped beneath foundations can lead to explosions.

- *Polychlorinated biphenyls (PCBs)*. Formerly used in electrical equipment, PCBs bioaccumulate in humans and are thought to be carcinogenic and mutagenic.

- *Hazardous wastes*. These are defined by the Federal Resource Conservation and Recovery Act as substances that are chemically reactive, ignitable, corrosive, or toxic. The U.S. Environmental Protection Agency has developed a standard test, the Toxicity Characteristic Leaching Procedure (TCLP), to identify these four hazardous characteristics.

120. SITES OF CONCERN

Many sites in urban areas contain soils and/or groundwater that may be contaminated; however, the presence of hazardous materials on a site may not be obvious. Sites that appear to be clean and have no commonly known sources of contamination may have been affected by past uses on the site or in the surrounding area. Many activities, industrial and otherwise, use hazardous materials, and many hazardous waste management practices that are now considered unacceptable were once common. Contaminants may have spilled or leaked into the soil or groundwater, or been dispersed in the air or contained in fugitive dust, for example. Hazardous materials can contaminate a site in several ways:

- They may be present in the soils, groundwater, or buildings and structures on site, as the residue of past or current activities. Typical activities include manufacturing processes that utilize and thus require storage and handling of hazardous materials.

- They may migrate to the site from areas off-site in contaminated groundwater flow or through site soils from an upgradient location, for example, or from a leaking underground storage tank nearby.

- They may be incorporated in the buildings and structures on site themselves; examples are lead in paints or asbestos in insulation, tiling, or roofing materials.

130. POSSIBLE EXPOSURE

The presence of hazardous materials on a given site threatens human health or the environment only when exposure to those materials can occur. Potential routes of exposure to elevated levels of hazardous materials can include direct contact between contaminated soil and skin (dermal), breathing of suspended soil particles (inhalation), swallowing soil (ingestion), or drinking contaminated water (oral). Activities that can lead to exposure include the following:

- Introducing a new population to an area containing hazardous materials.

- Excavation, dewatering, grading, or construction activities on a contaminated site.

- Creation of fugitive dust from exposed soils containing hazardous materials.

- Demolition of buildings and structures that include hazardous materials.

- Introduction of new activities or processes that use hazardous materials.

The results of the proposed action, and thus the circumstances in which potential exposure could occur, determines the way hazardous materials are analyzed for CEQR.

200. Determining Whether a Hazardous Materials Assessment is Appropriate

The potential for significant impacts from hazardous materials can occur when: a) hazardous materials exist on a site, *and* b) an action would increase pathways to their exposure; or c) an action would introduce new activities or processes using hazardous materials. If all three of these elements can be definitively ruled out, then there is no need to examine hazardous materials in further detail.

In general, however, it may be difficult to ascertain whether a site contains hazardous materials. Therefore, for any sites with the potential to contain hazardous substances, unless the action would absolutely not lead to increased exposure pathways or introduce any new contaminants, an assessment of hazardous materials is appropriate. On this basis, actions that require hazardous materials assessments include, but are not limited to, the following:

- Rezoning of a manufacturing zone to a commercial or residential zone.

- New development in a manufacturing zone.

- Development adjacent to a manufacturing zone or existing manufacturing or commercial facilities (including nonconforming uses) listed in the appendix.

- Rezoning from commercial to residential designation if the rezoned area would have allowed a use that may have stored, used, disposed of, or generated hazardous materials. C8 districts are examples of such designations.

- Development on a vacant or underutilized site if there is a reason to suspect contamination or illegal dumping.

- Development adjacent to a solid waste landfill site, State or Federal inactive hazardous waste site, power-generating/transmitting facility, or railroad tracks or a railroad right-of-way.

- Development where underground and/or aboveground storage tanks are on or adjacent to the site.

- An action directly affecting a site on which asbestos-containing materials or transformers possibly containing PCBs are present.

- Development adjacent to former municipal incinerators.

300. Assessment Methods

The hazardous materials assessment begins with a qualitative assessment, based on research and field observations, to determine whether the site of the proposed action may contain any contamination from past or present activities on the site or nearby. If a potential for contamination is found during this assessment, then surface and subsurface investigations are conducted to confirm the presence and extent of the contamination. For actions that only require assessment because they themselves would use hazardous materials, this initial assessment and surface and subsurface investigations may not be necessary. For generic or programmatic actions that would facilitate new ground disturbance, the approach would be similar, although often less detail would be needed.

310. STUDY AREA

The aim of the hazardous materials analysis is to determine whether there is the potential for any hazardous materials to affect people or the environment as a result of the action. The project site is the focus of the study area. The study area for the preliminary assessment (discussed below in Section 320) should also include all other areas that might have affected or be affecting the project site. Usually, this includes at least the adjacent properties, and often the properties within 400 feet of the project site. Record searches for spills and hazardous waste sites are performed for a larger area, usually about a 1,000-foot radius from the project site. In unusual cases, these searches may include wider areas. Record searches for underground storage tanks are performed for the project site, and for any adjacent properties on which there is reason to believe that tanks were or are located. In addition, if the action would involve excavation for utilities, the path of those utilities would also be considered for hazardous materials.

For the detailed surface and subsurface investigation (discussed below in Section 330), the study area is limited to the project site itself. On the site, this assessment is performed for any areas that have the potential for contamination and increased exposure pathways, based on the initial assessment.

320. PRELIMINARY ASSESSMENT

The preliminary assessment is a qualitative evaluation of environmental conditions present at a site based on a review of readily available information, site observations, and interviews. These assessments do not include sampling or testing of soil, groundwater, or structures (with the frequent exception of asbestos-containing materials) that are performed as part of subsequent work. The first three of the following tasks, at a minimum, should be included in the assessment.

- Historical land use review.
- Regulatory agency list review.
- Site and surrounding area reconnaissance.
- Surface and subsurface drainage preliminary evaluation (needed if off-site sources of concern are discovered).

For a generic action that would affect large areas, such site-specific analysis may not be possible. In this case, the approach typically considers what the potential impacts would be for a variety of different types of sites (see Section 400, below).

321. Historical Land Use Review

Hazardous substances can persist in the soil for long periods of time. Many adsorb (cling) onto soil particles and remain there, or are a constituent of commonly used filling materials, such as cinders and ash. Site contamination can also occur from past uses on adjacent properties, such as when underground storage tanks have leaked or when groundwater has been contaminated. Therefore, past activities on a site and the adjacent properties must be considered in an evaluation of the potential for contamination. Several readily available sources of information can be used to research the history of the site, including the following:

- Fire insurance maps.
- Historical maps.
- City directories.
- New York City Department of Building records.
- New York City Fire Department underground storage tank (UST) records.
- Chain-of-Ownership (title deed search).
- Interviews with people knowledgeable about the site.

Aerial photographs are another source of information that can be used during the historical review. While these photographs provide valuable information, the density of buildings in most locations may make it difficult to evaluate possible sources of contamination. (Refer to the historic resources section of this Manual, Section 3F, for more information on research sources.)

The historical review should extend back at least 50 years and should address use, structures, types of businesses, zoning changes, and site coverages. (If activities that may have involved potential hazardous substances are identified as far back as 50 years ago, the investigation should examine older uses.) In particular, possible uses of concern should be noted. These include manufacturing uses, automobile-related businesses, landfilling for solid waste disposal, and other commercial establishments that may have used hazardous substances. A complete list is provided in the appendix. If an archaeological review is being performed, this work can be coordinated with it.

322. Regulatory Agency List Review

The next step in the assessment is a review of the records of the various public agencies—local, State, and Federal—that regulate the storage, handling, emissions, and spill cleanup of hazardous or toxic materials. This research is conducted to evaluate the potential for on-site contamination from off-site sources. As part of this process, incinerators, underground and above-ground storage tanks, active solid waste landfills, permitted hazardous waste management facilities, inactive hazardous waste facilities, suspected hazardous waste sites, and hazardous substance spill locations are noted both on the site and within a prudent radius of the subject property (see study area discussion in 310, above).

The agencies to be contacted during the regulatory review are listed in Table 3J-1 and described below.

The U.S. Environmental Protection Agency (EPA) National Priorities List (NPL) and Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) list should be reviewed to determine if the property or surrounding properties within the search radius appear on the lists. The NPL contains sites that are targeted for EPA-mandated cleanup under the Federal Comprehensive Environmental Responsibility, Compensation and Liability Act (CERCLA), which authorizes identification and remediation of uncontrolled hazardous waste sites. The CERCLIS list contains potential hazardous waste sites

Table 3J-1
Regulatory Agency Inquiries

Regulatory Agency	Regulatory List
EPA 26 Federal Plaza New York, NY 10278 Freedom of Information Act Officer	▪ CERCLIS ▪ RCRIS ▪ ERNS ▪ NPL ▪ Surface Impoundment Assessment Survey ▪ Industrial Subtitle D (Solid Waste) Facility Survey ▪ National Survey of Solid Waste (Municipal) Landfill Facilities
DEC 50 Wolf Road Albany, NY 12233 Division of Hazardous Waste Remediation Bulk Storage Section—Division of Water Division of Solid and Hazardous Waste	 ▪ Inactive Hazardous Waste Disposal Sites In New York State (listed by county) ▪ List of Leaking Underground Storage Tanks ▪ List of Major Oil Storage Facilities ▪ Petroleum Bulk Storage Facilities List ▪ List of Chemical Bulk Storage Facilities ▪ List of Solid Waste Management Facilities
NYC Fire Department 250 Livingston Street Brooklyn, New York 11201	▪ List of Registered Underground Storage Tanks
DEP Bureau of Environmental Remediation and Enforcement 59-17 Junction Blvd., 1st Floor Low Rise Corona, New York 11368-5107	▪ Emergency Response Incidents ▪ Spill Law Notices of Violation

for which there is not enough information to determine if the site should be included on the NPL.

The Resource Conservation and Recovery Information System (RCRIS) list identifies registered hazardous waste generators, transporters and treatment, storage and disposal facilities as defined by the Federal Resource Conservation and Recovery Act (RCRA), which regulates management and disposal of hazardous wastes currently generated, treated, stored, disposed, or distributed. Inclusion on the RCRIS Notifiers list does not, in and of itself, indicate the facility is a source of contamination. For example, all dry cleaning establishments in New York City are on the RCRIS list.

In addition, the EPA Office of Solid Waste's information about landfilling should be consulted. In 1986, the EPA Office of Solid Waste conducted national surveys to determine locations of landfilling by industry and municipalities. Information gathered by these surveys is reported in Industrial Subtitle D (Solid Waste) Facility Survey and National Survey of Solid Waste (Municipal) Landfill Facilities. EPA also conducted a survey to locate surface impoundments and assess their groundwater contamination potential. This survey was performed from 1978 to 1980 and its findings were reported in the Surface Impoundment Assessment Survey.

The EPA's Emergency Response Notification System (ERNS), a compilation of hazardous substance spills reported to Federal and State authorities, should also be consulted.

At the State level, the New York State Department of Environmental Conservation (DEC) should be contacted to determine: (1) if the site or nearby sites are on the Inactive Hazardous Disposal Site Registry and therefore subject to a State consent order for assessment and possible clean-up; (2) if there have been any large-scale landfilling operations on or near the site; and (3) if there are records of leaking underground storage

tanks, major oil storage facilities, petroleum bulk storage facilities, chemical bulk storage facilities, or solid waste management facilities. The regional Spill Response Team maintains records of petroleum or other spill incidents reported to the Emergency Response Notification System (ERNS) and is contacted during the records search.

Several local regulatory sources should also be contacted. In New York City, the Department of Environmental Protection (DEP), Bureau of Environmental Remediation and Enforcement (BERE) maintains files on hazardous materials emergency incidents as well as a list of sites that have been issued notices of violation and clean-up orders under the Spill Law. Also, under the Community Right-to-Know Law, DEP is authorized to gather information from facilities that use, store, or manufacture hazardous substances. The New York City Fire Department maintains records on underground storage tank testing and leak history information, and a request for this information is a routine part of any initial assessment.

323. Site and Surrounding Area Reconnaissance

Following completion of the historical review and review of regulatory agency lists, a visit to the site and nearby sites within the search radius is typically performed to evaluate the potential for contamination of the subject property from on-site and off-site sources and to confirm literature search information. Items considered during project site reconnaissance can include, but are not limited to, the following:

- Site zoning and use.
- Determination of site boundaries.
- Site coverings, such as asphalt, concrete, exposed soil, or vegetation, and their current condition (note specific conditions, such as soil staining and distressed vegetation).
- Direction of surface water flow from and to the site and location of storm sewers.
- Presence of hazardous materials storage or handling, pollution control devices, and above- and below-ground storage tanks, and drains or dry wells through which hazardous materials could be disposed.
- Types of operations conducted on-site, along with the processes, materials, and quantity of materials involved in these operations.
- Handling, disposal, and management of wastes, such as drum handling and storage procedures.
- Presence of any of the uses listed in the appendix.
- Records concerning generation, storage, and disposal of on-site waste.
- Building components, such as asbestos-containing materials, lead-based paints, and polychlorinated biphenyl (PCB)-containing transformers.
- Pole- or pad-mounted PCB-containing electrical transformers on or adjacent to the site.
- Evidence of land-filling practices, such as depressed or mounded areas.
- Evidence of dumping or drum fragments.

The review of neighboring and adjacent sites is usually less detailed. Often, windshield or curbside evaluation will suffice. Particular attention should be paid to those sites that appear on the regulatory agency lists. When identifying neighboring and adjacent sites, the following should be addressed:

- General zoning (residential, commercial, industrial, etc.) and land use.
- General operations and environmentally regulated materials.
- Indications of chemical activities.
- Presence of any of the uses listed in the appendix.
- General appearance.
- Site coverings, such as asphalt, concrete, exposed soil, vegetation, etc., and their present condition.
- Direction of surface water flow.
- Presence of hazardous material storage or handling, pollution control devices, above- and below-ground storage tanks, drains or dry wells, sump systems, etc.
- Confirmation of regulatory listed sites and observations of the site conditions.

If access to the site is not possible, the potential worst-case conditions are assumed, based on information obtained in the historical land use review and regulatory agency list review (Sections 321 and 322, above) and visits to the site boundaries.

324. Surface and Subsurface Drainage Evaluation

Surface and subsurface drainage pattern evaluation is important if off-site sources of concern are discovered as part of the work described in 322 and 323, above. This evaluation provides an indication of the direction contaminants, if present, may be transported. Surface drainage patterns in New York City are largely determined by the substantial amount of paved areas and the location of storm drains. Depending on the drainage patterns of the site and surrounding area, run-off from spills on adjacent or nearby sites may reach the subject site.

Subsurface drainage is a function of the local geology. Most of the City is blanketed by glacial deposits consisting of sands, gravels, clays, and till.

Many waterfront and low areas have been filled over time, notably at south shore locations and the southern tip of Manhattan. This natural and man-made cover is typically underlain by unconsolidated Cretaceous formations with varying groundwater flow properties. These formations, in turn, rest on bedrock consisting of crystalline rock. The general topography varies with location, and this affects the speed and direction of groundwater flow. In addition, tidal influence may alter groundwater flow direction and gradients in waterfront areas.

Topographic maps produced by the United States Geological Survey (USGS) can be used to predict direction of surface and groundwater flow. Typically, a 7.5-minute scale map is used (see Section 730, below). Three sources of New York City groundwater information are "Groundwater in Bronx, New York and Richmond Counties with Summary Data on Kings and Queens Counties, New York City, New York," U.S. Geological Survey in Cooperation with the Water Power and Control Commission, Bulletin GW-32, 1953; "Reconnaissance of the Ground-Water Resources of Kings and Queens Counties, New York," U.S. Geological Survey Open File Report 81-1186; and "Subsurface Geology and Paleogeography of Queens County, Long Island, New York," U.S. Geological Survey, Water-Supply Paper 2001-A, 1978. Charts and maps indicating the direction of groundwater flow are not readily available, and consultation with a geologist familiar with the New York City area is recommended.

The surface and subsurface drainage evaluation should conclude whether conditions that indicate that hazardous materials may have moved onto the site exist, as follows:

- The site is downgradient of groundwater flow from a suspected contaminated site.
- The site's surface is topographically downgradient from a suspected contaminated site.

325. Assessment Conclusions

Based on the historical land use review, regulatory review, site inspections, and surface and subsurface drainage evaluation (if needed), assess the potential for contamination on the project site. In general, hazardous materials may be a concern for the action if any of the following have occurred:

- Past or present uses on the site or in the surrounding area used or use hazardous materials.
- The site or surrounding area includes locations listed in regulatory agencies' records.
- If past or present surrounding uses are a concern, the site is downgradient of groundwater flow or topographically downgradient from those suspected sites.

The conclusions of this assessment can fall into four categories:

1. The assessment determines little or no likelihood of contamination, and, therefore, no significant impacts resulting from hazardous materials. This is the conclusion of the environmental assessment for hazardous materials.
2. Contamination may exist, and there is a potential for significant impacts. However, enough is known at this point that potential worst-case impacts can be disclosed and mitigation developed without additional work during the CEQR review. Note that DEP must be contacted when potential significant adverse impacts are identified. An example of this situation is a gasoline station, where the potential impacts resulting from constituents that may have leaked or spilled are known and mitigation is straightforward. A surface and subsurface assessment or its equivalent may be required to properly frame and implement mitigation (in the case of the gasoline station, proper removal of the tanks and removal of contaminated soils and disposal at a landfill rated to accept such soils), but it need not be undertaken until shortly before construction is scheduled to begin. At that time, the lead agency should follow the procedures for a surface and subsurface assessment and mitigation set forth below. This level of contamination, because its properties are well known and mitigation well established, would not require issuance of a Positive Declaration. Depending on impacts in other technical areas, the appropriate surface and subsurface assessment and remediation could in this case become part of the project, or could be required as a condition in a Conditional Negative Declaration. (More information about Positive Declarations, Conditional Negative Declarations, and Negative Declarations is provided in Chapter 1 of this Manual; for more information on Conditional Negative Declarations related to petroleum products, see Section 500, below.)
3. Contamination may exist, but not enough is known at this point to disclose the reasonable

significant potential impacts that could occur. More work is necessary. At this point, DEP must be contacted. Additional work (surface and subsurface investigations, described in Section 330, below) can be performed to determine the nature and extent of any contamination, or a Positive Declaration can be issued and such work performed as part of the EIS. This is discussed in more detail in Section 420, below.

4. Contamination is known to exist. More work is required to determine its nature and extent so that significant impacts can be fully disclosed and mitigation developed as appropriate. At this point, DEP must be contacted. Additional work (surface and subsurface investigations, described in Section 330, below) can be performed to determine the nature and extent of any contamination, or a Positive Declaration can be issued and such work performed as part of the EIS. This is discussed in more detail in Section 420, below.

The initial assessment is documented for the record, describing the scope of work, activities, findings, and conclusions. The report would typically include the following kinds of information:

- Site and adjacent site history.
- Surface and subsurface drainage patterns.
- Site reconnaissance findings.
- Regulatory agency list review findings.
- Potential impact from adjacent sites, such as landfills, NPL sites, surface impoundments, leaking USTs, USTs of unknown status, etc.
- On-site concerns, such as leaking USTs, USTs of unknown status, dumping of hazardous materials, PCBs, etc.
- Recommendations for additional actions, if any.

330. DETAILED PHYSICAL ASSESSMENT

Once an initial assessment has determined that a site may be contaminated (conclusions 3 and 4 in Section 325, above), the next step is a more detailed physical investigation of the site to ascertain whether any hazardous materials are actually present, and to characterize the type and potential extent of contamination from those materials. The detailed assessment may include one or more of several physical investigations. Geophysical investigations, which do not penetrate to the subsurface but seek to characterize it through a number of techniques, are useful in locating buried objects or material (such as an underground tank) or the location of contaminated groundwater. These investigations are usually undertaken to help focus the more detailed subsurface sampling program. Soil-gas sampling, another physical investigation, probes the near subsurface for volatile compounds, which emit gases relatively easy to obtain, measure, and analyze. This technique can be used to confirm the absence of some contaminants, but it is usually undertaken to help focus more detailed sampling. Such detailed investigation includes soil borings, monitoring wells, and testing of buildings and structures.

In some cases, depending on the potential contaminants and the surface and subsurface drainage patterns on the site, it may be necessary to conduct a physical investigation of the soils or groundwater on an adjacent site, so as to develop appropriate mitigation measures.

A work plan for physical investigation is developed based on review of the initial assessment data; it may involve some or all of the assessment techniques. The plan (also called a sampling protocol) contains three major elements: (1) a survey and analytical plan, addressing the types of surveys to be undertaken, the rationale for the approach, the various sampling locations, and the investigative, sampling, and laboratory analysis methods to be used; (2) a health and safety plan for personnel undertaking the work; and (3) a quality assurance and quality control plan for the acquisition, handling, and analysis of samples taken. The lead agency should prepare the work plan in advance of initiating field activities and coordinate with DEP's Office of Environmental Planning for a review of its completeness before implementation.

331. *Survey and Analytical Plan*

The survey and analytical plan describes the site investigation appropriate to find and identify the type and extent of contamination that may be present. In general, it is advisable to first use geophysical or soil-gas surveys, where appropriate, to help locate concentrations of contaminants and focus soil or groundwater sampling in those areas. If this approach is taken, the work plan would indicate two stages, with the detailed soil or groundwater sampling programs to be defined in the second stage. The results of these initial surveys may also eliminate the need for more extensive sampling. The elements of the plan are generally as follows.

331.1. *First Stage Surveys*

Geophysical Survey. A geophysical survey may be undertaken to help locate buried metallic objects or material, to characterize the subsurface conditions and geology, and possibly to determine the presence or

extent of a groundwater contaminant plume. Typical geophysical tools and techniques may include magnetometers (to test for buried metal, such as tanks or drums), ground-penetrating radar, ground conductivity surveys, and seismic refraction surveys. Limits on geophysical techniques can include overall cost and the presence of interference structures, such as overhead electric wires or excessive subsurface metal that can produce anomalous readings and difficulty in interpretation of data. The goal of the geophysical survey is to guide subsequent field work by aiding in the determination of optimum sampling locations at the site. Occasionally, the results of the geophysical survey will suffice, and additional testing will not be required. An example would be where presence of an existing UST is the only issue. If the geophysical survey indicates that a UST is not on the site (and there is no documentation to indicate the possibility that tanks may have been located there in the past), no additional work would be necessary.

Soil-Gas Survey. A soil-gas survey tests the unsaturated zone (area above the water table) of the subsurface environment for the presence of volatile organic compounds (VOCs). Typical volatile compounds include constituents in gasoline and industrial solvents, such as trichloroethene and perchloroethene. These VOCs may persist from surface spills or leaking underground storage tanks or may be diffusing upward into the unsaturated zone from a contaminated water table. Typical techniques include the placement of a vapor sampling probe (usually a hollow steel rod with a slotted intake point) into the subsurface, purging the sampling system, and testing the effluent soil gas with field analytical equipment. This analytical equipment can include flame ionization detectors, photo-ionization detectors, portable gas chromatographs, and combustible gas meters.

Occasionally, a soil-gas survey will suffice for this analysis, particularly if it yields negative results, and no additional work will be necessary. Most often, however, soil-gas analysis is a good screening technique but requires the subsurface geologic formation to be permeable enough to allow the transmission and detection of subsurface volatile organic vapors. Additionally, soil-gas surveying techniques work best for volatile compounds, but have limited use for heavier petroleum products or other less volatile compounds, such as fuel oils, whose volatile constituents have been distilled off during the refining process.

331.2. Detailed Surveys

Soil Boring and Monitoring Well Plan. The soil boring and monitoring well installation program is usually implemented at the areas of concern identified in the initial assessment with guidance from any geophysical or soil-gas surveys. Soil and groundwater samples are taken from those areas of the site most likely to be contaminated. For example, if PCB transformers were noted in the initial assessment, a sample of the surface soils in those locations would be taken to determine if the transformers had leaked. The soil boring and well installation program is usually accomplished by mobilizing an environmental drilling rig at the site. Soil samples are generally obtained with a split-spoon sampler. For both groundwater and subsurface soil, sampling depends on rig access to the site and the presence of overhead utilities and right-of-way issues. Soil boring or monitoring well installation will require that all underground utilities and structures be marked out before drilling activities. Soil samples may be obtained by hand auguring if rig access is not available; however, this requires the subsurface to be penetrable by the hand auger and can only extend to limited depths.

Drilling and subsurface sampling equipment should be decontaminated prior to all drilling efforts. The soil boring and monitoring well installation plan should address the proposed number of wells or borings; well or boring depth; well specifications; split-spoon sampling interval; organic vapor screening and soil description methods; potential aquifer permeability testing or determination; well development techniques; handling and disposal of borehole cuttings and well development water; and method of determining the groundwater elevation.

Although split spoon is the commonly used sampling tool, other tools may be used if they obtain appropriate results. For example, the hydropunch groundwater sampling tool is a relatively new device gaining wider use and acceptance that can be used to obtain groundwater samples during a test boring program. The hydropunch tool can be used generally anywhere a split-spoon sampler can be used. The hydropunch allows the acquisition of a groundwater sample without the installation of a permanent monitoring well. The hydropunch requires relatively permeable geologic formations and will not allow for the determination of the groundwater flow direction, as will permanent monitoring wells.

Testing Buildings and Structures. It is possible for building structures to be contaminated with hazardous materials. These materials could have been introduced in construction materials or discharged as a result of poor operational practices on the part of an industrial occupant. Appropriate sampling techniques depend on

the material of concern and the location of the contamination in or on the building. Wipe samples, bulk samples, air samples, coring samples, or field measurement may be appropriate in different situations.

Common building materials include asbestos-containing thermal systems, surfacing and miscellaneous materials, and lead in painted surfaces. Under local law 76 (see Section 711.3, below) bulk samples of suspect asbestos-containing materials must be collected by a professional certified by DEP or the New York City Department of Health. Material containing more than 1 percent asbestos is considered asbestos-containing. If lead-based paint is suspected, an initial field assessment can be performed using a portable X-ray fluorescence (XRF) detector. If the initial field measurements indicate positive or inconclusive results, it is recommended that representative confirmatory sampling and laboratory analysis be performed. Lead dust may also be considered in some structures and on some paved surfaces in building yards or surrounding streets. Visible signs of staining, pooling, or discharge of waste material inside structures should be sampled based on the suspected material. For example, suspected PCB-containing surface stains are assessed by performing wipe samples, which are then analyzed in the laboratory (see below).

331.3. Constituents for Analysis and Analytic Methods

The conclusions of the initial assessment and the results of any geophysical or soil-gas surveys govern the selection of test compounds. Common types of hazardous materials found in soil and groundwater on sites in the City are petroleum hydrocarbons, VOCs, PCBs, polycyclic aromatic hydrocarbons (PAHs), and lead and other heavy metals. However, where past uses indicate that additional compounds could be on-site and there is no evidence to suggest that they are not, a broader testing of samples for possible contaminants is recommended. The samples should be analyzed by a laboratory accredited by the New York State Department of Health's Environmental Laboratory Approval Program (ELAP); samples from sites listed by DEC as hazardous waste sites must use a laboratory certified under EPA's Contract Laboratory Program. It is recommended that the EPA Target Compound List/Target Analyte List (EPA Contract Laboratory Program Statement of Work for Inorganics of Organics Analysis, Multi-Media, Multi-Concentration) and the corresponding EPA-approved analytical methods presented in EPA SW-846 be utilized. In most cases, the substances of interest will be included in the Target Compound/Target Analyte list. The specific compounds are selected and corresponding analytical methods are described. For example, if volatile organic compounds are anticipated to be encountered, EPA methods 8240 and 624 are specified for soil and groundwater analysis, respectively. It is also recommended, where the full range of possible contamination is very broad, to direct the laboratory to identify, using gas chromatography/mass spectroscopy (GC/MS), additional substances that may be present.

For buildings and structures, paint samples are analyzed for the presence of lead, utilizing the EPA Method 7420 (Flame Atomic Absorption) or 7421 (Graphite Furnace Atomic Absorption), as appropriate. Wipe samples for PCB-containing surface stains are analyzed using EPA Method 8080. Asbestos samples must be sent to a lab accredited by the New York State Department of Health's Environmental Laboratory Approval Program (ELAP) and the National Voluntary Laboratory Accreditation Program (NVLAP), and analyzed by polarized light microscopy (PLM) for its asbestos content.

332. Health and Safety Plan

Surface and subsurface assessments are conducted in accordance with a site-specific Health and Safety Plan, established to protect the health and safety of all on-site personnel. The plan is prepared in accordance with the applicable U.S. Occupational Health and Safety Administration (OSHA) standards under 40 CFR Part 1910.1200.

333. Quality Assurance and Quality Control

Before beginning field work, a laboratory analytical program and proper field and laboratory quality assurance/quality control (QA/QC) procedures must be developed. This program establishes general sampling and QA/QC requirements for all sampling and laboratory analysis activities. Also referred to as a Quality Assurance Project Plan (QAPP), its main goal is to assure sample integrity from the field to the laboratory and that the proper laboratory analytical procedures and protocols are followed. The program should include sampling QA/QC protocols for all compounds sampled. It should describe sampling techniques and methods to assure sampling integrity; decontamination procedures for all equipment; chain-of-custody procedures; sample preservation requirements; the experience and capabilities of personnel; and any other factors associated with obtaining, delivering, and analyzing hazardous waste samples.

340. CONCLUSIONS AND DOCUMENTATION

The results of the assessment investigation are interpreted to determine the potential for the presence of hazardous materials. The level and extent of contamination can be measured and interpreted from the site investigations and laboratory analysis. As part of the assessment, the soil and groundwater sampling data are qualitatively compared to existing guidelines and standards (these are described below in Section 710).

The final step of a surface and subsurface assessment is to document the methodologies, findings, and recommendations, including description of field activities, compilation and tabulation of analytical data, description of the site hydrogeology, interpretation of the analytical and site assessment data, and comparison to appropriate standards or guidance values. This document may become an appendix of the EAS or EIS.

400. Determining Impact Significance

410. POTENTIAL FOR SIGNIFICANT IMPACTS

The potential for significant adverse impacts from hazardous materials depends on the type of materials and their location on the site, and the proposed use(s) on the site, which determines the possible routes of exposure. In general, the following two questions can be used to determine whether a significant adverse impact would occur:

- Is there the potential for human exposure to contaminants? This includes future on-site occupants, off-site occupants, and construction workers.

- Is there the potential for environmental exposure to the contaminants? This includes contaminants entering on-site or surrounding natural resources or exacerbating existing environmental contamination.

If the answers to both of these questions are "no," it is unlikely that a potential for significant impact exists. If the answer to either is "yes," then significant adverse impact might occur. Based on those two general questions, examples of significant adverse impacts from hazardous materials include the following:

- Future occupants of the site may be exposed to on-site hazardous materials. For example, children at a residential site may eat contaminated soils or ingest lead-laden particles for a building's interior, or be exposed to contaminated groundwater.

- Future site occupants may be exposed to materials from off-site. For example, an underground gasoline storage tank on the adjacent property could leak into a building on the site.

- Workers may be exposed during site preparation, excavation, and construction. For example, sites that were formerly used as solid waste landfills can contain high levels of methane, which can lead to explosions during excavation; compounds adsorbed to soils may become airborne as dust and ingested through the nose and mouth. Dewatering activities could expose workers to contaminated groundwater.

- Occupants of adjacent properties may be exposed. For example, contaminated soil or dust could be transported to adjacent sites during excavation or construction. Further, construction activities could cause on-site contaminants to migrate off-site, depending on the soils and surface and subsurface drainage patterns.

- Operations related to the proposed action can result in a significant adverse impact to occupants of the site or surrounding property. An example is a manufacturing facility that does not properly dispose of its waste materials.

When hazardous materials are present, whether or not a significant impact would occur depends on the action or use proposed for the site, because this is what determines whether the potential for exposure could occur. If, for example, contaminated subsurface soil is to be excavated for the construction of a new building, this would constitute a potential significant adverse impact. The construction workers who would excavate the soil would be exposed to the contaminated soil. On the other hand, if the same contaminated subsurface soil was to remain in place, undisturbed, and an existing building was to be rehabilitated above it, then there would likely be no significant adverse impact. No humans would be exposed to the contaminated soils. As another example, if soil 50 feet below the surface of a site is contaminated with lead in concentrations greater than suggested guidelines, but no excavation is planned, then no significant impact would result. If the same concentrations were located in the top foot of soil, however, people could be exposed to the contamination even if no excavation were planned there, and a significant impact would result. Following is a list of action characteristics that indicate that a significant adverse impact could occur, if the site contains hazardous materials.

- *Residential or commercial uses or zoning.* A significant adverse impact would occur with lower levels of contaminants when a site is in residential and commercial areas than in manufacturing locations. This is particularly true because residential and commercial areas often have open, unpaved areas that can make contaminated areas more accessible.

- *Excavation.* When soil is to be excavated, construction workers and nearby residents may be exposed to contaminated materials. Therefore, a significant adverse impact would likely occur.

- *Site Coverage.* When contaminated sites are not covered or capped by structures, pavement, or clean fill, exposure—and therefore, significant adverse impact—is more likely.

In addition to the threat of existing hazardous materials, significant impacts can also occur because of future hazardous materials related to the proposed action. For any actions that will introduce hazardous materials to a site or that will involve management of hazardous materials, the methods of handling and disposing of those materials in accordance with all applicable regulations should be considered so that significant adverse impacts would not occur.

Conditions of contamination that are not considered significant include the following:

- When groundwater on the site exceeds groundwater quality standards, no significant impact would occur unless there is a definable route of exposure through drinking water or volatilization into buildings or structures, or if the action will exacerbate existing groundwater contamination, facilitate migration of contaminants in groundwater, or involve dewatering.

- In certain circumstances—particularly for asbestos—implementation of specific regulatory requirements would prevent significant impacts. For example, if the action requires demolition or renovation of a building containing asbestos, New York City law requires removal and disposal of the asbestos by certified professionals prior to exposure of construction workers, future occupants, etc., following prescribed procedures. This requirement applies whether or not an action is also subject to CEQR. The applicant must comply with the relevant New York City, New York State, and Federal regulations pertaining to asbestos-containing materials. Because asbestos is controlled by local law, its presence must be disclosed in CEQR, but it is assumed that there would be no significant impact if all regulations are followed. This is because the regulations typically require clean-up before exposure and because the regulations are comprehensive and specify remediation measures. Compliance with these regulations would ensure that no significant impact would occur. The above guidance is included for the information of lead agencies and applicants.

  If asbestos is an issue, but the action would not result in the disturbance of the in-place asbestos, such as in the reuse of an existing building, the CEQR analysis would consider the condition of the asbestos (i.e., whether it is friable) and assess the potential for significant impact due to any increased exposure.

Decisions about significant adverse impacts must be made on a site-specific, action-specific basis, considering all available information. The lead agency can make the determination of significance unassisted, but coordination with DEP's Office of Environmental Planning is strongly recommended. If any significant impacts are identified, the lead agency must coordinate with DEP.

For generic or programmatic actions, site-specific conclusions may not be possible. In this case, more general conclusions about the type of impacts that could be expected for different types of sites may be appropriate.

420. ASSESSMENT ISSUES FOR THE EAS AND EIS

Because the investigations of hazardous materials may be time consuming and costly, and access to a site may be restricted, CEQR practice regarding hazardous materials information requirements for the EAS or EIS has evolved as set forth here. Typically, an initial assessment is done for the EAS. The timing of additional assessment work depends on the ability to describe the potential for significant impacts. If the concerns for a site are so numerous or complex that a reasonable worst-case scenario cannot be developed, then a surface and subsurface investigation would be required before a Determination of Significance can be made for an EAS, or the DEIS is completed. (More information about Determinations of Significance, Positive Declarations, Conditional Negative Declarations, and Negative Declarations is provided in Chapter 1 of this Manual.)

If the theoretical worst-case site conditions and potential impacts can be described without testing, and a Positive Declaration is issued, then the DEIS can be completed without testing results. Work plan approval, however, for physical investigations must be obtained from DEP before DEIS completion. The protocol would then be appended to the DEIS and reference made to it in the text. Testing to describe site-specific conditions would be undertaken between the draft and final EIS and the results would be presented in the completed FEIS.

If the only hazardous materials impact of the proposed project site is due to petroleum product contamination from underground gasoline storage tanks on or adjacent to it, a Conditional Negative Declaration may be appropriate (as long as the action is not Type I and the lead agency is not the applicant; see Chapter 1 for more information on Conditional Negative Declarations and Section 500, below, for more information on use of a Conditional Negative Declaration related to petroleum products) and the testing to determine the extent of potential contamination could be undertaken before site grading, excavation, building construction, or any movement of soils at the site. For rezoning actions involving areas not controlled by the applicant, a zoning designation of "E" can be incorporated into the action's project description and used to disclose the condition and ensure that mitigation would be provided. This would allow issuance of a Negative Declaration before remediation occurs.

Where timely access to the site is impossible, the analysis relies on information obtained from records and visits to the site boundaries. The assessment would make conservative assumptions on the type and extent of hazardous materials potentially present and the impacts that could result from these contaminants. In this case, it may be necessary to disclose a scenario that could be overly conservative, but lacking other information, there is no choice. The protocol for additional sampling work is developed by the applicant/lead agency and approved by DEP for incorporation into the DEIS. The range of remediation measures that might be applied are described. The further investigations are completed and appropriate remediation determined before any site disturbance can begin.

500. Developing Mitigation

Mitigation is the implementation of actions designed to eliminate, reduce to acceptable levels, or control sources of significant impact. Several soil and groundwater mitigation measures are available depending on the nature and extent of contamination. The appropriate mitigation measures are selected on a case-specific basis. It is advisable that DEP be consulted concerning remediation measures.

DEP has developed standard testing protocols and procedures to remediate potential significant impacts related to the underground storage of petroleum products. Therefore, if the lead agency determines that the only substances of concern are related to petroleum products, and the action is not Type I or a rezoning, the following statement has been determined to be appropriate for a Conditional Negative Declaration:

> A soil and groundwater sampling protocol will be submitted to the Department of Environmental Protection's Bureau of Environmental Remediation and Enforcement for review and approval. In addition, remedial actions determined to be necessary based on the testing results will be submitted for approval by DEP/BERE. No site grading, excavation, or building construction will begin prior to DEP/BERE written approval of the sampling protocol and remediation program.

If there is evidence that hazardous wastes have been disposed of on-site and these wastes would pose a threat to health or the environment, DEC must be notified. DEC may choose to treat the wastes under its Inactive Hazardous Wastes Sites program. Under that program, a Remedial Investigation Feasibility Study would be undertaken. This would involve more detailed investigation and a study to select the preferred method of remediation for the hazardous wastes.

The surface and subsurface assessment performed defines the character and extent of contamination on a site, allowing remediation measures to be developed. Site mitigation techniques generally fall into one of the following categories: (1) containment; (2) removal; or (3) treatment. Each type, with selected examples, is described briefly in this section.

510. CONTAINMENT TECHNIQUES

Containment is the process of covering or enclosing contaminated materials to prevent direct contact with receptors. For subsurface contamination, capping of the affected area is often used to control the infiltration of surface water or rain water, therefore minimizing contaminant migration. Caps are often employed when contaminated materials are left in place. Capping is commonly performed together with measures for groundwater extraction or contaminant control, surface

water control, and gas collection or control. Various cap designs and capping materials are available. The selection of the cap design and materials depends on the nature of the waste to be covered, and the intended use of the capped area. The major disadvantages of capping include an uncertain design life and the need for long-term maintenance. Caps need periodic inspection and maintenance since they are vulnerable to cracking and to chemical deterioration.

Soil, hard, or multilayered RCRA caps are examples of this technique. Soil caps are used when the sole purpose of the cap is to separate the wastes from the surface environment. Hard caps are made of asphaltic or portland cement concrete. Multilayered caps are provided where RCRA design standards are required. These caps generally include an upper vegetative (topsoil) layer, a central drainage layer, and a bottom low-permeability layer consisting of a synthetic liner over at least 2 feet of compacted clay.

Lateral migration of contaminants can be contained by such techniques as construction of subsurface barriers, such as slurry walls; or soil grouting, in which liquid material is injected into the soil where it solidifies to form a barrier.

520. REMOVAL TECHNOLOGIES

Contaminated surface and subsurface materials can be removed from a site. The type of equipment and construction techniques selected depend on the physical characteristics of the materials being excavated, the volume of material to be excavated, the depth of the excavation, and the haul distances involved. Health and safety procedures and monitoring plans are typically developed to ensure the protection of the workers, the public, and the environment.

Once removed, the contaminated materials must be properly disposed of, usually in landfills approved for the purpose. The transport and disposal of hazardous wastes are regulated by the New York State Department of Environmental Conservation and the U.S. Department of Transportation. In some cases, it is possible to treat the materials and return them to the site (see below), to use them elsewhere (e.g., as fill), or to dispose of them at a non-hazardous wastes landfill.

Excavation of soil is applicable to the removal of dry to moist earth, gravel, or other non-rock materials above the water table. Groundwater extraction, often referred to as pump-and-treat technology, is designed to halt the lateral and vertical migration of contaminated groundwater while extracting contaminated groundwater for treatment and/or disposal. Under appropriate hydrogeologic conditions, groundwater collection technique and extraction wells are a standard component of remediation of contamination in the subsurface.

Sometimes subsurface contamination produces gas. Typically, methane, carbon dioxide, and other trace constituents gases can be explosive. Active gas collection technique should be one of monitoring and control technologies that identify the problem and attempt to control the releases, be it from subsurface lateral migration or from surface emissions.

Bulk liquids and sludges are sometimes found in pits, ponds, lagoons, sumps, trenches, or tanks. The liquids often must be removed to prevent the contamination of soil and groundwater adjacent to the area.

When abandoned storage drums are found at a site, actions may be warranted to remove the drums to prevent release of waste materials. Drum removal activities may include locating, staging, and opening of the drums; and sampling, testing, and consolidating the contents from the drums.

530. TREATMENT TECHNOLOGIES

Treatment technologies involve treating the contaminated materials to reduce the concentration of the contaminants of concern. This can be performed on-site or at a remote location.

Incineration is a well-proven method of treating solid, semi-solid, and liquid wastes containing organics. Soil vapor extraction consists of a network of wells with perforated well screens spanning the contaminated portion of the unsaturated zone to release volatile organic compounds (VOCs).

Air stripping is a well-proven technology in the removal of volatile organics from water. Vessels containing activated carbon are used to remove toxic substances from water. Activated carbon adsorption is widely used in the treatment of hazardous waste streams, especially for the removal of mixed organics from waters.

Soil flushing is the application of a liquid flushing agent to soils to physically and/or chemically remove contaminants. This new and innovative process is most applicable for a low- to medium-concentration contamination that is distributed over a wide area.

In situ biodegradation is the process of enhancing microbial action to remediate subsurface contaminants

that are adsorbed to soil particles or dissolved in the aqueous phase.

Precipitation is a process by which the chemical equilibrium of a waste water stream is altered to reduce the solubility of heavy metals.

Solidification refers to hazardous waste treatment processes that are designed to improve handling and physical characteristics of the waste, minimize free liquids, and decrease the leachability of pollutants. Stabilization techniques involve processes that limit solubility or that detoxify the waste contaminants even though the physical characteristics of the waste may or may not be changed or improved. The most common application of solidification techniques is for control of leachability from metals containing waste. Solidification can be done both in-situ and above grade.

540. MITIGATION TECHNIQUES FOR CONTAMINATION IN BUILDINGS OR STRUCTURES

Mitigation measures depend on the contaminant of concern and the location of the contamination in or on the building or structure. Generally, hazardous materials contaminating building components can be contained or removed. Lead-containing materials can be removed, enclosed, encapsulated, or managed in-place. (As noted in Section 400, asbestos regulations typically require clean-up before potential exposure. The method of handling asbestos, specified in the regulations, is similar to that described above. Lead and asbestos are the two most common contaminants, but other possible hazardous conditions may be present. The mitigation for specific problems should be resolved in coordination with DEP on a case-by-case basis.

550. MITIGATION FOR REZONINGS AND GENERIC OR PROGRAMMATIC ACTIONS

For rezonings, the environmental assessment may identify significant impacts from contamination on sites not controlled by the applicant. For generic or programmatic actions where specific sites cannot be identified, a range of typical potential impacts are noted. Then, typical measures to mitigate such impacts are identified. In such cases, when the contamination is related to petroleum products, a zoning designation of "E" can be assigned to those sites not controlled by the applicant. This discloses the potential contamination and ensures that mitigation will be provided before construction on those sites.

600. Developing Alternatives

The typical alternative for hazardous materials impacts is avoidance. If a significant impact is associated with the excavation of a site for the construction of a building, an alternative may be slab construction not requiring extensive excavation. If there is a concern for exposure of children to surface soils at a residential development, an alternative may be to pave the area or select another use for the site. For public actions, alternative sites may also be considered.

700. Regulations and Coordination

710. REGULATIONS AND STANDARDS

Regulations regarding hazardous materials address their identification, registration, classification, discharge, handling and storage, generation, transportation, and disposal. They also provide a means to identify and fund the clean-up of hazardous waste sites and hazardous waste releases. Regulations are promulgated by the City, State, or Federal government. An overview of key applicable regulations is presented here. (The primary reference for this section was Parkin, W.P., et.al., 1992, *The Complete Guide to Environmental Liability and Enforcement in New York*, sponsored by the National District Attorney's Association.)

711. Federal Government

711.1. Resource Conservation Recovery Act (RCRA) and Hazardous and Solid Waste Amendments (HSWA)

RCRA, adopted in 1976 and amended in 1984, creates the basic framework for the Federal regulation of hazardous wastes. It provides controls for the generation, transportation, treatment, storage, and disposal of hazardous waste through a comprehensive "cradle to grave" system of hazardous waste management techniques and requirements. EPA administers RCRA and delegates administration of major components to New York State. RCRA defines hazardous waste either as a listed hazardous waste or a waste exhibiting any of the characteristics of a hazardous waste (40 CFR Part 261). The four characteristics of hazardous waste are: (1) ignitability; (2) corrosivity; (3) reactivity; and (4) toxicity as measured by the Toxicity Characteristic Leaching Procedure (TCLP). The 1984 Hazards and Solid Waste Amendments (HSWA) added Federal regulation of underground storage tanks.

711.2. Comprehensive Environmental Response Compensation and Liability Act (CERCLA) and Superfund Amendments and Reauthorization (SARA)

Congress enacted CERCLA (also known as Superfund) and its amendments (40 CFR Part 300) to fund the clean-up of hazardous waste sites. CERCLA, which was amended by SARA, has created a national policy and procedures for containing and remediating released hazardous substances and for identifying and remediating sites contaminated with hazardous substances. CERCLA's province excludes crude oil, petroleum products, and natural gas products.

Title III of SARA, the Federal Emergency Planning and Community Right to Know Act, was promulgated to allow public access to information about local use of hazardous chemicals and to require each generator of such materials to develop chemical emergency planning procedures (40 CFR Part 300). A list of Extremely Hazardous Substances (EHS) and their respective reportable quantities was created.

711.3. Transportation of Hazardous Materials

The U.S. Department of Transportation addresses the listing and transportation requirements for hazardous materials under 49 CFR Part 171 and 172.

711.4. Toxic Substance Control Act (TSCA)

TSCA empowers EPA to regulate specific toxic substances. Federal regulation of polychlorinated biphenyls (PCBs) falls under TSCA.

712. New York State

712.1. Environmental Conservation Law

DEC has developed the regulatory framework for hazardous waste management in New York in response to the State's Environmental Conservation Law. The criteria for determining a hazardous waste closely parallel those of RCRA and are set forth in Volume 6 of the Codes, Rules and Regulations of the State of New York (NYCRR) Part 371.

The State has also created its own Superfund-like program to help finance the State's share of clean-up costs under the Federal program or to finance clean-ups at State sites that are not under the Federal program. New York State's Superfund program, the Inactive Hazardous Waste Sites Law, was passed in 1979. This program is described in 6 NYCRR Part 375, which was amended in May 1992. The law provides for the identification, listing, and remediation of inactive hazardous waste sites in New York. Under the law, DEC has provided for a comprehensive listing of inactive hazardous waste sites.

712.2. Petroleum and Hazardous Substances Storage Laws

The storage of petroleum and hazardous substances in New York State is regulated through a series of laws enacted to ensure proper storage and to address petroleum and hazardous substance spills and leaks. In 1984, Federal underground storage tank requirements were adopted as required by Subtitle I of RCRA. The New York State petroleum and hazardous substance storage laws are more comprehensive than the Federal laws and include the Oil Spill Prevention, Control and Compensation Act of 1977; the Petroleum Bulk Storage Act of 1986; and the Hazardous Substance Bulk Storage Act of 1986.

The Hazardous Substances Bulk Storage Act of 1986 specifically addresses the storage of non-petroleum hazardous substances. Owners of tanks storing listed hazardous substances are required to register all tanks storing listed hazardous substances with a capacity greater than 185 gallons.

713. New York City

713.1. Hazardous Substances Emergency Response Law (Spill Law)

New York City has enacted Local Law 42/1987, the New York City Hazardous Substances Emergency Response Law, also known as the Spill Law. Under this law, the City has declared its policy to respond to emergencies caused by releases or threatened releases of hazardous substances into the environment that may have an adverse effect on the public health, safety, and welfare and to prevent injury to human, plant, and animal life and property. DEP administers this law, which allows the department to order clean-up of hazardous substance spills.

713.2. Community Right-to-Know Law

The New York City Community Right-to-Know Local Law 26/1988 authorizes DEP to gather chemical information from facilities that use, store, or manufacture hazardous substances and to use this information for emergency planning and response purposes. The intent of this law is to protect the health and safety of the community and the environment against accidental release of hazardous materials. In addition, the law gives New York City residents the right to know the identities, quantities, characteristics, and locations of hazardous substances used, stored, and manufactured in their communities.

713.3. Asbestos Legislation

Asbestos-containing materials are regulated at the City, State, and Federal levels of government. DEP, pursuant to Local Laws 76/1985 and 80/1987, specifies requirements for building surveys, laboratory analyses, professional certifications, and asbestos abatement procedures. Local Laws 70/1985 and 21/1987, administered by the New York City Department of Sanitation, govern the transport, storage, and disposal of asbestos waste in the City. The City's regulations are comprehensive and go beyond those of the State and Federal governments. The New York State Industrial Code 56, administered by the New York State Department of Labor, and the EPA-administered National Emissions Standards for Hazardous Air Pollutants (NESHAP) also regulate asbestos activities.

713.4. Industrial Pretreatment Program

This program establishes standards for certain pollutants discharged to the sewer system, requiring pretreatment for effluent that would otherwise not meet the standards.

714. Applicable Standards

New York State has promulgated standards for ground and surface waters and proposed soil clean-up guidelines. The water standards clearly apply in New York City. The soil levels, however, are not yet requirements and are limited to industrial settings. New Jersey has proposed soil guidelines that represent substantial research and experience in a geographical area close to the City with similar urban and suburban settings and, as discussed below, should be considered appropriate for use on City proposals.

714.1. Surface and Groundwater

The DEC Division of Water has published Water Quality Regulations for Surface Waters and Groundwaters under 6 NYCRR Parts 700-705, effective September 1, 1991. Under these regulations DEC provides a water classification system for surface and groundwaters (Part 701). General conditions that apply to all water classifications are that the discharge of sewage, industrial waste, or other wastes shall not cause impairment of the best usages of the receiving waters as specified by the water classification at the location of the discharge and at other locations that may be affected by such discharge.

The Water Quality Regulations establish eight fresh surface water classifications, five saline surface water classifications, and three groundwater classifications, and for each, provide a definition of their best usage. Ambient Water Quality Standards and guidance values are categorized according to this water classification system. The standards are derived to provide for the protection of human health, potable water supply, aquatic life, and consumers of aquatic life.

Standards and guidance values for protection of the best usage as a source of potable water supply protect human health and drinking water sources and are referred to as health (water source) values. For the majority of specified substances, these values generally equal the maximum contaminant level (MCL) for that substance. If no specific MCL exists, the standard or guidance is 5 micrograms per liter ($\mu g/L$) or a less stringent value as determined by the Commissioner of the New York State Department of Health. For those substances that do not have an applicable health (water source) standard, and for which the DEC has determined that a threat to human health may exist if discharged into the waters of the State, a guidance value is derived by applying the procedures utilized by the State or a "general organic guidance" value of 50 $\mu g/L$ for an individual organic substance may be utilized (Part 702.15), whichever is more stringent.

The three classification categories of groundwater established based on their best usage include Class GA fresh groundwaters, Class GSA saline groundwaters, and Class GSB saline groundwaters. The best usage of Class GA groundwaters is as a source of potable water supply. Thus, the Class GA standards generally correspond to the MCL. The best usages of Class GSA saline groundwaters is as a source of potable mineral waters, for conversion to fresh potable waters, or as a raw material for the manufacture of sodium chloride or its derivatives or similar products. The best usage of Class GSB saline waters is as a receiving water for the disposal of wastes. The Class GSB is not assigned to any groundwater of the State, unless the commissioner of DEC finds that adjacent and tributary groundwaters and the best usages thereof will not be impaired by such classification. The groundwaters of the five boroughs are classified as Class GA groundwaters except where the criteria for saline groundwater is met (Part 703.5).

Groundwater analytical data generated from a site are typically compared with DEC standards and guidance values that apply to a site's groundwater classification. This comparison aids in the evaluation of the extent of impairment of the groundwater being analyzed.

714.2. Soil

Human exposure to soil contaminants can occur through inhalation, ingestion, or skin contact, as well as indirectly through contaminants leaching or percolating to groundwater, if it is used as a source of drinking water. There are generally no promulgated Federal, New York State, or New York City clean-up standards for contaminants in soil. There are, however, guidance values that have been proposed by various government agencies. These guidelines are typically derived from models employing numerous conservative assumptions developed to set clean-up levels at soil-contaminated sites.

In October 1991, the DEC issued draft *Clean-Up Policy and Guidelines, Volume I and II.* Volume II references applicable standards, criteria, and guidelines to help guide decision-making when determining clean-up levels. Initial target soil clean-up concentrations calculated using the toxicity values found in the EPA Health Effects Summary Tables are presented in the document. The guidance values consider direct human ingestion of soils containing a single compound. DEC warns that these values might only be sufficient to protect human health at *industrial sites*. If there is the potential for additional routes of human exposure, if there is off-site contamination, or if the site has the potential for non-industrial use, then the New York State Department of Health is typically involved in the development of site-specific clean-up criteria.

The New Jersey Department of Environmental Protection and Energy (DEPE) has also proposed soil clean-up levels. These proposed standards were published in *Clean-Up Standards for Contaminated Sites Proposed New Rules: N.J.A.C. 7:26D* in the February 3, 1992, edition of the New Jersey Register. In these proposed rules, soil standards are presented for surface and subsurface soils separately. A quantitative health risk assessment approach was used in the derivation of the DEPE surface soil standards for both residential and non-residential sites that would be protective of human health. Toxicity factors from standard data bases and exposure assumptions that are generally in line with EPA's recommendations for Reasonable Maximum Exposure were used. Surface soil was defined as the soils down to 2 feet in depth, because this is the zone that a receptor may ordinarily come in contact with during normal activities.

The DEC and DEPE guidelines are both health-based and may be considered protective for persons ingesting contaminated soils. The DEPE proposed soil standards are more comprehensive than the DEC guidelines in that both residential and non-residential standards were developed and that the exposure routes considered include the inhalation of vapors and particulates in addition to soil ingestion. The inclusion of the inhalation pathway is of particular importance, because some chemicals may cause adverse health effects only when they are inhaled and not when they are ingested.

The proposed DEPE clean-up standards for subsurface (greater than 2-feet-deep) soil are intended for the protection of groundwater, surface water, and structures. Since New York City does not use its groundwater for drinking water supplies in almost all areas, the subsurface standards may not be appropriate. An important consideration is the future use of the site. If it is not restricted to manufacturing uses only, it may be appropriate to use the DEPE residential surface guidelines as a reference point of comparison to the soils data. These values are presented in the appendix.

714.3. Hazardous Waste Characteristics

Before transport and disposal of contaminated soil from a site, the soil must be sampled and analyzed in accordance with 6 NYCRR Part 371 to determine if it is subject to regulation as a hazardous waste. A solid waste, such as contaminated soil, is considered a hazardous waste if it exhibits one or more of the characteristics identified in 6 NYCRR Part 371.3 or if it is a listed acutely hazardous or toxic waste.

720. APPLICABLE COORDINATION

As noted above, several Federal, State, and City regulations govern hazardous materials. The agencies that administer these regulations at a Federal and State level, such as EPA and DEC, typically are not active in the CEQR process. However, if a significant contamination problem is discovered during the environmental review, the appropriate regulatory agencies must be notified. For instance, if a petroleum spill is found during a site investigation being performed for a CEQR, DEC must be notified pursuant to Article 17, Section 1743 of the New York State Environmental Conservation Law and Article 12, Section 175 of the New York State Navigation Law. The appropriate Federal and New York City government agencies must also be notified. DEP can provide complete notification requirements. Other than regulatory notification requirements, however, Federal and State agencies typically do not have a review and/or approval role in the CEQR process.

At the City level, coordination with DEP's Office of Environmental Planning is required where the proposed site is likely to show potential for the presence of hazardous materials (such as a site in or near

manufacturing uses or with a history that reveals a potential hazardous materials issue). DEP will provide consistent technical guidance and review throughout the research, investigation, and remediation phases of a hazardous wastes assessment.

730. LOCATION OF INFORMATION

Throughout this section of the CEQR Manual, references to publications, regulations, regulatory agencies, and other sources of information are made. Generally, publications and guidelines can be purchased or obtained free-of-charge from the referenced agencies. Listed below are regulatory agencies and current addresses, along with publications and/or regulations that may be obtained.

- RCRA/Superfund Hotline
  Publications and technical information.

- Government Printing Office
  26 Federal Plaza
  New York, NY 10278
  EPA regulations and guidelines.
  Fee charged for publications.

- New York State DEC
  Regional Office, Region 2
  Hunters Point Plaza
  47-40 21st Street
  Long Island City, NY 11101

  Bureau of Air Resources
  Bureau of Hazardous Wastes
  Bureau of Marine Resources
  Bureau of Solid Waste Management
  Bureau of Water, Spill Prevention and Response

- DEP-OEP
  59-17 Junction Boulevard, 11th Floor
  Elmhurst, NY 11373

- DEP-BERE
  59-17 Junction Boulevard, 1st Floor
  Elmhurst, NY 11373
  Copies of "Spill Law" and Right-to-Know Laws available free of charge.

- United States Geological Survey
  P.O. Box 1669
  Albany, NY 12201
  Topographic maps. Also available at local map stores, such as the Hagstrom Map Company.

- New York Public Library
  455 Fifth Avenue
  New York, NY 10016
  Fire insurance maps and city directories.

- New York City Department
  of Buildings (Manhattan)
  60 Hudson Street
  New York, NY 10013
  Building renovation records and certificates of occupancy for past and present uses available for review.

- New York City Department
  of Buildings (Brooklyn)
  Municipal Building
  Brooklyn, NY 11201
  Building renovation records and certificates of occupancy for past and present uses available for review.

- New York City Department
  of Buildings (Bronx)
  1932 Arthur Avenue
  Bronx, NY 10457
  Building renovation records and certificates of occupancy for past and present uses available for review.

- New York City Department
  of Buildings (Queens)
  126-06 Queens Boulevard
  Kew Gardens, NY 11415
  Building renovation records and certificates of occupancy for past and present uses available for review.

- New York City Department
  of Buildings (Staten Island)
  Borough Hall
  Staten Island, NY 10301
  Building renovation records and certificates of occupancy for past and present uses available for review.

- New York City Fire Department
  Bureau of Fire Prevention
  250 Livingston Street
  Brooklyn, NY 11201
  Records on fuel tanks, storage of flammable materials.

- National Cartographic
  Information Center
  U.S. Department of the Interior,
  Geologic Survey
  507 National Center
  Reston, VA 27092
  Aerial photographs and information on commercial surveying firms.

K. Waterfront Revitalization Program

100. Definitions

Proposed actions subject to CEQR that are situated within the designated boundaries of New York City's Coastal Zone must be assessed for their consistency with the City's Local Waterfront Revitalization Program (LWRP). New York City's LWRP was adopted as a 197-a Plan in coordination with local, State, and Federal laws and regulations, including the State's Coastal Management Program and the Federal Coastal Zone Management Act of 1972 (see Section 710, below). The LWRP establishes the City's Coastal Zone and includes a set of 56 policy statements—44 State policies and 12 City policies—that address the waterfront's important natural, recreational, industrial, commercial, ecological, cultural, aesthetic, and energy resources.

The LWRP consistency review includes consideration and assessment of other local, State, and Federal laws and regulations governing disturbance and development within the Coastal Zone. Key laws and regulations include those governing wetlands, flood management, and coastal erosion. (Further information on laws and regulations is provided in Section 710, below.) Although the consistency review is independent from all other environmental sections and must stand on its own, it is supported and conducted with consideration of all the other technical analyses performed as part of the action's environmental assessment under CEQR.

The LWRP's policies address 10 basic issues: fish and wildlife, flooding and erosion, water resources, air quality, and scenic quality; public access and recreation resources; energy development and solid waste disposal; and development. The LWRP sets forth three major goals:

- To promote economic development, especially of water-dependent industries. Where water-dependent industries are not viable, other uses may be considered to redevelop the waterfront;
- To protect natural resources, including wetlands, significant coastal habitats, beaches and coastal erosion areas, and water quality; and
- To increase public access, visual access, and recreational use of the waterfront.

The Department of City Planning is beginning a process to revise the City's LWRP, to provide greater clarity and specificity. Some of the expected changes will incorporate a number of goals expressed in DCP's Comprehensive Waterfront Plan, released in 1992.

110. COASTAL ZONE

As described above, New York City's LWRP establishes Coastal Zone boundaries, within which all discretionary actions must be reviewed for consistency with Coastal Zone policies. The Coastal Zone, which is mapped in the City's *Coastal Zone Boundaries* maps, is the geographic area of New York City's coastal waters and adjacent shorelands that have a direct and significant effect on coastal waters. It generally extends landward from the pierhead line or property line (whichever is furthest seaward) to include coastal resources and generally at least to the first mapped street. The Coastal Zone generally includes islands, tidal wetlands, beaches, dunes, barrier islands, cliffs, bluffs, intertidal estuaries, flooding- and erosion-prone areas, port facilities, vital built features (such as historic resources), and other coastal locations. Terms and issues important in the determination of the Coastal Zone, and therefore important in a consideration of an action's effects in that Coastal Zone, include those described below.

- *Base flood or 100-year flood*. The flood having a 1 percent chance of being equalled or exceeded in any given year. The base flood elevation is the height in relation to mean sea level—expressed in National Geodetic Vertical Datum (NGVD)—expected to be reached by the waters of the base flood as noted on the Flood Insurance Rate Maps (established under the National Flood Insurance Act).

- *Erosion*. The loss or displacement of land along the coastline because of the action of waves, currents running along the shore, tides, wind, runoff of surface waters, or groundwater seepage, wind-driven water or waterborne ice, or other impacts of coastal storms (as established under the State Erosion Hazard Areas Act).

- *Erosion hazard areas*. Those erosion prone areas of the shore, as defined in State Erosion Hazard Areas Act, that (a) are determined as likely to be subject to erosion within a 4-year period, and (b) constitute natural protective features (i.e., beaches, dunes, shoals, bars, spits, barrier islands, bluffs and wetlands, natural protective vegetation).

- *Floodplains*. The lowlands adjoining the channel of a river, stream, or watercourse, or ocean, lake, or other body of standing water, which have been or may be inundated by floodwater (as established by the National Flood Insurance Act).

- *Bulkhead line.* The proposed or actual bulkhead line most recently adopted by the U.S. Army Corps of Engineers and the New York City Department of City Planning.

- *Pierhead line.* The proposed or actual pierhead line most recently adopted by the U. S. Army Corps of Engineers and the New York City Department of City Planning.

- *Public access.* Any area of publicly accessible open space on waterfront property. Public access also includes the pedestrian ways that provide an access route from a waterfront public access area to a public street, public park, public place, or public access area.

- *Visual corridor.* An area that provides a direct and unobstructed view to a waterway from a public vantage point within a public street, public park or other public place.

- *Water-dependent uses.* Uses that require direct access to a body of water to function or that use waterways for transport of materials, products, or people.

- *Waterfront-enhancing uses.* A group of primarily recreational, cultural, entertainment, or retail shopping uses that, when located at the water's edge, add to the public use and enjoyment of the waterfront.

120. COMPREHENSIVE WATERFRONT PLAN AND WATERFRONT ZONING TEXT AMENDMENT

The Department of City Planning's Comprehensive Waterfront Plan is a report identifying goals and objectives for the City's waterfront. This plan has not been formally adopted; rather it is a document for public discussion. It outlines a long-range plan for the whole waterfront of New York City, balancing the needs of environmentally sensitive areas, the working port, and opportunities for waterside public access, open space, housing, and commercial activity. The plan provides useful background information; however, the LWRP policies are the basis for determining consistency.

The plan suggests that different areas of the City's waterfront are appropriate for different uses or activities. It also provides suggested goals for the City's waterfront, including, among others, the following:

- To reestablish and maintain physical and visual public access to and along the waterfront;
- To promote a greater mix of uses in waterfront developments, to attract the public and enliven the waterfront;
- To encourage water-dependent uses along the City's waterfront;
- To create a desirable relationship between new development and the water's edge; and
- To protect natural resources in environmentally sensitive areas along the shore.

The waterfront plan proposes to control bulk and built form within waterfront zoning lots and areas adjacent to the waterfront through proposed waterfront zoning text. A zoning text amendment, approved in November 1993, establishes regulations for the provision of public access, location of water-dependent and waterfront-enhancing uses, treatment of piers and platforms, and bulk and design controls. In addition, floor area associated with land underwater would no longer be applied to upland portions of zoning lots.

In addition to the proposed waterfront zoning text, the waterfront plan also identifies other potential future discretionary actions, such as potential mapping recommendations for many portions of the waterfront and the use of waterfront access plans. These plans could be developed and proposed within the waterfront area for adoption by the City Planning Commission and City Council. A waterfront access plan might specify the location of upland public access connections or visual corridors appropriate to a local setting, or the placement of the public access zoning requirements on a given lot.

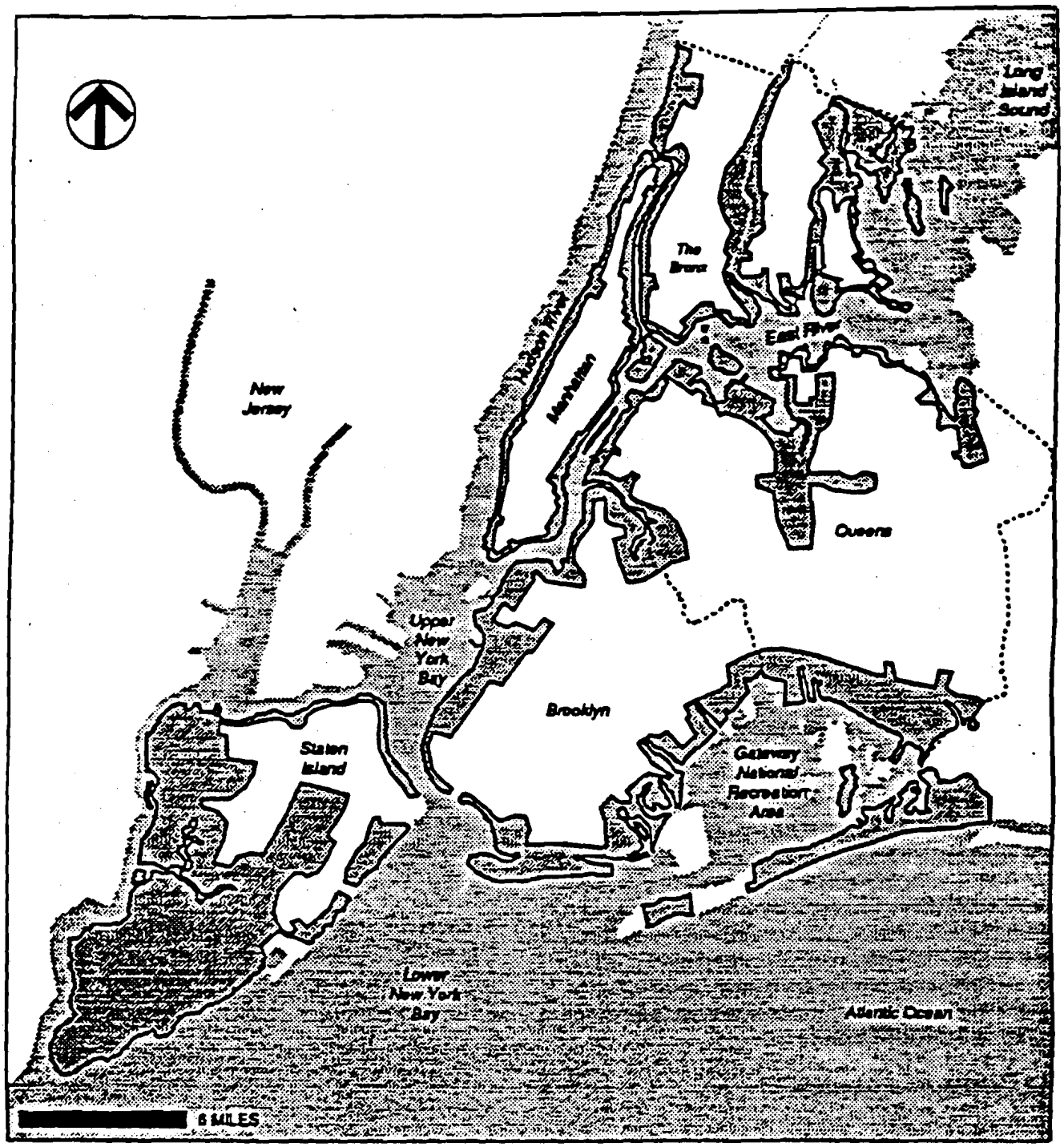
200. Determining Whether a Waterfront Revitalization Program Assessment is Appropriate

The LWRP applies to all discretionary actions in the designated Coastal Zone. As described above (Section 100), this zone is delineated in the 1986 *Coastal Zone Boundaries* maps published by the Department of City Planning, and is illustrated in Figure 3K-1. If the proposed action is located in the designated Coastal Zone, assessment of its consistency with the LWRP is required. For generic or programmatic actions, the potential locations likely to be affected within the Coastal Zone boundary should be considered.

300. Assessment Methods

Because the LWRP review considers the many laws affecting the coastal area, consideration of an action's consistency with the LWRP typically requires

Figure 3K-1
Coastal Zone



Coastal Zone Boundary

Note: Upland boundaries extend to the upland limit of zoning districts, natural area districts, and natural drainage basins. Federal property is excluded.

a comprehensive assessment, which also includes synthesis of different technical areas described in this Manual. Therefore, close coordination with the other technical areas will be needed. The analysis of each of these technical areas—such as natural or air resources, land use and zoning, or cultural resources—is summarized and presented in this section as it relates to the LWRP policies. Although much of the detail of each technical section can be cross-referenced, it is important that the discussion of each policy be able to stand on its own in this section. In some cases, supplemental information to that provided in the technical analyses may be necessary to complete the LWRP consistency evaluation.

For most actions, assessment of consistency with the program can begin with a preliminary analysis—a checklist designed to screen out actions that would have no potential for inconsistencies with the LWRP. Based on this screen, any potential inconsistencies identified are examined in more detail.

310. STUDY AREA/ELEMENTS

The study area for an assessment of the LWRP is generally defined by the site of the proposed action and those areas and resources within the Coastal Zone boundary that are likely to be affected by the proposed action. The study area may have to be enlarged for certain proposed actions to include resources that are part of a larger environmental system. For example, both natural drainage areas and potential erosion on downdrift properties may extend beyond the typical study area for a proposed action.

The assessment of an action's consistency with LWRP—whether the preliminary screening analysis (321, below) or the detailed analysis (322)—considers the future with the action in comparison to the No Action condition. More information on this framework is provided in Chapter 2. For example, when considering whether the action would be consistent with the surrounding land uses in a small harbor area (Policy 4), consider the uses that are expected to exist in the future rather than only the existing uses.

320. ANALYSIS TECHNIQUES

321. Preliminary Assessment

The first step for many actions is a preliminary evaluation of the action's potential for inconsistency with the LWRP policies. This evaluation involves using a screening checklist, and then assessing the potential inconsistencies identified by that checklist to determine whether a more detailed analysis is required (the detailed analysis is described in Section 322).

321.1. Screening Checklist

The following checklist was developed by the Department of City Planning to represent in a broad sense the 44 State Coastal Zone Management Program policies and 12 City LWRP policies. (The numbers and letters in parentheses after each question indicate the policy or policies that are the focus of the question.) It can be used for all actions in the Coastal Zone to highlight potential inconsistencies with those policies. A complete list of all 56 policies, together with some guidance in their interpretation, is provided in the appendix. For more information regarding the policies, the LWRP Manual (DCP, *Waterfront Revitalization Plan*, City of New York, 1982), available at the DCP bookstore, may be consulted. This information can provide assistance in interpretation of checklist questions, where required.

Figures 3K-2 through 3K6 can also provide assistance in using the checklist below. However, these maps are simplified. For information about more detailed maps, contact the Department of City Planning's Waterfront and Open Space Division (see Section 730, below).

1. Is the site(s) that would be affected by the action located in or near any significant coastal fish and wildlife habitats? (See Figure 3K-2; Section 31 of the Technical Manual describes these habitats in more detail.) (7)

2. Would the action involve any activity in or near a tidal or freshwater wetland? See Figure 3K-3; also see Section 31 for information on wetlands. (44)

3. Would the action result in any activities within a Federally designated flood hazard area and/or State-designated erosion hazard area? (See Figure 3K-4.) (11, 12, 17, C, D, E)

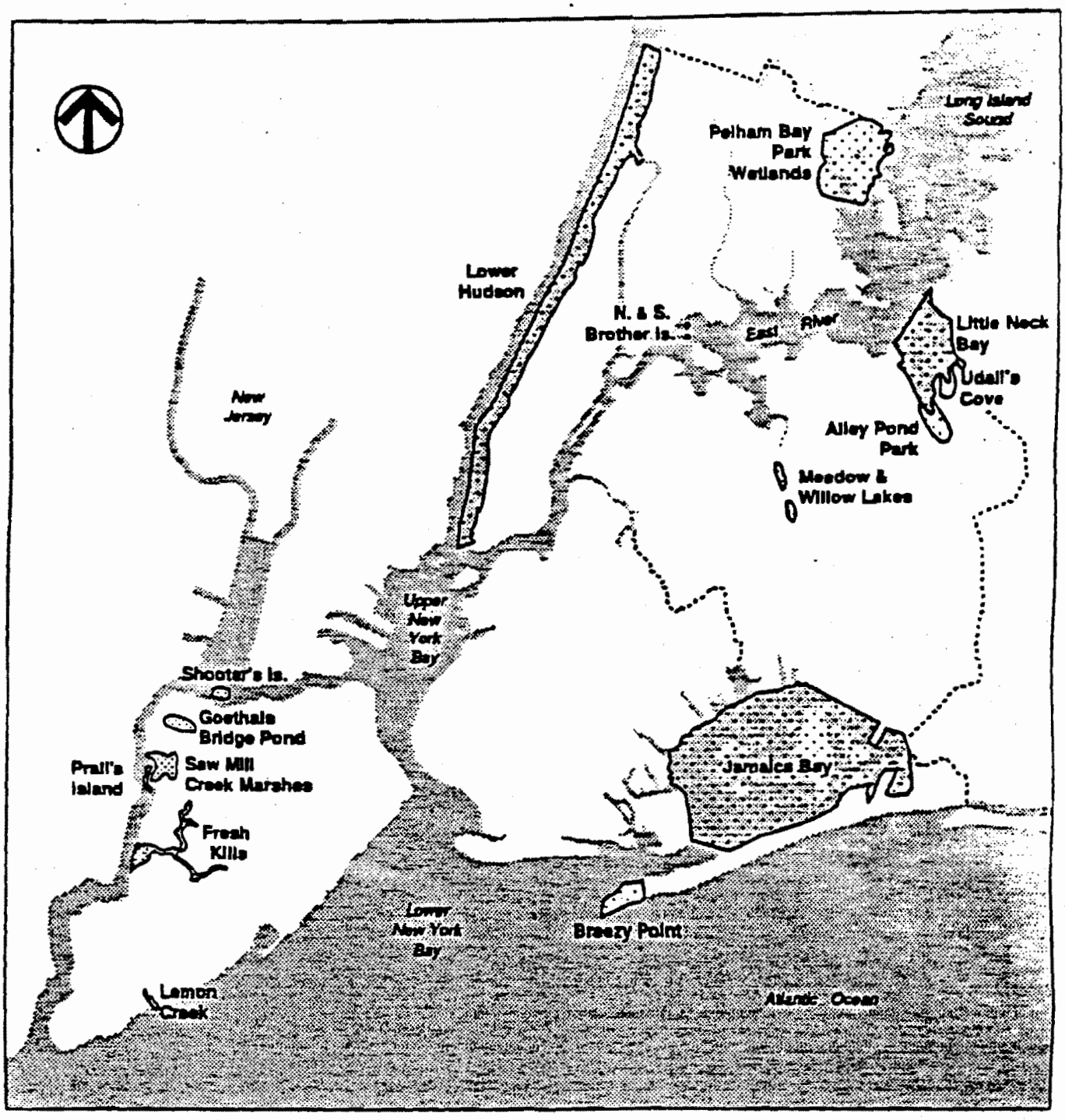
4. Would the action involve construction or reconstruction of a flood or erosion control structure? (13, 14, 16, 17, C, D, E)

5. Would the action involve any new or increased activity on or near any beach, dune, barrier island, or bluff? (12, G)

6. Would the action involve mining, dredging, or dredge disposal, or placement of dredged or fill materials in coastal waters? (15, 35, B)

Figure 3K-2

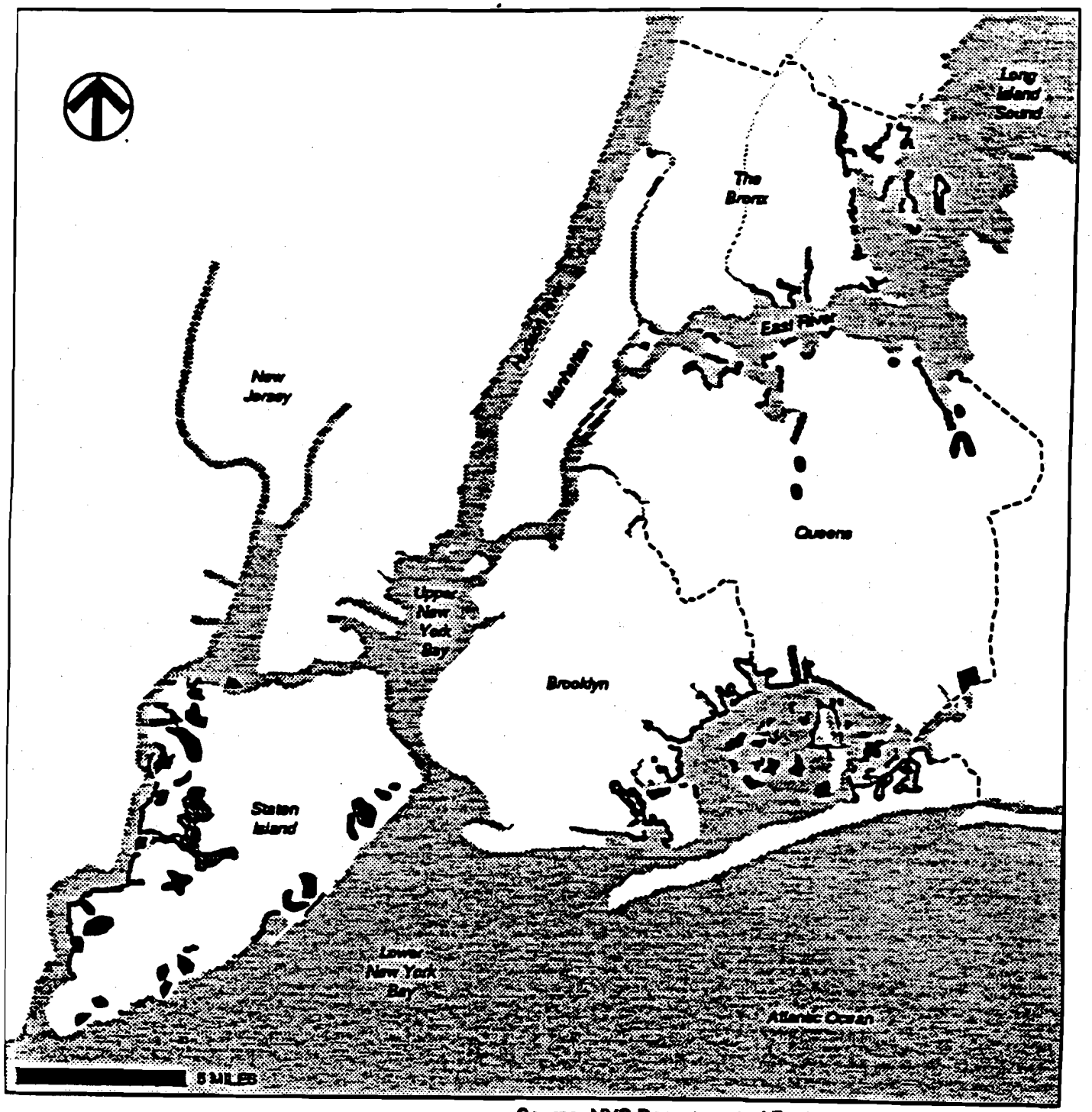
Significant Coastal Fish and Wildlife Habitat Designations



Source: NYS Department of State (1991)

Designated Area

Figure 3K-3
Wetlands

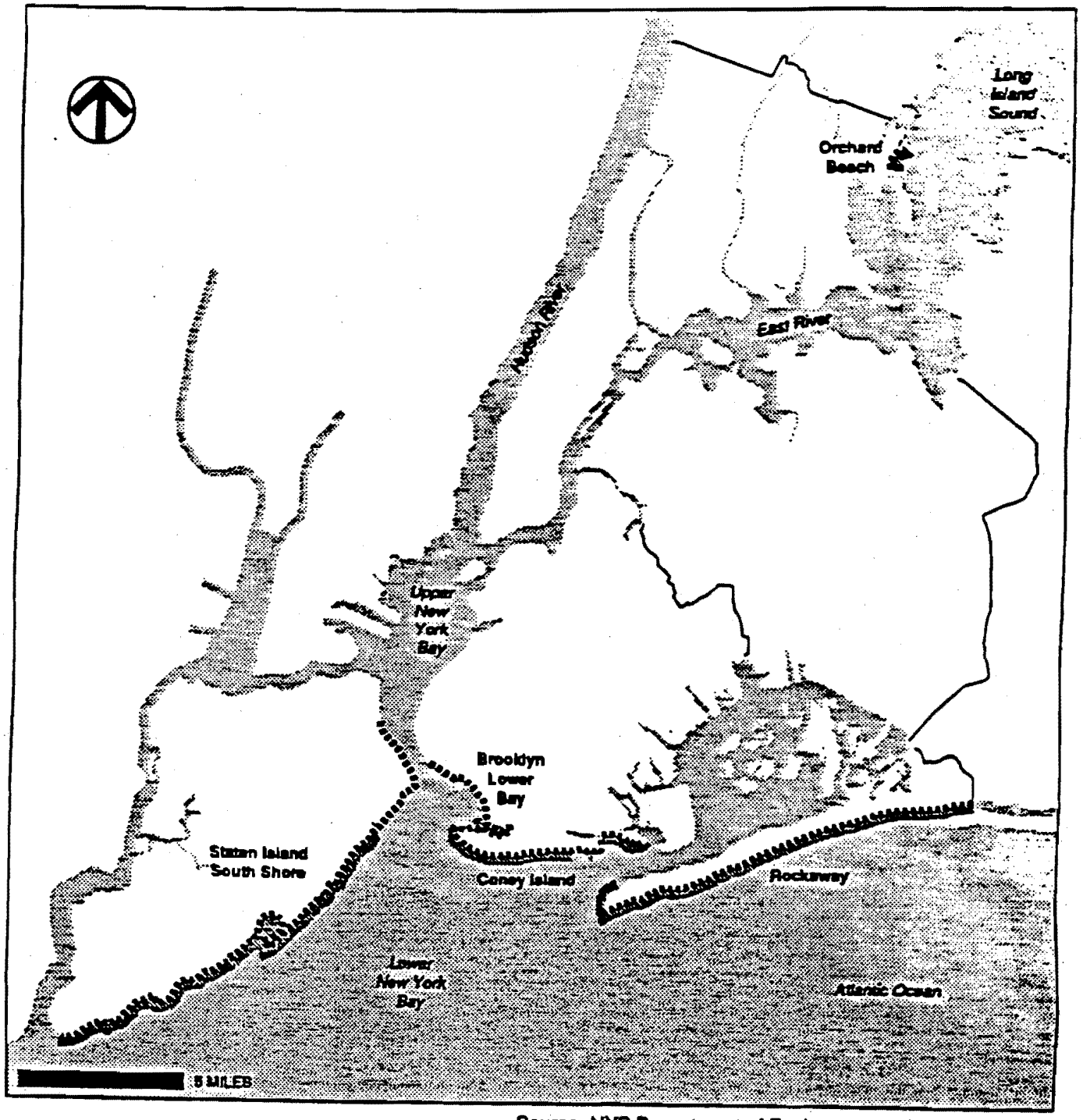


Source: NYS Department of Environmental Conservation

Major Tidal Wetlands

Major Freshwater Wetlands within the Coastal Zone

Figure 3K-4
Erosion Hazard Areas



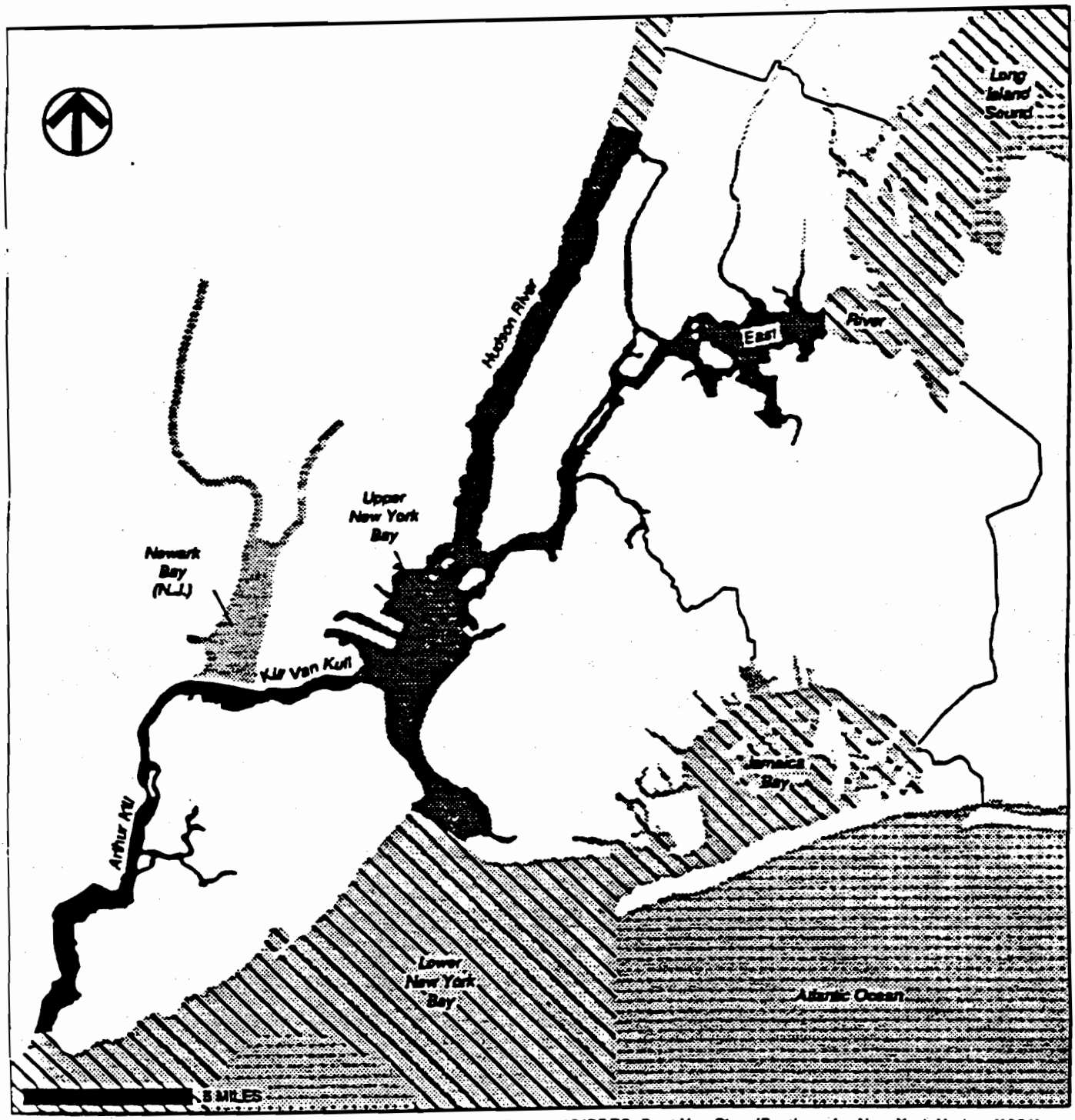
Source: NYS Department of Environmental Conservation

Designated Coastal Erosion Hazard Area

Sandy Beach

Figure 3K-5

New York Harbor Water Quality Goals



Source: NYSDEC, Best Use Classifications for New York Harbor (1991)

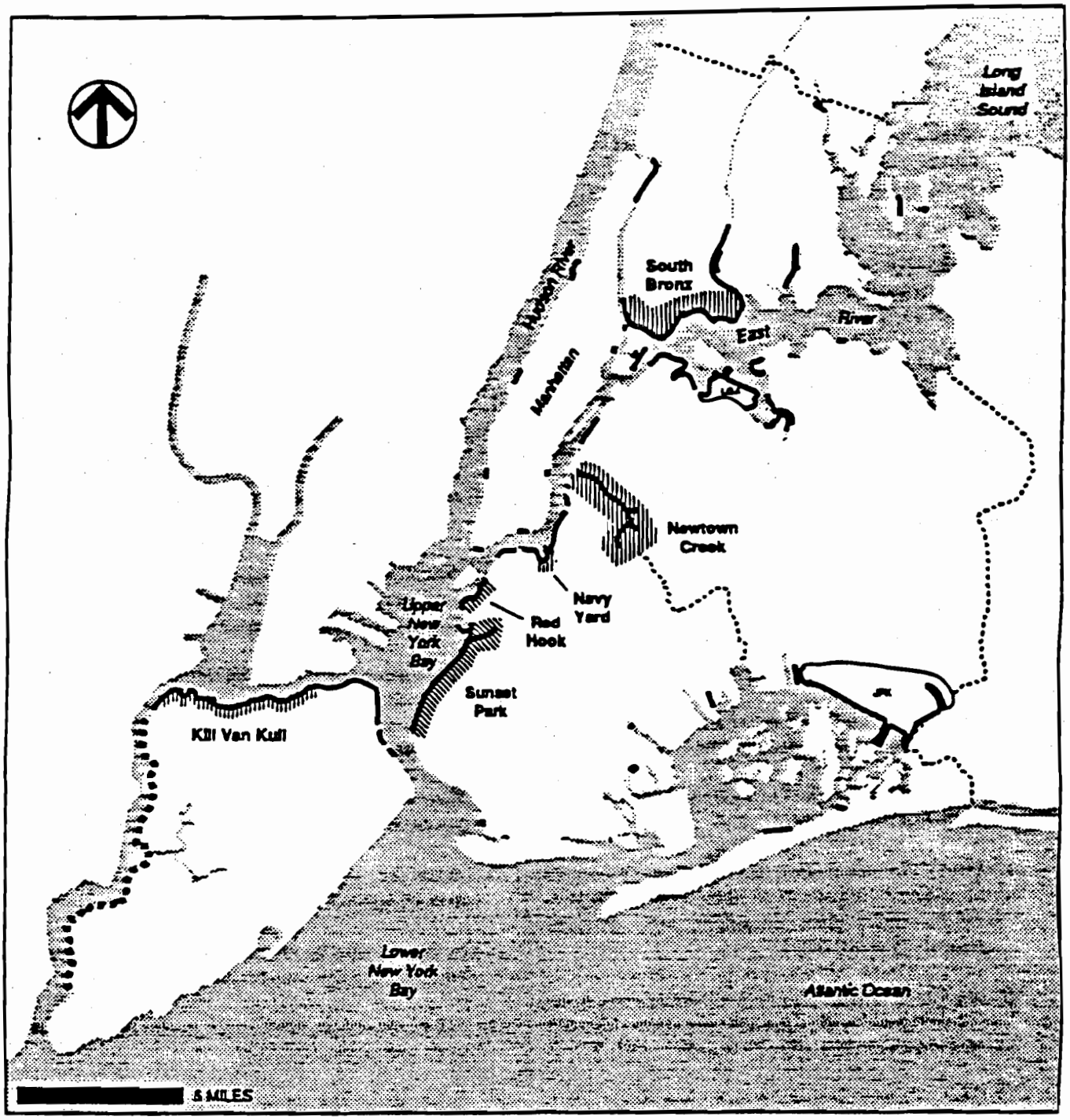
1 Shellfish Harvesting

2 Bathing

3 Fishing

4 Fish Survival

Figure 3K-6
Significant Maritime / Industrial Areas



NOTE: Waterfront manufacturing zoning districts proposed for rezoning or parkland are not shown.

bold name — Significant Maritime / Industrial Area

Airport

Waterfront Manufacturing Zoning District

Waterfront Manufacturing Zoning District with Special Environmental Constraints

7. Would the action result in any of the following:
   - Shipping, handling, or storing of solid wastes, hazardous materials, or other pollutants;
   - Development of a site that may contain contamination or has a history of underground fuel tanks, oil spills, etc.; or
   - Construction activities that could lead to erosion. (8, 36, 37, 38, 39)

8. Would the action result in the discharge of toxins, hazardous substances, or other pollutants, effluent, or waste into any waters? (8, 30, 31, 34, 37, 38, 40)

9. Would the action result in the draining of stormwater runoff or sewer overflows into coastal waters? (8, 32, 33)

10. Would the project in any way affect the water quality classification of nearby waters or be unable to be consistent with that classification? (See Figure 3K-5; also see Section 3I of this Manual.) (31)

11. Would the action cause violations of the National or State air quality standards? (See Section 3Q for information on air quality.) (41, 42)

12. Would the action result in significant amounts of acid rain precursors (nitrates and sulfates)? (See Section 3Q of this Manual.) (43)

13. Would the action have any effect on commercial or recreational use of fish resources? (9, 10)

14. Would the action have any effects on surface water or groundwater supplies? (38)

15. Would the action result in a reduction of existing or required access to or along coastal waters, public access areas, or public parks or open spaces? (19, 20, 21, F)

16. Would the action result in any development along the shoreline but NOT include new water-enhanced or water-dependent recreation space? (21, 22)

17. Would the action result in new open space that is not accessible to immobile (handicapped) user groups? (F)

18. Would the action result in the provision of open space without the provision for its maintenance? (H)

19. Would the action affect natural or built resources that contribute to the scenic quality of a coastal area? (25)

20. Does the site currently include elements that degrade the area's scenic quality or block views to the water? (25)

21. Would the proposed action have a significant adverse impact on historic or archaeological resources (see Section 3F of this Manual)? (23)

22. Would the action be located in an important maritime and industrial area as shown in the New York City Comprehensive Waterfront Plan (see Figure 3K-6)? Some of these areas may include portions of the following locations:
   - Kill Van Kull in Staten Island from Howland Hook to Snug Harbor;
   - Brooklyn waterfront at Red Hook and Sunset Park (from Pier 6 to Owls Head);
   - Brooklyn Navy Yard;
   - Newtown Creek; and
   - South Bronx (Port Morris and Hunts Point). (2, 3)

23. Would the action be located in a small harbor area (any area with a unique maritime identity; for example, Sheepshead Bay or City Island)? (4)

24. Would the action involve the siting or construction of a facility essential to the generation or transmission of energy, or a natural gas facility, or would it develop new energy resources? (27, 29, I)

25. Would the action involve ice management practices? (28)

26. Would the action affect any sites that have been used as landfills? (J,L)

27. Is illegal dumping occurring on a site that would be affected by the action? (K)

28. Would the action affect solid waste management goals and objectives? (L)

29. Is the site of the action a deteriorated or underutilized waterfront site? (1, A)

30. Does the site of the action include any waterfront structures (e.g., piers, docks, bulkheads, wharves, or erosion protection devices)? (A)

31. Would the action result in a change in scale or character of a neighborhood? (1)

32. If the action would affect a site located on the waterfront, would it facilitate the siting of a use that is NOT water-dependent? (2)

33. Would the proposed action require provision of new public services or infrastructure in an undeveloped or sparsely populated section of the coastal area? (5, 6)

34. Would the action result in a physical alteration to a site along the waterfront, including land along the shoreline, land underwater, or coastal waters? (2, 11, 12, 18, 20-22, 25, 28, 32, 35, 37, 38, 41, 43, 44, A-E)

321.2. Assessment of Potential Inconsistencies

After completing the preliminary checklist above, the next task is to assess the responses to the checklist. "Yes" answers to any of the questions indicate potential inconsistencies with a policy or policies of the LWRP, and must be further examined. The numbers and letters in parentheses after each question indicate the policy or policies that are the focus of the question. The policies are provided in the appendix, along with some interpretation. For any questions in 321.1, above, that warrant a "yes" answer or for which an answer is ambiguous, provide a brief explanation. These explanations can briefly assess the consistency of the proposed action with the noted policy or policies.

321.3. Preliminary Assessment Consistency Determination

When the answer to all the questions in the preliminary checklist is "no," or when the additional assessment of potential inconsistencies with LWRP policies completed in Section 321.2 indicates that the action would be consistent with those policies, the assessment of the Waterfront Revitalization Program is complete. The action would be consistent with the Local Waterfront Revitalization Program. See Sections 721 and 722, below, for a discussion of the notifications that are required in this case.

In some cases, however, the additional information provided as part of the preliminary assessment for any "yes" answers in the checklist would not eliminate potential inconsistencies, or will not be adequate to address such issues fully. In particular, consider whether the action requires the balancing of several different policies or would result in potential inconsistencies with LWRP policies. For those actions, a detailed assessment should be completed, as described in Section 322, below.

322. Detailed Analysis

The detailed analysis considers all 56 LWRP policies, and assesses consistency with all those that are relevant to the action. The complete list of waterfront policies is provided in the appendix. This assessment may require additional information about the affected site and the action, such as the following:

- Piers, Platforms, or Floating Structures
- Mean High Water
- Mean Low Water
- Pierhead Line
- Bulkhead Line
- Water-Dependent and Water-Enhanced Uses
- Property Lines
- Depth to Water Table
- Ownership; Documentation of Lands Underwater
- Existing and Proposed Vegetation
- Existing and Proposed Stormwater Drainage
- Existing and Proposed Public Access
- Topography
- Wetlands (Freshwater and Tidal)
- Coastal Erosion Hazard Area
- Beach or Bank Profile
- Public Access
- Floodplains
- Base Flood Elevation

As described below under Section 400, if an action would be inconsistent with a LWRP policy, it is most often appropriate to determine whether it would also forward other policies, so that these conflicting policies can be balanced with regard to appropriate uses for the site in question.

The level of detail of the analysis will depend on the nature of the action and the relevance of each policy to the action. Qualitative and quantitative effects may be pertinent. It should be noted, however, that several policies require adherence to specific minimum standards. For each policy relevant to the proposed action, provide a brief description of how it relates to the action, and a statement as to whether or not the action is consistent with the policy. Where a policy relates to other technical analyses performed, the analysis of the LWRP can refer to the other section of the environmental assessment.

400. Determining Impact Significance

For any given policy of the LWRP, a proposed action may advance that policy, be neutral to it, or

hinder the policy. It is the last category—hinderance of a policy—that may result in an inconsistency and, therefore, requires more scrutiny in the policy assessment.

If the lead agency determines that the action is consistent with the LWRP policies, no further assessment is necessary. As stated in Part II.F of the EAS, the lead agency should include an analysis of LWRP consistency as part of the EAS. For actions determined to be consistent with LWRP policies, the analysis should state that the action would not substantially hinder the achievement of any of the coastal policies.

The LWRP policies represent objectives that may conflict with each other in the context of a given action, and the determination of a potential significant impact should address each of the policies individually. In determining significance of inconsistencies, the lead agency may have to balance the policies that would be furthered by the action against any impacts that would hinder the policies.

If an action is inconsistent with a policy, consider whether changes to the action could be made so that the action would become consistent.

If such changes are not possible, consider whether the inconsistency is of such a degree as to be significant. The lead agency may determine that some inconsistencies are not significant. For example, a proposed new structure that would slightly block a view corridor toward the water may be found to be insignificant, depending on the existing width of that view corridor and other circumstances.

For inconsistencies with LWRP policies, the lead agency must be able to certify that the following four requirements are satisfied to approve an action:

- No reasonable alternatives exist that would permit the action to be taken in a manner that would not substantially hinder the achievement of the policy;
- The action would minimize all adverse effects related to the policy inconsistency to the maximum extent practicable;
- The action would advance one or more of the other coastal policies; and
- The action would result in an overriding local public benefit.

According to the LWRP, the City cannot proceed with an action if there is an LWRP inconsistency and the lead agency cannot make those findings. To make those findings, the action can be modified as described below in Sections 500 and 600. Even if the four findings can be made, substantial inconsistencies with any of the LWRP policies may result in significant adverse impacts that should be disclosed.

The lead agency shall forward a copy of the certification of LWRP consistency to the Waterfront Division of the Department of City Planning, whether or not the action is subject to City Planning Commission approval. An example of a form that could be used by the lead agency to transmit its LWRP determination to DCP is provided in the appendix. Since DCP is responsible for keeping a LWRP file with the New York State Department of State, this will ensure document consistency between the City and State. The Waterfront Division of DCP will be responsible for forwarding LWRP determinations to the State for all reviews conducted by lead agencies.

500. Developing Mitigation

When an action would result in significant adverse impacts related to inconsistencies with the LWRP, but those significant impacts are proposed to be mitigated, then the action would be consistent with the LWRP. Appropriate mitigation measures will vary, depending on the particular inconsistency. The measures must either be sufficient to address the policy inconsistency, or enable the lead agency to make the four findings described in Section 400. Proposed mitigation measures also must be assessed for consistency with the LWRP to the same degree as the proposed action. Mitigation for a significant adverse impact related to the LWRP may require coordination with other technical analyses.

Mitigation measures may include those described in Section 500 of the different technical sections of this Manual. In some cases, those measures may have to be modified to provide appropriate mitigation for impacts related to the LWRP's policies. For example, mitigation for significant impacts related to flooding and erosion (Policies 11-17, C, E, and G) is discussed in Section 3I, "Natural Resources."

In some cases, however, the significant impact will be specific to the assessment of LWRP, and will not have been identified in the analysis of another technical area. For example, a reduction in existing or potential public access to or along coastal waters would be inconsistent with the LWRP (Policies 19 and 20), although it might not constitute a significant impact identified in the other technical analyses.

600. Developing Alternatives

Sometimes, a proposed action would result in an inconsistency with policies of the LWRP that can be avoided through changes to the action. Such changes can include alternative uses (for example, water-dependent uses rather than those that are not) or alternative design (e.g., a different site plan to avoid development in the floodplain, or different building heights or site location to avoid a visual impact). Often, these will be the same alternatives used to avoid significant impacts in the other technical areas; sometimes, they will be specific to the assessment of LWRP.

700. Regulations and Coordination

710. REGULATIONS AND STANDARDS

New York City's Local Waterfront Revitalization Program was adopted in coordination with local, State, and Federal regulatory programs, and in the assessment, considers the many Federal, State, and local laws affecting the coastal area. For more information on the many rules and regulations affecting cultural resources, coastal erosion, flood management, natural resources, hazardous materials, and air quality, see Section 710 of the appropriate technical sections of this Manual.

711. Federal Laws and Regulations

- Coastal Zone Management Act (P.L. 92-583, 16 USC 1451 et seq.). Administrative responsibility: U.S. Department of Commerce, National Oceanic and Atmospheric Administration (NOAA).
  The Act established the Federal Coastal Zone Management Program to encourage and assist the states in preparing and implementing management programs to "preserve, protect, develop and, whenever possible, to restore or enhance the resources of the nation's Coastal Zone."
- Marine Protection, Research, and Sanctuaries Act of 1972 (Section 103; 33 USC 1413).
- National Flood Insurance Act of 1968.
- Flood Disaster Protection Act.
- Water Pollution Control Act.
- Clean Air Act.
- Clean Water Act, Section 404 (33 USC 1344).
- National Environmental Policy Act.
- Rivers and Harbors Act of 1899, Section 10 (33 USC 403).
- Fish and Wildlife Coordination Act.
- Endangered Species Act.
- National Historic Preservation Act.
- Deepwater Port Act.
- National Fishing Enhancement Act of 1984.
- Marine Mammal Protection Act.
- Federal Power Act.

712. New York State Laws and Regulations

- State Environmental Quality Review, Environmental Conservation Law, Part 617.
  —Part 617.9(e) describes the linkage between SEQR and the coastal policies of Article 42 of the Executive Law, as implemented by 19 NYCRR 600.5.
  —Part 617.14 (10)(i)(ii) describes the inclusion of the State and local coastal policies in the preparation and content of Environmental Impact Statements.
- Waterfront Revitalization and Coastal Resources Act (New York State Executive Law, 1981; Sections 910 et seq. Article 42; and implementing regulations 19 NYCRR).
  —Part 600: Policies and Procedures.
  —Part 601: Local Government Waterfront Revitalization Programs.
  —Part 602: Coastal Area Boundary; Significant Fish and Wildlife Habitats; Important Agricultural Lands and Scenic Resources of Statewide Significance; Identification, Mapping, and Designation Procedures.
- *State Guidelines for Federal Reviews: Procedural Guidelines for Coordinating New York State Department of State and New York City Waterfront Revitalization Program Consistency Review of Federal Agency Actions*, Coastal Management Program, Department of State, State of New York, 1985.
- *Guidelines for Notification and Review of State Agency Actions Where Local Waterfront Programs Are in Effect*, Coastal Management Program, Department of State, State of New York.
- Coastal Zone Management Rules and Regulations (6 NYCRR 505).
- Coastal Erosion Hazard Areas Act.
- Flood Hazard Areas.
- Freshwater Wetlands Protection Program.
- Tidal Wetlands Protection Program.
- Classification of Waters Program.
- Endangered and Threatened Species Program.
- Historic Preservation Act.

713. New York City Laws and Regulations

- Waterfront Revitalization, approved 197-a Plan, Calendar of the Board of Estimate of the City of New York, Item No. 17, Thursday, September 30, 1982.
- Procedures for the City Planning Commission, acting as the City Coastal Commission, approved

by the City Coastal Commission acting as the City Planning Commission, 1987.
This set of procedures links the Waterfront Revitalization Program with the ULURP process and describes the City Planning Commission's role in the State and Federal actions that otherwise do not require local involvement.

- Occupancy and Construction Restrictions within Special Flood Hazard Areas—Local Law 33 of 1988.
- General Limitations on Occupancy and Construction within Special Flood Hazard Areas—Article 10, New York Administrative Code.
- Grading and Drainage Rules—Local Law 7.

720. APPLICABLE COORDINATION

721. City Coastal Commission

Lead agencies conduct their own review of an action's consistency with the LWRP during environmental assessment. If the City Planning Commission is an involved agency because the action will come before the City Planning Commission, the City Planning Commission acting as the City Coastal Commission is required to make a LWRP consistency finding. The City Coastal Commission may elect to adopt the consistency determination and environmental findings of the lead agency or adopt different LWRP consistency findings. For this reason, the lead agency may wish to consult with the Department of City Planning, Waterfront and Open Space Division, acting as advisors to the City Coastal Commission, prior to issuance of its CEQR determination.

The City Coastal Commission's involvement may occur for a variety of Federal and State actions and actions subject to ULURP (Charter section 197-c) or Charter section 197-a or 200.

722. Other Agency Coordination

Once a determination is made by a lead agency that an action is consistent with the policies of the LWRP, the lead agency shall forward a copy of the certification of LWRP consistency to the Waterfront Division of the Department of City Planning, whether or not the action is subject to City Planning Commission approval. An example of a form that could be used by the lead agency to transmit its LWRP determination to DCP is provided in the appendix. Since DCP is responsible for keeping a LWRP file with the New York State Department of State, this will ensure document consistency between the City and State. The Waterfront Division of DCP will be responsible for forwarding LWRP determinations to the State for all reviews conducted by lead agencies.

723. Technical Coordination

The assessment of the action's consistency with LWRP relies primarily on information and analyses of the other technical areas discussed in this Manual. Thus, coordination with the other environmental analyses can be very useful.

730. LOCATION OF INFORMATION

- New York City Department of City Planning
  22 Reade Street
  New York, NY 10007
  Waterfront and Open Space Division

- New York City Department of City Planning
  22 Reade Street
  New York, NY 10007
  Bookstore and Map Sales Office
  —Department of City Planning, *Coastal Zone Boundary*, City of New York, 1986
  —Department of City Planning, *Waterfront Revitalization Program*, City of New York, 1982
  —Department of City Planning, *New York City Comprehensive Waterfront Plan: Reclaiming the City's Edge*, 1992
  —Department of City Planning, *New York City Waterfront Symbol*, City of New York, 1989
  —New York City Zoning Resolution, Waterfront Text

- New York State Department of Environmental Conservation
  Region 2
  47-40 21st Street
  Long Island City, NY 11101
  —Coastal Erosion Hazard Area Maps
  —Tidal Wetland Maps
  —Freshwater Wetlands Maps
  —Department of Environmental Conservation, "Stormwater for New Development," a memorandum to Regional Water Engineers, Bureau Directors, Section Chiefs, dated April 1990.
  —Department of Environmental Conservation, *Floodplain Regulation and the National Flood Insurance Program: A Handbook for the New York Communities*, Water Division, Flood Protection Bureau, State of New York, 1990.
  —Significant Coastal Fish and Wildlife Habitat Designations.

- Federal Emergency Management Agency
  26 Federal Plaza
  New York, NY 10278
  —Federal Emergency Management Agency, Flood Insurance Rate Maps, National Flood Insurance Program, 1983.
  —Federal Emergency Management Agency, *Flood Insurance Study: City of New York, New York*, Community Number 360497, 1991.

L. Infrastructure

The City's "infrastructure" comprises the physical systems that support its population—water supply; wastewater; sanitation; energy; even roadways, bridges, tunnels, and public transportation. Many of these topics are discussed elsewhere in this Manual (Sections 3M, "Solid Waste and Sanitation Services; 3N, "Energy;" 3O, "Traffic and Parking;" and 3P, "Transit and Pedestrians"). This section discusses water supply, sewage treatment, and stormwater management.

100. Definitions

110. WATER SUPPLY

111. New York City Water Supply System

Most of New York City obtains water from three water supply systems, operated by the Department of Environmental Protection, that form a network of reservoirs, aqueducts, and tunnels extending as far as 125 miles north of the City. The watersheds of the three systems cover almost 2,000 square miles, and their 19 reservoirs and three controlled lakes have a storage capacity of 550 billion gallons. The water flows to the City through aqueducts, reaching most consumers by gravity alone; some 3 percent of the City's water must be pumped to its final destination.

The Delaware and Catskill systems collect water from watershed areas in the Catskill Mountains and deliver it to the Hillview Reservoir in Yonkers. From there, it is distributed to the rest of the City through one of two tunnels, City Tunnel No. 1, which goes through the Bronx and Manhattan to Brooklyn, and City Tunnel No. 2, which goes through the Bronx, Queens, and Brooklyn (and from there through the Richmond Tunnel to Staten Island). A third tunnel, City Tunnel No. 3, is under construction.

The Croton system collects water from watershed areas in Westchester and Putnam Counties and delivers it to the Jerome Park Reservoir in the Bronx. From there, it is distributed to the Bronx and Manhattan through the New Croton Aqueduct, which goes through the Bronx and Manhattan to the Central Park Reservoir.

Within the City, a grid of underground distribution mains distribute water to consumers. Large mains—up to 50 inches in diameter—feed smaller mains, such as 12- and 6-inch mains, that distribute water to individual locations. These mains also provide water to fire hydrants along many of the City's streets (although certain areas of the City have separate high-pressure lines for fire hydrants). Water pressure throughout the City water supply system is controlled by regulators.

New York City consumes some 1.5 billion gallons of water per day through this water supply system. To reduce this consumption, the City has recently instituted a number of water conservation programs, including installation of or incentives to install low-flow fixtures, water metering, hydrant locking, and public education.

112. Jamaica Water Supply Company System

In addition to the public system, some customers in southeastern Queens receive water from the Jamaica Water Supply Company. Half of this water comes from underground aquifers beneath Queens (the Jameco and Magothy Aquifers); the other half is purchased from New York City.

120. SANITARY SEWAGE AND STORMWATER DISPOSAL

New York City's sewer system consists of a grid of sewers beneath the streets that send wastewater flows to 14 different treatment plants, known as "water pollution control plants," or "WPCPs." The areas served by each of these plants are called "drainage basins." Most of this system is a "combined" sewer system—it carries both sanitary sewage from buildings and stormwater collected in catch basins and storm drains. However, some areas of the City, primarily in Queens and Staten Island, operate with separate systems for sanitary sewage and stormwater. In addition, small areas of Staten Island and Queens use septic systems to dispose of sanitary sewage, rather than any of the City's WPCPs. Some developments in Staten Island also use small privately owned and operated sewage treatment plants to treat sanitary sewage.

121. City Sewer System

Collection sewers beneath the City's streets collect sewage from the buildings along the streets. Collection sewers can be 1 to 2 feet in diameter on side streets, and 3 or 4 feet in diameter under larger roadways. They connect to trunk sewers, generally 5 to 7 feet in diameter, which bring the sewage to interceptor sewers. These large interceptor sewers (often 11 or 12 feet in diameter) bring the wastewater collected from the various smaller mains to the water pollution control plants for treatment.

121.1. Combined Sewer Systems

About 85 percent of the City's sewer system collects both "dry-weather" wastewater (primarily sanitary sewage as well as wastewater from industries) and

stormwater. During dry weather, combined sewers function as sanitary sewers, conveying all flows to the WPCPs for treatment. During wet weather, however, large volumes of rainfall runoff (10 to 50 times the dry-weather flow) can enter the system through storm drains along the City's streets. If this water were conveyed to the treatment plants, it would exceed their hydraulic capacity; the plants are designed to handle only twice their average dry-weather flow for limited periods. To avoid flooding the plants, "regulators" are built into the combined sewers to act as relief valves. These are chambers set to allow two times the average dry-weather flow into the interceptor (WPCPs have capacity to treat twice the dry weather flow); during storms, if a greater amount of wastewater reaches the regulator, the excess is directed to outfalls into the nearest waterway (e.g., the Hudson River, East River, etc.). During such overflow periods, a portion of the sanitary sewage entering or already in the combined sewers discharges into the waterway along with the stormwater and debris washed from the streets. This untreated overflow is known as "combined sewer overflow," or "CSO."

Combined sewer overflow is a concern because it contains oil and gasoline from street traffic, floating debris (also called "floatables," and usually consisting primarily of street litter), various pollutants from industrial facilities (both pollutants discharged into the sewer system and pollutants in the runoff from these facilities), and untreated sewage. To reduce the amount of pollution currently reaching the City's waters because of these overflows, however, the City has initiated a Combined Sewer Overflow Abatement Program. This program includes assessment of CSO problem areas, and such measures to reduce these problems as infiltration and inflow control, which will address and eliminate extraneous flows into the sewer system, such as groundwater infiltration into broken or leaky pipes; placement of containment booms at some stormwater outfall locations to capture floatables that are discharged into the receiving water during wet weather; and CSO retention (the use of storage areas for CSO, from which the overflow can be pumped back to the WPCP for treatment during dry-weather periods of lower flows).

121.2. Separate Systems

Certain areas of the City are served by separate storm and sanitary sewers. In these areas, sanitary sewage is sent to the water pollution control plants, but stormwater is sent through separate pipes into the nearest waterway. Areas served by separate sewers include certain areas in Queens and Staten Island. In addition, under the State Pollutant Discharge Elimination System permits for the City's WPCPs (discussed below in 122.1), no new stormwater hook-ups to the combined system are permitted for waterfront sites in New York City; at these locations, the stormwater must flow through separate pipes to the receiving water body.

122. City Water Pollution Control System

122.1. Sanitary Sewage Treatment

New York City's sewage is treated at 14 water pollution control plants: Coney Island, Newtown Creek, Owls Head, Red Hook, and 26th Ward in Brooklyn; Hunts Point in the Bronx; North River and Wards Island in Manhattan; Bowery Bay, Jamaica, Rockaway, and Tallmans Island in Queens; and Oakwood Beach and Port Richmond on Staten Island. Together, these plants treat some 1.7 billion gallons of sewage per day. The drainage basins of each of these plants are shown in Figure 3L-1.

The City's water pollution control plants treat the wastewater through a variety of physical and biological processes that remove solids so that, when treatment is complete, the water can be discharged into one of the City's waterways without adversely affecting water quality. This treated wastewater to be discharged is called "effluent." The major processes used in the City's treatment plants are as follows:

- Mechanical and physical removal of trash, grit, scum, and sludge (this is "preliminary" or "primary" treatment);
- Biological treatment of remaining sewage ("secondary" treatment);
- Concentration, biological decomposition through anaerobic digestion, with energy recovery, and disposal of sludge; and
- Disinfection of liquid effluent.

Each of the City's 14 WPCPs is regulated through a State Pollutant Discharge Elimination System (SPDES) permit issued by the New York State Department of Environmental Conservation (DEC) to ensure that water quality in the receiving water body is not adversely affected by WPCP effluent. The permits specify the maximum average monthly dry-weather flow in millions of gallons per day, or mgd (based on the quantity of wastewater that the plants can adequately treat), and such effluent parameters as the minimum percent (85 percent) of biological oxygen demand (BOD) that must be removed (BOD, a measure of the amount of oxygen consumed in decomposition of organic matter, is an indicator of the quantity of organic pollution in wastewater); the minimum percent of suspended solid loadings that must be removed (also 85 percent); the

Figure 3L-1

New York City WPCP Drainage Areas

maximum concentrations of suspended solids, fecal coliform, settleable solids, and other pollutants; and the range of acceptable pH levels. The permits also stipulate monitoring requirements for the regulated parameters, as well as for odor control, and require infiltration/inflow assessments and correction programs if the plants reach a certain percent of their permitted capacity. The permitted capacity of each of the City's water pollution control plants is shown in Table 3L-1.

Table 3L-1

Permitted Capacity at New York City Water Pollution Control Plants

Plant	Rated Capacity (mgd)
Brooklyn	
Coney Island	100
Newtown Creek	310
Owls Head	120
Red Hook	60
26th Ward	85
Bronx	
Hunts Point	200
Manhattan	
North River	170
Wards Island	250
Queens	
Bowery Bay	150
Jamaica	100
Rockaway	45
Tallmans Island	80
Staten Island	
Oakwood Beach	40
Port Richmond	60

Three of the City's Water Pollution Control Plants are subject to Orders on Consent between DEP and DEC. These set forth methods for reducing wastewater flow to the plants. These methods include, for example, water conservation measures, such as installation of or incentives to install low-flow toilet and shower fixtures, water metering, and hydrant locking, as well as diversions of flow to other plants and measures to improve plant operations, and public education. The following plants currently have Consent Orders: North River, Wards Island, and Newtown Creek. In addition, the City has committed to a flow reduction program for the Coney Island plant.

122.2. Industrial Pretreatment

In addition to the parameters described above, the City accepts industrial effluent into the sewer system if it complies, or has been treated to comply, with certain standards. This additional treatment is required to protect human health, the environment, and the sewers and WPCPs from toxic and hazardous discharges. The City's Industrial Pretreatment Program identifies and monitors industrial uses that discharge pollutants of concern into the sewer system. This program is administered by the Division of Drainage Basin Management of the Department of Environmental Protection, Bureau of Clean Water. The Division of Drainage Basin Management uses directives, which are similar to discharge permits, to notify each industrial use of its effluent requirements. The directives summarize the Industrial Pretreatment Program's legal authority (see Section 710) and monitoring and inspection requirements, and list discharge limits that each of the identified industries must meet.

123. Septic Systems

The southwestern part of Staten Island and parts of Queens use septic systems to dispose of sanitary sewage, rather than the City's sanitary sewer system. Septic systems consist of underground tanks that retain sewage for decomposition, and surrounding soils that filter the wastewater once it is released from the tank. In the septic tank, the solids in the sewage settle to the bottom, and the liquid undergoes some anaerobic decomposition before being discharged through perforations into the surrounding soils. These are specially prepared, absorbent soils, generally termed "disposal fields." Here, the effluent undergoes additional treatment: it is strained and absorbed by the soils, and microbial organisms in the soil convert it into minerals, gases, and nutrients. Septic systems are subject to approval by DEP, and those that process more than 1,000 gallons of wastewater per day require SPDES permits from DEC.

124. Privately Operated Treatment Plants

Small privately owned and operated sewage treatment plants serve only a local area. Some of these are in use on Staten Island. These are sewage treatment plants that operate in much the same way as larger, municipal water pollution control plants, but with a smaller capacity. They can be on- or off-site, and may be constructed as "package treatment plants." As at municipal plants, the effluent from these plants is discharged to a nearby waterway, subject to the regulations of a SPDES permit. Privately owned and operated treatment plants are used in areas where City sewers and treatment by a municipal WPCP are not available.

125. Stormwater Management

On undeveloped sites, rainfall is normally absorbed into the ground through permeable surfaces. In urban settings, however, where permeable surfaces are less common, it typically flows across land ("sheet flows") toward low points—most often, water bodies or storm sewers. The storm sewers direct this stormwater through underground pipes to an outfall that discharges into the nearest waterway. As described above, in New York City, these can be either combined or separate systems. Generally, in either system, stormwater flows to the nearest waterway without treatment.

200. Determining Whether an Infrastructure Assessment is Appropriate

210. WATER SUPPLY

211. New York City Water Supply System

As described in Section 320, because of the size of the City's water supply system and because the City is committed to maintaining adequate water supply and pressure for all users, few actions would have the potential to result in significant adverse impacts on that system. Certain actions that would not increase water demand would not affect the system and therefore would not require an assessment of water supply. Actions that could affect water pressure, and that therefore need assessment, are as follows:

- Actions that would have exceptionally large demand for water, such as power plants, very large cooling systems, or large developments (e.g., those that use more than 1 million gallons per day, such as the World Trade Center). For these actions, a detailed assessment of effects on water pressure and supply may be needed.

- The following locations are at the end of the water system, where water pressure can be low, and actions that would result in a large draw of water there could reduce the water pressure to below acceptable levels. Therefore, an assessment may be appropriate:

  1. Rockaway Peninsula.
  2. Within the U-shaped area in western Staten Island bounded by Richmond Parkway, the West Shore Expressway, Arthur Kill Road, and Arden Road (see Figure 3L-2).
  3. Coney Island.

212. Jamaica Water Supply Company System

Any action that would result in a large draw of water from the Jamaica Water Supply Company should be assessed to be sure that adequate water exists to accommodate the project. These are actions that would be located at sites in Cambria Heights, Hollis, Hollis-wood, Jamaica, Jamaica Estates, Kew Gardens, Laurel-ton, Queens Village, Richmond Hill, Rosedale, St. Albans, South Ozone Park, and Springfield Gardens. Some of the actions that would occur in these areas may be so small that they would not need a detailed assessment. (For more information on groundwater, see Section 3I.) The lead agency may consult with DEP for guidance in assessing actions in this area.

220. WASTEWATER TREATMENT

221. City WPCPs

The City is committed to adequately treating all wastewater generated in the City and to maintaining its wastewater treatment plants at or below the capacity permitted by applicable State and Federal permits, orders, and decrees. To achieve this goal, Citywide programs and policies have been and will continue to be developed to accommodate expected flows through the City's plants and ensure that they fall within authorized capacities. Therefore, only unusual actions with very large flows could have the potential for significant impacts on sewage treatment. Actions that would be consistent with the Consent Orders and other programs enacted for the WPCP that would serve the action would not result in significant adverse impacts. For CEQR review, it may be appropriate to disclose the increase in expected sewage generated by the action. This would allow the lead agency to confirm that the proposed action would be consistent with any Consent Orders or other applicable programs. The methods for this disclosure are presented in Section 322.1 below.

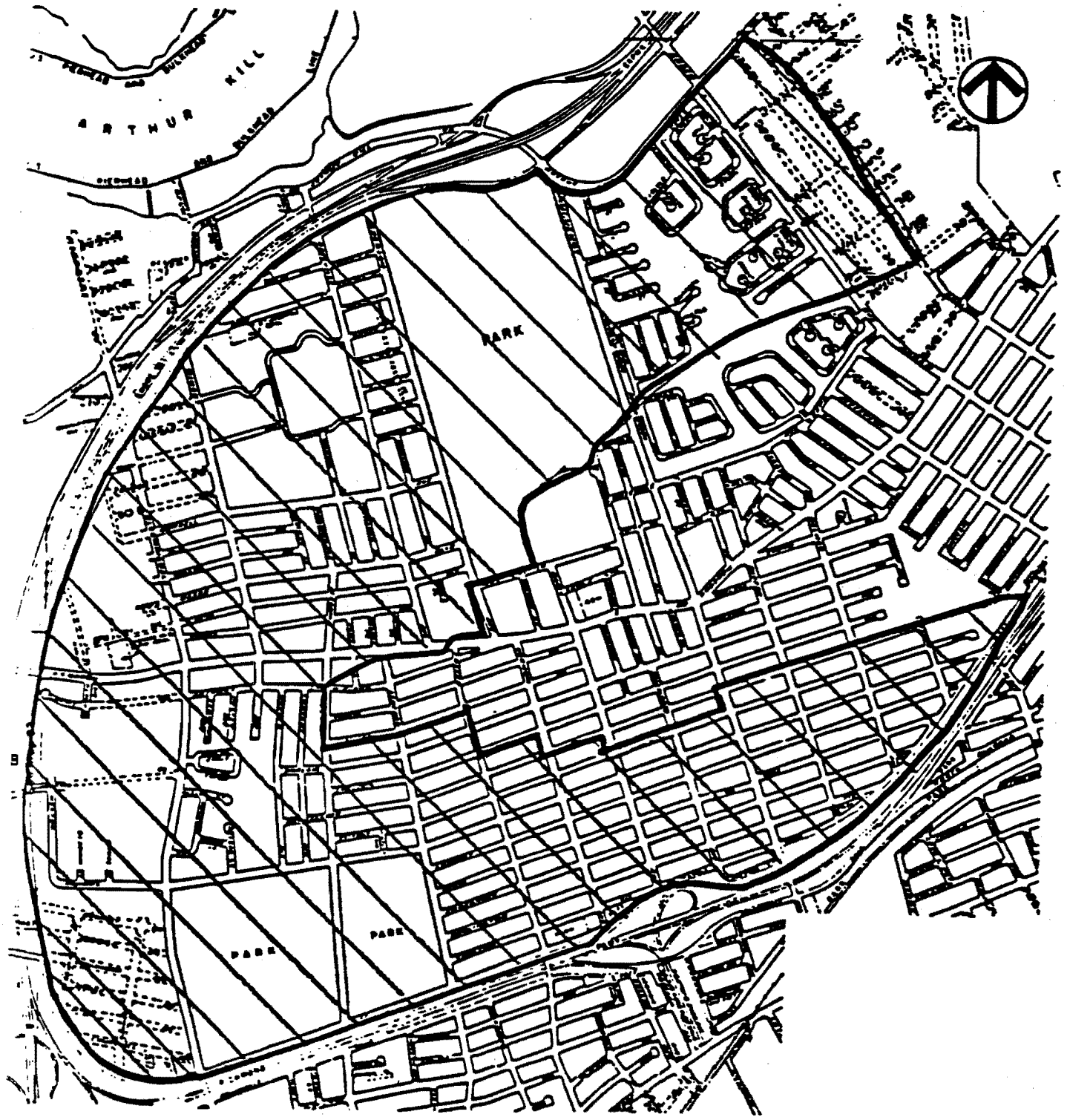
222. Industrial Pretreatment Program

For industrial facilities, the following criteria indicate that the facility would be subject to the City's Industrial Pretreatment Program:

- The facility would discharge an average of 25,000 gallons per day or more of wastewater other than sanitary, noncontact cooling, and boiler blowdown wastewaters.

- The facility would contribute industrial flows—including contact flows (those that come into contact with a manufacturing process or product) and noncontact flows (including, but not limited to, cooling water for equipment and boiler

Figure 3L-2
Staten Island Area
Subject to Pressure Variations



Area Subject to Pressure Variations

blowdown wastewaters)—that make up 1 percent or more of the permitted annual average dry-weather capacity of the water pollution control plant to which flows would be directed.

- The facility would be subject to Federal categorical pretreatment standards (the industry categories for such facilities are included in a table at the end of this section).

- The facility's Standard Industrial Code (SIC) is listed in the table at the end of this section.

Generally, if such facilities comply with the City's Industrial Pretreatment Program, no significant impacts would occur. For disclosure purposes, however, it is often appropriate to provide a description of the facility's effluent and how it would comply with the Industrial Pretreatment Program. This allows the lead agency to confirm that the industrial facility would be in compliance.

223. Septic Systems

Similarly, actions that would use new or existing private septic systems rather than the City's water pollution control plants would not be expected to have significant adverse impacts if all applicable regulations are followed. However, for these actions it may also be appropriate to disclose details about sanitary sewage treatment and compliance with applicable regulations.

224. Privately Operated Treatment Plants

Actions that would use existing privately owned and operated treatment plants, rather than the City's WPCPs, would not be expected to have significant adverse impacts if these plants are operated properly and within their SPDES permit levels. For actions that involve construction of a new privately owned treatment plant, a water quality assessment would be appropriate if no SPDES permit has been issued. For those plants currently operating under a valid SPDES permit, it would be appropriate to disclose whether the permit condition for flow would be met with implementation of the proposed action.

230. STORMWATER MANAGEMENT

An assessment of stormwater may be appropriate for the following actions:

- Any of the industrial activities listed in the table at the end of this section, including manufacturing, processing, or raw materials storage areas at those sites. These activities must obtain a SPDES permit for any stormwater discharges to a separate sewer system; discharges to the combined system could also be of concern, although no SPDES permit would be required. More information on SPDES permits is available from DEC.

- Actions that would be served by separate sewers, if the action would greatly increase the amount of paved area on the site (such as could occur if an undeveloped site were developed into a parking lot or paved area). Stormwater from paved areas can carry oils and other pollutants.

- Actions that would be served by a separate storm system and that would involve construction activities including clearing, grading, and excavation. Such construction activities involving more than 5 acres also require a SPDES permit from DEC.

- Construction of a new stormwater outfall. For more information on this type of action, see Section 31, "Natural Resources."

300. Assessment Methods

310. STUDY AREA

311. Water Supply

The study area for analysis of water supply is the project site itself and the system it could affect—usually, the area served by the water pressure regulator that serves the site, or the supply area of the Jamaica Water Supply Company, as appropriate.

312. Wastewater Treatment

312.1. City WPCPs

The analysis of sewage typically focuses on the effects of increased flows to the water pollution control plant(s) that would serve the site. Therefore, the study area includes that plant, and may also consider its drainage basin.

312.2. Septic Systems

The study area for septic systems is that area that could be adversely affected by the systems. This is usually an area immediately surrounding the system, unless wetlands or water bodies are located within and extending past that radius. If so, the effects on those resources are also assessed.

312.3. Privately Operated Treatment Plants

Analysis of new privately operated treatment plants focuses on the effect of effluent from those plants on

the receiving water unless a SDPES permit has already been issued. In flowing water, such as rivers or streams, and in tidally affected areas, those effects may occur near the discharge point; the analysis is generally restricted to the area close to the outfall. In still water bodies, such as ponds, the whole water body may be analyzed. More information about water quality and natural resources impacts is provided in Section 3I, "Natural Resources." Analysis of existing privately operated treatment plants would typically focus on whether those plants had adequate capacity to handle additional wastewater flows resulting from the proposed action, based on the existing SPDES permit limits for flow.

313. Stormwater Management

Analysis of stormwater also focuses on the effects of that stormwater on the water body to which it is released. As described above in Section 100, stormwater can be released to the City's water bodies during combined sewer overflows, for areas served by a combined sewer system; or at all times, for areas served by a separate system. More information about this analysis is also provided in Section 3I, "Natural Resources."

320. ANALYSIS TECHNIQUES

321. Water Supply

321.1. New York City Water Supply System

The assessment of effects on water supply and water pressure can be performed as follows:

1. Assess existing water use on the project site.
2. Assess the likely water usage on the project site for future no action conditions, and characterize the effects on the existing system. This projection should take into consideration any water conservation measures that would be implemented by the build year.
3. Predictions of an action's average and peak daily water demand are made based on the uses expected with the action. The rates provided in Table 3L-2 can be used for this assessment for most actions. Water usage for industries depends on the manufacturing processes involved, and should be documented.
4. Describe the existing water distribution system serving the project area, based on information obtained from DEP.
5. Assess the effects of the proposed action's incremental demand on the system and determine if there would be sufficient capacity to maintain adequate supply and pressure. This analysis, which considers the pipe sizes and grid of the water system to determine water pressure loss, is usually performed by DEP; contact that agency for further information.

Table 3L-2

Water Usage and Sewage Generation Rates for Use in Impact Assessment

Use	Rate (Gallons Per Day)
Residential	112 gpd/person
Retail/Public Use	
Domestic	0.17 gpd/sf
Air Conditioning	0.17 gpd/sf
Health Club	
Domestic	65 gpd/patron
Air Conditioning	0.17 gpd/sf
Commercial/Office	
Domestic	25 gpd/person
Air Conditioning	0.10 gpd/sf
Movie/Theater	
Domestic	5 gpd/seat
Air Conditioning	0.17 gpd/sf
Fast Food Restaurant	
Domestic	2 gpd/meal
Air Conditioning	0.17 gpd/sf
Restaurant	
Domestic	10 gpd/meal
Air Conditioning	0.17 gpd/sf
Hotel	
Domestic	150 gpd/rm/occupant
Function Space	0.17 gpd/sf
Air Conditioning	0.10 gpd/sf
Schools	
Domestic	30 gpd/seat
Air Conditioning	0.10 gpd/sf
Hospitals	
Domestic	300 gpd/bed
Air Conditioning	0.17 gpd/sf

Note: These rates are for new uses incorporating low-flow fixtures, as required by law.

321.2. Jamaica Water Supply Company System

For actions that would be served by the Jamaica Water Supply Company System, complete steps 1 through 3 in Section 321.1, above. Then, consult the Jamaica Water Supply Company to ascertain whether there would be adequate water to supply the project.

Issues related to an action's potential effects on water quality of the groundwater are discussed in Section 3I, "Natural Resources."

322. Wastewater Treatment

322.1. City WPCPs

An assessment of sanitary sewage typically consists of identifying the water pollution control plant to which the flows would be sent, and estimating expected flows that the action would generate. Figure 3L-1 shows each water pollution control plant's drainage basin. For sites near the boundaries of several drainage basins, DEP's Office of Environmental Planning can assist in determining which plant would serve the action. In certain areas near such boundaries, sewage could be routed to either of the WPCPs; DEP would make the determination as to which WPCP should be used. For assessment purposes, the rates provided in Table 3L-2 (excluding air conditioning rates) can be used to estimate an action's daily sanitary sewage generation. As part of this assessment, the lead agency may also choose to obtain the actual average annual dry-weather flows to the WPCP that would serve the action, and consider the effect of the flows from the action on the total flows to the plant. This information, which is typically examined for the latest 12-month period, is available from DEP's Office of Environmental Planning. DEP's Office of Environmental Planning can also be contacted for assistance in determining whether the action would be consistent with a plant's Consent Order and other applicable programs. (As noted above, three plants are currently subject to Consent Orders—North River, Wards Island, and Newtown Creek. In addition, the City has also committed to a flow reduction program at the Coney Island plant.)

To estimate total annual average flows in the build year, the analysis separates background growth in population and employment from new development in the drainage basin. To calculate sewage from no action developments, the rates listed in Table 3L-2 would be applicable. For background growth, multiply the number of new residents by 137 gallons per day and the number of new employees by 85 gallons per day. (DEP's Office of Environmental Planning can provide population and employment projections for each treatment plant drainage area.) Add the background flows and known no action development flows to the plant's latest 12-month annual average to obtain the total no action flows in the drainage basin.

322.2. Industrial Pretreatment

The assessment of effluent from a proposed industrial facility identifies the pollutants in that effluent, and considers whether the effluent would comply with the discharge limits set by the City's Industrial Pretreatment Program. The concentrations of various pollutants in the process wastewater, before any treatment, should be determined. Then, the short- and long-term effective removal rates of the proposed treatment measures should be evaluated to calculate the expected concentrations in the wastewater. The Division of Drainage Basin Management of DEP's Bureau of Clean Water can provide more information about methods of compliance with the Industrial Pretreatment Program.

322.3. Septic Systems

The assessment of septic systems focuses on whether those systems can function properly, given their proposed setting and design. It considers the systems' compliance with ordinances, requirements, and good engineering practice. As part of this assessment, percolation tests are performed to determine the rate at which effluent would percolate through the site's soils. Information on the depth of groundwater and bedrock is also important; the bottom of the septic leaching field must be a specified distance from groundwater and rock for the system to function properly. All available information related to those septic systems, including the results of the percolation tests, is submitted to the DEP for review. Additionally, septic systems located close to surface or ground water bodies or wetlands are assessed for their effects on those resources (see Section 3I, "Natural Resources").

322.4. Privately Operated Treatment Plants

The assessment of potential environmental impacts from new privately operated treatment plants without a SPDES permit focuses on the water body to which the plant's effluent would be discharged, and whether the plant would affect its water quality. Adverse effects on water quality from sewage treatment plants can occur, principally because of reductions in dissolved oxygen from the addition of organic pollution to the receiving water. Sewage plants can also contribute to the levels of fecal and total coliforms and other pollutants, if they are not functioning properly. The methodology for assessing effects on water quality is described in 3I, "Natural Resources," and summarized below.

The first step in the assessment of a new plant's effects on dissolved oxygen levels is collecting data on available water quality in the receiving water, or, when these data are not available, water quality sampling. Then, the loads of BOD, suspended solids, and other pollutants expected from the plant are calculated. In some cases, the total pollutant loading from the action is so small compared with the size of the water body

that there would clearly be no significant impact. In other cases, the new pollutants could be expected to affect water quality. For these cases, computer-simulated models can be used to determine the effects of the various pollutants in sewage effluent on the water quality.

For actions that would affect existing private treatment plants with valid SPDES permits, the analysis typically focuses on whether the plant would have adequate capacity to treat the additional wastewater generated by the action.

323. *Stormwater Management*

Stormwater can be of concern if it transmits new or increased levels of pollutants to the City's water bodies. This is an issue primarily for industrial facilities, but also for development sites served by storm sewers that would be covered with large areas of pavement. An assessment of these potential impacts can be conducted as follows.

1. Describe the way stormwater currently drains from the site. This description can include an estimate of the amount of stormwater that currently enters the City sewer system, based on the amount of area covered by impervious materials.
2. Describe any changes to that drainage that would result in the future if the action is not implemented.
3. Describe any changes that would result because of the action (paving, development, etc.). Also include a discussion of how stormwater would be managed on the site (i.e., retention, detention, etc.) Determine the volume (in gallons) and peak discharge rates (in cubic feet per second) of stormwater expected from the site with the action. A number of methods can be used to estimate these rates, including TR-20 and TR-55, computerized models developed by the U.S. Department of Agriculture, Soil Conservation Service; the "rational method;" the U.S. Environmental Protection Agency's Stormwater Management Model (SWMM); and others.
4. Estimate the types and loadings of pollutants that could be in the stormwater. Techniques for this assessment range from simple calculations to sophisticated models. One model is the U.S. Environmental Protection Agency's SWMM, which has four different levels of evaluation for urban water management analysis. The simplest, Level I, is useful for assessment of environmental impacts. If a serious problem is identified, other more sophisticated levels of analysis can be used to determine the extent of the problem.

In general, runoff from typical nonindustrial sites in New York City can have the following pollutant levels, based on the DEP's ongoing sampling of stormwater:

Pollutant	Concentration (mg/l)
BOD	26
Suspended Solids	126
Total Phosphorus	0.26
Total Nitrogen	0.76
Oil and Grease	41
Cadmium	0.0017
Chromium	0.007
Copper	0.23
Lead	0.038
Mercury	0.00018
Nickel	0.046
Zinc	0.21

Pollutant loadings from industrial sites will depend on the processes involved. Note that the SPDES permits for industrial sites (SPDES permits are required for certain industrial sites served by separate sewers; see Section 230, above) will require development and use of a stormwater pollution prevention plan. This plan must identify potential sources of pollution and describe and ensure the implementation of practices to reduce those pollutants. More information on the applicability and requirements of such SPDES permits is available from DEC.

5. Given the quantity and quality of the stormwater that would be discharged, the effects on the receiving water body are then assessed. This assessment considers overall flow, circulation, elevation, salinity, and water quality. More information about water quality is provided in Section 31, "Natural Resources."

400. Determining Impact Significance

418. *WATER SUPPLY*

Because of the large volume of the City's water supply system, any given action's water consumption would not be likely to be significant relative to the total Citywide demand. Significant impacts on water supply could occur, however, if an action demanded enough water to reduce water pressure in a localized area to below acceptable levels. Generally, this would occur if the action resulted in water pressure of less than 20 pounds per square inch. Significant impacts could also

occur for actions that would demand very large quantities of water, which could overburden the existing system and require a change in the system. This is unlikely, however, except for projects that draw extremely large volumes of water.

To determine whether an action may have significant impacts on water quality in the aquifers used by the Jamaica Water Supply Company, see Sections 3J, "Hazardous Materials," and 3I, "Natural Resources." Also, consultation with the Jamaica Water Supply Company can assist in determining whether adequate water is available to meet the needs of the proposed action.

420. WASTEWATER TREATMENT

421. City WPCPs

Because of the large volumes of wastewater treated at the City's water pollution control plants relative to the incremental flows contributed by an action, and because the City is committed to maintaining adequate wastewater treatment, any given action would not likely have a significant impact on any of those plants, unless the action would not be consistent with the provisions of a Consent Order or other applicable program.

422. Industrial Pretreatment

Actions that facilitate industrial development that sends effluent to the City's sewer system can result in significant adverse impacts on the operations of the WPCP or sewer system if that effluent does not meet the standards of the City's Industrial Pretreatment Program.

Additionally, significant adverse impacts would occur if the effluent discharged from the facility into a sewer would not be in compliance with the City's sewer regulations. This would occur if the effluent has a pH lower than 5 or greater than 9.5 (which would result in a significant adverse impact on the sewer system), or would exceed any of the following concentrations (resulting in significant impacts on the water pollution control plant; cyanide levels above those listed below could also result in a significant adverse impact on the sewer system):

Substance	Concentration (mg/l)
Petroleum hydrocarbons	50
Cadmium	2
Chromium (hexavalent)	5
Copper	5
Cyanide (amenable)	0.2
Lead	2
Mercury	0.05
Nickel	3
Zinc	5

423. Septic Systems

Significant adverse impacts from septic systems would occur if those systems could not function properly, because of their placement or design. This could occur if, because of the permeability of the soil, the needed leaching area could not be provided within the lot size. In addition, septic systems located close to a surface or groundwater body or wetland could have significant adverse impacts on those resources (see Section 3I, "Natural Resources").

424. Privately Operated Treatment Plants

Privately operated treatment plants that would result in lowered water quality in the receiving water body would have significant adverse impacts on that water body. An action that would increase flows at a privately operated treatment plant to above allowable flows indicated in the SPDES permit would have significant adverse impacts.

430. STORMWATER

Generally, significant adverse impacts from stormwater would occur if the stormwater would result in a lowering of water quality in the receiving body. For most water bodies, however, this is very unlikely to occur.

500. Developing Mitigation

510. WATER SUPPLY

For significant impacts on water supply that result in reduced water pressure, mitigation measures can include water conservation measures incorporated into the project, or, for very large users of water, alternative water supplies. Changes to the water distribution system, implemented by DEP, can also assist in maintaining adequate water pressure.

520. WASTEWATER TREATMENT

521. City WPCPs

In general, water conservation and wastewater reduction measures can help to reduce the flows to the City's water pollution control plants. Gray-water recycling for nonpotable uses can also be considered, if appropriate and if any public health concerns are met.

522. Septic Systems

Mitigation for septic systems that would not function properly consists of redesign or relocation to a new part of the site.

523. Privately Operated Treatment Plants

Providing a higher level of treatment is the mitigation measure for new treatment plants that would result in significant adverse impacts on water quality. The level of treatment necessary would depend on what water quality parameter would be affected, exceeding the levels allowed by the SPDES permit. For impacts that would result from exceeding allowable flow limits, water conservation and wastewater reduction measures to reduce flows to the plant could serve as mitigation. Similarly, for significant impacts on existing privately operated plants, water conservation and wastewater reduction measures that would bring the plants' flows to within their permitted capacities would mitigate significant adverse impacts.

530. STORMWATER MANAGEMENT

Stormwater management systems can be incorporated into the project to mitigate potential significant impacts from stormwater. These systems can include infiltration devices—such as vegetated buffer areas, pervious surfaces, and infiltration basins and trenches—that allow the stormwater to seep into the ground instead of entering the sewer system; retention systems, such as ponds or created wetlands, that collect runoff and allow for evaporation and infiltration; and detention systems, such as dry detention areas or ponds, that store the stormwater and gradually release it during off-peak periods. Additionally, certain industrial facilities that discharge stormwater to a separate sewer system are required by DEC to have a stormwater pollution prevention plan. This plan must identify potential sources of pollution and describe and ensure the implementation of practices to reduce those pollutants. Such a plan may also be appropriate for such industrial facilities even if they are served by the City's combined sewer system.

600. Developing Alternatives

Many of the mitigation measures described in Section 500 can also serve as alternatives. Actions that would involve septic systems or construction of privately operated treatment plants resulting in significant adverse impacts may consider hook-up to the City sewer system as an alternative.

700. Regulations and Coordination

710. REGULATIONS AND STANDARDS

- Section 301 of the Clean Water Act (33 USC 1311; 40 CFR 133) requires all municipal WPCPs to operate with secondary treatment and authorizes the U.S. Environmental Protection Agency (EPA) to set effluent standards for all municipal discharges.

- Interstate Sanitation Commission water quality standards. The ISC, established by New York, New Jersey, and Connecticut through a congressionally approved Tri-State Compact, has established water quality standards for tidal waters in the vicinity of New York.

- Section 402 of the Clean Water Act: National Pollutant Discharge Eliminations System (NPDES) Program (33 USC 1342). Under the NPDES program, any point source discharge and stormwater discharges associated with industrial activities and municipal separate storm sewer systems require a permit. The State of New York is authorized to administer the NPDES program under its own State program.

- State Pollutant Discharge Elimination System (SPDES) Program—Water Pollution Control Act (Environmental Conservation Law Article 17; 6 NYCRR Parts 750-757). The SPDES program is designed to eliminate the pollution of New York waters and to maintain the highest quality of water possible, consistent with public health and enjoyment of the resource, protection and propagation of fish and wildlife, and industrial development in the State. SPDES permits are required for construction or use of an outlet or discharge pipe ("point sources") of wastewater discharging into the surface waters or groundwaters of the State, or construction or operation of disposal systems such as sewage treatment plants.

  Each of the City's 14 water pollution control plants is regulated by a SPDES permit. Other activities that require SPDES permits include septic systems designed to process more than 1,000 gallons per day; new treatment plants; stormwater discharges from certain industrial facilities to separate sewer systems; and stormwater discharges from construction activities to separate sewer systems, if more than 5 acres of ground would be disturbed.

- No new stormwater hook-ups on waterfront sites. The SPDES permits for the City's 14 WPCPs specify that new developments within a certain distance of a waterway may not create new stormwater hook-ups to the combined system.

- Classification of Waters—Article 6 of the New York State Public Health Law; 6 NYCRR Part 800. Under this program, the State Water Pollution Control Board adopts and assigns classifications and standards on the basis of the existing or expected best usage of the State's waters. All of the State's surface and ground waters are assigned a water quality classification.
- Section 307 of the Clean Water Act: Federal Standards for Industrial Pretreatment (33 USC 1317). This section of the Clean Water Act establishes standards for certain pollutants discharged to a sewage system, requiring pretreatment for effluent that would otherwise not meet the standards.
- New York City Industrial Pretreatment Program. Like the Federal program (see above), this program establishes standards for concentrations of pollutants in industrial effluent.
- Combined Sewer Overflow Abatement Program. Under this program, implemented by DEP, New York City aims to reduce the amount of pollution reaching the City's waters. This program includes assessment of CSO problem areas, and such measures to reduce these problems as infiltration and inflow control, which will address and eliminate extraneous flows into the sewer system, such as groundwater infiltration into broken or leaky pipes; placement of containment booms at some stormwater outfall locations to capture floatables that are discharged into the receiving water during wet weather; and CSO retention (the use of storage areas for CSO, from which the overflow can be pumped back into the sewer system during dry weather).
- Rules and Regulations Relating to the Use of the Public Sewers, issued by DEP, Bureau of Water Pollution Control and Bureau of Sewers.
- Title 10 of the New York State Public Health Law, Part 75, Appendix 75 A. This is the State law that governs septic systems.
- New York State Design Standards for Wastewater Treatment, 1988.
- Interim New York City regulations for septic systems, issued by DEP.

720. APPLICABLE COORDINATION

Actions that would result in new water demand in the district of Queens served by the Jamaica Water Supply Company should consult with that company. Any actions involving new hook-ups for water supply or sewage treatment will need to coordinate with DEP, which is the agency responsible for the water and sewer mains and hook-ups. Industrial actions subject to the City's Industrial Pretreatment Program should coordinate with DEP, Division of Drainage Basin Management regarding that program. Projects involving septic systems will need to consult with DEP's Division of Sewer Regulation and Control. Actions involving privately operated treatment plants should coordinate with both DEP and DEC.

730. LOCATION OF INFORMATION

- New York City Department of Environmental Protection
  59-17 Junction Boulevard
  Elmhurst, Queens, NY 11373
  Office of Environmental Planning

- New York City Department of Environmental Protection
  96-06 Horace Harding Expressway
  Corona, Queens, NY 11368
  Division of Sewer Regulation and Control

- New York State Department of Environmental Conservation
  47-40 21st Street
  Long Island City, NY 11101

- New York State Department of Environmental Conservation
  50 Wolf Road
  Albany, NY 12233-1750
  Stormwater Hotline

- Jamaica Water Supply Company
  410 Lakeville Road
  Lake Success, NY 11040

800. Additional Information

As described in Section 222, certain industries would be subject to the City's Industrial Pretreatment Program. These include industries subject to Federal categorical pretreatment standards, which are listed in Table 3L-3, and industries with Standard Industrial Codes listed in Table 3L-4. In addition, those industries listed in Table 3L-5 must obtain a SPDES permit for any stormwater discharges to a separate sewer system. For all these actions, assessment under CEQR is usually appropriate, as described in Section 200.

Table 3L-3
Industry Categories for Federal Categorical Pretreatment Standards

This is a list of the industries subject to Federal Categorical Pretreatment Standards. SIC codes are included when available and are intended to be used as guidance only.

Category	Subcategory	SIC Code
Aluminum Forming		
	Rolling with Neat Oils	3353,3355
	Rolling with Emulsions	3353,3355
	Extrusion	3354
	Forging	3463
	Drawing with Neat Oils	3354,3355
	Drawing with Emulsions or Soaps	3354,3355
Battery Manufacturing		
	Cadmium	3691,3692
	Calcium	
	Lead	
	Leclanche	
	Lithium	
	Magnesium	
	Zinc	
Coil Coating		
	Steel Basis Material	3479
	Galvanized Basis Material	3479
	Aluminum Basis Material	3479,3497
	Canmaking	3411
Copper Forming		
Electrical and Electronic Components (Phase 1)		
	Semiconductors	3674
	Electronic Crystals	3679
Electrical and Electronic Components (Phase 2)		
	Cathode Ray Tube	3671
	Luminescent Materials	3672
Electroplating		
	Electroplating of Common Metals	
	Electroplating of Precious Metals	
	Electroplating of Specialty Metals	
	Anodizing	
	Coatings	
	Chemical Etching and Milling	
	Electroless Plating	
	Printed Circuit Boards	
Inorganic Chemicals Manufacturing (Phase 1 and Phase 2)		
Phase 1		281
	Aluminum Chloride	
	Aluminum Sulfate	
	Calcium Carbide	
	Calcium Chloride	
	Calcium Oxide	
	Chlor-alkali	
	—Mercury Cell	

Table 3L-3 (Continued)

Industry Categories for Federal Categorical Pretreatment Standards

Category	Subcategory	SIC Code
Inorganic Chemicals Manufacturing (Phase 1 and Phase 2) (Continued)		
Phase 1 (Continued)		281
	—Diaphragm Cell Hydrochloric Acid Hydrofluoric Acid Hydrogen Peroxide Nitric Acid Potassium Metal Potassium Dichromate Potassium Sulfate Sodium Bicarbonate Sodium Carbonate Sodium Chloride Sodium Dichromate and Sodium Sulfate Sodium Metal Sodium Silicate Sodium Sulfite Sulfuric Acid Titanium Dioxide —Sulfate —Chloride —Chlorine Ilmenite Aluminum Fluoride Ammonium Chloride Ammonium Hydroxide Barium Carbonate Borax Boric Acid Bromine Calcium Carbonate Calcium Hydroxide Carbon Dioxide Carbon Monoxide and Byproduct Hydrogen Chrome Pigments Chromic Acid Copper Sulfate Cuprous Oxide Ferric Chloride Ferrous Sulfate Fluorine Hydrogen Hydrogen Cyanide Iodine Lead Monoxide Lithium Carbonate Manganese Sulfate Nickel Sulfate Strong Nitric Acid Oxygen and Nitrogen Potassium Chloride	

Table 3L-3 (Continued)

Industry Categories for Federal Categorical Pretreatment Standards

Category	Subcategory	SIC Code
Inorganic Chemicals Manufacturing (Phase 1 and Phase 2) (Continued)		
Phase 1 (Continued)		281
	Potassium Iodide Potassium Permanganate Silver Nitrate Sodium Bisulfite Sodium Fluoride Sodium Hydrosulfide Sodium Hydrosulfite Sodium Silicofluoride Sodium Thiosulfate Stannic Oxide Sulfur Dioxide Zinc Oxide Zinc Sulfate Cadmium Pigments and Salts —Cadmium Pigments —Cadmium Salts Cobalt Salts Sodium Chlorate Zinc Chloride	
Phase 2		
	Cadmium Compounds Cobalt Salts Copper Salts Nickel Salts Sodium Chlorate Zinc Chloride	
Iron and Steel		
	Cokemaking Sintering Ironmaking Steelmaking Vacuum Degassing Continuous Casting Hot Forming Salt Bath Descaling Acid Pickling Cold Forming Alkaline Cleaning Hot Coating	3312 3312 3312 3312 3312 3312 3312,3215,3317 3312,3315,3317 3312,3315,3317 3316 3312,3315,3316,3317 3312,3315,3317
Leather Tanning and Finishing		3111
	Hair Pulp, Chrome Tan, Retan-Wet Finish Hair Save, Chrome Tan, Retan-Wet Finish Hair Save or Pulp, Nonchrome Tan, Retan-Wet Finish Retan-Wet Finish Sides No Beamhouse Through the Blue	

Table 3L-3 (Continued)

Industry Categories for Federal Categorical Pretreatment Standards

Category	Subcategory	SIC Code
Leather Tanning and Finishing (Continued)		3111
	Shearling Pigskin Retan-Wet Finish-Splits	
Metal Finishing		
Metal Molding & Casting (Foundries)		3321,3322,3324,3325, 3362,3363,3365,3369
	Aluminum Casting Copper Casting Ferrous Casting Zinc Casting	
Nonferrous Metals Forming and Metal Powders		3356,3357,3463,3497
	Lead/Tin/Bismuth Forming Magnesium Forming Nickel/Cobalt Forming Precious Metals Forming Refractory Metals Forming Titanium forming Uranium Forming Zinc Forming Zirconium/Hafnium Forming Metal Powers	
Nonferrous Metals Manufacturing (Phase 1)		
	Primary Aluminum Smelting Secondary Aluminum Smelting Primary Copper Smelting Primary Electrolytic Copper Refining Secondary Copper Primary Lead Primary Zinc Metallurgical Acid Plants Primary Tungsten Primary Columbium-Tantalum Secondary Silver Secondary Lead	
Nonferrous Metals Manufacturing (Phase 2)		
	Bauxite Refining Metallurgical Acid Plants Primary Antimony Primary Beryllium Primary and Secondary Germanium and Gallium Secondary Indium Secondary Mercury Primary Molybdenum and Rhenium Secondary Molybdenum and Vanadium Primary Nickel and Cobalt Secondary Nickel Primary Precious Metals and Mercury	

Table 3L-3 (Continued)
Industry Categories for Federal Categorical Pretreatment Standards

Category	Subcategory	SIC Code
Nonferrous Metals Manufacturing (Phase 2) (Continued)		
	Secondary Precious Metals Primary Rare Earth Metals Secondary Tantalum Secondary Tin Primary and Secondary Titanium Secondary Tungsten and Cobalt Secondary Uranium Primary Zirconium and Hafnium	
Organic Chemicals, Plastic, & Synthetic Fibers		2821,2823,2824,2865, 2869
	Rayon Fibers Other Fibers Thermoplastic Resins Thermosetting Resins Commodity Organic Chemicals Bulk Organic Chemicals Specialty Organic Chemicals Direct Discharge Point Sources that use End-of-Pipe Biological Treatment Direct Discharge Point Sources that do not use End-of-Pipe Biological Treatment	
Pesticide Chemicals		
	Organic Pesticide Chemicals Manufacturing Metallo-Organic Pesticide Manufacturing Pesticide Chemical Formulating & Packaging	2869 2869 2879
Petroleum Refining		
	Topping Cracking Petrochemical Lube Integrated Facilities	
Pharmaceuticals Manufacturing		2831,2833,2834,2844
	Fermentation Products Extraction Products Chemical Synthesis Products Mixing/Compounding and Formulation Biological products Medicinal chemicals and botanical products Pharmaceutical products All fermentation, biological, and natural extraction, chemical synthesis, and formulation products that are considered as pharmaceutically active ingredients by the FDA but are not classified under SIC 2831, 2833, 2834 Cosmetic preparations that function as a skin treatment	 2831 2833 2834 2844

Table 3L-3 (Continued)

Industry Categories for Federal Categorical Pretreatment Standards

Category	Subcategory	SIC Code
Pharmaceuticals Manufacturing (Continued)		2831,2833,2834,2844
	Products with multiple end uses that are attributable to pharmaceutical manufacturing as a final pharmaceutical product, component of a pharmaceutical formulation, or pharmaceutical intermediate	
Porcelain Enameling		
	Steel Basis Material	3431,3469,3479,3631, 3632,3633,3639
	Cast Iron Basis Material	3431,3631
	Aluminum Basis Material	3469,3479,3631
	Copper Basis Material	3469,3479,3631
Pulp, Paper, and Paperboard		
	Unbleached Kraft	2611,2621,2631
	Semi-chemical	2611,2621,2631
	Reserved	
	Unbleached Kraft—Neutral Sulfite Semi-Chemical (Cross Recovery)	2611,2621,2631
	Paperboard from Wastepaper	2631
	Dissolving Kraft	2611
	Market Bleached Kraft	2611
	Board, Course and Tissue (BCT) Bleached Kraft	2611,2621,2631
	Fine Bleached Kraft	2611,2621
	Papergrade sulfite (Blow Pit Wash)	2611,2621
	Dissolving Sulfite Pulp	2611
	Groundwood-Chemi-mechanical	2611,2621
	Groundwood-Thermo-mechanical	2611,2621
	Groundwood-Course Molded, and News (CMN) Papers	2611,2621
	Groundwood-Fine Papers	2611,2621
	Soda	2611,2621
	Deink	2621
	Nonintegrated-Fine Papers	2621
	Nonintegrated-Tissue Papers	2631
	Tissue from Wastepaper	2647
	Papergrade Sulfite (Drum Wash)	2611,2621
	Unbleached Kraft and Semi-chemical	2611,2621,2631
	Wastepaper Molded Products	2646
	Nonintegrated-Lightweight Papers	2621
	Nonintegrated-Filter and Non-woven Papers	2621
	Nonintegrated Paperboard	2631
	Builders' Paper and Roofing Felt	2493,2621
Steam Electric Power Generation		4911,4931

Table 3L-3 (Continued)

Industry Categories for Federal Categorical Pretreatment Standards

Category	Subcategory	SIC Code
Timber Products Processing	Barking	2421,2426,2432,2491, 2499
	Veneer	2432
	Plywood	2432
	Hardboard-Dry Process	2499
	Hardboard-West Process	2499
	Wood Preserving-Water Borne or Nonpressure	2491
	Wood Preserving-Steam	2491
	Wood Preserving-Boultonizing	2491
	Wet Storage	2491,2421,2426,2429, 2431,2499
	Log Washing	2491,2421,2426,2429, 2431,2432,2499
	Sawmills & Planning Mills	2421,2426,2429,2431
	Finishing	2421,2426,2429,2431, 2432,2499
	Particleboard Manufacturing	2492
	Insulation Board	2661
	Wood Furniture and Fixture Production without Water Wash Spray Booths or Laundry Facilities	2511,2512,2519,2521, 2531,2541,2591,2599
	Wood Furniture and Fixture Production with Water Wash Spray Booths or Laundry Facilities	2511,2512,2519,2521, 2531,2541,2591,2599

Table 3L-4
Standard Industrial Codes for Industries that May Need Assessment

2011	Meat Packing Plants
2013	Sausages & Other Prepared Meat Products
2015	Poultry Slaughtering & Processing
2016	Poultry Dressing Plants
2017	Poultry and Egg Processing
2022	Natural, Processed and Imitation Cheese
2023	Dry, Condensed & Evaporated Dairy Products
2024	Ice Cream and Frozen Desserts
2026	Fluid Milk
2032	Canned Specialties
2033	Canned Fruits & Vegetables
2034	Dehydrated Fruits, Vegetables, Soups
2035	Pickles, Sauces, and Salad Dressings
2037	Frozen Fruits, Fruit Juices & Vegetables
2038	Frozen Specialties, NEC
2041	Flour and Other Grain Mill Products
2044	Rice Milling
2045	Prepared Flour Mixes & Doughs
2047	Dog and Cat Food
2051	Bread, Cake, and Related Products
2052	Cookies and Crackers
2062	Cane Sugar Refining
2064	Candy & Other Confectionary Products
2065	Confectionery Products
2066	Chocolate and Cocoa Products
2067	Chewing Gum
2068	Salted & Roasted Nuts & Seeds
2075	Soybean Oil Mills
2076	Vegetable Oil Mills, NEC
2079	Edible Fats and Oils, NEC
2082	Malt Beverages
2084	Wines, Brandy, and Brandy Spirits
2085	Distilled & Blended Liquors
2086	Bottled and Canned Soft Drinks
2087	Flavoring Extracts & Syrups, NEC
2091	Canned & Cured Fish & Seafoods
2092	Prepared Fresh or Frozen Fish & Seafoods
2095	Roasted Coffee
2096	Potato, Corn Chips & Similar Snacks
2097	Manufactured Ice
2098	Macaroni, Spaghetti, Vermicelli & Noodles
2099	Food Preparations, NEC
2211	Broadwoven Fabric Mills, Cotton
2221	Broadwoven Fabric Mills, Manmade
2230	Weaving and Finishing Mills, Wool
2231	Broadwoven Fabric Mills, Wool
2257	Weft Knit Fabric Mills
2258	Lace & Warp Knit Fabric Mills

Table 3L-4 (Continued)

Standard Industrial Codes for Industries that May Need Assessment

2261	Finishing Plants, Cotton
2262	Finishing Plants, Manmade
2269	Finishers of Textiles, NEC
2282	Throwing and Winding Mills
2292	Lace Goods
2294	Processed Textile Waste
2295	Coated Fabrics, Not Rubberized
2299	Textile Goods, NEC
2311	Men's & Boys' Suits, Coats & Overcoats
2325	Men's & Boys' Trousers & Slacks
2399	Fabricated Textile Products, NEC
2452	Prefabricated Wood Buildings
2499	Wood Products, NEC
2511	Wood Household Furniture
2512	Wood Household Furniture, Upholstered
2514	Metal Household Furniture
2515	Mattresses and Bedsprings
2517	Wood TV and Radio Cabinets
2519	Household Furniture, NEC
2521	Wood Office Furniture
2522	Office Furniture, Except Wood
2531	Public Building and Related Furniture
2541	Wood Partitions and Fixtures
2542	Partitions & Fixtures, Except Wood
2591	Drapery Hardware, Window Blinds & Shades
2599	Furniture and Fixtures, NEC
2621	Paper Mills
2631	Paperboard Mills
2641	Paper Coating and Glazing
2642	Envelopes
2643	Bags, Except Textile Bags
2645	Die-Cut Paper and Board
2646	Pressed and Molded Pulp Goods
2647	Sanitary Paper Products
2648	Stationery Products
2649	Converted Paper Products, NEC
2651	Folding Paperboard Boxes
2652	Setup Paperboard Boxes
2653	Corrugated and Solid Fiber Boxes
2654	Sanitary Food Containers
2655	Fiber Cans, Drums and Similar Products
2656	Sanitary Food Containers, Except Folding
2657	Folding Paperboard Boxes, Including Sanitary
2671	Packaging Paper & Plastics Film
2672	Coated & Laminated Paper, NEC
2673	Plastics, Foil & Coated Paper Bags
2674	Uncoated Paper & Multiwall Bags

Table 3L-4 (Continued)

Standard Industrial Codes for Industries that May Need Assessment

2675	Die-Cut Paper & Paperboard & Cardboard
2676	Sanitary Paper Products
2677	Envelopes
2678	Stationery, Tablets & Related Products
2679	Converted Paper Products, NEC
2753	Engraving and Plate Printing
2754	Commercial Printing, Gravure
2793	Photoengraving
2796	Platemaking & Related Services
2812	Alkalies and Chlorine
2816	Inorganic Pigments
2819	Industrial Inorganic Chemicals, NEC
2821	Plastics Materials and Resins
2822	Synthetic Rubber
2823	Cellulosic Manmade Fibers
2824	Manmade Organic Fibers, Except Cellulosic
2831	Biological Products
2833	Medicinal & Botanical Products
2834	Pharmaceutical Preparations
2841	Soap and Other Detergents
2842	Polishes and Sanitation Goods
2843	Surface Active Agents
2844	Toilet Preparations
2851	Paints and Allied Products
2865	Cyclic Crudes and Intermediates
2869	Industrial Organic Chemicals, NEC
2873	Nitrogenous Fertilizers
2879	Pesticides and Agricultural Chemicals, NEC
2891	Adhesives and Sealants
2893	Printing Ink
2899	Chemicals and Chemical Preparations, NEC
3052	Rubber and Plastics Hose and Belting
3079	Miscellaneous Plastics Products
3081	Unsupported Plastics Film and Sheet
3082	Unsupported Plastics Profile Shapes
3083	Plastic Plates, Sheet and Profile Shapes
3085	Plastic Bottles
3086	Plastic Foam Products
3087	Custom Compounding of Plastic Resins
3089	Plastics Products, NEC
3111	Leather Tanning and Finishing
3131	Boot and Shoe Cut Stock and Findings
3171	Women's Handbags and Purses
3291	Abrasive Products
3312	Blast Furnaces and Steel Mills
3313	Electrometallurgical Products
3315	Steel Wiredrawing and Steel Nails and Spikes

Table 3L-4 (Continued)

Standard Industrial Codes for Industries that May Need Assessment

3317	Steel Pipe and Tubes
3321	Gray and Ductible Iron Foundries
3324	Steel Investment Foundries
3331	Primary Smelting and Refining of Copper
3332	Primary Lead
3334	Primary Production of Aluminum
3339	Primary Nonferrous Metals, NEC
3341	Secondary Nonferrous Metals
3351	Rolling, Drawing and Extruding of Copper
3354	Aluminum Extruded Products
3355	Aluminum Rolling and Drawing, NEC
3356	Nonferrous Rolling and Drawing, NEC
3357	Drawing and Insulating of Nonferrous Wire
3361	Aluminum Foundries
3362	Brass, Bronze, and Copper Foundries
3363	Aluminum Die-Castings
3364	Nonferrous Die-Castings, Except Aluminum
3365	Aluminum Foundries
3366	Copper Foundries
3369	Nonferrous Foundries, NEC
3398	Metal Heat Treating
3399	Primary Metal Products, NEC
3411	Metal Cans
3412	Metal Barrels, Drums, Kegs and Pails
3421	Cutlery
3423	Hand and Edge Tools, NEC
3425	Saw Blades and Handsaws
3429	Hardware, NEC
3431	Enameled Iron and Metal Sanitary Ware
3432	Plumbing Fixture Fittings and Trim
3433	Heating Equipment, Except Electric
3441	Fabricated Structural Metal
3442	Metal Doors, Sash, Frames, Molding and Trim
3443	Fabricated Plate Work (Boiler Shops)
3444	Sheet Metal Work
3446	Architectural and Ornamental Metal Work
3448	Prefabricated Metal Buildings
3449	Miscellaneous Structural Metal Work
3451	Screw Machine Products
3452	Bolts, Nuts, Screws, Rivets and Washers
3462	Iron and Steel Forgings
3465	Automotive Stampings
3466	Crowns and Closures
3469	Metal Stampings, NEC
3471	Plating and Polishing
3479	Coating, Engraving and Allied Services, NEC
3484	Small Arms

Table 3L-4 (Continued)

Standard Industrial Codes for Industries that May Need Assessment

3491	Industrial Valves
3492	Fluid Power Valves and Hose Fittings
3493	Steel Springs, Except Wire
3494	Valves and Pipe Fittings, NEC
3495	Ware Springs
3496	Miscellaneous Fabricated Wire Products
3497	Metal Foil and Leaf
3498	Fabricated Pipe and Pipe Fittings
3499	Fabricated Metal Products, NEC
3511	Turbines and Turbine Generator Sets
3519	Internal Combustion Engines, NEC
3523	Farm Machinery and Equipment
3531	Construction Machinery and Equipment
3533	Oil and Gas Field Machinery and Equipment
3534	Elevators and Moving Stairways
3535	Conveyors and Conveying Equipment
3536	Hoists, Cranes, and Monorails
3537	Industrial Trucks and Tractors
3541	Machine Tools, Metal Cutting Types
3542	Machine Tools, Metal Forming Types
3543	Industrial Patterns
3544	Special Dies, Tools, Jigs and Fixtures
3545	Machine Tool Accessories
3546	Power-Driven Handtools
3548	Welding Apparatus
3549	Metalworking Machinery, NEC
3551	Food Products Machinery
3552	Textile Machinery
3553	Woodworking Machinery
3554	Paper Industries Machinery
3555	Printing Trades Machinery and Equipment
3556	Food Products Machinery
3559	Special Industry Machinery, NEC
3561	Pumps and Pumping Equipment
3562	Ball and Roller Bearings
3563	Air and Gas Compressors
3564	Blowers and Fans
3565	Packaging Machinery
3566	Speed Changers, Drives and Gears
3567	Industrial Process Furnaces and Ovens
3568	Mechanical Power Transmission Equipment, NEC
3569	General Industrial Machinery, NEC
3571	Electronic Computers
3572	Computer Storage Devices
3573	Electronic Computing Equipment
3574	Calculating and Accounting Machines
3575	Computer Terminals

Table 3L-4 (Continued)

Standard Industrial Codes for Industries that May Need Assessment

3576	Scales and Balances, except Laboratory
3577	Computer Peripheral Equipment, NEC
3578	Calculating and Accounting Equipment
3579	Office Machines, NEC
3581	Automatic Vending Machines
3582	Commercial Laundry Equipment
3585	Refrigeration and Heating Equipment
3589	Service Industry Machinery, NEC
3592	Carburetors, Pistons, Rings, Valves
3593	Fluid Power Cylinders and Actuators
3594	Fluid Power Pumps and Motors
3596	Scales and Balances, except Laboratory
3599	Industrial Machinery, NEC
3612	Transformers, except Electronic
3613	Switchgear and Switchboard Apparatus
3621	Motors and Generators
3622	Industrial Controls
3623	Welding Apparatus, Electric
3624	Carbon and Graphite Products
3625	Relays and Industrial Controls
3629	Electrical Industrial Apparatus, NEC
3631	Household Cooking Equipment
3632	Household Refrigerators and Freezers
3634	Electric Housewares and Fans
3636	Sewing Machines
3639	Household Appliances, NEC
3641	Electric Lamp Bulbs and Tubes
3643	Current-Carrying Wiring Devices
3644	Noncurrent-Carrying Wiring Devices
3645	Residential Electric Lighting Fixtures
3646	Commercial Lighting Fixtures
3547	Vehicular Lighting Equipment
3648	Lighting Equipment, NEC
3651	Household Audio and Video Equipment
3652	Prerecorded Records and Tapes
3661	Telephone and Telegraph Apparatus
3662	Radio and TV Communication Equipment
3663	Radio and TV Communications Equipment
3669	Communications Equipment, NEC
3671	Electron Tubes
3673	Electron Tubes, Transmitting
3674	Semiconductors and Related Devices
3675	Electronic Capacitors
3677	Electronic Coils and Transformers
3678	Electronic Connectors
3679	Electronic Components, NEC
3693	X-Ray Apparatus and Tubes

Table 3L-4 (Continued)

Standard Industrial Codes for Industries that May Need Assessment

3694	Engine Electrical Equipment
3695	Magnetic and Optical Recording Media
3699	Electrical Equipment and Supplies, NEC
3711	Motor Vehicles and Car Bodies
3713	Truck and Bus Bodies
3714	Motor Vehicle Parts and Accessories
3715	Truck Trailers
3721	Aircraft
3724	Aircraft Engines and Engine Parts
3728	Aircraft Parts and Equipment, NEC
3731	Ship Building and Repairing
3732	Boat Building and Repairing
3743	Railroad Equipment
3751	Motorcycles, Bicycles, and Parts
3761	Guided Missiles and Space Vehicles
3764	Space Propulsion Units and Parts
3799	Transportation Equipment, NEC
3811	Engineering and Scientific Instruments
3812	Search and Navigation Equipment
3821	Laboratory Apparatus and Furniture
3822	Environmental Controls
3823	Process Control Instruments
3824	Fluid Meters and Counting Devices
3825	Instruments to Measure Electricity
3826	Analytical Instruments
3827	Optical Instruments and Lenses
3829	Measuring and Controlling Devices, NEC
3832	Optical Instruments and Lenses
3841	Surgical and Medical Instruments
3842	Surgical Appliances and Supplies
3843	Dental Equipment and Supplies
3845	Electromedical Equipment
3851	Ophthalmic Goods
3861	Photographic Equipment and Supplies
3873	Watches, Clocks, Watchcases and Parts
3911	Jewelry, Precious Metal
3914	Silverware and Plated Ware
3915	Jewelers' Materials and Lapidary Work
3931	Musical Instruments
3942	Dolls and Stuffed Toys
3944	Games, Toys, and Children's Vehicles
3949	Sporting and Athletic Goods, NEC
3951	Pens and Mechanical Pencils
3952	Lead Pencils and Art Goods
3953	Marking Devices
3955	Carbon Paper and Inked Ribbons
3961	Costume Jewelry

Table 3L-4 (Continued)

Standard Industrial Codes for Industries that May Need Assessment

3962	Artificial Flowers
3963	Buttons
3964	Needles, Pins, and Fasteners
3965	Fasteners, Buttons, Needles and Pins
3991	Brooms and Brushes
3993	Signs and Advertising Specialties
3995	Burial Caskets
3996	Hard Surface Floor Coverings, NEC
3999	Manufacturing Industries, NEC
4511	Air Transportation, Scheduled
4512	Air Transportation, Scheduled
4513	Air Courier Services
5085	Industrial Supplies
5141	Groceries, General Line
5142	Packaged Frozen Foods
5144	Poultry and Poultry Products
5146	Fish and Seafoods
5147	Meats and Meat Products
5148	Fresh Fruits and Vegetables
5149	Groceries and Related Products, NEC
5161	Chemicals and Allied Products
5162	Plastic Materials and Basic Shapes
5169	Chemicals and Allied Products, NEC
5198	Paints, Varnishes, and Supplies
5211	Lumber and Other Building Materials
5231	Paint, Glass and Wallpaper Stores
5461	Retail Bakeries
5462	Retail Bakeries, Baking and Selling
7211	Power Laundries, Family and Commercial
7213	Linen Supply
7214	Diaper Service
7384	Photofinishing Laboratories
7395	Photofinishing Laboratory

Table 3L-5
Categories of Industries that Require a DEC SPDES Permit for Stormwater Discharges to Separate Sewers

1	Facilities subject to stormwater effluent limitations guidelines, new source performance standards, or toxic pollutant effluent standards under 40 CFR Subchapter N (except facilities with toxic pollutant effluent standards which are exempted under category 11 below.
2	Facilities classified as Standard Industrial Classification 24 (except 2434), 26 (except 265 and 267), 28, (except 283), 29, 311, 32 (except 323), 33, 3441, 373.
3	Facilities classified as Standard Industrial Classifications 10 through 14 (minor industry) including active or inactive mining operations (except for areas of coal mining operations meeting the definition of a reclamation area under 40 CFR 434.11(l)) and oil and gas exploration, production, processing, or treatment operations, or transmission facilities that discharge stormwater contaminated by contact with or that has come into contact with, any overburden, raw material, intermediate products, finished products, byproducts or waste products located on the site of such operations; inactive mining operations are mining sites that are not being actively mined, but which have an identifiable owner/operator.
4	Hazardous waste treatment, storage, or disposal facilities, including those that are operating under interim status or a permit under subtitle C of RCRA.
5	Landfills, land application sites, and open dumps that have received any industrial wastes (waste that is received from any of the facilities described in this table) including those that are subject to regulation under Subtitle D of RCRA.
6	Facilities involved in the recycling of materials, including metal scrapyards, battery reclaimers, salvage yards, and automobile junkyards, including but limited to those classified as Standard Industrial Classification 5015 and 5093.
7	Steam electric power generating facilities, including coal handling sites.
8	Transportation facilities classified as Standard Industrial Classifications 40, 41, 42 (except 4221-4225), 43, 44, 45 and 5171 which have vehicle maintenance shops, equipment cleaning operations, or airport deicing operations. Only those portions of the facility that are either involved in vehicle maintenance (including vehicle rehabilitation, mechanical repairs, painting, fueling, and lubrication), equipment cleaning operations, airport deicing operations, or which are otherwise identified in items 1-7 or 9-11.
9	Treatment works treating domestic sewage or any other sewage sludge or wastewater treatment device or system, used in the storage treatment, recycling, and reclamation of municipal or domestic sewage, including land dedicated to the disposal of sewage sludge that are located within the confines of the facility, with a design flow of 1.0 mgd or more, or required to have an approved pretreatment program under 40 CFR part 403. Not included are farms lands, domestic gardens or lands used for sludge management where sludge is beneficially reused and which are not physically located in the confines of the facility, or areas that are in compliance with 40 CFR part 503.
10	Construction activity including clearing, grading and excavation activities except: operations that result in the disturbance of less than 5 acres of total land area which are not part of a larger common plan of development or sale.
11	Facilities under Standard Industrial classification 20, 21, 22, 23, 2434, 25, 265, 267, 27, 283, 285, 30, 31 (except 311), 323, 34 (except 3441), 35, 36, 37 (except 373), 38, 39, 4221-25 (and which are not otherwise included within categories 1-10).

M. Solid Waste and Sanitation Services

100. Definitions

110. COLLECTION, TRANSFER, AND TRANSPORT SYSTEMS

111. Collection

111.1. Municipal Solid Wastes

In New York City, municipal solid wastes are collected by the Department of Sanitation. These include wastes generated by residences, some nonprofit institutions, and City agencies, but do not include construction debris, asbestos, or hazardous industrial wastes from these sources. Commercial establishments (restaurants, retail, offices, industries, etc.) in the City are required to contract with private carters typically for waste collection and disposal. Private carters charge on a per-cubic-yard basis. Depending on the source and the collection route, they use either manual or containerized collection. Businesses are required to source-separate certain types of recyclable materials, and private carters may also separate other types from the waste after collection.

111.2. Medical Wastes

Medical facilities separate their wastes into two categories: potentially hazardous or infectious materials and ordinary waste. The former are regulated by the New York State Departments of Health and Environmental Conservation (see Section 410, below). Regulated medical waste in the City must be placed in special sealed containers and disposed of in facilities permitted to process such waste, either by incineration, another form of sterilization, disinfection, or another approved method. Medical facilities are required by law to recycle some of their ordinary waste (that is, non-regulated medical waste).

111.3. Other Wastes

The Department of Sanitation also collects wastes from street trash cans and street-sweeping operations. Other types of solid waste, including construction and demolition debris, hazardous materials, and dredge spoils, are addressed in other sections of this Manual (3S, "Construction Impacts," 3J, "Hazardous Materials," and 3I, "Natural Resources," respectively).

112. Transfer Stations

After collection, most nonrecyclable waste is currently taken to transfer stations to be loaded onto the vehicle that will transport it to a landfill. (In the future, a greater percentage of waste will be either recycled or incinerated.) The Department of Sanitation uses marine transfer stations, located on covered piers in every borough but Staten Island. Private carters primarily use truck transfer stations, where trucks are unloaded and the wastes are processed for reloading into larger vehicles.

113. Landfills

From the transfer stations, most of the City's nonrecyclable waste is transported to the Fresh Kills landfill on Staten Island, where it is buried under controlled conditions. Private carters can also transport waste to Fresh Kills, where they pay a fee for disposal (a "tipping" fee), or to landfills outside the City, where the tipping fee may be lower.

114. Incinerators and Waste-to-Energy Facilities

Some of the City's waste is taken to incinerators to reduce its volume before landfilling. One of the City's incinerators is proposed to be upgraded, and a waste-to-energy plant is planned. Waste-to-energy facilities recover usable energy (in the form of steam) from the incineration process.

115. Materials Recovery Facilities

At these processing centers, recyclable materials collected by the Department of Sanitation are separated into types and grades of materials (glass, plastic, paper, etc.) and prepared for shipping.

120. COMPREHENSIVE SOLID WASTE MANAGEMENT PLAN

Solid wastes in the City of New York must be managed in conformance with the City's Comprehensive Solid Waste Management Plan of 1992, which was adopted pursuant to the State's Solid Waste Management Act of 1988 and Local Law 19 of 1989. The City's plan establishes a hierarchy for waste management, with waste prevention the most preferred method, followed by re-use, energy recovery, and land burial, thereby limiting the amount of solid waste to be landfilled at the Fresh Kills Landfill. The plan also aims to further the ability of the Department of Sanitation to comply with New York City's mandatory recycling law, Local Law 19 of 1989, which requires that designated recyclable materials be source-separated.

200. Determining Whether a Solid Waste and Sanitation Services Assessment is Appropriate

In addition to establishing a hierarchy for waste management, the City's Comprehensive Solid Waste Management Plan develops goals for the management of the components of the City's waste and identifies procedures and facilities that may be required to meet those goals. The Plan includes timetables for the phased implementations of its recommendations.

Regulatory changes affecting the generation or management of the City's waste may require evaluation for consistency with the Comprehensive Solid Waste Management Plan. Similarly, it may also be appropriate to analyze actions involving the construction, operation, or closing of any type of solid waste management facility for consistency with the Plan.

It should be noted that if the action involves a new waste management facility, such as incinerator or autoclave, impact analyses of other technical areas (air, traffic, noise, etc.) may also be appropriate. The other sections of this Manual (Sections 3A through 3U) provide assistance in determining which analyses may be appropriate.

Actions involving construction of housing or other development generally do not require evaluation for solid waste impacts unless they are unusually large. The City's Comprehensive Solid Waste Management Plan is based on stated assumptions, including projected rates of growth in the generation of solid waste. Projections for residential waste, for example, are based on assumed increases in population and assumed increases in waste generated per household. The projections are Citywide averages. The measures proposed to be implemented by the City pursuant to the plan are therefore designed to meet the goals of the plan notwithstanding further development within certain defined future conditions. It is possible that an unusually large project or a project involving a use with unusual waste generation characteristics would increase a component of the City's waste stream beyond the projections for that component in the plan. However, a generation rate of less than 10,000 pounds per week, for example, is not considered large. Wastes with special characteristics, such as medical wastes, are subject to handling and disposal regulations. Compliance with applicable requirements would generally eliminate possible significant adverse impacts.

However, it is recommended that the CEQR documentation disclose solid waste and service demand (if relevant) generated by an action. This will allow the lead agency to confirm that the proposed action conforms to the Comprehensive Solid Waste Management Plan.

300. Assessment Methods

310. ANALYSIS TECHNIQUES

An assessment of solid waste for actions that would generate solid waste consists of describing the waste management features of the project and quantifying the incremental quantities of waste that an action would generate. The assessment of medical facilities is somewhat different, as described below.

311. Actions that Would Generate Solid Waste

As noted above, to disclose the solid waste characteristics of a proposed action, its design and operating characteristics for solid waste management are considered. Features that minimize waste, beyond those required by law, are identified. Examples of such features include the following:

- Installation of such equipment as air-dryers in public lavatories.
- Provisions for on-site composting.
- Provisions for material storage to allow use of bulk-packaged supplies (this would minimize the use of packaging).

Project features that would enhance recycling (i.e., to facilitate the separation, storage, collection, processing, or marketing of recyclables) beyond that required by law are also identified. Project features to facilitate waste collection, such as provisions for containerized collection, are also identified. At the same time, any aspects of the action that would result in generation of high levels of solid waste, that might make recycling difficult, or that might impede waste collection would also be identified.

The amount of waste that the project would generate is then determined. For most actions, the Citywide average rates for waste generation provided as part of the City's Comprehensive Solid Waste Management Plan can be used to make this determination. These rates are provided in Table 3M-1. Actions with additional waste management features, however (see above), could generate less solid waste than indicated in the table.

If the proposed action would lead to substantial new development (for example, Queens West in Hunters Point), it may be appropriate to assess whether

Table 3M-1
Solid Waste Generation Rates

Use	Rate (pounds per week)
Residential	
Individual	17
Household	41
Institutional	
Public Elementary School	3 per pupil
Public Intermediate School	4 per pupil
Public High School	2 per pupil
Private School (K-8)	1 per pupil
Private School (6-12)	4 per pupil
College	1 per pupil
Hospital	51 per bed
Government Office	0.03 per square foot
Correctional Facility	13 per inmate
Commercial	
Office Buildings	13 per employee
Single Offices	9 per employee
Wholesale	66 per employee
General Retail	79 per employee
Restaurants	251 per employee
Fast Food	200 per employee
Food Stores	284 per employee
Hotels	75 per employee
Industrial	
Apparel and Textile Manufacturing	125 per employee
Printing/Publishing	240 per employee

Source: New York City Department of Sanitation

additional trucks or other sanitation services may be required. Although the additional trucks or services would not necessarily in themselves constitute solid waste or service impacts, the information may be appropriate for use in another technical analysis, such as noise. The average collection truck for residential refuse carries up to 11 tons (16 tons for containerized collections), and recycling trucks carry about 10 tons. If the proposed action would generate more than half a truck's capacity of solid waste per day, then it is assumed that an extra truck would be required. Information on street sweepers and other equipment, as relevant, can be obtained from the Department of Sanitation.

312. Regulated Medical Waste

The assessment considers how regulated medical wastes would be handled and disposed, to ensure that these procedures would comply with the appropriate regulations. With a large waste generator, it may be appropriate to estimate additional truck trips, as discussed above. The number of truck trips associated with the new facility can be obtained from the carrier.

320. CONSISTENCY WITH THE CITY'S COMPREHENSIVE SOLID WASTE MANAGEMENT PLAN

For consistency with the City's Comprehensive Solid Waste Management Plan, the lead agency should consider whether the proposed action would meet the following goals:

- Adhering to the hierarchy of preferred solid waste management, which places waste reduction first, followed by reuse or recycling, energy recovery/incineration, and land burial.
- Limiting the amount of solid waste to be landfilled at Fresh Kills Landfill.
- Furthering the ability of New York City Department of Sanitation to comply with the New York City Recycling Law.

400. Regulations and Coordination

410. REGULATIONS AND STANDARDS

- Federal Medical Waste Tracking Act of 1988 (Public Law 100-582; 40 CFR 259). Establishes packaging, labeling, shipping, and tracking requirements for regulated medical waste.
- State Health Care Facilities Regulations (Article 28 of the Public Health Law; 10 NYCRR Part 70). The New York State Department of Health regulates health care facilities.
- State Solid Waste Management Facilities Regulations (6 NYCRR Part 360). These regulations govern the construction and operation of all waste-management facilities.
- Regulated Medical Waste Storage, Containment, and Disposal Regulations (6 NYCRR Part 360-10). DEC regulates all generators of medical wastes (except home generators) and all transporters. Disposal, treatment, and processing facilities (except nonincineration facilities on a hospital site) are regulated under Part 360, and incinerators under Part 219.
- New York State Solid Waste Management Act of 1988 (Chapter 70, Laws of 1988; Article 27 of the State's Environmental Conservation Law). This State law mandated preparation of the City's Comprehensive Solid Waste Management Plan.
- New York City Comprehensive Solid Waste Management Plan.
- New York City Mandatory Recycling Law (Local Law 19 of 1989). All waste generators, collectors, and transfer stations in the City of New York are subject to the provisions of Local Law 19. This law and rules promulgated pursuant to it

require that generators source-separate specified types of materials in a specified way.

- Department of Sanitation Transfer Station Rules (Local Law 40 of 1990).
- New York City Zoning Resolution. The Zoning Resolution also regulates the siting and operation of waste-management facilities in New York City.
- Local Law 75 of 1989. All generators of regulated medical waste must file with the Department of Sanitation a solid waste removal plan; generators of more than 50 pounds per month must file annual updates.

420. APPLICABLE COORDINATION

Coordination with the New York City Department of Sanitation for solid waste issues may be helpful.

430. LOCATION OF INFORMATION

The City's Comprehensive Solid Waste Management Plan/Final Generic Environmental Impact Statement is the best single source for data on existing conditions, existing and proposed solid waste management systems, and waste generation and composition for any particular area or type of generator. This plan is available for review at the offices of OEC, at the main branches of public libraries in each of the boroughs, and at the offices of the borough presidents. Other information on current Department of Sanitation operations can be obtained by contacting the department's Office of Operations, Planning, Evaluation, and Control.

- New York City Department of Sanitation
  125 Worth Street
  New York, NY 10013

N. Energy

CEQR requires the assessment of energy consumption during environmental review. This mandate comes from the SEQRA regulations, which require that EISs include an identification of any irreversible and irretrievable commitments of resources associated with the implementation of the action and "a discussion of the effects of the proposed action on the use and conservation of energy, if applicable and significant." (The State's Environmental Assessment Form also includes a brief assessment of energy.) CEQR, under Executive Order 91, has the same requirements.

100. Definitions

Energy analysis focuses on an action's consumption of energy, and where relevant, any effects on the transmission of energy that could result from the action. It also considers the consumption of energy during construction, including "embodied" energy—the total energy consumed in the production and transportation of building materials used during construction. Most often, the assessment is of the energy sources typically used for heating, electricity, and transportation—fossil fuels (oil, coal, gas, etc.), hydroelectric power, and occasionally, miscellaneous fuels like wood, solid waste, or other combustible materials.

200. Determining Whether an Energy Assessment is Appropriate

All new structures requiring heating and cooling are subject to the New York State Energy Conservation Code, which reflects State and City energy policy. Therefore, those actions that would result in new construction or substantial renovation of buildings would not create adverse energy impacts, and would not require a detailed energy assessment. A detailed assessment of energy impacts would be limited to actions that might somehow affect the transmission or generation of energy or that generate substantial indirect consumption of energy (such as a new roadway that could lead to a substantial increase in the number of vehicle miles traveled, and thus, fuel consumed in the City). Such occurrences are not typical in New York City, and their analysis is not addressed in this Technical Manual.

Although significant adverse energy impacts are not anticipated for the great majority of actions under CEQR, it is recommended that the amount of energy to be consumed during construction and long-term operation be disclosed in the environmental assessment. The methods are presented below.

300. Assessment Methods

Disclosing energy consumed by a proposed action begins with an analysis of operational energy, or the amount of energy that would be consumed annually after the activity facilitated by the action is operating. Usually, this encompasses heating, cooling, fans, water heating, lighting, power, and auxiliaries. Actions involving construction also assess "embodied" energy, or the amount of energy required for construction activities (including the energy in the production of construction materials).

The measure of energy used in the analysis is usually BTUs per year. One BTU, or British Thermal Unit, is the quantity of heat required to raise the temperature of one pound of water one Fahrenheit degree. This unit of measure can be used to compare consumption of energy from different sources (e.g., gasoline, hydroelectric power, etc.), taking into consideration how efficiently those sources are converted to energy. Its use avoids the confusion inherent in comparing different measures of output (e.g., horsepower, kilowatt hours, etc.) and consumption (e.g., tons per day, cubic feet per minute, etc.). Several standard reference documents provide tables that list the factors for converting various energy measures to BTUs.

310. OPERATIONAL ENERGY CONSUMPTION

Operational energy is calculated in BTUs for each project element. The energy requirements of the different uses that would result from an action are sometimes available from the project architect or engineer. When they are not, standard reference tables can be used to estimate energy usage. Table 3N-1 provides rates that can be used for different land uses, depending on the year of construction of the building in which they will be housed. These rates were developed by the American Society of Heating, Refrigeration, and Air Conditioning Engineers (ASHRAE). Such figures are not available for manufacturing uses, because energy demands vary widely for those uses, depending on building requirements and the manufacturing activity proposed. Such information is obtained from the manufacturer.

The next step is to determine the net increase in energy consumption that would result from the action. Often this is the same as the amount of energy that would be consumed by the action. If the action would result in removal of sources of energy consumption, however, these are subtracted from the projected annual energy use to determine the net increase. The standard references give energy consumption rates for uses in

buildings constructed before 1979, when the State's energy code was promulgated.

Table 3N-1
Annual Direct, Operational Energy Consumption
(in thousands of BTUs per square foot)

Land Use	Constructed through 1975	Constructed after 1975
Single-family residence	177.0	150.9
Multifamily building	253.8	124.4
Retail	278.1	162.3
Office building	250.2	96.4
School	140.2	76.4

Source: *Energy Conservation in New Building Design*, Conservation Paper Number 43B, Energy Research and Development Administration, 1976.

Note: Components in these summary calculations include heating, cooling, auxiliaries, fans, water heating, lighting, and power.

Once the net energy consumption has been determined, it may be appropriate to consult with the appropriate energy supplier and request confirmation that there would be no problem in providing the additional load and making service connections.

320. EMBODIED ENERGY CONSUMPTION

Actions that would result in construction also assess the amount of embodied energy that would be used during that construction. Rates that can be used to determine the amount of embodied energy used in the construction of different types of buildings are provided in Table 3N-2.

400. Regulations and Coordination

410. REGULATIONS AND STANDARDS

State energy policy is presented in Section 3-101 of the State's Energy Law. The New York State Energy Conservation Construction Code, which first became effective in 1979 (and has since been amended), sets minimum standards for the design and construction of all new buildings and substantial renovation of existing buildings throughout New York State. There is also a State Energy Plan, available from the New York State Energy Office or the New York City Department of Telecommunications and Energy.

420. COORDINATION

Consultation with energy suppliers is typically appropriate to determine if a proposed action would require extension or upgrading of energy transmission facilities. Consolidated Edison Company, through its Enlightened Energy Program, and the New York State Energy Office both provide information about loans and rebates to assist businesses with initial costs associated with installing energy-efficient equipment.

Table 3N-2
Energy Embodiment
(per Square Foot of Building Type)

Land Use	BTUs per Square Foot
Residential—1-family	702,047
Residential—2- to 4-family	625,050
Residential—Garden Apt.	648,455
Residential—High-Rise	735,978
Hotel/Motel	1,128,655
Industrial	972,551
Office	1,641,748
Warehouses	558,432
Garages/Service Stations	771,489
Retail/Restaurant	941,353
Religious Buildings	1,257,766
Educational	1,386,046
Hospitals	1,722,200
Social/Recreational	1,379,793
Misc. Nonresidential	1,101,991
Laboratories	2,074,056
Libraries, Museums	1,743,588

Source: *Energy Use for Building Construction*, Energy Research and Development Administration, 1976.

Energy policy in the City is established by the New York City Department of Telecommunications and Energy. Guidance on energy conservation measures and techniques are available through this office.

430. LOCATION OF INFORMATION

- New York City Department of Telecommunications and Energy
  75 Park Place
  New York, NY 10007

- Bureau of Codes and Standards
  New York State Energy Office
  Agency Building 2
  Two Rockefeller Plaza
  Albany, NY 12223

- Con Edison
  4 Irving Place
  New York, NY 10003

O. Traffic and Parking

100. Definitions

The objective of the traffic and parking analyses is to determine whether a proposed action can be expected to have a significant impact on street and roadway conditions and on parking facilities. In particular, it addresses the following major technical areas:

- *Traffic flow and operating conditions*, including the volume of traffic expected to occur in the future with the action and the impact of this volume on traffic levels of service. The purpose of this assessment is to evaluate the sufficiency of street and highway elements to adequately process the proposed action's expected traffic flow and operating condition changes.

- *Parking conditions*, including the occupancy levels of parking lots and garages (public and accessory) as well as curbside parking spaces. The purpose is to determine what effect the proposed action would have on parking resources in the area.

- *Goods delivery*, including the capacity of proposed loading areas to accommodate the expected volume of deliveries and their ability to do so without interfering with vehicular and pedestrian traffic.

- *Vehicular and pedestrian safety* at existing problem locations and potential future problem locations.

To analyze each of these technical areas, specific technical methodologies, databases, and procedures have been developed and are referenced in this section of the Manual. It is also important to note the relationship of these analyses with air quality and noise studies that may need to be conducted. Both the air quality and noise analyses may call for extensive traffic information that needs to be collected and formatted in a manner that can be easily used for air quality and noise analysis purposes. The interrelated needs of these three technical subjects should be kept in mind during the course of the data collection and analysis stages. It may also be necessary to assess traffic impacts on residential streets as part of the neighborhood character studies.

200. Determining Whether Traffic and Parking Analyses are Appropriate

It is possible that detailed traffic and parking analyses may not be needed for actions that would facilitate low- or low- to moderate-density development in particular sections of the City. Before undertaking any traffic or parking analyses, reference should be made to Table 30-1 to determine whether *any* numerical analyses are needed.

If the proposed action would result in development greater than the levels shown in Table 30-1 or if development does not fall in any of the categories in Table 30-1, a preliminary trip generation analysis—and, possibly, traffic impact analysis—will likely be needed. (If the proposed action involves a mix of land uses, it is appropriate to use a weighted average in determining whether further analysis is needed.) For programmatic actions that would affect more than one area, the thresholds in Table 30-1 may be considered on an area-by-area basis.

These development thresholds were determined by applying typical trip generation and modal split assumptions for the land uses cited in the table for each of the zones, up to a development density whose vehicle and transit trip generation would not likely cause significant impacts, based on a review of many traffic impact studies and EISs conducted previously under the CEQR process. The development densities cited in Table 30-1 above generally result in fewer than 50 peak hour vehicle trips (with "trips" referring to trip ends), for which significant traffic impacts are generally unlikely.

If development expected under the proposed action is greater than the thresholds indicated in Table 30-1, a preliminary trip generation analysis will generally be appropriate to determine the volume of vehicular trips expected during the peak hour. The methodologies available for use in determining vehicular trip generation are presented later in this chapter (Section 341). As described in that section, this involves either: a) utilizing available trip generation rates for the type of land use proposed and available modal split characteristics for the site of the proposed action (Section 341.1 and 341.2); or b) obtaining these data via new surveys at a comparable facility in the same (or comparable) part of the City (Section 341.3).

In most areas of the City, akin to zones 1 through 4 in Table 30-1, if the proposed action is projected to result in fewer than 30 peak hour vehicular trip ends (with a taxi trip to or from the site counting as two trip ends), it is unlikely that further traffic analysis is necessary. For other areas, if the proposed action would generate fewer than 50 such trip ends, a need for further traffic analysis would be unlikely. (For programmatic actions, depending on the type of action and the areas that would be affected, more trips may be tolerated before doing a detailed analysis if there are multiple locations affected by the action.) However, it should be

Table 30-1
Minimum Development Densities Potentially Requiring Traffic Analysis

Development Type	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5
Residential (number of new dwelling units)	150	125	100	75	50
Office/Industrial (additional 1,000 gsf)	75	50	35	25	20
Retail/Restaurant (additional 1,000 gsf)	10	8	5	5	5
Community Facility (additional 1,000 gsf)	25	25	25	15	15
Public Parking Facility (number of new spaces)	45	45	45	50	50

With the following zone definitions:

Zone 1: Manhattan, 60th Street and south

Zone 2: Manhattan north of 60th Street, including Roosevelt Island; Downtown Brooklyn

Zone 3: Long Island City; Downtown Flushing

Zone 4: St. George (Staten Island); all other areas located within one mile of subway stations (except in Staten Island)

Zone 5: All other areas

emphasized that proposed actions affecting central business districts or congested intersections have at times been found to create significant traffic impacts and traffic-related air quality impacts even when their trip generation is substantially fewer than 30 vehicles in the peak hour. This is especially true for proposed actions that generate a significant volume of trucks and/or buses, since trucks and buses are considered to be "equivalent" to more than one car. If the combination of projected trip generation and site of the proposed action indicates the potential for significant traffic or air quality impact, further traffic analysis—including a quantification of traffic volumes, intersection capacities, and levels of service—may be appropriate, with assessment methods detailed in the following section. Consultation with the New York City Department of Transportation (NYCDOT) and New York City Department of Environmental Protection (DEP) may be advisable to determine whether such analyses are needed.

300. Assessment Methods

This part of the traffic and parking section provides background information on each of the key components of the analyses to be conducted, the reasons why the analyses are required and guidance regarding the extent of the analyses required, approaches to conducting the analyses, and specific methodologies available for use. A discussion of factors to be considered in determining significant impacts, the approach to identifying and evaluating appropriate mitigation measures, and approaches to developing and evaluating alternatives that reduce or avoid impacts follows. For some aspects of the analyses to be conducted, it is possible to be fairly specific about the methodologies to be used; for example, this is usually true regarding the selection of an appropriate capacity analysis methodology. For other aspects of the analyses, it is difficult to be very specific or provide definitive guidelines, so the Manual provides the framework for selecting appropriate analysis methodologies and more general guidelines; this is particularly true for defining the appropriate study area for analysis.

For proposed actions requiring the preparation of a traffic analysis, the study areas to be analyzed, assessment methodologies, and technical assumptions are outlined and documented as much as possible. Typically, such documentation outlines at least the following:

The various study areas to be analyzed for potential traffic and parking impacts.

- The availability and appropriateness of existing data, and the expected need (if any) to collect new data via field surveys and counts. (See Section 730 for the availability of existing data.)

- The technical analysis methodologies to be used, and key technical assumptions such as trip generation rates, modal splits, average vehicle occupancies—including a preliminary projection of the volume of trips to be made by travel mode during the proposed action's peak travel hours—and a first-cut trip assignment that will help identify (preliminarily) potential significant impact locations.

The data assembly effort and the subsequent analyses should reflect the need for close coordination of traffic, air quality, and noise analyses.

310. STUDY AREA DEFINITION

The first step in preparing for and conducting the traffic and parking impact analyses is the definition of

the specific physical locations to be studied including, but not limited to, streets, intersections, highway facilities, and parking facilities. The identification of which locations and facilities are to be studied and the extent of the coverage—e.g., one block, one-half mile, one mile, etc., from the site—is a function of the type of the proposed action, its geographical setting, and its size and scale. It could very well range from one block to an entire neighborhood or subarea of the City. The Manual presents guidelines for defining the appropriate study area because a precise definition is not possible—study area definition will call for considerable judgment. For some technical areas, there may be a need to define a primary study area and a secondary study area, with the primary area being the focus of intense analysis and the secondary area being the focus of a more targeted and less intense analysis. Guidelines follow.

311. Traffic Study Areas

Definition of an appropriate traffic study area is probably the single most critical decision to be made, and the one in which hard guidelines are most difficult to formulate. In this work element, it is important to cover *key* potential impact locations with the understanding that the study area should be appropriately sized and that bigger is not necessarily better.

The Institute of Transportation Engineers (ITE), in its 1988 publication entitled, *A Proposed Recommended Practice: Traffic Access and Impact Studies for Site Development*, indicates that all roads, ramps, and intersections through which peak hour site-generated traffic composes at least 5 percent of the existing capacity on an intersection approach, or roadway sections on which accident potential or residential traffic character is expected to be significantly impacted, should constitute the scope of the traffic impact study area. Traffic impact analyses in New York City have typically not been tied to this definition, but have considered several primary factors in defining the traffic study area, including the following:

- Approximately how many new vehicle trips would be generated by the proposed action in its peak hours? Since the magnitude of the projected trip generation is one guide to be considered in defining the extensiveness of the study area, a first-cut trip generation estimate is a useful tool at this stage of the analyses.

- What are the most logical traffic routes for access to the site (i.e., its "traffic assignment")? These are traced on a map and used to identify potential analysis locations along them. While these routes may change later during the trip assignment phase when more precise information may be available, a first-cut definition of potential impact locations can be made.

- What are the problem locations or potential problem locations along these routes or next to these routes that could be affected by traffic generated by the proposed action? It is useful to review information available from previous reports and databases regarding problem locations, and it is very important to drive or walk the area during peak travel hours to make an informed determination.

The traffic study area may be contiguous, or it may be a set of non-contiguous intersections combined into a study "area." The traffic study area could extend from a minimum of one to two blocks from the site to as much as one-half mile or so from the site. The study area need not have a particular shape; it could be rectangular, it could be a long and narrow area extending along a major route to the project site, etc. It is defined by the routes along which traffic proceeds to and from the site, and typically includes major arterials and streets along the most direct routes to the project site as well as significant alternate routes. Multilegged intersections and other problem locations along these routes should generally be incorporated into the traffic study area.

Although it is difficult to outline the number of analysis locations encompassed within the study area for a detailed traffic analysis, in most cases it would range from a low of 6 to 8 intersections or analysis locations to a high of about 30 such locations. The six-to-eight analysis location guideline reflects analyses at the four corners of a typical square block site plus one additional analysis location along each approach route to the site. The 30 analysis location guideline reflects the potential to cover two or three avenues or streets on each side of the site, as well. Obviously, a small-scale action that would generate a modest volume of peak hour trips in a congestion-free area could require even fewer than the six-to-eight analysis location guideline, but should not include less than the four main corners of the project site (or the two main corners of the project site and two other critical intersections, as appropriate). Similarly, a major development project in a congested section of the City could require significantly more than 30 analysis locations; "mega-projects" could encompass traffic study areas with 100 or more intersections. However, in the event that the study area appears to be very large and encompass significantly more than 30 analysis locations, care should be exercised that some of the

intermediate locations within the area—but not on a direct route to the site—are not included unnecessarily. It is advisable to use a knowledgeable traffic expert and/or consult with NYCDOT to ensure that the traffic study area is appropriately defined.

The completion of the trip generation and preliminary traffic assignment steps first can provide a sound basis for defining the traffic study area. It is also possible to "screen out" several analysis locations at this stage of the work effort, providing that the preliminary trip generation estimates and the preliminary traffic assignments are close to their final versions. It is also possible that once the full traffic impact analyses have been completed, the initially defined traffic study area may need to be enlarged to encompass other intersections found likely to be impacted as well.

Another screen may be considered based on significant impact guidelines that follow later in this traffic and parking section of the Manual. That is, if a proposed action would generate fewer than five peak hour vehicles through an intersection—*any* intersection—any impacts there would not be considered significant, because the incremental volume of trips would be imperceptible. If such an intersection has been included within the traffic study area, it may be analyzed for existing conditions to depict the setting of the proposed action in full, but it does not *need* to be analyzed for existing or future conditions with or without the project. The final documentation of findings should indicate that the volume of trips expected to pass through other access routes to/from the site were found unlikely to be sufficient to generate significant impacts.

For programmatic actions, there are alternative approaches to defining the traffic study area, depending on the nature of the programmatic action that is proposed and how much information exists about its implementation. A few case examples of how study area definitions have been made within CEQR until now illustrate this point.

For the Department of City Planning's (DCP) proposed Quality Housing Program Zoning Text Amendments, the sites that could be affected included some 4,000 blocks Citywide. For the environmental assessment, 30 neighborhoods were defined as representative neighborhoods for the action, and four intersections within each neighborhood were selected as representative critical analysis locations for those neighborhoods. Although it was possible that other neighborhoods could be affected, and that the four intersections might not have been the only intersections to be affected, the analyses were deemed to cover representative reasonable worst-case analysis locations Citywide.

For the Department of Sanitation's proposed Solid Waste Management Plan GEIS, the locations at which candidate solid waste facilities could be sited covered literally hundreds of parcels Citywide. It was also not known which of some 70 solid waste technologies or facility types would be implemented at each. To evaluate the potential impacts of alternative sets of facilities at an enormous range of candidate sites Citywide, the traffic analysis grouped the candidate sites into "neighborhoods" of sites and selected one critical traffic analysis location per neighborhood for detailed impact assessment. As with the Quality Housing analyses, it was implicit that if significant impacts were not found at the critical intersection, then it could be assumed that there would be no significant impacts in that neighborhood.

For a programmatic action on a multiparcel site in which the total development density may be known but the block-by-block distribution is not, it is possible to define a set of analysis locations at which traffic impacts can be assumed to be most critical as well as other representative locations that will depict the proposed project's impacts at other sensitive, if not necessarily critical, impact locations. As with a site-specific proposed action, the analysis traces out the most likely arrival and departure routes to the boundary of the multiparcel site, and defines an appropriate set of analysis locations that could be significantly impacted along them. Representative potentially sensitive locations within the multiparcel site are also identified and included within the traffic study area.

312. Parking Study Area

An appropriately sized parking study area encompasses those facilities—i.e., parking lots and garages and on-street curb spaces—in which vehicular traffic destined for the site of the proposed action would likely park. The extent of the area corresponds to the maximum distance that someone driving to the site would be willing to walk. This walking distance is a function of several parameters, including the following:

- How much accessory and/or public parking would be provided on-site as part of the proposed action? Would it be sufficient or would project-generated vehicles need to park off-site? If on-site parking would be sufficient, there would be no need to define a parking study area unless the proposed action would eliminate a significant amount of available public parking.

- What is the nature of the site's surrounding area? Is the site centrally located within the surrounding street network or, for example, is it a waterfront site from which drivers cannot proceed in all four directions to find parking? Is the area somewhat desolate in peak project hours, thereby making drivers anxious about walking greater distances from their parked cars to the site? Is there an abundance of available parking in the area that affords the driver the opportunity to walk short distances and not require an analysis of parking sites more distant from the project site?

In general, about a ¼-mile walk is considered the maximum distance from primary off-site parking facilities to the project site, although it could be longer or shorter depending on the factors noted above. (Amusement parks, arenas, beaches, and recreational facilities are examples of land uses with parking demands that often extend beyond ¼ mile of the project site.) Should the parking spaces available within this distance of the site, along with whatever amount of parking is provided on-site, prove insufficient to accommodate the peak parking demand, consideration should be given to extending the study area to a maximum of ½ mile of the site. However, care should be exercised in noting that this is the extent to which drivers would have to go to find available parking, and it does not necessarily indicate that this extended parking study area supply is acceptable. It will merely constitute a piece of information to be disclosed to decision-makers and the public at large.

320. ANALYSIS OF EXISTING CONDITIONS

Once the study areas have been defined, the analysis of existing conditions becomes the building block upon which all impact analyses are based. The objective of the existing conditions analysis is to determine existing volumes, traffic patterns, and levels of service as a description of the setting within which the proposed action would occur. It is important that existing conditions be defined precisely since this is a reflection of activity levels that actually occur today, and since existing conditions will serve as the baseline for future conditions analyses that require at least some projection.

The guidelines provided for the existing conditions analyses include traffic and parking guidelines in this section, and transit and pedestrian guidelines in the following section. In some cases, surveys to be conducted may overlap two or more of these technical areas, so if different individuals will be responsible for traffic, transit, and pedestrian analyses, for example, they should each be involved in understanding the nature and extent of surveys to be conducted and technical assumptions to be made so that there are no internal conflicts within the different analyses.

321. Existing Traffic Conditions

The analysis of existing traffic conditions entails two key steps: a) the assembly and/or collection of traffic volume and speed-and-delay data needed for the analyses; and, b) the determination of roadway capacity, volume-to-capacity ratios, average vehicle delays, and level of service at the traffic analysis locations within the study area.

321.1. Determination of the Peak Hour for Analysis Purposes

The first step in the analysis of existing conditions is the determination of the peak travel hours to be analyzed. For most proposed actions, the peak analysis hours will be the same as the peak travel hours already occurring on study area streets, i.e., specific one-hour periods within the morning home-to-work rush hour and the late afternoon/early evening return trip. For some projects, it will also include an analysis of midday traffic conditions if impacts during the midday period could be significant. AM, midday, and PM peak hour analyses will generally be needed for most office, commercial, residential, and major mixed-use projects, although midday analyses may not be required for some residential projects in areas where midday traffic conditions are not an issue.

Other types of proposed actions are more likely to require traffic analyses at other times of the day and/or on weekends. A major retail project, for example, may need to be analyzed for weekday midday conditions and on weekends. A proposed sports arena or concert hall may also require an analysis for a weeknight event, a Friday night or Saturday night event, and a weekend afternoon event. A solid waste facility may generate traffic during other off-peak hours—e.g., earlier in the morning and afternoon than the conventional peak commuter hours.

The setting of the proposed action also plays a role in determining the peak hours to be analyzed. For a movie theater located in the Manhattan central business district (CBD) may require a "conventional" weekday or Friday late afternoon/early evening analysis as well as a Friday night or Saturday night analysis, since even a moderate level of movie-going activity on a Friday at, say, 5:30 to 6:30 PM may overlap with background commuter travel peaks to create a significant impact.

The traffic analysis considers the peak activity hours for the proposed action, the peak hours for background traffic already existing in the study area, and which combinations of the two may generate significant impacts. It might be the busiest hours of the proposed action superimposed on light, moderate, or heavy traffic hours that already exist. It might be more moderate activity hours of the proposed action superimposed on the heaviest existing traffic hours. Or it might be both. The source of existing traffic volumes may either be available 24-hour automatic traffic record (ATR) machine counts or new counts obtained from ATR machines installed to determine prevailing peak hours in the study area.

One means of making this determination quantitatively rather than just qualitatively is to prepare a table showing existing hour-by-hour traffic volumes at a set of representative intersections within the area or at a cordon line around the area, side by side with hour-by-hour projections of the expected trip generation of the project. A comparison of the two sets of volumes would indicate: a) which travel hours are likely to be the busiest in the future; and b) at which hours would the influence, or impact, of the proposed action's trip making levels likely be the greatest. From this comparison, potential significant impact hours—and thus the peak traffic hours to be analyzed—can be identified.

In some cases, the peak hour of the project's trip generation would coincide with the existing peak hour, and it will be clear that this is the peak condition to be analyzed. In other cases, the two peak hours will be *very* close, and it may then be proper to use the existing peak hour and later—during the impact analysis stage—to superimpose the peak trip generation of the proposed project onto the peak existing condition. In yet other cases where the two peaks are not coincidental (or nearly coincidental), judgment will be needed as to which of the two peaks (the existing peak or the proposed action's peak) would reflect the worst impact condition, or whether both hours require detailed study.

321.2. Assembly and Collection of Traffic Volumes, Street Network Characteristics, and Speed-and-Delay Data

Use of Available Data. Once the peak analysis hours have been determined, the next step in the existing traffic conditions analysis is to define the volume of traffic operating within the study area, and to create traffic volume maps to be used in subsequently analyzing roadway and intersection capacities and levels of service. In starting this task, it may be helpful to review NYCDOT traffic volume data, particularly available ATR machine counts in the area (perhaps the count data used to determine the peak analysis hours), as well as intersection turning counts and vehicle classification counts (i.e., a breakdown of the total volume by auto, taxi, truck, bus, etc.).

A second source of data that can be reviewed very early in the analysis effort are completed CEQR documents—EISs, EASs, or other traffic impact studies conducted for projects in the study area that are on file at NYCDOT offices, or at OEC, DCP, or DEP.

The most important criteria to be used in considering whether available traffic volume data can be used concerns the age of the volume data and the nature of changes, if any, in the street network, adjacent land uses, or traffic patterns, as discussed below:

- In many parts of the City, volume data that are more than three years old are generally inappropriate for use in traffic studies; only in unusual cases might such data be usable. Available volume data are usually most appropriate for an active part of the City if they are not more than three years old; it may be possible to use slightly older data for a section of the City that has undergone very little change in land use and/or activity levels since the data were collected. The key factor is whether available data are reasonably representative of existing conditions. It is also important that the data were collected at an appropriate time of year, for a typical day, and within a full peak hour (as opposed to spot counts). The older the data are, the more necessary it should be that they comply fully with the parameters that will follow below under "New Data Collection." Volume data available for a previous year may need to be increased to reflect conditions in the "existing" year of the study.

- Available data are generally appropriate for analysis purposes if there have been no substantive changes in adjacent or nearby land uses that would affect traffic volumes or patterns within the study area. For example, if a major development project has been built within a few blocks of the site of the proposed action that has generated a significant amount of traffic during the peak travel hours, new traffic counts would likely be needed. If a nearby street has been converted from two-way operation to one-way operation, or has been closed, or if a new highway ramp has been built that affects traffic volumes or patterns in the study area, new traffic counts will also likely be needed. If the available traffic volumes were collected at a time when traffic patterns were atypical—for

example, at a time when a nearby bridge or viaduct was closed or partially closed for reconstruction—new traffic counts will likely be needed, or the data collected will need to be adjusted to reflect typical conditions (It may be helpful to consult with NYCDOT regarding the adjustment of such volume data). These examples are not intended to be all-inclusive, but should indicate that if conditions at the time of analysis are materially different from those at the time available volume data were collected, new counts will likely be needed in lieu of the available data. Conditions in the study area at the time the available traffic counts were conducted, therefore, need to be researched.

To determine whether data older than three years are acceptable for use, the evaluation should consider whether the land use or traffic activity picture of the study area has changed over the time period in question. It is much more likely that older data will not be acceptable simply because conditions influencing traffic patterns or volumes are more likely to have occurred over this longer time frame. Therefore, such older data may be considered in only a limited number of sections of the City; also, it may be necessary to adjust these data for growth that occurred over this period.

New Data Collection. If the decision is made to collect new traffic volume data, several guidelines are presented below to help ensure that appropriate, representative traffic data are collected.

- Traffic counts should reflect typical conditions at the locations being analyzed. Traffic counts taken during periods of the year within which traffic volumes or patterns are unusually low or high will not provide representative traffic data. These periods usually include: the peak pre-Christmas and post-holiday shopping season, encompassing the latter half of December and the first half of January (it is usually better to avoid the entire period from Thanksgiving through January); the last half of June and all of July and August, when schools are closed and many people are away on summer vacation; and other holiday periods. Exceptions to this guideline may be considered if the peak trip generation of a proposed action coincides with one of these periods. For example, a proposed water park, marina, or amusement park *should* have its traffic counts taken during the summer months when traffic patterns are likely to be representative of future background conditions. On the other hand, a proposed office project should *not* have its traffic counts conducted during the summer months when many people tend to take vacation time from work and when traffic volumes are typically lower than during the remainder of the year.

  Although it is possible to adjust field-collected traffic counts for seasonal variation, it is noted here that such adjustments are not necessary if the traffic counts have in fact been collected on typical days within a typical period of the year for that land use. It usually is preferable to rely on typical day counts rather than on seasonally adjusted counts.

- Weekday traffic counts should generally not be taken on a Monday or Friday, since there is a tendency for volumes to be different on those days than on more typical weekdays, i.e., Tuesdays, Wednesdays, or Thursdays. Traffic counts should also not be taken on either the day before or day after a holiday, since people also tend to take an extra day off or leave work early on those days. Obviously, traffic counts should also not be taken on any holiday where traffic may historically be lower or higher than on typical days. National holidays such as Memorial Day, Labor Day, etc., are included here, as are others that are significantly observed in New York such as Martin Luther King, Jr. Day, and Rosh Hashanah (Jewish New Year), for example. Some judgment needs to be exercised for holidays that are not considered major. Traffic counts also should not be conducted during periods when extensive construction work in the area is significantly altering traffic patterns, unless reasonable adjustments to the count data can be made.

  Manual traffic counts should also not be conducted on days when inclement weather influences people's driving patterns. Traffic counts on snow days or on days for which snow has been predicted (even if it does not materialize), for example, should be avoided. Rainy day counts should also be avoided if possible, but if the counts are already under way once it has begun raining, the volumes collected can be considered acceptable since the weather has probably not influenced a significant number of people to drive or not to drive.

- Weekday traffic counts should be conducted over a sufficient number of days to be considered representative of a typical day. Historically, weekday traffic counts have generally been taken over a three-day period to ensure that a representative day is reflected in the traffic volume analyses, and so

that any abnormality in a given day's worth of counts can be identified and adjusted (or discarded). For example, three days of counts can be taken in one of two ways: a) three days of manual counts that are subsequently averaged to reflect a typical day; or b) one day of manual counts collected concurrently with a three-day 24-hour automatic traffic recorder (ATR) machine count, from which adjustments to the one-day manual count can be made. It is entirely possible that fewer or more than three days of counts may be needed to represent a typical day.

Before averaging several days of manual counts, or adjusting one day of manual counts to reflect several days of ATR counts, the entire body of data collected should be reviewed to make sure that there was no "event" going on at the time the counts were taken that would significantly alter the accuracy of the counts. Such events could include the malfunctioning of the ATR machine for a period of time, vandalism to the ATR machine, a street opening for utility repairs (for example) that would narrow the number of lanes available and therefore limit the volume of traffic that passed through the area, etc. This need not be a lengthy review providing that the proper agencies and/or news services have been contacted to determine that nothing unusual was planned for the count day or occurred on that day.

- Weekend traffic counts should be conducted for more than a single day to be considered reasonably representative of a typical weekend day. For those types of proposed actions with activities that extend at generally equal levels over several hours, and for which a particular peak hour is not easily discernible, the ATR count period should extend over all hours that could potentially comprise the peak hour for the study area and/or the proposed action.

- Manual traffic counts taken at study area locations for the purposes of determining the volume of through and turning traffic should be conducted over the course of the full peak hour, and not for a shorter period of time and then factored upward to reflect a full hour's worth of data. The counts should generally be taken over a minimum of 1½ hours, overlapping the projected peak hour plus at least 15 minutes on each side of the peak (e.g., 7:45 to 9:15 AM for a projected 8 to 9 AM peak hour), to ensure capturing any peaking that could occur at the beginning or end of the peak hour. The additional 15 minutes of data on either side of the peak will allow confirmation that the peak hour has been covered. If ATR machines are not used in the data collection effort, it is suggested that 30 minutes of counts be conducted on both sides of the peak hour to assure that the peak hour of the network has been covered (the ATR machine would ordinarily give more coverage than would manual counts).

- Manual traffic counts taken at study area locations for the purpose of identifying the mix of vehicles (autos, taxis, buses, trucks, etc.)—also referred to as "vehicle classification counts"—may be taken for less than the 1½ or 2 hours discussed above because vehicle mixes at a given location are usually not subject to wide fluctuations over the peak hour. Usually, vehicle classification counts should be conducted for a minimum of 20 minutes providing the sample count collected has about 100 vehicles recorded, to provide an adequate sample for statistical purposes.

The traffic data collection task is one of the most important steps in the traffic analysis process because it is of paramount importance that existing conditions be accurately portrayed. It will usually take a week or more to define the scope of the traffic count program, organize it properly (including setting up the field data sheets), and plan for any potential contingencies. This is one step of the overall impact analysis process in which major errors that are not caught in time can cause nearly all subsequent work to be redone. Field survey crews should be adequately trained prior to conducting the counts, and monitored during the counting effort to ensure a high quality data collection effort.

Preparation of Peak Hour Traffic Volume Maps. Once all of the traffic volume data have been assembled/collected, the next step is to prepare traffic volume maps for each of the peak hours for which the proposed action will be evaluated. As described previously, the preliminary choice of peak hours to be analyzed is generally made at the very outset of the project when study areas are defined.

Once the data collection effort is complete, the analysis returns to the initial identification of the peak hours to be analyzed, reviews the data collected, and then determines the precise peaks to be analyzed. For traffic, these peak hours are usually identified to the nearest 15 minutes, i.e., 7:15 to 8:15 AM rather than simply 7 to 8 AM. Then, all of the peak hour volumes are plotted on a map of the study area, including all through and turning volumes at each location counted, to present a total picture of traffic volumes throughout

the study area. These traffic volume maps can then be "balanced" so that volumes at adjacent intersections are consistent with one another. For example, if the northbound through volume on Sixth Avenue at 43rd Street in Manhattan is 2,000 vehicles per hour (vph) and there are 200 vehicles turning onto Sixth Avenue from westbound 43rd Street, the northbound volume on Sixth Avenue at 44th Street should be exactly 2,200 vph, providing there are no parking garage entrances or other places for vehicles to leave the street network between 43rd and 44th Streets.

These balanced traffic volume maps are key inputs for determining volume-to-capacity (v/c) ratios, average vehicle delays, and levels of service throughout the study area.

Street Geometry and Physical Inventory. As part of the overall data assembly/data collection effort, information on the street network is needed. This provides a description of what the area's traffic network "looks like" and how it is sized to accommodate traffic flow. It also becomes an additional set of inputs to the determination of street capacity and traffic level of service. Data to be collected varies depending on the capacity analysis methodology used, but generally includes the following:

- The width, number of lanes, and direction of each street in the study area and along the major routes into the study area. For added clarity, the direction of streets should be presented graphically, while street width information may be presented in either graphic, tabular, or text format, whichever is clearer.

- Traffic control devices, such as traffic signals, stop signs, yield signs, turn prohibitions, etc., the locations of which are illustrated graphically. For signalized intersections, signal cycle lengths, phasings, and timings will be needed for the capacity analyses to be conducted. Signal timing data can be obtained from NYCDOT and field-checked; consultation with NYCDOT is advisable should there be discrepancies between the two sets of timings.

- General on-street parking regulations in the area and on the blocks leading to and away from the intersections being analyzed (more detailed parking inventories will be needed for the parking analyses and are outlined later). This information may be presented either graphically, in tabular form, or in text within the analysis documentation. The presence of bus stops and fire hydrants is accounted for in the traffic and parking capacity analyses.

- General pavement or alignment conditions along the major roadways in the area that affect traffic flow, e.g., poor pavement conditions, difficult vertical or horizontal geometries that affect traffic flow, or other like conditions should be noted.

Travel Speed and Delay Data. Travel speed and delay data are generally collected for use in the mobile source air quality analyses, and should be collected concurrently with the traffic count program. In particular, the running speed of the traffic, stopped delay at intersections, vehicle classifications, roadway geometrics, and signal timing data will be required (see Section 3Q, "Air Quality"). These data are collected concurrently to correlate travel speeds to traffic volumes and volume-to-capacity ratios for air quality analysis purposes. If there is no need for travel speed data for air quality purposes, there will likely not be a need to collect these data at all. If air quality analyses do require this information, it is important to coordinate traffic and air quality analysis locations and their data needs (including the length of the corridor along which travel speed data are needed for the air quality analysis), so that the data collection process can be conducted more efficiently.

Travel speed and delay data are generally best collected via the "floating car technique," in which the survey car seeks to travel at the speed of a typical car in the traffic stream—by passing approximately the same number of cars as pass it. A driver and data recorder are dispatched in a car and travel a route (or routes) through each of the air quality analysis sites, recording speed and delay information for each approach to each site. Under the floating car technique, the driver is instructed to drive at the typical speed of other drivers, passing as many cars as pass the test vehicle.

For the purposes of the field work, it is advisable to create a form noting the points along the route so that the elapsed time can be recorded and on which the location, extent, and type of delays can also be noted. By comparing the elapsed time it takes to go from point to point to the distance between the two points, actual travel speeds can be quantified. As noted above, the travel speed and delay runs should progress at the same time as the traffic counts, i.e., over the same time period and number of days. A total of at least six to nine runs per link is generally necessary to replicate typical conditions. At times, it may be necessary to dispatch more than one team to complete the required

number of runs at the required number of air quality analysis sites.

321.3. Analysis of Roadway Capacity and Level of Service

After the preparation of balanced traffic volume maps, the determination of the capacity and level of service of the study area's roads and intersections is the next critical step in the overall traffic analyses. The key to evaluating urban area traffic conditions is the analysis of its intersections, since the capacity of an urban street is typically controlled by the capacity at its intersections with other streets. At times, the linkages between a highway and the study area street network may also play a critical role in the analysis. In general, the capacity of an intersection—i.e., the maximum number of vehicles that can pass through it—depends on several factors and can be evaluated by one of several available methodologies. Use of one of these methodologies produces the capacity of each of the approaches to the intersection and, when compared with the volume along the various approaches, the approach's operating conditions, expressed in terms of volume-to-capacity (v/c) ratio and/or level of service.

The *1985 Highway Capacity Manual* (*1985 HCM*) was developed by the Transportation Research Board and is used nationwide; it is also appropriate for use in New York City. It is currently being used by NYCDOT. The *1985 HCM* will be the most appropriate methodology for most actions. A variation of this methodology, the "enhanced" form of the *1985 HCM*, was developed from data collected in Manhattan south of 72nd Street and is appropriate for use in that part of the central business district. It may also be appropriate for use in other high-density, highly trafficked areas with congestion levels and operating conditions similar to those in the Manhattan CBD. These methodologies reflect the type of congested traffic flow that occurs in the midtown- and downtown-type areas, with conflicts between autos, buses, taxis, and pedestrians. A discussion of these methodologies follows.

1985 Highway Capacity Manual Methodology. The *1985 HCM* contains different procedures for signalized and unsignalized intersections because of the nature of driver actions, and therefore capacity, at the two different types of intersections.

According to the *1985 HCM*, the capacities of *signalized intersections* are based on three sets of inputs: 1) geometric conditions, including the number of lanes, the length of storage bays for turns, the type of area the analysis locations are situated in (e.g., central business district, others), and the existence of parking at the curb; 2) traffic conditions, including volumes by movement, vehicle classification, parking maneuvers, the nature of vehicular platooning in arrivals at the intersection, and pedestrian conflicts; and, 3) signalization conditions, including signal cycle length and timings, signal phasing, and the existence of signal actuation capabilities by either vehicles or pedestrians.

Based on all of these inputs, the *1985 HCM* model then calculates the ratio of the volume on the street to the street's capacity (i.e., its volume-to-capacity, or v/c, ratios), average vehicle delays, and level of service, with the level of service defined in terms of the average delay encountered by vehicles along each intersection approach and even each individual movement along each approach (separately for left-turn lanes or designated through or right-turn lanes). According to the *1985 HCM*, the conditions that the driver is likely to encounter at each level of service (LOS) for signalized intersections are as follows:

- LOS A describes operations with very low delay, i.e., less than 5.0 seconds per vehicle. This occurs when signal progression is extremely favorable, and most vehicles arrive during the green phase. Most vehicles do not stop at all.

- LOS B describes operations with delay in the range of 5.1 to 15.0 seconds per vehicle. This generally occurs with good progression and/or short cycle lengths. Again, most vehicles do not stop at the intersection.

- LOS C describes operations with delay in the range of 15.1 to 25.0 seconds per vehicle. These higher delays may result from fair progression and/or longer cycle lengths. The number of vehicles stopping is significant at this level, although many still pass through the intersection without stopping.

- LOS D describes operations with delay in the range of 25.1 to 40.0 seconds per vehicle. At LOS D, the influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high v/c ratios. Many vehicles stop, and the proportion of vehicles not stopping declines.

- LOS E describes operations with delay in the range of 40.1 to 60.0 seconds per vehicle. This is considered to be the limit of acceptable delay. These high delay values generally indicate poor

progression, long cycle lengths, and high v/c ratios.

- LOS F describes operations with delay of more than 60.0 seconds per vehicle. This is considered to be unacceptable to most drivers. This condition often occurs with oversaturation, i.e., when arrival flow rates exceed the capacity of the intersection. It may also occur at high v/c ratios with cycle failures. Poor progression and long cycle lengths may also be contributing to such delays.

The procedures to be used in conducting the *1985 HCM* analyses are contained and fully detailed in that *1985 Highway Capacity Manual* and within the computer software packages available for it. However, it should be noted that the *1985 HCM* provides for two alternative means of obtaining selected inputs to the capacity analyses—either detailed surveys of inputs such as platooning, number of parking maneuvers, number of pedestrians, etc.; or use of "default" values (to be used in lieu of surveyed information) specified in the HCM. The conduct of surveys to obtain this information, rather than using the default values, will result in more accurate results. For proposed actions in settings where significant impacts would likely occur, such surveys may be appropriate, because more accurate results are achieved. Such surveys are typically performed for a representative period (minimum of 30 minutes) during the peak analysis hours. For proposed actions expected to generate a modest level of trip making in an area that is unlikely to be significantly impacted, use of the HCM's default values will generally suffice. For programmatic actions, use of the default values is generally acceptable, since it does not make as much sense to mandate collection of more detailed information when the specific intersections that would be affected by the programmatic action may not be known with certainty.

Capacity analyses for *unsignalized intersections* is based on the use of "gaps" in a major traffic stream by vehicles crossing through or turning into that stream. At unsignalized intersections, "Stop" or "Yield" signs are used to assign the right-of-way to one street while controlling movements from the other street(s). This forces drivers on the controlled street—usually the "minor" street approach to the intersection—to use judgment when selecting gaps in the major street flow through which they can enter and turn into the intersection, or cross entirely through the intersection.

The capacity analysis method used for unsignalized intersections under the *1985 HCM* generally assumes that major street traffic is not affected by minor street flows. Left turns from the major street are assumed to be affected by the opposing, or oncoming, major street flow. Minor street traffic is obviously affected by all conflicting movements.

In analyzing the ability of traffic to use gaps in the major street traffic flows, the *1985 HCM* recognizes that certain movements are more able to use these gaps than others. Right turns from the minor street are most able to use available gaps, since they need to be concerned only with gaps in one direction of major street traffic. Left turns from the major street are the next movement most able to use available gaps, followed by through movements and then left turns from the minor streets (which must recognize and negotiate their way through gaps in two directions of major street flows, for a two-way street). This is important to understand because it reflects the frequent capacity shortages for vehicles seeking to make left turns from a minor street onto a major street.

The key input data required to analyze unsignalized intersections include geometric factors and volumes. Geometric factors include the number and use of lanes, channelization, percent grades, curb radii and approach angles, and sight distances. The capacity computations result in a determination of the reserve, or unused, capacity per lane, with the following criteria used to define levels of service:

Reserve Capacity in Passenger Car Equivalents Per Hour	Level of Service
400 or greater	A
300-399	B
200-299	C
100-199	D
0- 99	E
•	F

Note:

- indicates that when the demand volume exceeds the capacity of the lane, extreme delays are encountered, which may cause severe congestion.

Any highway or highway ramp/local street merge or weave conditions should also utilize *1985 HCM* procedures. All methodologies, data needs, and procedural steps are detailed in full in the *Highway Capacity Manual* and reference should be made to Chapters 3 through 6 of the *1985 HCM* for guidance. Since the inclusion of highway mainline analyses within a New York City traffic study is not generally commonplace, further explanations are not provided here within this Manual. The intersections of highway ramps with adjacent service roads and streets, however, would

follow the procedures outlined above for signalized and unsignalized intersections.

"Enhanced" 1985 Highway Capacity Manual Methodology. NYCDOT and NYSDOT have calibrated the *1985 Highway Capacity Manual* procedures for the type of traffic conditions typical of heavily trafficked intersections in the Manhattan CBD. These "enhanced" procedures are currently the preferred methodology for Manhattan south of 72nd Street.

The primary factor to be modified as part of this "enhanced" methodology includes an increased value for the ideal saturation flow rate, which represents the maximum rate of flow at which passenger cars can pass through an intersection under a set of ideal operating conditions. Studies conducted in New York City indicate that the ideal saturation flow rate is higher here than the value used in the basic *1985 HCM* model. The findings of these studies—aimed at producing an "enhanced" *1985 HCM* model for use in the City—were documented in a June 1989 NYCDOT document entitled, "The *1985 Highway Capacity Manual* and its Application to New York City."

Other Methodologies. Other methodologies may be employed only if they can be proved appropriate for use in their particular study area and only if they are compatible with air quality models used, as well. However, it should be emphasized that the concurrence of NYCDOT regarding the use of such models is strongly urged before they are employed.

321.4. Overview of Level of Service Determinations

The Manual sections appearing above present the definitions of the various levels of service and the criteria for determining whether a given intersection operates at level of service A, B, C, D, E, or F. Overall, according to generally accepted practice in New York City, LOS A, B, and C reflect clearly acceptable conditions; LOS D reflects the existence of delays within a generally tolerable range; and E and F indicate delays increasing into often unacceptable or breakdown conditions (LOS F).

Once the capacity analyses have been completed, and levels of service have been preliminarily defined for each intersection approach, this finding should be reviewed and compared to conditions observed at the site, as well as to information that is also available from the travel speed and delay runs. It is often possible that the computed v/c ratios or levels of service do not accurately reflect field conditions. There are several examples of this.

For example, it is possible that major congestion at an intersection upstream of (i.e., "above") the intersection being analyzed does not allow traffic to proceed on to the next intersection in a normal manner. Perhaps there is a Con Edison construction activity that narrows southbound Fifth Avenue at 45th Street, for example, to only two lanes as opposed to its normal five or six lanes. Therefore, only a small volume of traffic can pass through the 45th Street intersection, which then accelerates as it passes through a full-width Fifth Avenue at 43rd Street. Without observing this in the field and understanding this traffic action, an erroneously low volume could be used at 43rd Street that would lead to a determination that the intersection is operating at a clearly acceptable level of service, when under normal conditions at 45th Street, the intersection at 43rd Street would not operate that well.

It is also possible that the occurrence of double-parking activities or truck loading/unloading activities can create level of service conditions that are worse than those projected via the capacity analysis methodology employed. There are many such potential field conditions that should be understood and considered during the development of traffic volume maps, conduct of capacity analyses, and determination of an intersection's typical level of service. All available information should be weighed before finally determining level of service and defining which intersections operate in a problematic manner. These evaluations should generally be made by an individual with several years of experience in the traffic field.

322. Existing Parking Conditions

The objective of the existing parking conditions analyses is to document the extent to which public parking is available and utilized in the study area today. The analysis consists of an inventory of on-street and off-street (i.e., parking lot and garage) spaces, and a summary tabulation indicating the amount of parking spaces remaining available for potential future parkers in the area.

322.1. On-Street Parking Analyses

Typically, a parking analysis provides both a qualitative overview of parking in the area and quantified summaries of the nature and extent of parking that occurs. Qualitatively, it should include a general overview of the type of parking regulations that exist in the area. Is it generally an "alternate-side-of-the-street" type parking area with metered parking available along key retail streets (with those key streets specified by name)? Is it an area where curb parking is generally prohibited to allow maximum street frontage for

commercial vehicle deliveries or for additional traffic capacity, as is the case in much of Midtown Manhattan? This overview provides an initial view of the overall nature of parking in the area.

Quantitatively, the analysis includes a tabulation of the number of legal on-street parking spaces that exist within the parking study area by the critical times of day for parking. For a conventional office or residential project, this would be at 8 to 9 AM when people arrive at work or leave their homes to go to work, at midday (usually between 12 noon and 2 PM) when parking in a business area is frequently at peak occupancy, and at any other times when parking regulations change significantly. This is generally most applicable in areas where alternate-side-of-the street parking regulations exist—typically from 8 to 11 AM or from 11 AM to 2 PM—and where curb occupancies change just before and just after the hours that the restrictions are in place. The number of spaces can be obtained by tabulating the length of curb space at which it is legal to park (i.e., excluding fire hydrants, driveways, restricted parking areas, etc.) and dividing by an average parking space length of 22 feet, or by counting the number of cars actually parked at the curb plus those that could fit within available gaps.

The analysis includes a tabulation of how many legal on-street parking spaces exist at the likely periods of lowest supply and highest demand, such as 8 AM, 11 AM, and 2 PM, since the peak times for parking activity and parking facility utilization often differ from the peak times for potential traffic impacts, as well as how many are occupied and how many vacancies exist. For proposed actions that have significant trip making activities at other times, those other peak times are also assessed. For example, this could include weekend or week night hours for a concert hall, sports arena, convention center, movie theater, etc.

It may also be advisable to include a more detailed map indicating the key parking regulations on the blockfaces of the project site and within a more convenient walking distance than the full parking study area. This is needed for two reasons: 1) to provide a better picture of actual conditions at the site; and 2) should a future parking shortfall be identified and additional on-street parking prohibitions be needed as mitigation for traffic impacts, it will facilitate the determination of the spaces to be taken.

322.2. Off-Street Parking Analyses

The location of all public parking lots and garages within the study area are inventoried and mapped. The licensed capacity of each (which, by regulation, must be posted at its entrance) is noted. Then, surveys of the occupancy levels of each parking lot and garage are undertaken to determine the extent to which each are occupied at a representative morning peak hour, such as 8 or 9 AM, and at a time of typical maximum occupancy, such as 12 to 1 PM, or 1 to 2 PM.

For specific types of actions that generate a significant amount of in and out parking activity, an hour-by-hour parking occupancy survey may be needed. Examples of this include shopping centers, multiplex movie theaters, and major mixed-use development projects. For several of these uses or others that generate parking activity at other times of the week, weekend and/or week night surveys may also be appropriate. For example, a proposed museum may be expected to generate traffic and parking activity weekdays from 10 AM to 8 PM and on weekends from 10 AM to 6 PM. For this proposal, parking occupancy surveys might be performed at 10 AM, when museum employees would come to work and look for nearby parking; at 12 noon or 2 PM, when visitor activity would build to an assumed maximum; perhaps at an evening hour, such as 7 PM, when there would be a significant amount of patronage and demand for parking in the area from other uses; and at a representative weekend peak hour, when visitor traffic is expected to be greatest and/or when parking facilities in the area are most fully utilized. Reasonable judgment will be needed here.

The tabulation of off-street parking availability typically indicates the name and location of each facility, its posted capacity, and the percentage utilization (or number of spaces occupied) for the representative critical hours identified, as discussed above. A summary statement of the overall extent to which such parking is available in the study area is included, noting any significant differentials by subarea. For example, it could be that only 65 percent of a study area's off-street parking supply is occupied at peak hours, but that the three facilities closest to the proposed project site are fully utilized because development density is greatest there. These important findings would be highlighted.

Occupancy surveys can be taken in one of several ways. The most accurate procedure is to physically count the number of vehicles parked at the lot or garage. At times, however, this may not be permitted by the lot's owner or manager. In these cases, it is also possible to interview the lot manager or an attendant and ask to what extent the facility fills up by time of day, or to make a visual judgment that a parking lot is, say, two-thirds occupied. For some facilities, it may be possible to obtain computer records of daily occupancy. It may also be necessary to conduct counts

of the number of entering and exiting vehicles for air quality analysis needs—coordination is suggested prior to doing these surveys.

330. FUTURE NO ACTION CONDITION

The future no action condition accounts for general background traffic growth within or through the study area, plus trip making expected to be generated by major proposed projects that are also likely to be in place by the proposed action's build year. Background growth rates typically used in conducting the technical analyses are presented in this section of the Manual, as are the methodologies used in accounting for trips from expected development projects.

331. Background Growth Rates

The development of background growth rates follows the general trends in traffic and growth prevalent through various sections of the City over a number of years. It reflects the general long-term trend rather than quick deviations from the general trend. Several sources of information are generally used to develop this projection, including bridge and tunnel volume counts that are collected and monitored by NYCDOT, as well as general development trends throughout the City. Such information, and land use and population data, are available from the New York City Department of City Planning.

For traffic and parking analysis purposes, the following annual growth rates have been used recently in CEQR documents:

- Manhattan 0.50%
- Bronx 0.50%
- Downtown Brooklyn 0.50%
- Other Brooklyn 1.00%
- Long Island City 0.50%
- Other Queens 1.00%
- St. George (Staten Island) 1.00%
- Other Staten Island 1.50%

Since traffic growth is influenced by market conditions, modal split changes, and other factors, these rates may change over time. It is helpful to consider those factors when determining a suitable growth rate. Further, it should be noted that these growth rates above reflect peak travel hour expectations rather than daily figures. In some areas, daily traffic growth may in fact be significantly greater or less than the rates above, while peak hour growth is constrained by the presence of traffic capacity bottlenecks during the peak periods. It should also be noted that these are *recommended* rates; other rates can be researched, calculated, and used if there are data to substantiate them (documentation of the assumptions and/or data used to make these calculations is suggested). This will be especially true for proposed actions with peak travel hours at non-peak times, such as a concert hall or amusement park that is to be active on weekends and/or during summer months. The future no action parking analyses typically use the same background growth rates as the traffic analyses because, in general, the growth of traffic and parking are closely linked.

332. No Action Development Project Trip Making

In addition to the background growth rate that is applied evenly throughout the study area (i.e., at all intersections for the traffic analysis), the analysis also accounts for trips to and from major development projects that are not assumed to be part of an area's general growth. Here, too, the determination of whether a proposed no build project should be considered part of the general background or superimposed on top of the general background growth will call for considerable judgment.

Another means of determining whether or not proposed no build development projects would be appropriately considered as part of the background is to calculate the total amount of peak hour trip making expected from all of the projects and then calculate the percentage increase in traffic this constitutes within the study area. If the calculated percentage is less than the recommended growth rates enumerated above, it can generally be assumed that each of the developments fall within the background growth rate and do not need to be superimposed on it.

There are several ways to determine the amount of trip making associated with a no build project. The best way is to use the trip projections cited in that project's traffic impact analysis, if such an analysis exists. If such trip projections are not available, the methodologies described in the next section of the Manual on trip generation and trip assignment for build analyses can be used. This second means of determining no action trip making will entail additional work beyond just using available projections.

If it is necessary to conduct independent trip making estimates of no build projects, and there are just one or two such projects, the same procedures cited in the build analysis section below can be used. However, if there are several no build development projects, the build trip generation methodologies are followed but it is possible to use a condensed method of assigning the traffic trips to the street network. The analysis can

determine the total volume of new vehicle trips expected, compare that volume with the existing volume at a representative "cordon line" around the study area, determine the percentage increase from the new trips, and then ascribe that percentage to all intersection and roadway links to be analyzed. This process could also be used for assigning parking trips.

333. Preparation of Future No Action Volumes and Levels of Service

Balanced traffic volume maps, traffic level of service analyses, and parking utilization projections are prepared to reflect no action conditions, adhering to the same methodologies outlined in the existing conditions analyses. Text and tables provide a full description of future no action conditions and include text and tabular comparisons of how conditions are expected to change from existing conditions in the future no action scenario.

This assessment accounts for any programmed street or highway changes that could affect traffic flow or levels of service. For example, if NYCDOT has programmed the widening of a particular street in the study area by the proposed action's build year, changes to intersection capacity and the resulting level of service would be included as part of the no action analysis. Other examples may include street direction changes, street closures, and possibly even major changes outside of the study area (such as a permanent viaduct closure) that would affect travel within the study area. These would be confirmed with NYCDOT.

340. FUTURE ACTION CONDITION

The objective of these analyses is to determine projected future conditions with the proposed action in place and fully operational. These future action conditions are then compared with the future no action scenario to determine whether or not the proposed action would have a significant impact on the study area's traffic and parking facilities and require mitigation.

The assessment of projected future action conditions consists of a series of analytical steps, namely:

- *Trip generation*. The determination of the volume of trips generated by a project on a daily basis and during peak travel hours. The hourly distribution of a project's generated trips is also referred to as its "temporal distribution."
- *Modal split*. The determination of the percentage of all generated trips that would occur by travel mode. That is, how many trips would be made by auto, taxi, subway, bus, walk, or other modes. For traffic and parking analyses, part of this step is to determine the volume of vehicular traffic generated by accounting for the average occupancy of autos and taxis.
- *Trip assignment*. The routing, or "assignment," of trips by each travel mode to specific streets and highways, parking facilities, subway lines and stations, bus routes, and sidewalks en route from their origin to their destination.
- *Capacity and level of service analysis*. The evaluation of conditions within the study area with project-generated trips superimposed on the future no action condition, as a representation of the projected future action condition.

Once these steps have been completed, a determination of significant impacts—based on a comparison of future build conditions with no action conditions and with thresholds of acceptability—can be made.

The text and tabular sections that follow provide the technical guidelines needed to make each of these analyses and determinations. Several aspects or technical assumptions can be defined reasonably precisely, such as trip generation rates and modal split characteristics for specific types of actions in specific parts of the City. Other aspects of the analyses—including trip assignments, for example—will require considerable judgment.

341. Trip Generation

The trip generation analyses provide the estimated volume of *person* trips expected to be generated by the proposed action over the course of the entire day as well as during peak analysis hours. The classification of a proposed action's daily trips by hour of the day is also referred to as its temporal distribution. There is a significant body of data available within previous EISs, traffic studies, and professional literature (most notably, the Institute of Transportation Engineers' *Trip Generation Manual*), some of which relate trip generation rates as daily numbers, while others relate the information as hourly numbers. It may also be necessary—and in many cases advisable—to conduct original surveys to determine an appropriate trip generation rate to be used.

341.1. Use of Previously Researched Trip Generation Rates

There has been considerable trip generation analysis work done in the City to date as part of EISs and other studies, so rates for certain specific land use types

in specific parts of the City have been defined and approved for use on previous projects. Table 30-2 presents a partial list of previously researched trip generation rates that may be used, providing the proposed action being analyzed matches the building(s) or land uses surveyed.

For example, several different trip generation rates and temporal distributions have been researched and used in previous EISs and traffic impact studies regarding office space in Midtown Manhattan. One of the primary sources of this information, Pushkarev & Zupan's *Urban Space for Pedestrians*, reports three different trip generation rates for office buildings in Manhattan, ranging from 13 to 18 person trips per 1,000 square feet of space per day with different percentage breakdowns by hour of the day. These rates reflect trip generation for different types of office buildings with different peaking characteristics.

There may also be a special nuance to the specific proposed action being analyzed that makes its trip generation expectations significantly different from those listed in Table 30-2. For example, the trip generation rate cited for Midtown office space may not be appropriate for back-office space outside of Manhattan or even within Manhattan, since back-office space generally does not generate the same volume of visitor and business trips as does general office space. A second example could encompass variations of the trip generation rate cited in Table 30-2. The specific land use being analyzed could, for example, be decorator showroom space that generates fewer trips than general retail facilities. Here, too, it may be necessary to conduct original surveys if there is likelihood that the general retail rate is not appropriate.

Should the proposed action being analyzed be different from those land uses with previously researched trip generation rates, two courses of action are available. One would be to review similar land uses in the ITE *Trip Generation Manual* and modify those rates for the local New York City setting of the proposed action. The second, and preferable, route would be to conduct trip generation surveys of the same land use in a comparable setting of the City. Additional guidelines follow in Sections 341.2 and 341.3 below.

It is also generally appropriate to determine the volume of truck and van deliveries generated by a proposed action separately from the trip generation/modal split analyses detailed above. Two sources of truck trip generation rates have typically been used: Wilbur Smith and Associates' *Motor Trucks in the Metropolis* and the Federal Highway Administration's *Curbside Pick-up and Delivery Operations and Arterial Traffic Impacts*. These sources report daily truck trip generation rates (truck stops) of 0.05 per dwelling unit, 0.20 per 1,000 square feet of office space, and 0.35 per 1,000 square feet of retail space, which would also be subject to a temporal distribution analysis to ascertain peak hour truck trips. It is also possible, in some cases, to review delivery vehicle logs or interview prospective operators of a facility regarding the expected volume of deliveries for a specific, more unique, type of land use, such as supermarkets, hotels, or others.

341.2. Use of the ITE Trip Generation Manual

The *Trip Generation Manual* is a very comprehensive body of information based on surveys conducted in national settings that are often very dissimilar from New York City and that therefore may not be fully appropriate for use in many parts of the City. It is generally based on surveys in places with lesser density and, most often, with little or no available public transportation service. In using the ITE data, which are usually presented as *vehicle* trip generation rates rather than as *person* trip generation rates, the data are adjusted for local modal split characteristics in the proposed action's study area. It may be possible to contact ITE to determine the specific locale in which its surveys were conducted, and even (at times) to contact the particular individual at the agency or consulting firm who was responsible for the actual surveys themselves, to make a more precise comparison of modal splits between the locale surveyed and the site of the proposed action.

For example, the ITE *Trip Generation Manual*'s rate for AM peak hour vehicle trips at hospitals is 0.35 per bed. If this is generally appropriate for settings characterized by no nearby bus or subway routes, it can be assumed that the auto share of hospital arrivals is probably 100 percent or close to it. A proposed hospital in a section of eastern Queens that is also unserved by public transportation could, therefore, use the same trip generation rate. A proposed hospital along Queens Boulevard in central Queens where only half of the trips made are likely to be made by auto or taxi would therefore be presumed to have a *vehicle* trip generation rate that is half of the rate cited in the ITE Manual, providing it can be assumed that the average vehicle occupancy is the same for both the ITE setting as well as the Queens Boulevard setting.

341.3. Conduct of Original Surveys

It is often preferable or appropriate to conduct original surveys of the same type of land use in a set-

Table 30-2
Examples of Previously Researched Trip Generation Rates
(Typical Weekday)

Land Use and Location	Daily Person Trips	Peak Hour Percentage		
		AM	Midday	PM
Office, Manhattan (multi-tenant type building)	18.0 per 1,000 gsf	12	15	14
Office, Manhattan (corporate headquarters-type building)	13.0 per 1,000 gsf	15	17	15
Residential (Citywide)	7.8 per DU	10	5	11
Boutique Retail, Manhattan	205 per 1,000 gsf	1	22	10
Restaurant, Manhattan	173 per 1,000 gsf	1	17	8

341.3. Conduct of Original Surveys

It is often preferable or appropriate to conduct original surveys of the same type of land use in a setting comparable to the site of the proposed action. Although this seems rather straightforward, it may call for considerable judgment. For example, in the case of the proposed hospital along Queens Boulevard, it may be possible to find another hospital along the same corridor that is equivalently sited with regard to bus and subway service. On the other hand, there may very well not be a hospital similarly sited to the proposed hospital in eastern Queens elsewhere in the borough. However, there may be such a hospital located in another neighborhood that can be assumed to have similar modal split characteristics to those of the proposed action, and that can be surveyed.

Even so, a number of other factors need to be considered. For example, is the hospital to be surveyed of a comparable size to that of the proposed action, or will there have to be a proportioning of the findings of the survey to the size of the proposed facility to be analyzed? Does the hospital being surveyed have functions and health care facilities generally comparable to the one being proposed? If one is a teaching hospital while the other is not, the former may generate more or fewer trips during key periods of the day.

In general, it will not be easy, nor should it be necessary, to find a survey target that is perfectly comparable to the proposed action in its study area. There are many factors to consider in choosing a survey site and, later, in using the survey data wisely. Once again, in general, these factors include the following:

- Is the facility being surveyed comparable to the proposed facility?
- Is the site of the facility to be surveyed comparable in its transit service availability and its modal split characteristics to the site of the proposed action?
- Is the size of the site to be surveyed comparable to that of the proposed action, and does any difference play a role in trip making to and from the site?
- Are the hours that the survey site is open and active similar to those of the proposed action?

It is possible that a somewhat different type of facility in the same neighborhood as the proposed action may have very similar trip generation characteristics to the proposed action's. For example, a library in the Riverdale section of the Bronx may have similar trip-making characteristics to a proposed museum there. It may not be necessary to seek out a museum in a comparable setting to survey, but perhaps a library (or similar public facility) would be satisfactory. Or, after surveying the library, it may be possible to use the ITE Manual to compare the *relative* trip generation rates of libraries and museums nationally and then adjust the surveyed rate of the library to the presumed rate of the museum.

There are many nuances to consider. It may be necessary or advisable to survey more than one facility deemed potentially comparable to the proposed action, and then weigh the survey data obtained and make a reasoned judgment as to where the proposed action would fit within the range of data available.

If usable trip generation rates are not listed in Table 30-2 and not available from other surveys, the conduct of original surveys in comparable settings would be deemed a desirable analytical tool. In conducting a trip generation survey, there are several important considerations to keep in mind:

- The surveys should be conducted during the peak periods for the type of facility being surveyed.
- All entry and exit points should be covered, not just the main entrance/exit location, so that *all* trips are recorded.

- Entries and exits should be recorded separately, since they will eventually be translated into arriving and departing vehicle trips.

- Weather conditions should be noted along with any other occurrences that could be affecting the volume of tripmaking on the survey day, since adjustments may be needed afterward.

The survey methodology, hard data, and significant findings and assumptions used should all be summarized in a brief technical memorandum, so that this body of information will serve as backup documentation for the analyses and can subsequently be used by others.

342. Modal Split

Modal split analyses provide information on which travel modes are likely to be used by persons going to and from the proposed action, including autos, taxis and car services, subways, buses, ferries, commuter rail, bicycles, and walking. These modes are considered in terms of percentages—i.e., what percent of the total number of people traveling to and from the site would be via that mode. The modal split percentages are then applied to the hourly trip generation estimates to determine the volume of persons traveling to and from the site by each mode for each of the analysis hours. A subsequent step applies an average vehicle occupancy factor to the number of persons using autos or taxis/car services to determine the volume of vehicles that the proposed action would generate.

The determination of a proposed action's modal split may also need to recognize that a percentage of its trip generation may be considered "linked trips;" that is, that trips within the area of the project site may be linked with other modes or nearby destinations. For example, a proposed shopping mall in downtown Brooklyn or downtown Flushing would be expected to generate person trips to it on the basis of its expected trip generation rate, yet a percentage of these trips may not be newly generated into the area by it, but rather by the downtown and highly pedestrian nature of the area. Therefore, some of the walk-in trips to its retail components may be trips already made to the area and that may now include an additional walk "link" to it. This phenomenon can be reflected in the analyses via either a higher "walk" modal split percentage for the proposed action, or by dividing the project's overall trip generation into "linked" and "non-linked" components and assigning them separately to the study area network.

Similar to the previous discussion on trip generation, there is a significant body of data available within previous EISs and other databases, including the U.S. Census. For many combinations of land use types and geographical locations within the City, there are previously researched modal splits available for use. For other combinations, there are either sources of information that can be investigated, or the conduct of original surveys will be needed.

342.1. Use of Previously Accepted Modal Splits

Because there has been a considerable amount of survey and analysis work done on previous transportation studies, previously researched modal splits are available for use for various combinations of proposed actions in certain parts of the City. Table 30-3 presents a list of previously accepted modal splits that may be used, unless there is some special aspect of the proposed action that calls for its modal split to be significantly different from those listed.

There are not many examples of such unique cases, but one is presented for illustrative purposes. Modal splits have been surveyed for high-rise residential buildings in Midtown Manhattan. Should a proposed action call for a similar type of building, but be intended as the residence of foreign consuls or diplomats—in which case a significantly higher use of taxis, car services, and limousines would be expected vs. minimal use of mass transit—it may be appropriate to make modifications in the modal split of Table 30-3. While such circumstances are likely to be fairly rare, they point to the need to think through the proposed action's expected travel behavior as opposed to merely using the rates shown.

342.2. Use of U.S. Census Data

Another important potential source of modal split information is the U.S. Census, which contains data on journey-to-work trips by mode for each census tract in the City. Therefore, modal split percentages can be readily obtained for residential projects for any study area. It is also possible to obtain *reverse* journey-to-work information for a census tract, which would provide information on how people travel to a workplace in a particular census tract. This can be helpful in determining modal split characteristics for, say, commercial space proposed in a given area. The New York City Department of City Planning has census information. This information can also be obtained by contacting the New York Metropolitan Transportation Council (NYMTC), which will tabulate the information for a fee.

342.3. Conduct of Original Surveys

It will often be appropriate to conduct original surveys of modal split for the same type of land use as the proposed action in the same setting or in a comparable one. When the proposed action is similar to land uses that currently exist in the same study area, this is a very straightforward task. If not, a similar study area—that is, one with similar travel characteristics and mass transit availability—is identified to prepare an appropriate modal split study. This is generally the case when a proposed action includes a land use that is either unique overall (e.g., an amusement park) or just unique to the proposed action's study area (e.g., a hotel in the downtown section of St. George, Staten Island). If either of these two situations are the case, much of the discussion on trip generation surveys is again appropriate here. It will be necessary to find either a similar land use to survey within the proposed action's study area, the identical (or nearly identical) land use located in a generally comparable area of the City that can be compared to the proposed action's study area.

In conducting modal split surveys, it may be important to determine the mode of travel both to *and* from the site being surveyed. For several land uses, there may be a tendency for people to travel there by one mode and leave by another. As an example, a proposed restaurant, concert hall, or entertainment facility in Midtown Manhattan may cater to a primarily transit and walk-in populace as they arrive at 6 PM or 7 PM, but be significantly more taxi-oriented for departures later at night. The same facility may also have different modal split and vehicle occupancy characteristics by time of day. For the same Midtown eatery/entertainment facility cited above, the heavy walk-in trade during the daytime might be replaced by a significantly higher auto-oriented clientele at nighttime. Daytime arrivals by taxi may be oriented to single individual arrivals, while nighttime arrivals may be more couples or parties of four. The surveys consider the nature of the facility being surveyed and how its activity patterns, clientele, and surrounding area and transit services change by time of day for the analysis hours being studied.

Many of the same guidelines cited for the selection of traffic count days are again appropriate for trip generation and modal split surveys. Days typical for that facility are chosen for survey.

Some other factors to keep in mind when preparing for and conducting modal split surveys include the following:

- The positioning of survey staff should not bias the findings of the survey. For example, if people traveling to a particular building by subway typically approach the building from its, say, west side, positioning survey staff on the east side of the entrance to the building may result in their missing several or many subway trips.

- All entry and exit points should be covered. Although a building's rear door may look inconspicuous, it may in fact be used by a substantial number of people who get off the subway on that side of the building, or people who park in a garage on that street.

- Weather conditions should be noted since they may play a significant role in the decision of how to travel to work, particularly on days with inclement weather.

- Survey staff should be directed not to approach people selectively, i.e., to avoid a tendency to approach people based on their age, race, or sex, since this could bias the findings of the survey. One proper strategy is to approach every second or third person so as to preclude statistically biasing the survey.

It is also often advisable to conduct the trip generation surveys and modal split surveys concurrently. This helps provide an understanding of whether the particular modal split characteristics surveyed represented a particularly busy day or light day at the site. It is possible that for major trip generators, choice of travel mode can be influenced by patrons' expectations that travel to the site and to the area will be congested or not.

342.4. Determination of the Volume of Trips by Travel Mode

Once the modal split characteristics of a proposed action have been determined on a percentage basis, the volume of trips by mode can be determined by multiplying the volume of person trips to be generated in each analysis hour by the modal split percentage. This yields the volume of persons traveling by each mode for bus, subway, and walk modes and, for certain projects in unique settings, by rail or ferry. To determine the volume of vehicles—i.e., autos and taxis—generated in the analysis hours, an average vehicle occupancy factor is applied. This factor will differ for different land uses and in different parts of the City. As one example, average auto and taxi occupancies of 1.65 and 1.40, respectively, have most often been used for office and residential projects in Midtown Manhattan.

Table 30-3

Examples of Previously Accepted Modal Splits for Transportation Analyses
(Typical Weekday Peak Hour)

Land Use and Location	Percentage of All Trips by Mode					
	Auto	Taxi	Subway/Rail	Bus	Walk	Other
Office, Midtown Manhattan	6	7	60	10	varies	varies
Office, Lower Manhattan	5	5	70	10	varies	varies
Office, Downtown Brooklyn	22	1	64	8	5	–
Office, Long Island City	32	1	60	5	2	–
Residential, Midtown Manhattan	10	10	45	15	20	–
Residential, Long Island City	23	1	63	3	10	–
Retail, Midtown Manhattan	2	3	20	5	70	–

Note: Modal split percentages above are *examples*. Specific values vary by location within an area relative to transit proximity and services.

At the conclusion of this analysis element, it is advantageous to summarize in a table the volume of vehicular trips by mode—auto, taxi, and truck—for each of the analysis hours, both to document the volume of trips generated and to facilitate the subsequent trip assignment task.

343. *Trip Assignment for Traffic and Parking*

This element of the build analysis entails the routing, or "assignment," of vehicle trips to and from the project site and its parking facilities via streets and highways. To estimate which streets and highways are likely to be used and the extent to which each will receive vehicular traffic, either origin-and-destination studies can be used or prevailing traffic volume patterns in the area can be reviewed and replicated via reasoned technical judgment.

343.1. *Trip Origins and Destinations*

The first step in the traffic assignment process is to determine the extent to which trips to the project site will be made from various parts of the metropolitan region. The best source of this information, if available, is origin-and-destination (O&D or O/D) data, or information about the location where a trip began and the location where it will end. For certain parts of the City that have been studied or surveyed before, such data may be readily available. An example of this is Midtown Manhattan office space, for which there exists a body of information on what percentage of Midtown's employees typically come from Manhattan residences, the other boroughs, New Jersey, Long Island, etc. This information has been derived from the U.S. Census or other O&D surveys. The U.S. Census also contains information on where residents of individual census tracts work, which gives the same information for home-to-work trips, and which can be used.

It is also possible to survey O&D patterns of a comparable type of site, similar to the types of surveys outlined regarding trip generation and modal split. Such surveys would ask travelers where their trip originated from (say, for surveys conducted at a work site for a commercial project) or where their trip was destined to (say, for surveys conducted at a residential building for people en route to their work places). The survey would also ask the trip purpose, since there may be important differences identified between work trips and recreational, educational, or other trips.

Many of the same survey guidelines discussed previously are followed, such as finding and surveying a similar type of facility in the same study area as the site of the proposed action. In this case, it will obviously be necessary that O&D data to be obtained and applied to a proposed residential building in Flushing be obtained via surveys of a residential building in Flushing and not in, say, Astoria since the choice of traffic routes will be different. On the other hand, a more unique type of proposed action such as, for example, an amphitheater in the Coney Island area of Brooklyn may not have a comparable survey location in the same area. In this case, information could be drawn from other similar types of facilities elsewhere in New York or for other different types of recreational/entertainment facilities in Brooklyn or Queens to make a reasonable and reasoned judgment for the specific proposed action being analyzed.

For certain projects, the sponsors or developers of the project may have conducted market studies that indicate the likely distribution of its users, and which can be used as a surrogate for new O&D studies. Once such O&D or market analysis data have been obtained, these can be used as the basis for the more specific traffic assignments that follow, which are presented below.

As part of many larger regional transportation studies, travel models have been developed that simulate the routes expected to be used by projected future projects. These studies may use one of several models that are currently in use nationally, including, for example, TRANPLAN, MINUTP, and others. The objective of these models is to define mathematically the travel characteristics of individual links in the regional roadway network to simulate how people decide to use specific routes and, thus, to predict how future trips will likely be made.

However, most of these traffic simulation models are very time-consuming and costly to develop, and do not necessarily provide more accuracy at an intersection-by-intersection level. They are generally beyond the means or required scope of the type of analyses covered in this Manual, unless the proposed action's sponsor/analyst team independently chooses to develop such a model. The analyst may, however, consider contacting NYCDOT and NYSDOT to identify whether any recent studies have such modeled O&D information available for public use.

343.2. Study Area Traffic Assignments

Once the regional trip origins and destinations have been established, the assignment of vehicular trips to specific streets and through specific intersections within the traffic study area can proceed.

First, the major highway routes available to approach or depart the study area from each of the major trip origins or destinations are identified. For example, if the proposed action is a shopping center in downtown Flushing and available O&D sources indicate that 30 percent of the traffic will likely come from Long Island, the westbound Long Island Expressway and Grand Central Parkway would be identified as the major highway routes available to these travelers.

Next, the traffic assignment process identifies the "target" for which motorists would aim for parking their cars. If this is an on-site parking garage, the most logical and direct routes to it would be identified for each arriving vehicular component. In some cases, there may be a single desirable route to the site, while for other cases there may be two or more alternatives, with the alternatives possibly being reasonably equivalent and possibly not. The site-generated traffic would be assigned to each of these likely routes to the extent (percentage-wise) deemed appropriate. The analysis considers the nature of the available routes to the site. Whether or not the most direct route is also the most congested is also a question to be asked when considering the routing options available. Some motorists will seek to avoid major traffic choke points—i.e., where there is very little or no capacity available—and to some degree this can be recognized and assumed in the analyses. On the other hand, it may not be appropriate to assume that most or all motorists will circulate away from a problem location to other far more circuitous routes. Considerable reasonable judgment is required here.

A proposed action may have multiple parking facilities available to it, both on-street and off-street. In this case, the analysis would consider how specific arrival routes could link up with the different parking sites via a reasoned judgment as to where motorists coming from different directions are likely to park. If a site has multiple parking facilities available to it, more cars cannot be assigned to any of them than its capacity can accommodate. It is also possible, for example, that a proposed action would have a major parking garage on-site and several lesser sources of parking supply available to it a few blocks away. Motorists driving to the site would first drive to the major close-in garage where many of them would be accommodated, but where several or more may be turned away due to a lack of capacity. These motorists would then have to look elsewhere after being turned away from their first choice. This concept is often called "touching the site;" that is, motorists may be assumed to first drive to their preferred parking location ("touch the site") prior to recirculating through the area and looking elsewhere if parking spaces are unavailable there. If the proposed action were a corporate headquarters office space, for example, there may be assigned parking spaces, or employees may be expected to "learn," for example, that after 8:30 AM the closest garage always fills up and that those arriving at 8:45 or 9 AM do not touch the site but, in fact, go directly elsewhere to park. Also note that parking lots and garages that are occupied at 95 to 100 percent of their capacity or that have fewer than 50 vacant spaces in a lot with more than approximately 1,000 spaces in the existing or future no action condition may be considered to be at capacity and therefore unable to attract new parkers.

There are a multitude of such factors to consider very carefully with the motorists' point of view in

mind. This traffic assignment step is the major determinant of whether and where a proposed action could have significant impacts. Again, factors for consideration include, but are not limited to, the following:

- Where are trips to the site of the proposed action expected to come from? Where will return trips go to?

- What are the major highway and arterial routes expected to be used by these motorists from their individual trip origins (and to their respective destinations)?

- Which streets are most likely to be used by motorists in getting to the project site from the major highways and/or arterials? How do they link to the facilities at which project-generated trips will park?

- Will traffic destined for the project site be accommodated at the site's one or primary parking facility, or will it be necessary for project-generated trips to circulate through the study area in search of hard-to-find parking? How can such a travel pattern be "modelled" in the traffic assignment?

For programmatic actions, it will often be necessary to employ a more generic approach to the traffic assignment process. For the Quality Housing project cited previously (Section 311, above), the traffic analyses assumed a more generic assignment of traffic to the candidate sites based on the major traffic roadways serving the area, and the general likelihood of traffic passing through the defined traffic analysis locations. General traffic flow percentages were applied from each direction towards the neighborhood as a whole, and a percentage of each direction's percentage applied to the specific intersections being analyzed. Within the representative neighborhoods, the analysis was able to define the specific blocks that the zoning text amendments could potentially affect based on the distribution of soft sites, so the analysis could also identify (very roughly) the extent to which external traffic would approach different sectors of the neighborhood and, thus, pass through the analysis locations.

A similar approach to the traffic assignments was employed in the Solid Waste Management Plan GEIS. The "traffic shed" approaching each neighborhood was defined on the basis of the major feeder routes to the neighborhoods and percentages ascribed to each direction of flow. Then, a percentage of these overall percentages was assigned to routes through the critical intersection in each neighborhood.

The definition of vehicular traffic assignments may also account for pass-by trips and diverted-linked trips, in addition to a site's primary trips. The incorporation of an adjustment factor in the analyses to account for these phenomena is generally most applicable for major retail projects. Primary trips are trips made for the specific purpose of visiting the trip generator. Pass-by trips, on the other hand, are made as intermediate stops on the way from an origin to a primary trip destination. They are attracted to the site from traffic passing the site on an adjacent street that contains direct access to the generator. Diverted-linked trips are trips attracted from streets near the site but that require some diversion from one street to another to gain access to the site. The ITE *Trip Generation Manual* presents an excellent elaboration on accounting for these trips, including a range of pass-by and diverted-linked trip percentages surveyed at shopping centers across the country. Since the range indicated in the *Trip Generation Manual* is so extensive and the New York City database in this technical area is very limited, considerable care needs to be exercised that the estimates to be used for pass-by and diverted-linked trips are reasonable and not excessive. The estimates of the percentages to be used should reflect the extent of retail activity already in the vicinity of the site and volumes on adjacent and nearby roadways. In general, the combination of pass-by trips and diverted-linked trips can generally be assumed to be 25 percent; higher percentages would require justification. Documentation for any assumptions should be provided.

In addition to auto trip assignments, taxi and truck trips are also assigned to the street network. It is important to note that project-generated *taxi* and *truck* trips may have a very different assignment than auto trips, especially in Manhattan where most taxi trips are local. For taxi trip assignments, it is more likely that judgment—rather than O&D data—will be used to determine likely taxi activity patterns. It is also important to note that all taxi trips assigned "in" to the site should also be assigned away or "out" from the site, regardless of whether they are occupied or unoccupied.

Project-generated *truck trips* are routed on designated truck routes, as per NYCDOT guidelines and regulations. These regulations require trucks to use specific routes for the majority of their trips, i.e., until they must move onto local streets to reach their destination. NYSDOT regulations also preclude trucks and commercial traffic from using certain regional highways—generally those designated as "Parkways" or "Drives."

At the conclusion of these trip assignment steps for autos, taxis, and trucks, the analysis will have a percentage-assignment of the project's trip generation by each mode by highway and street in the study area network. At this point, these percentage assignments are reviewed to determine whether they reasonably represent expected traffic patterns to the site, and also whether there are any locations that would be likely to receive a significant amount of project-generated trips and that could be significantly impacted that were not included within the original study area. If so, they are added at this time and analyzed through each of the steps identified up to this point.

The last step in the trip assignment process is to multiply the project's expected total vehicle trip generation by the percentages assigned to each link and intersection in the network to determine the volume of vehicular trips likely to use the study area's street network. These volumes are then added to the future no action traffic volumes to prepare balanced future action traffic volume maps for each analysis hour.

The traffic assignments will also determine the volume of peak hour trips that are attracted to and depart from each of the parking facilities within the study area. The analysis would confirm that these peak hour trips to each parking facility do not exceed the number of spaces identified as available there at that time of the day. In fact, if the traffic assignment process indicates that the peak hour arrivals at a parking facility are even close to its capacity, further scrutiny of the trips assigned would be exercised, since parking lots and garages typically take more than just the peak hour or even two consecutive hours to fill up.

344. Preparation of Future Build Volumes and Levels of Service

Balanced traffic volume maps are prepared for action conditions, using the same methodologies outlined previously. It is important that these traffic volume maps balance, and that there are no unexplainable significant increases or decreases in traffic volume from one block to the next.

Capacity and level of service analyses are then completed as part of the assessment of future action traffic conditions, as are future action occupancy analyses of study area parking lots and garages. The methodologies to be used are the same as described previously, with certain special considerations.

Within the traffic analyses, the traffic assignment process may, for example, result in significant increases in the percentage of turns at specific intersections, so it may be necessary to recompute any capacity analysis input factors that could change. Should there be a shortage of parking spaces in the area, project-generated traffic may need to be assumed to recirculate through the area in search of available parking. Some of this may be accounted for within prevailing *1985 HCM* software packages or trip assignment models, but is checked nonetheless.

Also, as part of the proposed action, changes may be proposed for specific streets that produce changes in their capacities, which would also be checked. Should a street closure, for example, be a part of the proposed action, the traffic assignment would not only encompass the routing of new project-generated trips to the site, but also the diversion of future no action trips to alternative streets. The location of a truck dock as part of the proposed action may result in blockages to vehicular traffic flow while trucks back into the dock area—the effects of these operations (and the loss of "green" time)—would also be factored into the capacity and level of service analyses.

The future action analyses culminate with the preparation of balanced traffic volume maps and a full set of capacity and level of service analyses (including v/c ratios and average vehicle delays) for traffic conditions, as well as occupancy findings for parking facilities. Findings are presented in a clear tabular format that facilitates the subsequent comparison of no action and action conditions as part of the determination of significant impacts.

345. Assessment of Construction Phase Impacts

In addition to the assessment of impacts when the project is fully operational in its build year, the transportation analyses may also address projected impacts during a proposed action's construction phase. Multiphased projects may need to have construction impacts addressed for each of their phases. Because construction phase impacts are temporary in nature, they are typically analyzed in a primarily qualitative manner. Therefore, the determination of construction phase impacts entails an abbreviated version of the impact assessment framework described above. It focuses on depicting the key locations that are likely to be impacted and the general magnitude and duration of the impacts expected, rather than on all potential impact locations analyzed within the regular action analyses. However, construction phase impacts that last for extended periods may need to be addressed quantitatively, since such a construction period is often not considered temporary.

The construction phase impact assessment presents the anticipated *construction schedule*, indicating the *extent and duration of streets and roadway closures* (if any) by time of day and day(s) of the week. Such closures could entail the complete closure of a street 24 hours a day, the taking of one curb lane 24 hours a day to accommodate construction vehicles or field offices parked at the site, the closure of a lane or lanes during parts of the day, or other combinations or construction scenarios. The analysis comments on the extent to which these lane or street closures would impact on traffic flow in a qualitative, yet detailed, manner. This qualitative assessment considers whether the capacity losses and/or full street closures would affect traffic patterns, create traffic diversions, cause backups, and generally cause a significant deterioration in local or regional traffic flow.

The construction phase impact assessment also reviews any *impacts on parking supply* caused by the taking of lanes or the removal of parking spaces in on-site or nearby parking lots and garages, especially in active retail or residential areas where such losses may be deemed significant by store owners, shoppers, and residents. It considers the number of spaces lost during critical parking hours in the area over an extended period and, by comparing the reduction with the parking occupancy analyses previously conducted, determines whether this loss is likely to be significant or not.

The construction phase impact assessment also *estimates the volume of vehicular traffic expected to be* generated during the critical time span of the construction schedule. This includes an estimate of the volume of autos bringing construction workers to the site during the peak travel periods, and the volume of trucks or other construction vehicles expected to access the site during those periods. This discussion also indicates whether the peak hours for construction vehicle access and departure are the same as peak commuting or background traffic conditions in the area. For example, the analyses might note that during the peak construction period approximately 10 to 15 trucks and 50 autos are expected to bring construction workers to the site during the 7 to 8 AM peak arrival hour for construction-related activity, and 3 to 5 trucks and 15 autos are expected to do likewise during the 8 to 9 AM peak travel hour in the study area today.

Lastly, the construction phase impact assessment addresses the likely significance of any such impacts on the study area street network. Quantitatively, this could include an evaluation of expected levels of service at a small representative sample of intersections in the study area that would be affected by construction traffic, or an assessment that peak hour trips are likely to be small enough not to have significant impacts on levels of service, v/c ratios, or average vehicle delays. The impact assessment also indicates the routes that heavy construction vehicles would use to approach and depart the site and whether or not any residential streets would be used.

346. Assessment of Vehicular and Pedestrian Safety Impacts

While the large majority of proposed actions will not require a detailed analysis of safety impacts, for some actions, they may need to be addressed. Such actions may include the presence of sensitive land uses in the vicinity of the proposed project, such as hospitals, schools, nursing homes, or elderly housing, that could be affected by traffic volumes generated by the proposed project.

Another case could include the proposed project's proximity to a roadway that either has high accident rates or a design that makes it difficult for pedestrians to traverse easily. One example of this would be wide boulevards with main roads and service roads that often require pedestrians to cross within two signal phases rather than one. The absence of pedestrian crosswalks at key access points to/from a proposed project, the absence of a left turn signal phase at high turning volume locations (especially those traversed by significant pedestrian volumes), locations with difficult sight lines, etc., may all serve as indicators of current or future problems, and the potential for significant impacts associated with the proposed project. The determination of significant impact potential will likely involve the experienced judgment of an individual knowledgeable in the traffic field, since there are no standard analysis methodologies available today for clearly delineating such impacts.

The assessment of impacts can generally be made at a qualitative level, but should indicate the nature of the impact, the volumes affected by or affecting such impacts (including the types of vehicles, including trucks; and the age group of pedestrians, such as children or the elderly), and the likelihood of its severity, if possible. Subsequently, the types of measures that would be required to mitigate significant impacts should be identified.

The analysis of the proposed action may also consider potential impacts on bicycle activity—for example, does the proposed action affect bicycle routes or paths, where the number of bicyclists is substantial? Such analyses are essentially qualitative in nature, and may be combined with an evaluation of pedestrian safety.

The key issue to be resolved in safety analyses is the extent to which vehicular and pedestrian exposure to accidents may reasonably be expected to increase with the proposed action in place. This exposure could include substantial increases to vehicular or pedestrian activity levels at locations currently experiencing high accident rates, or the introduction of vehicular or pedestrian activities in such a manner as to create new problem locations. An example of the former would be the addition of substantial new traffic volumes at intersections that have experienced an unusual volume of accidents and/or fatalities. An example of the latter would be the addition of a major new traffic generator immediately adjacent to a school or, conversely, the development of a school along a roadway where its crossing by students would pose safety problems.

The following reference material may be helpful in addressing these issues: a) accident records at New York Police Department offices at One Police Plaza in Lower Manhattan; b) reports such as the *Midtown Transportation Factbook* (although its 1977 data is quite old), *Traffic Fatalities Data in New York City*, and other databases that may be available at NYCDOT offices at 51 Chambers Street; c) New York State Department of Transportation (NYSDOT) CLASS data available in its Albany offices; and d) local police precinct experience in recent years.

400. Determining Impact Significance

The comparison of expected conditions in the future with and without the proposed action in place determines whether any impacts, or changes in future conditions, are to be expected. Whether or not an impact should be considered significant has not been defined with any universal concurrence in the traffic field. Nationally, there are no hard Federal or industrywide standards in use. Each municipality, county, or State agency responsible for traffic operations and/or site plan approvals has either developed its own local set of standards, or responds to development proposals more qualitatively based on their sense of whether the proposal's trip generation is likely to be significant.

The differences between the hours of operation of different types of actions, the differences in the location of the actions Citywide, and the differences in the types of travel modes generated by the proposed action all play a role in determining whether or not an action's impacts are deemed significant. For example, two proposed actions, one of which would generate its trips during the conventional peak travel hours and the other of which would generate its traffic during non-peak hours, would not have the same effects on a community. With the same amount of trip generation or even the same resultant level of service, one's impacts may be significant while the other's may not. In another example, if two proposed actions would generate the same volume of traffic, but one would be situated in a commercial area and the other on a quiet residential street, it is possible that only one of these actions would have significant impacts.

The determination of significant impacts must respond to several important questions:

- Would generated vehicle trips likely cause a noticeable change in volumes on study area streets?
- Would generated vehicle trips likely cause traffic delays considered unacceptable?
- Would generated vehicle trips likely create significant hardships for pedestrians crossing the affected streets?
- Would generated pedestrian trips likely cause noticeable delays and congestion to vehicular traffic?
- Would the location and use of truck docks or other goods delivery areas create problems for trucks seeking to load and unload deliveries, or for other vehicles trying to pass the site, or for pedestrians who must confront trucks backing into their loading areas?

The sections that follow present recommended guidelines for determining impact significance in the areas of traffic operations and parking.

410. DETERMINATION OF SIGNIFICANT TRAFFIC IMPACTS

Different municipalities and agencies around the country use different definitions of a significant traffic impact. There is no industrywide standard for the definition of a significant traffic impact. In general, however, there is agreement that deterioration in level of service within the clearly acceptable range (LOS A through LOS C) is not considered significant.

In several municipalities, deterioration in level of service of one level or more—i.e., from LOS C to D, or from D to E, or from E to F—is considered significant. Other municipalities/regions use this same definition and add to it that deterioration within LOS E or F—e.g., from a "low-end" v/c ratio or average vehicle delay to a "high-end" v/c or delay within the

same level of service category—is significant, although there is often no specificity of the increment of v/c or delay required to define significant. There are also variations on this basic criterion. For example, deterioration from LOS D to E may be considered a significant impact, while deterioration from LOS C to D is not, presumably because LOS D is often considered acceptable in densely traveled urban settings.

Some municipalities use a sliding scale definition of significant impact. For example, this can mean that for LOS A, B, or C, v/c ratios can increase by 0.04 before impacts are considered significant enough to warrant mitigation. For LOS D, an increase of 0.02 may be allowed, while for LOS E or F, an increase of 0.01 is allowed before mitigation is required.

The following set of guidelines are appropriate in determining whether or not the traffic impacts of a proposed action being evaluated are significant:

- Intersection level of service deteriorating within clearly acceptable ranges (LOS A through LOS C) should not be considered a significant traffic impact. The level of service changes, however, would be disclosed and may, in fact, constitute significant impacts on neighborhood character, should they occur on residential streets (refer to Section 3H, "Neighborhood Character"). Levels of service that deteriorate from acceptable LOS A, B, or C in the future no action condition to marginally unacceptable LOS D or unacceptable LOS E or F in the future build condition would be considered significant impacts.

- For signalized intersections analyzed via *1985 Highway Capacity Manual* procedures, with future no action levels of service of D, an increase in projected delays of five or more seconds in a lane group should be considered significant. For no action LOS E, 4 seconds of delay should be considered significant. For no action LOS F, 3 seconds of delay should be considered significant. However, if the no action LOS F condition already has delays in excess of 120 seconds, more than 1.0 second of delay should be considered significant, unless the proposed action would generate fewer than five vehicles through that intersection (all approaches) in the peak hour. These significant impacts would require mitigation.

  The sliding scale of significant delays, noted above by level of service at signalized intersections, is premised on the assumption that up to a 5-second delay can be accepted by motorists at currently acceptable levels of service (including marginally acceptable LOS D), and that at "stop-and-go" conditions where delays are greater than 120 seconds, delays of even 1 second should not be tolerated, and that mitigation should be required.

- For unsignalized intersections, if the reserve capacity in the action condition is between 100 and 150 pcph (mid-LOS D to LOS E), a decrease of 25 pcph or more between the no action and action conditions should be considered significant. If the reserve capacity in the action condition is below 100 pcph (LOS E or worse), a decrease of 10 pcph should be considered significant unless the proposed action would generate fewer than five passenger-car equivalents in the peak hour along the critical approach being analyzed. For the minor street to trigger significant impacts, 90 passenger car equivalents must be identified in the future build condition in any peak hour.

- Highway or ramp sections being analyzed—including main line capacity sections, weaving areas, and ramp junctions—should not deteriorate more than one-half of a level of service between no action and action conditions when no action level of service is in the E or F range.

Even though v/c ratios are not considered a determinant of significant impacts under *Highway Capacity Manual* procedures, v/c increases approaching 1.00 may indicate that problem conditions are approaching. Computer v/c ratios should be presented alongside delay and LOS findings within any traffic analysis documentation, and v/c ratios at or above 0.85 should be disclosed.

Additionally, if the traffic analyses indicate that future no action v/c ratios below 0.95 are projected to increase to more than 0.95, or where future no action v/c ratios above 0.95 are expected to increase by 0.020 or more, for locations where acceptable levels of service are projected to occur in the future action condition, additional analyses should be conducted to determine how close the proposed action's increment is to creating a significant impact. These analyses should consist of determining how much additional traffic at that analysis location would cause the level of service to deteriorate from its projected acceptable level of service to unacceptable level of service D. This incremental volume represents the "buffer" available to NYCDOT before it may need to consider capacity improvements, and this volume should be provided to NYCDOT.

For programmatic actions, it may be appropriate to extrapolate significant traffic impact findings for a representative set of intersections analyzed to the larger set of potentially affected intersections in a neighborhood. For example, for a set of four representative intersections in a neighborhood, a finding of no significant impact could possibly be extrapolated to a more general finding that no location in the neighborhood would be likely to be significantly impacted. Should the analysis indicate that one of the four locations would incur a significant impact, it may be possible to extrapolate that some percentage of the 40 intersections in the neighborhood that could be affected would possibly incur significant impacts.

This may be a difficult extrapolation to make and should be made with care. The analysis considers how representative or how critical the intersections analyzed are relative to other potentially affected locations in the area, the extent to which the analyzed intersections would be affected to a lesser or greater extent than other intersections not analyzed, etc. It should seek to provide some indication of what the analysis at the intersections studied mean overall.

As part of the assessment of potential neighborhood character impacts, traffic issues will need to be reviewed, as noted in Section 3H, since traffic volume increases on residential streets (i.e., where half of the block or more is occupied by residential buildings) may be considered significant even if they do not produce a significant LOS impact or vehicle delay increase at the closest intersections. For residential streets with future no action volumes of less than about 500 vph, a build volume increase of approximately 100 vph or more may be considered significant. For streets with no action volumes of 500 vph or more, a build volume increase of approximately 150 vph or more may be considered significant. This evaluation should also be sensitive to truck traffic increases on residential streets, in which case even a modest level of generated traffic may be considered significant.

420. DETERMINATION OF SIGNIFICANT PARKING IMPACTS

The build analysis culminates with an assessment of the impact of the proposed project on the study area's or neighborhood's available parking supply. Should the proposed action generate the need for more parking than it provides, this shortfall of spaces may constitute a significant impact on the area's resources. The availability of off-street and on-street parking spaces within a convenient distance (usually considered to be about a 5-minute, or ¼-mile, walk) is considered in making this determination. For example, should the amount of available parking spaces within this distance from the project site be ample to accommodate the project's parking shortfall, there would not be a significant impact. On the other hand, should the available parking supply just barely be able to accommodate the proposed action's shortfall, there would be an impact, but not necessarily a significant impact. In this case, the local parking supply would be sufficient to accommodate the proposed action's shortfall on a typical day but at the cost of usurping all of the adjacent area's supply, which may not be desirable in certain areas, particularly residential areas.

- For proposed actions within the Manhattan CBD (the area south of 61st Street), the inability of the proposed action or the surrounding area to accommodate projected future parking demands would generally be considered a parking shortfall, but is not deemed to be a significant impact. The unsatisfied demand for parking spaces would result in vehicles parking outside of the immediate area and motorists' perhaps walking extended distances to their destination or taking mass transit or a taxi for the final "leg" of their trip. Or, it is possible that, in time, this demand will shift to an alternative travel mode.

- For proposed actions in other CBDs or outlying business districts (OBDs), such as downtown Brooklyn, downtown Jamaica, and downtown Flushing, a parking shortfall that exceeds more than half the available on-street and off-street parking spaces within ¼ mile of the site may be considered significant, since the need for parking in these areas is often critical to businesses in the area.

- For residential areas outside the Manhattan CBD, a parking shortfall that exceeds the number of off-street parking spaces and more than half the available on-street spaces within ¼ mile of the site may be considered significant. It is also possible that very small shortfalls may be deemed insignificant.

One other evaluation can be considered outside the Manhattan CBD, namely whether there is sufficient available parking within ½ mile (rather than ¼ mile) of the project site to accommodate the projected shortfall. If there is—and it should be noted that ½-mile may be considered a less-than-convenient walk for many motorists—parking impacts may not necessarily be significant, and this information would be provided for decision-makers. Even if there is sufficient parking available within this extended distance from the project site,

there is a possibility that project parkers would find spaces to park in closer to the site and thus force others who arrive later or live in the area to park farther away from their destinations, thereby still creating an overall significant impact. A similar approach would be used for programmatic actions.

500. Developing Mitigation

The identification of significant impacts leads to the need to identify and evaluate suitable mitigation measures, i.e., measures that mitigate the impact or return projected future conditions to what they would be if the proposed action were not in place, or to acceptable levels (for future no action LOS D, E, or F, mitigation back to the no action condition is required; for future no action LOS A, B, or C, mitigation to mid-LOS D is required). In general, the analysis begins by identifying those measures that would be effective in mitigating the impact at the least cost and then proceeds to measures of increasingly higher cost only if the lower cost measures are deemed insufficient. In doing so, care should be exercised that the implementation of a given measure not mitigate impacts in one area—either geographic or technical—only to create new significant impacts or aggravate already projected significant impacts elsewhere.

For example, one commonly recommended traffic mitigation measure is to retime existing traffic signals to provide increased green time—and thus increased capacity—to the intersection approach that is significantly impacted. Not only should the traffic analysis make sure that other intersection approaches that would lose green time could afford to do so, and that existing signal progression along an important arterial not be unduly impacted, but also that pedestrians crossing the street still have sufficient green time for them at crosswalks losing pedestrian green time. The same concern is apparent with respect to parking, where the prohibition of curbside parking along an intersection approach that requires an additional travel lane could reduce the supply of parking spaces by an amount large enough to trigger a parking shortfall. Other examples indicating trade-offs between traffic and transit issues, and transit and pedestrian issues, are described in Section 3P, "Transit and Pedestrians." Also, traffic mitigation analyses need to consider potential implications on air quality, noise, and, possibly, neighborhood character analyses.

The separate transportation services and facilities need to be considered as a system, wherein changes in one could impact activity patterns and/or levels of service in another. This is a very important point that needs to be viewed comprehensively. It is possible that recommendation of a major new transit service—such as institution of ferry service at a new waterfront site—that is generally viewed as a major overall access benefit, would also have secondary impacts that need to be evaluated as to whether they are significant and themselves require mitigation. Would pedestrian flows to and from the ferry landing cause impacts? If buses are rerouted to connect with the ferry, would intersection capacity be affected? Would there be sufficient parking for ferry users? This does not mean that broader, more effective or desirable mitigation measures should not be considered, but rather that a comprehensive look and evaluation is needed.

There are two alternative approaches to the mitigation analyses for a programmatic action. The first entails a detailed quantitative analysis of mitigation measures similar to that done for site-specific actions, with the advisory note that the traffic analysis may need to extrapolate the findings to more than just the sample intersections analyzed.

The other approach entails a qualitative evaluation of whether the impacts of a programmatic action can be mitigated and by what level of mitigation measure (low-cost, moderate-cost, high-cost, enforcement, or travel demand management). This can be done but will generally require considerable judgment of an individual with at least several years of experience in the traffic field. For example, it would be necessary for this individual to look at the signal timing at a particular intersection and at the relative levels of service of an intersection's approaches and determine whether a simple green time reallocation would be sufficient to mitigate significant impacts, or whether parking regulation modifications are sufficient, or whether a higher level of mitigation costs will be needed. The basis for such judgmental determinations should be clearly explained in the analyses.

Once the mitigation analyses have been completed, it is necessary to review the required mitigation measures with NYCDOT and gain its approval, since NYCDOT is the agency responsible for their implementation. For EISs, it is preferable to do this at the draft EIS stage; in any case, it must be concluded before finalizing the final EIS.

510. TRAFFIC MITIGATION

The range of traffic mitigation measures can be viewed as encompassing five categories: a) low-cost, readily implementable measures; b) moderate-cost, fairly readily implementable measures; c) higher capital

cost measures; d) enforcement measures; and, e) trip reduction or travel demand management measures. Some discussion of the benefits and issues associated with each of these types of measures is presented below.

511. Low-Cost, Readily Implementable Measures

These mitigation measures typically include signal phasing and timing modifications, parking regulation modifications, lane restriping and pavement marking changes, and turn prohibitions, street direction changes, and other traffic-signage-oriented changes. NYCDOT approval is required for the acceptance and implementation of these measures.

- *Signal phasing and timing modifications.* The goal of signal timing modifications, which is often the first traffic mitigation measure considered, is to shift green time from the approaches to an intersection that have clearly sufficient capacity to those that need additional green time to accommodate their traffic demand. Signal phasing modifications are considered typically when a specific movement at an intersection requires exclusive time for its movement to be completed. For example, northbound left turns at an intersection may often proceed together with all other north- and southbound traffic. Provision of a separate signal phase for left turns will generally allow them to move conflict-free and, thus, at a better level of service. Care should always be exercised that provision of such an exclusive phase not significantly impact other traffic movements at the intersection.

  Signal phasing modifications need not only be the provision of a separate phase for a particular left turn volume. It could also be an advance phase for an entire approach to an intersection, or a combination of different movements that do not conflict, etc. Phasing and timing modifications may also be helpful in mitigating pedestrian crossing problems at particular intersections. Application to NYCDOT must be made for signal phasing and/or timing modifications.

  Evaluation of these measures also considers their implication on pedestrian crossings and waiting areas, as well as on the overall signal progression along a corridor or through a CBD area.

- *Parking regulation modifications.* The goal of this measure is to restrict, remove, or relocate curb parking (including bus stops) along streets where additional travel lanes are needed for traffic capacity reasons, or to reduce conflicts between cars involved in parking maneuvers and through traffic. In adding capacity by removing on-street parking, the analysis also evaluates whether there is sufficient parking space within the study area to accommodate those parked cars that have been displaced.

- *Lane restriping and pavement marking changes.* The objective of these measures is to make more efficient use of a street's width, either in providing an exclusive turning lane, restriping the lane markings to give greater width to those movements that need them, etc. For example, an intersection approach characterized by a very heavy left-turn movement and low to moderate through and right-turn lanes may currently provide a 10-foot left-turn lane and three 12-foot lanes for the other movements. Restriping the approach to provide a 13-foot left-turn lane and three 11-foot for the other movements may provide left-turning vehicles with the capacity they need. One other objective would be to improve pedestrian safety by widening crosswalks at critical intersections.

- *Street direction and other signage-oriented changes.* At times, it may be advisable, or necessary, to convert a two-way street to one-way operation or vice versa, or convert a pair of two-way streets into a pair of one-way streets. This tends to provide greater traffic capacity since it removes conflicts typically inherent in two-way traffic, particularly from left turns vs. oncoming traffic movements at high volume intersections.

  Other traffic mitigation measures here include the prohibition of left turns or right turns, or signage that requires all vehicles in a given lane to turn left or right or to only proceed through the intersection. Since it generally takes more time and capacity for vehicles to make turns than to proceed straight through an intersection, these measures often offer substantial capacity benefits. However, the traffic analysis would need to carefully assess the diversions of traffic to other streets and their impacts there. Consideration of these measures may often entail a significant amount of analytical work, and have therefore generally been relegated to a secondary position after consideration of signal timing and parking regulation modifications. On the other hand, street direction changes and turn prohibitions usually offer substantial capacity benefits that make them worthy of consideration.

512. Moderate-Cost, Fairly Readily Implementable Measures

These measures typically involve a level of capital costs somewhat higher than those defined above, yet which are generally considered moderate overall, such as intersection channelization improvements, traffic signal installation, and others.

- *Intersection channelization improvements.* Channelization improvements are intended to provide traffic movements with greater clarity or ease of movement. They may include minor widening of the approach to an intersection to provide an increased curb radius for right-turning vehicles, a median separating the two directions of traffic flow on a two-way street, or islands for pedestrian refuge or to delineate space for turn movements through an intersection.

  Channelization improvements may also be needed to offset a roadway's centerline so that one of the lanes available to traffic can be used in one direction in, say, the AM and the other direction in the PM, to make more efficient use of the total roadway width available to traffic. If this type of channelization is accomplished via traffic cones, it is really an enforcement-type of mitigation (discussed later). If it involves overhead signage, it is generally a moderate cost measure.

- *Traffic signal installation.* At times, it may be necessary to propose the installation of a traffic signal where an unsignalized intersection does not possess sufficient reserve capacity to process cross-street traffic volumes or where it would mitigate vehicular or pedestrian safety impacts. Recommendation of this mitigation measure also requires the completion of a signal warrant analysis—this is a set of volume and safety evaluations needed to determine whether a signal is warranted, even if *1985 Highway Capacity Manual* analyses indicate that an unsignalized intersection would benefit with the installation of a traffic signal.

There are NYCDOT, New York State, and Federal government guidelines on the conduct of signal warrant analyses. The NYCDOT guidelines should be consulted and a *preliminary* warrant analysis conducted to determine the likelihood that an intersection's volumes will warrant a signal. A final warrant analysis is usually conducted by NYCDOT only *after* a proposed project is built and operational; NYCDOT has generally chosen not to authorize installation of a new signal until volumes and conditions projected in a proposed action's traffic study actually occur.

513. Higher-Cost Mitigation Measures

In general, this category of mitigation measures includes street widenings, construction of new streets, construction of new ramps to or from an existing highway, implementation of a sophisticated computerized traffic control system, and other measures that are typically physically oriented and not readily implementable.

- *Street widenings.* When implementation of capacity improvements such as signal phasing and timing changes, curb parking prohibitions, bus stop relocations, and others are not sufficient to provide the required capacity within the existing street width, it may be possible to widen the street, to provide wider travel lanes or additional travel lanes. The effect on pedestrian movements in the area would be jointly analyzed with this mitigation measure.

- *Construction of new streets.* At times, it may be advantageous to either reopen a closed, or demapped, street or construct a new street leading to a development site. This access improvement could thus potentially provide a new access route to the site and alleviate projected congestion on existing routes. It is a relatively uncommon measure that is occasionally available to large projects in settings where existing street access is rather limited.

- *Construction of new highway ramps.* The objective of this measure is to provide an additional means of access from the primary regional route(s) leading to a project site. When access to the site is via an existing highway ramp that leads to an already congested local street en route to the site, construction of a new ramp could relocate traffic to another street better able to accommodate it. Since many of the City's highways are under New York State Department of Transportation's jurisdiction, coordination and approval from that agency may be required.

- *Computerized traffic control systems.* The objective of these systems are varied—some provide coordinated signal progression to traffic along key City arterials, others provide variable-message communication to drivers informing them of congested routes and/or optimum alternatives, etc. These measures, while available, are typically not appropriate for most projects, except perhaps for some major proposed actions.

514. Enforcement Measures

These measures generally involve costs that accrue to the City on a regular, repeating basis rather than as one-time construction costs, and include the deployment of traffic enforcement agents (TEAs), parking enforcement agents (PEAs), or certain types of physical improvements that are variable by time of day.

- *Traffic enforcement agents.* TEAs are often deployed by NYCDOT at critical locations where it is important to minimize spillback through an intersection, and thus avoid potential gridlock. By virtue of their being stationed at busy intersections, the TEAs are also able to manually override the traffic light's signal timing patterns, and allocate the amount of green time to each approach of traffic that minimizes queues and delays. The recommendation of deploying TEAs at a significant impact location may be appropriate where: a) an intersection is unsignalized and a TEA could ensure that minor street traffic gets the green time needed to pass into or through the intersection; or b) an intersection requires several different timings to function optimally at different times of the day and where it is inappropriate or undesirable to install a multi-dial signal controller.

- *Parking enforcement agents.* PEAs may be deployed by NYCDOT to ensure that on-street parking regulations are obeyed and that the required number of moving travel lanes—and thus capacity—is maintained during critical time periods. Within the traffic analyses, it may be insufficient to assume that the mere replacement of an existing curb parking regulation with a more restrictive one will automatically ensure that the curb lane is fully free of parked cars at times when its capacity is needed for moving traffic. At critical locations, the deployment of PEAs will assist in ensuring that the lane's capacity will be available.

It should be noted that the use of enforcement agents as mitigation is not a preferred measure due to their recurring annual cost. Historically, enforcement agents have been considered only for City-sponsored projects as a matter of City policy.

515. Trip Reduction or Travel Demand Management Measures

Trip reduction or travel demand management (TDM) measures seek to either reduce the volume of vehicular trips generated by a project, divert them to higher-occupancy vehicles than single-occupant autos, or divert them to hours that are not as critical as the hours for which significant impacts were identified. These measures include carpooling or vanpooling, staggered work hours or flextime programs, new transit services or transit subsidies, telecommuting, and a range of other actions.

- *Carpooling and vanpooling.* The objective here is to promote the formation of carpools or vanpools that will draw people out of their single-occupant vehicles or otherwise increase the average occupancies of all vehicle traffic generated by the site.

- *Staggered work hours and flextime programs.* The objective of these actions is to stagger the times at which people drive to and leave their workplace so as to reduce the volume of vehicular traffic on the road during the affected area's peak commuting hours. With staggered work hours, employees work somewhat different shifts; under flextime, employees are free to arrive at work at any time within a given range (say, 7:30 to 9:30 AM) and leave within a given range (say, 4 to 6 PM).

- *New transit services.* This action may include provision of a company shuttle bus linking the workplace with the nearest mass transit stop, initiating shuttle bus or jitney service for noontime trips to local retail areas, or the extension of existing bus routes to the site, with the objective of promoting transit usage to the maximum extent possible.

- *Transit subsidies.* This includes companies giving their employers vouchers to be used in their purchase of commuter rail tickets or tokens. The local example of this is the Transitchek program, which allows employees to use a voucher to pay for some transit fare purchases per month.

- *Telecommuting.* With telecommuting, employees may work a specified number of days per week or per month either at a telecommuting center where they can complete their assignments on a centralized set of computers or work stations, or at employer-provided installations in their home. The objective is to reduce the volume of trips being made.

Although the measures described above may be implemented individually, their implementation as a collective menu of trip reduction options—referred to as TDM—is a relatively new concept in mitigation. Often, employers are required to implement a TDM plan with a specified mandatory trip reduction—say, reduction of peak hour vehicle trips by 15 percent—with each of

several TDM action options available to employees, as long as the overall goal is met.

Again, the definition of the mitigation needs of the proposed action would typically start with the low-cost, readily implementable measures and proceed to the higher cost measures. TDM actions can be considered concurrently with the low-cost measures and may, in fact, be more desirable since they reduce auto dependency. It should be noted, however, that embracing TDM as mitigation will mean that the project developer, sponsor, and/or tenant will need to make a firm commitment to actions that may to some degree affect the way their business is conducted (e.g., altering work schedules, commitment to vanpools, etc.).

520. PARKING MITIGATION

The range of measures that could generally be considered to mitigate significant parking impacts include the following:

- Provision of additional parking spaces as part of the proposed action, including such provision off-site but within a convenient walking distance from the site.

- Modification of existing on-street parking regulations in an appropriate manner—for example, where a less restrictive parking regulation would not affect the capacity of the street to process adjacent vehicular traffic demands.

- Implementation of new transit services (e.g., bus routes or bus route extensions) or trip reduction initiatives that would change the projected modal split or reduce the number of vehicles traveling to (and parking at) the project site.

In general, where a significant impact has been identified, a proposed action should strive to provide the amount of parking it needs as part of the proposed action rather than relying on available on-street parking supplies.

600. Developing Alternatives

610. DEVELOPMENT OF ALTERNATIVES

The alternatives analysis of the EIS is intended to depict and analyze alternatives to the proposed action that are likely to eliminate or reduce significant impacts expected to be generated by the proposed action. Since traffic impacts are often among those determined to be significant, there are attributes of a proposed action that, if changed, can result in a reduction of expected impacts. Guidance regarding the development of such alternatives follows.

611. *Reductions in Size*

The first and most logical alternative is a scaling down of the size of the proposed action, e.g., reducing the amount of proposed square footage to reduce its overall trip generation. This approach will generally lead to a proportional reduction in the amount of trips generated, but not necessarily in the magnitude of the impacts that would occur.

612. *Different Uses*

A second type of alternative involves replacement of a high trip-generating land use component of the proposed action with a lesser trip generator. For example, residential uses are generally much lower generators of trips than are office buildings or shopping centers. A shifting of proposed development space accordingly would likely reduce the magnitude of the impacts on the area's traffic network. Care would also be needed to make sure that the times in which trips are reduced are those times at which significant impacts are expected. For example, potential replacement of office space with retail space may reduce the volume of trips generated by auto in the AM when retail activity is light, but not at midday when retail uses are very active. Should the preceding build analyses determine that there would be a significant traffic impact in only the midday peak hour, this replacement alternative would not be beneficial.

Consideration of this category of alternative must also recognize that different types of land uses may tend to have different modal splits as well, and that a land use that has a lower overall trip generation rate may not necessarily generate fewer trips by *all* modes. For example, framing an alternative that responds to a significant traffic impact under the proposed action with a less-intensive overall trip generator that has a higher auto-plus-taxi use percentage may not result in a removal of the impact. The alternatives analysis would consider the type of impact found significant and consider alternatives that reduce *that* impact during the specific significant impact hour.

613. *Changes in Access and Circulation*

Another type of alternative revolves around physical site changes that do not necessarily reduce the overall volume of trips generated or the number of trips generated during a specific impact hour, but that affect access and circulation patterns and effectively move

traffic to locations or routes that would not be significantly impacted. There are several examples of this.

Relocation of a project's proposed parking facility or the facility's entrance may positively affect traffic patterns and divert traffic away from significant impact locations. Provision of parking—or additional parking—can reduce the undesirable circulation of vehicles on-street in search of hard-to-find parking spaces. This is especially true for proposed actions that either do not include parking as part of their project, or where the amount of parking is appreciably short of the demand. For major projects that include large parking garages (e.g., 500 or more parking spaces), it may be advantageous to split the parking into two sites rather than one, to disperse traffic to different routes rather than having all of it concentrated at a single entrance and exit location and a single primary access route.

Relocation of a project's main entrance can also alter access patterns for both vehicular, transit, and pedestrian access. A proposed action that generates a substantial volume of vehicular drop-offs, such as a hotel in Midtown Manhattan, for example, could potentially shift its main entrance to a location on the site that reduces significant traffic impacts at critical locations or that minimizes conflicts between vehicles engaged in picking up or dropping off passengers and other vehicles driving past the site. Such "front door" relocation may also make pedestrian access from nearby subway stations more convenient or reduce congestion at key crosswalks or corner reservoir spaces in the affected area.

Relocation of a project's loading docks, or their reconfiguration, could also have similar benefits in moving the goods delivery function to a location that does not significantly impact traffic or pedestrian flow. Reconfiguration of a proposed loading dock from a back-in operation to one in which the trucks can pull directly into the delivery area would also relieve pressure on traffic and pedestrian movements. It should also be noted that NYCDOT has indicated a strong preference for front-in and front-out truck operations.

614. Other Alternatives

Potentially, there may be other alternatives that are tailored to a specific proposed action at a specific site that could be developed. In general, to be effective, they should either reduce the overall level of trip making, shift trip making to noncritical hours or to noncritical modes, or alter the physical design of a project to relocate trips away from identified significant impact locations.

620. EVALUATION OF ALTERNATIVES

In evaluating the impacts of the alternatives relative to the impacts previously determined for the proposed action, it is generally not necessary to conduct a full reanalysis of the traffic and parking systems conducted as part of the build analyses. However, regardless of the technical approach taken, conclusions made from the analyses of alternatives must have a degree of confidence reasonably comparable to that for the analysis of the proposed action.

For alternatives that reduce the size but not the land use mix of the proposed action, it may be possible to scale down the proposed action's trip generation projection and then pro-rate the findings of the traffic and parking analyses accordingly. Yet, while the scaling down of volumes may be appropriate, the pro-rated evaluation of vehicle delay time and other level of service analyses may not. It is generally possible to reanalyze just the locations determined to have significant impacts under the proposed action and report these findings along with the overall trip reduction that would occur under the alternative.

A more comprehensive approach would be to evaluate a set of analysis locations that includes several or all significant impact locations and report the number and percentage of significant impacts likely to be avoided. This may be especially appropriate for proposed actions with extensive study areas and with a substantial number of projected significant impacts. For example, a proposed action with a study area encompassing 100 traffic intersections analyzed for two different build years within a multiphase build-out, which is determined to have 45 significant impact locations in one build year and 30 in the other, need not reanalyze all of the 75 significant impact conditions. It may be possible to analyze a smaller, yet representative, set of significant impact locations (say, the most impacted 15 of the locations), reanalyze those for the two build years, and project the findings into the likely number of significant impacts that would remain overall under the alternative.

For alternatives that alter the mix of land uses within the proposed action or replace a more intensive trip generator with another less intensive trip generator, it would generally be necessary to first quantify the magnitude of changes in the projected trip generation by travel mode for the peak analysis hours, and then determine the likelihood that new impacts could be created from those determined for the proposed action. Afterwards, the technical analysis approach could follow the guidelines provided immediately above.

For alternatives that contain physical design changes that alter access and circulation patterns, the analysis would evaluate the likely access routes expected under the alternative, and where these changes would positively and adversely affect traffic conditions. If this review indicates that traffic increases would occur along routes and at locations that likely will not be significantly impacted, this evaluation is documented. If it encompasses locations that have not been analyzed earlier in the EIS, and it is readily apparent that conditions there are not currently problematic nor are they likely to be problematic, that evaluation would suffice but is reported. If this evaluation cannot be made with a reasonable degree of certainty, other available sources of data would be sought to make a preliminary evaluation. If this preliminary evaluation indicates that problematic levels of service currently exist, or that significant impacts may occur in the future with background growth and the project-generated trips factored in, these findings would be documented based on the data at hand.

In general, the evaluation of alternatives documents the following:

- Would the alternative result in increased or decreased trip making by travel mode during the peak analysis hours? This finding is typically quantified.

- Would the alternative result in the reduction or elimination of significant impacts, and by what amount? It is preferable to determine whether all significant impacts would be avoided or reduced under the alternative, but for very large-scale proposed actions a representative set of significant impact locations may suffice as long as the technical analysis can present its conclusions in a comparably confident manner to that of the proposed action. An assessment of the implications of the analyses on this representative set of locations is presented for the overall study area.

- Would any new significant impacts be expected to occur under an alternative? This would be especially germane for alternatives that alter travel patterns within the study area.

700. Regulations and Coordination

710. REGULATIONS AND STANDARDS

There are no specific regulations governing the conduct of traffic and parking analyses. Therefore, the procedures and methodologies that are defined in this Manual are intended to provide assistance in the structuring and conduct of transportation analyses for environmental assessment.

720. APPLICABLE COORDINATION

Lead agencies should be aware that it may be necessary to seek approvals for mitigation measures from agencies that would be responsible for implementing those measures. In these instances, the lead agency should confer with the appropriate agencies. These agencies include the NYCDOT for traffic, parking, and goods delivery analyses. It is also advisable to confer with the DCP regarding its policy guidelines. It is also important to note that coordination with the analytical needs of other environmental categories (e.g., air quality, noise, neighborhood character) may be needed; other sections of this Manual should be referred to regarding those needs.

730. LOCATION OF INFORMATION

Much, but certainly not all, of the information needed to conduct the traffic and parking analyses may be available within the technical libraries and files maintained by City and State agencies. Although it is likely that a significant amount of data will need to be collected via field surveys and traffic counts, contact should be made with OEC, NYCDOT, DCP, and other agencies that may possess information that would be helpful and could save time and resources. In some cases, the traffic analyses may be improved through the use of a specific set of available data, rather than new counts or surveys. This may be true, for example, where a recent similar study has been completed in the same or neighboring area, and it is important for the data and findings of that study and the analysis of the proposed action to be consistent.

An initial listing of the location of primary sources of available traffic and parking data is presented below, and followed with an indication of those technical areas in which original research or surveys are often required. This list may be revised or augmented from time to time.

731. Sources of Available Traffic Data

- EISs and EASs that contain original volume or survey data that are reasonably recent enough to be valid for the area surveyed. It is strongly preferred that traffic count data not be more than three years old at the time the draft EIS is certified as complete. It may be possible to use somewhat older data, but only for areas that have undergone

very little change and for which the data still validly represent conditions in the area.

Sources: For OEC, 52 Chambers Street, Manhattan; for DCP, 22 Reade Street, Manhattan; for DEP, 59-17 Junction Boulevard, Corona, Queens; and for NYCDOT, Traffic Planning Division, 40 Worth Street, Manhattan.

- Traffic studies with original volume or survey data that satisfy the guidelines described above.

  Source: NYCDOT, Traffic Planning Division, 40 Worth Street, Manhattan.

- NYCDOT 24-hour automatic traffic recorder (ATR) counts or other intersection counts, with the same time frames noted above.

  Source: NYCDOT, Traffic Planning Division, 40 Worth Street, Manhattan.

- Bridge and tunnel volume information, including peak hour volumes and growth trends, which may help in developing trend line projections and understanding seasonal fluctuations in traffic volumes.

  Source: NYCDOT, Traffic Planning Division, 40 Worth Street, Manhattan.

- NYCDOT Truck Regulations, which define the designated truck routes to be used for traffic analyses.

  Source: NYCDOT, Traffic Planning Division, 40 Worth Street, Manhattan.

- NYCDOT signal operations information, which provides signal phasing and timing information needed to conduct the traffic analyses.

  Source: NYCDOT, 34-02 Queens Boulevard, Long Island City, Queens.

- NYCDOT parking regulations inventory, which provides a computer listing of all approved parking regulation signs throughout the City, for use in the traffic analyses should field surveys indicate that signs have been vandalized or stolen.

  Source: NYCDOT, 28-11 Queens Plaza North, Long Island City, Queens.

- Institute of Transportation Engineers (ITE) *Trip Generation Manual* (Fifth Edition, 1991), which provides a comprehensive summary of trip generation rates for determining the volume of trips that a proposed action will generate. These rates are based on nationwide, rather than local, surveys which may not be appropriate for New York City conditions in many cases.

  Sources: NYCDOT, Traffic Planning Division, 40 Worth Street, Manhattan; or ITE Headquarters, Washington, D.C.

- Trip generation and temporal distribution data published in *Urban Space for Pedestrians* by Pushkarev & Zupan (1975).

  Source: NYCDOT, Traffic Planning Division, 40 Worth Street, Manhattan.

It is also entirely possible, and generally quite likely, that additional surveys or original research will be needed to provide either the most up-to-date representation of conditions where available data are too old to be used or where the data required simply are not available. Moreover, recently collected original survey data are typically preferred, providing they are obtained in a proper manner and reflect the specific nature and geographical setting of the proposed action.

732. Sources of Available Parking Data

- EISs or EASs that contain parking inventory or occupancy information that is reasonably representative of current conditions.

  Sources: OEC, DCP, DEP, or DOT, as cited above.

- Parking studies that contain such data.

  Source: NYCDOT, Traffic Planning Division, 40 Worth Street, Manhattan, as cited above.

- NYCDOT parking regulations inventory.
  Source: NYCDOT, 28-11 Queens Plaza North, Long Island City, Queens.

- ITE *Parking Generation Manual*, which provides the maximum parking supply needed to serve a proposed land use. As discussed earlier for trip generation data, it should be noted that data contained in the *Parking Generation Manual* is based on nationwide sources of survey data that may not be fully appropriate in New York City.

Sources: NYCDOT, Traffic Planning Division, 40 Worth Street, Manhattan; or ITE headquarters, Washington, D.C.

- Parking capacities and licensing information.

  Source: New York City Department of Consumer Affairs, 80 Lafayette Street, Manhattan.

P. Transit and Pedestrians

100. Definitions

The objective of the transit and pedestrian analyses is to determine whether a proposed action can be expected to have a significant impact on public transportation facilities and services and on pedestrian flows. In particular, these analyses can address the following major technical areas:

- *Rail and subway facilities and services*, including the capacity of subway lines (known as "line haul" capacity), station platforms, stairwells, corridors and passageways, token booths/control areas, turnstiles, and other critical station elements to accommodate projected volumes of passengers in the future with the proposed action in place.

- *Bus service*, including the ability of existing routes and their frequency of service to accommodate the expected level of bus demand without overloading existing services. Franchise bus routes and private carriers are generally not included in these analyses, but may be included if they are operating on a regular basis.

- *Pedestrian flow and conditions*, including the capacity of sidewalks, crosswalks, and intersection corners to process or store the volume of pedestrians expected to be generated at specific locations by the proposed action.

Specific methodologies, databases, and procedures that can be used to analyze these technical areas have been developed and are presented in this section of the Manual. As cited in the previous section on traffic and parking, there are some interrelationships between all of these transportation systems—traffic, parking, transit, and pedestrians—that may need to be reflected in the analyses.

It is also possible that analyses of ferry service and the movement of pedestrians to and from ferries may need to be conducted for proposed actions that may include a ferry component or be expected to significantly impact ferry operations. The potential need for such analysis is generally less likely to occur than it is for subway, bus, and on-street pedestrian flow analyses. The assumptions and methodologies available to analyze ferry systems are generally similar to those used for subway and pedestrian analyses.

200. Determining Whether Transit and Pedestrian Analyses are Appropriate

It is possible that detailed transit and pedestrian analyses may not be needed for low- or low- to moderate-density proposed actions in particular sections of the City. Before undertaking any analyses, refer to Table 30-1 in Section 30 on traffic and parking to determine whether *any* numerical analyses would be appropriate. If the proposed action would result in development less than the levels shown in Table 30-1, further analysis will likely not be needed for transit and pedestrian analyses, either, except in unusual circumstances.

However, if development expected under the proposed action exceeds the minimum thresholds indicated in Table 30-1, a preliminary trip generation analysis typically should be conducted to determine the volume of transit and pedestrian trips expected to be generated during the peak hour. The methodologies available for use in determining transit and pedestrian trip generation are presented later in this section. In general, it will be necessary to either: a) utilize available trip generation rates for the type of use proposed and available modal split characteristics for the site of the proposed action; or b) obtain these data via new surveys at a comparable facility in the same (or comparable) part of the City.

According to general thresholds used by the Metropolitan Transportation Authority (MTA), if the proposed action is projected to result in fewer than 100 peak hour rail or bus transit riders, further transit analyses have not typically been required and are unlikely to be needed since the proposed action is considered unlikely to create a significant transit impact. It is also possible that higher transit trip projections would not be expected to impact transit services, especially for stations or bus routes that are not heavily patronized today. Should the projected transit ridership be deemed clearly unlikely to produce significant impacts, this finding should be documented and further analyses would not be needed. However, proposed actions that affect central business districts or already congested subway lines or stations or bus routes have at times been found to have transit impacts even when the projected number of new riders is less than 100. If the proposed action might have such an impact, further analysis may be appropriate. Consultation with the MTA may be necessary if potentially significant impacts could occur. For programmatic actions that affect more than one neighborhood, the 100-rider threshold would be applied on a per-neighborhood basis.

Regarding pedestrian analyses, quantitative studies have sometimes been performed for proposed actions

that would result in residential or office projects that are 50 percent greater than the levels identified in Table 30-1 of Section 30. This is typical for proposed actions located near already congested intersections, sidewalks with a sizable amount of street furniture, narrow sidewalks, long traffic lights, or active subway entrances. However, in some cases, it is possible that actions resulting in developments substantially above the Table 30-1 thresholds would still not significantly impact pedestrian facilities and therefore not require further analysis. One example of such a case would be a cinema in a shopping center where there are no crosswalks or sidewalks to be analyzed.

For both transit and pedestrian analyses of a proposed action, the preliminary trip generation analyses—including relevant assumptions and findings vis-a-vis significant impact potential—should typically be documented, including the rationale used in determining whether impacts would or would not be expected to occur.

300. Assessment Methods

This part of the transit and pedestrian section provides background information on each of the key components of the analyses to be conducted, the reasons why the analyses would be appropriate and guidance regarding the extent of the analyses needed, and specific methodologies available for use. Discussions of factors to be considered in determining significant impacts, the approach to identifying and evaluating appropriate mitigation measures, and approaches to developing alternatives that reduce or avoid impacts follow. For proposed actions requiring the preparation of an EIS or EAS, it is important that facilities to be analyzed, assessment methodologies, and technical assumptions all be outlined and documented as much as possible.

310. STUDY AREA DEFINITION

The first step in preparing for and conducting the transit and pedestrian impact analyses is the definition of the specific physical locations and facilities to be studied. Guidelines are presented below.

311. Rail Transit Study Area

For the analysis of subway and rail facilities, the study area relates more to specific lines and stations proximate to the site than to a physical area or to intersections, unlike the traffic analysis. For the subway system, the closest station to the proposed project site would be studied for each line serving the site, provided that station is within ½ mile of the project site. That is, for example, for a 42nd Street site along Ninth Avenue in Manhattan that is served (within ½ mile) by the 42nd Street stations of the A/C/E lines, the 1/2/3 and N/R lines, and the D/F lines, each of these stations would be included in the rail transit study area. Should a proposed project site be served equally well by two different stations along the same line, it is possible that both stations may need to be studied. The extent to which subway riders would travel to the site should be determined, by direction, to identify which of the two stations could potentially be significantly affected.

The rail transit study area encompasses the key elements within each station, e.g., its key stairwells, token booth/control areas, turnstile banks, platforms, and corridors and passageways, where applicable. It also typically includes an assessment of the line-haul capacity of the specific subway lines serving those stations, since it is possible that the stations themselves are adequately sized, but the subway cars are so overloaded as to preclude passengers from riding them comfortably or at all. Therefore, both the stations and the overall lines themselves are analyzed. For programmatic actions that affect several neighborhoods, it may be necessary to analyze the cumulative impacts of the action at key locations within the line-haul analyses or at major passenger transfer locations.

Commuter rail lines, such as the Long Island Rail Road or Metro-North, could also be the subjects of such analyses, depending on a proposed action's modal split and origin/destination characteristics. For example, should the LIRR station in Flushing be situated within ½ mile of a proposed project site, its key station elements and line-haul capacity might need to be addressed.

312. Bus Transit Study Area

The definition of the appropriate study area for bus services follows the same principles outlined above. First, a review of available bus route maps and field observations of the project site is conducted to identify the primary bus routes and stops serving the site. Based on this information and the likely entrance and exit points for the proposed project's buildings, a simple pedestrian routing analysis would indicate which bus routes and stops should be the focus of new trips. Bus routes generally coming within ½ mile of the project site may need to be addressed and the closest bus stop along each potentially affected bus route would be studied.

The bus analyses may need to cover the queuing of bus passengers waiting at the bus stops where this is currently a problem. It also addresses the number of

riders on the bus when it arrives and leaves the bus stop and at the maximum load point on the route. Thus, the analysis will determine whether the number of bus riders generated by a proposed action would cause overloading on the buses serving the site, either at the key bus stops right next to the project site or at other critical bus stops away from the site. This latter piece of information is important because the project under study may be located adjacent to the first stop on a bus route's morning run and so will not cause any overloading at that stop. On the other hand, passengers used to getting on the bus at the next stop (or some other subsequent stop) and getting a seat or comfortable standing room at that stop may no longer have that seat or standing room and thus could potentially be impacted.

313. Pedestrian Study Area

The pedestrian studies consider several elements, such as the sidewalks, crosswalks, corner reservoirs at intersections where pedestrians wait for a green traffic light enabling them to cross the street, and other potentially key pedestrian paths.

To determine the appropriate study area, the key question is: what are the routes pedestrians would use going to and from the proposed project from subway stations, bus stops, and parking facilities being studied? The analysis would first trace through these routes to note which are likely to be the most heavily used. Those routes and related sidewalks, crosswalks, and corner reservoirs become the focus of the pedestrian studies.

Since the area that could potentially be subject to evaluation may be large, the initial study area is typically defined as being, at a minimum, the sidewalks, crosswalks, and corner reservoirs approaching the four corners of a single-block project site, and the same pedestrian elements along the most critical route to the site from the major transit systems and parking facilities serving the site (but not all pedestrian routes to the site). For example, the pedestrian analysis for a proposed office building in Lower Manhattan would consider the four corners of the office site as well as the major elements en route to the site from the closest subway stations reasonably expected to be used, but not necessarily all subway stations and bus stops serving the project site.

Defining the pedestrian study area is not an exact science and will call for considerable judgment in defining the paths and elements most potentially subject to significant impact. As a very general guideline, it is likely that the pedestrian analyses will encompass at least the four corners of the site, and generally not more than an additional 5 to 10 pedestrian elements away from the project block.

If the proposed action encompasses a multiblock site, it may be appropriate to study not only the four corners of the site, but also any internal corners and elements along which pedestrian activity is expected to be most intense and along which significant impacts could occur. These elements may include the internal routes from proposed parking facilities or subway station entrances to major building entrances, routes to project open space expected to attract significant pedestrian activity, or other pedestrian elements.

For a programmatic action for which the location and densities of specific buildings may not be known, it may be possible to consider a typical block and a maximum amount of proposed density on that block as a potential indicator of significant impact potential. The findings of this type of analysis would need to be documented and put into perspective in the environmental assessment in terms of its reasonable worst-case assumptions for analysis purposes and its meaning vis-a-vis the study area as a whole.

320. ANALYSIS OF EXISTING CONDITIONS

Once the study areas have been defined, the analysis of existing conditions becomes the building block on which all impact analyses are based. The objective of the existing conditions analysis is to determine existing volumes, pedestrian and passenger flow patterns, and levels of service (a measure of congestion) to provide a baseline from which future conditions can be predicted. The definition of existing conditions is important because it is a reflection of activity levels that actually occur today as opposed to future conditions, which require at least some projection.

The guidelines provided for the existing conditions analyses are discussed separately below for rail transit, bus transit, and pedestrians. In some cases, surveys and analyses may overlap in two or more of these technical areas or the traffic analyses, so coordination and understanding of the nature and extent of surveys to be conducted and technical assumptions to be made may be necessary between the various analyses. Potential sources of trip generation and modal split information needed for all technical transportation analyses are described in the previous section on traffic and parking.

321. Existing Rail Transit Conditions

The existing rail transit conditions analysis identifies the rail and subway lines serving the project site, the frequency of service provided, and ridership and

levels of service that exist at the current time. For sites that are well-served by transit, these will include lines and stations within a convenient walking distance. For other project sites not as well-served by transit, it is advisable to identify the closest rail facility, providing that a significant number of people would use transit to reach the site and then access the site from the station via bus or available taxi services.

The analysis of existing rail transit conditions entails the assembly and/or collection of ridership data and pedestrian flows through the stations to be analyzed, the determination of the capacity and levels of service of the station elements that need to be analyzed, and an evaluation of the overall line-haul capacity of the routes serving the site.

321.1. Determination of the Peak Hour for Analysis Purposes

The first step in the analysis of existing conditions is the determination of the peak travel hours to be analyzed. For most proposed actions, the peak analysis hours will be the same as the peak travel hours already occurring on affected subway lines—i.e., specific 1-hour periods within the AM and PM rush hours. For proposed actions different than the most typical residential or commercial actions, it is possible that analysis at other times of the day and/or on weekends could be called for. A major retail project, for example, may need to be analyzed for weekday midday conditions and on weekends. A proposed sports arena or concert hall may also require an analysis for a weeknight event, a Friday night or Saturday night event, and a weekend afternoon event if it is expected to significantly use nearby transit facilities and/or produce high volumes of pedestrians at critical street locations.

321.2. Assembly and Collection of Passenger and Pedestrian Volumes Within Stations

Available data can be used if there have been no major changes in nearby land uses or transit services that would have significantly affected transit usage since the data were collected. However, most of the data needed to conduct the rail transit analyses will generally need to be newly collected. It is usually appropriate to collect new pedestrian counts in the subway and rail stations to be analyzed for a given action, along with counts of riders lined up to purchase subway tokens, since these data are generally not available unless the station in question has previously been analyzed as part of another project's EIS or by the MTA as part of a separate study. It is also generally appropriate to observe pedestrian movement patterns through the station and along critical platforms simultaneously with the counts. Data that do not need to be newly collected include turnstile registration counts that provide the number of riders entering the subway system by turnstile location for each station, although this number can also be observed by surveyors from the turnstiles themselves at the various stations; and the line-haul volume of riders per line at various checkpoints along each route. These data can be obtained by contacting the MTA or the New York City Transit Authority (NYCTA).

New counts may include any or all of the following, depending on whether these elements are part of the transit study area:

- Up and down stairwell pedestrian counts. Typically, these counts should be taken in 15-minute increments to be used in accepted capacity analysis methodologies, which determine level of service for the peak 15 minutes of flow.

- The number of persons waiting at token booths to purchase tokens only if token booth lines are an existing or anticipated problem. This is the case primarily for major stations observed to persistently have long waiting lines during peak hours. A few examples of this include the token booth at the south end of the E train station at Chambers Street, and the main token booth of the 1, 2, and 3 lines at 34th Street at the northeast corner of the LIRR concourse. Issues to be analyzed here could include the amount of remaining physical space available for pedestrians, potentially excessive waiting times, both, or others.

- The number of persons passing through the turnstiles at stations, where queues and delays are an existing or anticipated problem and where significant impacts may occur. Observations of two-way flow are made since this information is needed to conduct the subsequent capacity analysis of the turnstile. These station elements are included in the study area generally only if existing conditions are problematic and likely to deteriorate in the future.

- The volume of pedestrians along key corridors or passageways within the station or connecting the station with other stations or on-street uses, if these elements have been identified as potentially significant impact locations within the study area. Examples of these include the passageway connecting the BMT Pacific Street station and the IRT Atlantic Avenue station in Brooklyn, and the Roosevelt Passageway connecting the main concourse

area of Grand Central Terminal with exits to the street at the northwest corner of the terminal.

- The nature of queuing and walk movements on station platforms when platform congestion is a current problem or is identified as a potential problem in the future.

Each of these counts and observations are conducted over the course of the full peak hour in 15-minute increments (or in 5-minute increments for locations experiencing very short duration/high peaking characteristics, e.g., major rail terminal stairways). The only exception here relates to the platform surveys, which are observations rather than discrete passenger counts.

Many of the guidelines for appropriate survey days defined for new traffic data collection (see Section 30) are applicable here as well. Transit station counts and surveys should not be taken on days when activity levels are unusually low, and they should generally be taken on a Tuesday, Wednesday, or Thursday for conventional weekday peak hour analyses. With the availability of daily turnstile registration data, however, it is not necessary to conduct station counts for more than one day. To determine whether the one day surveyed in detail represents a typical day for that station, it is advisable to obtain a full week of registration counts and review them. If the day does not appear typical, adjustments to the survey data are made.

Counts typically should not be taken on days when there are either breakdowns in transit service or a major event under way in the City that could significantly affect train ridership. For example, the presence of a transit strike, not only to basic subway service but potentially also to local private bus operators, would obviously affect ridership patterns. Cutbacks in subway service due to local track rehabilitation may also alter ridership on nearby lines as well as the line directly affected. Prior to setting up for the count program, it is appropriate to determine whether there is anything happening that would alter a day's surveys from being typical.

Except for a few cases, it is generally not necessary to balance pedestrian flows among the various elements within stations. Exceptions to this may include areas where a substantial amount of activity occurs at elements in close proximity to each other, where it would be helpful to understand the relationship between flows. One example of this, again, is the passageway connecting the BMT Pacific Street and IRT Atlantic Avenue stations in downtown Brooklyn, where consistently high movements between the various stairwells and the passageway are best depicted via a pedestrian flow map.

321.3. Analysis of Station Element Level of Service

The analysis of conditions at stations entails a determination of the capacities of the stairwells, corridors, turnstiles, and other elements to be analyzed, coupled with a comparison of these capacities with the volume of passengers/pedestrians using them, to produce the station element's level of service (LOS).

Information regarding the analysis of station element capacities is detailed within the NYCTA's *Station Planning and Design Guidelines* (December 3, 1990), key excerpts of which are presented below (refer to the original document for a full review). If it is likely that mitigation measures will be needed for a given proposed action, it is advisable to contact the MTA to help ensure that the proper station elements are being addressed prior to the start of the analyses.

The NYCTA *Station Planning and Design Guidelines* provide the following maximum theoretical capacities for station elements:

- Regular turnstiles:
  40 persons per minute for one-way turnstiles
  32 persons per minute for two-way turnstiles (assuming 20 percent reduction for cross-traffic)

- High entrance turnstiles:
  20 persons per minute

- Exit gates:
  50 persons per minute for 3-foot wide gates
  75 persons per minute for 4-foot wide gates

- High revolving exit gate:
  30 persons per minute

- Stairs:
  1,000 persons per hour per foot of width in the *up* direction
  1,330 persons per hour per foot of width in the *down* direction (assumes one-third faster movement than the up direction)

- Passageways:
  2,000 persons per hour per foot of width in the *up* direction (assumes a slope of up to 5 percent)

- Ramps:
  1,500 persons per hour per foot of width in the *up* direction (assumes a slope of up to 5 percent)

- Escalators:
  For a speed of 90 feet per minute (or 68 treads per minute), three persons every two treads (in persons per hour) for a double, or 4-foot wide, escalator

These capacities represent maximum theoretical values, which do not reflect preferred pedestrian flow conditions. In computing the capacity of some station elements, some adjustments may be needed. For example, it is necessary to consider the *effective* width (and not the full width) of a station element, which is the clear space between two points—i.e., the actual width less the clearance space allowed for obstructions, such as handrails, pipes, signs, etc. The effective width of a walkway is based on the narrowest point minus 2 feet to account for pedestrian behavior, where people leave a buffer between themselves and a wall of obstruction. Effective widths of stairwells are assumed to be 1 foot less than the actual width to account for handrails and similar obstructions.

An additional adjustment needs to be made to reflect the reduced capacity available on a facility when pedestrians are moving in opposite directions. Counterflow traffic results in pedestrian "friction" that reduces the effective width of a facility for passenger flows. When pedestrian flow is fully one-way, there is no need for an adjustment. When one-half to two-thirds of the pedestrian flow is in one direction, capacity is reduced by 10 percent. When more than two-thirds of the pedestrian flow is in one direction, a 20 percent reduction to capacity is incorporated.

Stairways, Corridors, and Passageways. In evaluating these facilities, the methodology of determining level of service consists of identifying the peak 15-minute volume and dividing it by the service capacity considered desirable by the NYCTA. The NYCTA capacity criteria cited above and adjusted for their effective widths are used. The resulting volume-to-capacity, or v/c, ratio is then compared with a scale that identifies level of service within a range of v/c ratios.

Levels of service for stairways, corridors, and passageways presented below are based on guidelines developed by John J. Fruin in *Pedestrian Planning and Design* (1971) that reflect the pedestrian movements and the amount of area available for those movements. Overall, there are six levels of service, which reflect the amount of area occupied by pedestrians. The difference between each level is based on the freedom to choose walking speed, the ability to bypass slower moving pedestrians, and ease of contraflow movements at pedestrian traffic concentrations.

- At LOS A and B, there is sufficient area to allow pedestrians to freely select walking speed and bypass slower-moving pedestrians. When cross flow and reverse flow movement exists, minor conflicts may occur. There are no severe peak concentrations. V/C ratios for LOS A range from 0.00 to 0.45, while for LOS B they range from 0.45 to 0.70.

- At LOS C, pedestrian movement is fluid although somewhat restricted. It provides sufficient room for standing without personal contact. Circulation through queuing areas, however, will require adjustment to walking speed. V/C ratios range from 0.70 to 1.00.

- At LOS D, walking speed is restricted and reduced. Reverse flow and cross flow movement is severely restricted due to congestion and difficulty in bypassing slower-moving pedestrians. These conditions are common in many Manhattan locations during peak periods and represent somewhat congested conditions, with v/c ratios ranging from 1.00 to 1.33.

- LOS E and F represent severe congestion, with LOS E v/c ratios ranging from 1.33 to 1.67. Walking speed is restricted and there is insufficient area to bypass others and contraflow movement is difficult. LOS F is "bumper-to-bumper" pedestrian flow, with forward progress achievable only through shuffling.

It is very important to emphasize here that although both traffic analyses and transit and pedestrian analyses use the term "level of service" to portray flow or circulation conditions, the definition and meaning of level of service for one is not equivalent to the same level of service for the other. That is, LOS D for traffic flow, for example, does not have the same meaning nor connotation vis-a-vis acceptability as does LOS D for pedestrian flow or spatial needs.

The Transit Authority's minimum standard for pedestrian conditions has traditionally been established as the breakpoint between LOS C and LOS D, at a v/c ratio of 1.00, also referred to as LOS C/D. Thus, LOS C/D is used to determine the design capacity of critical elements during peak travel hours.

The quantification and determination of level of service is based on the flow rate of pedestrians (in pedestrians per effective foot of width per minute, or PFM), as follows:

For stairways:

LOS A (Unrestricted)	5 PFM or less
LOS B (Slightly restricted, no impact on speed)	5-7 PFM
LOS C (Speeds reduced, difficult to pass)	7-10 PFM
LOS D (Restricted, reverse flow conflicts)	10-13 PFM
LOS E (Severely restricted)	13-17 PFM
LOS F (Many stoppages, no discernible flow)	17 PFM or more

For corridors and passageways:

LOS A (Unrestricted)	7 PFM or less
LOS B (Slightly restricted)	7-10 PFM
LOS C (Restricted, but fluid)	10-15 PFM
LOS D (Restricted, necessary to continually alter walking)	15-20 PFM
LOS E (Severely restricted)	20-25 PFM
LOS F (Forward progress only by shuffling, no reverse movement possible)	25 PFM or more

One example is provided for illustrative purposes. For a stairway that is 6 feet wide and experiences one-third of its total flow in the opposite direction (i.e., a friction factor of 0.90), the hourly processing capacity of the stairway would be determined by multiplying the LOS C/D stair processing rate of 10 PFM times 60 minutes per hour, or 600 pedestrians per foot per hour. This would then be reduced by multiplying this number (600) by the stairway's effective width of 5 feet (6 feet less 1 foot to account for handrails) and 0.90 for contraflow friction. This would yield an hourly stair processing capacity of 2,700 pedestrians per hour. Fifteen-minute processing rates would simply be obtained by taking one-quarter of this hourly rate, or 675 pedestrians per 15 minutes. If the recorded volume of pedestrians at this stairway is 540 persons per 15 minutes, the resulting v/c of 0.80 would indicate that the stairway is currently operating within acceptable LOS C. If the recorded volume was 940 pedestrians, its v/c of 1.40 would indicate unacceptable LOS E conditions. For the analysis of a 10-foot station corridor, the same procedure would be used, with the single substitution being the LOS C/D processing rate of 15 PFM. Therefore, the following formulas can be used.

For stairways:

$$v/c = \frac{V}{150WeFF}$$

where V = 15-minute pedestrian volume
We = effective width of stairs
FF = friction factor

For corridors:

$$v/c = \frac{V}{225WeFF}$$

where We = effective width of the corridor

Platforms. The time-space methodology can be used to determine level of service for platform conditions. This methodology is defined in *Pedestrian Time-Space Concept* authored in 1986 by Gregory Benz, which built on the pedestrian research and analysis work conducted earlier by Mr. Fruin. Both bodies of work on pedestrian activity recognize that people require varying amounts of space and time for walking or standing. The amount of space available affects people's comfort level and, more important, their ability to circulate and move about the platform. These pedestrian activities are also classified through a range of levels of service, LOS A through LOS F.

The time-space methodology considers pedestrian facilities as dynamic zones for moving through and waiting in. Pedestrians can either walk through a certain zone on the platform or wait within it; both types of activities require time and space. The boundary between levels of service C and D (i.e., LOS C/D) is considered acceptable; it is associated with a volume-to-capacity ratio of 1.00.

The definition of zones to be analyzed for a given project involves observations of platform layouts and how pedestrians exit the trains, walk along them to the stairwells, or wait for the next train. Consideration of the entire platform as a single zone would not be correct, since platforms have sections that are very active and others that are seldom used or used with no apparent congestion problem. This is critical to the overall analyses since the creation of zones that are too large could understate potential problems. On the other hand, the definition of zones that are too small—e.g., generally less than one subway car length—could depict

conditions that are worse than actually exist. Considerable judgment is needed.

In determining platform LOS, available time-space is compared to required time-space. The *available* time-space in each zone is determined by multiplying the area in each zone (in square feet) by the 15-minute analysis period. This total area is then reduced to account for space unused by pedestrians, such as the back edge of the platform wall and the area surrounding refuse containers, etc. The resulting area is the platform's effective area. The *required* time-space is a function of the volume of pedestrians walking through the zone within the 15-minute analysis period, plus the number of persons waiting in that zone during this period.

Initially, acceptable level-of-service C/D standards are used to calculate walk and queue space requirements of platforms. These are 7 square feet per person for standing pedestrians and 16 square feet per person for walking. In the event that available time-space does not meet the required amount, lower level-of-service standards (e.g., mid-LOS D, D/E, etc.) are used to recompute walk and space requirements. In this iterative fashion, the use of time-space procedures are used to determine the level of service for each zone under existing conditions.

For certain platform and stairwell conditions, it may also be appropriate to analyze the queuing of passengers at the foot or the top of problem stairwells. The analysis begins with observations when trains have unloaded their passengers and queuing begins to occur. The volume of passengers in the queue, and the length of time it takes for the queue to dissipate, are field-recorded.

Turnstiles. Levels of service for turnstiles are also described in terms of volume-to-capacity ratios, with acceptable conditions again defined by the NYTA as LOS C/D. For a regular turnstile with a one-way flow and a maximum theoretical capacity of 40 persons per minute, the LOS C/D capacity would be 24 persons per minute. The volume of passengers processed through the turnstile is compared with this capacity to determine the v/c ratio and level of service; any volume-to-capacity ratio greater than 1.00 signifies volumes beyond capacity and extended queues.

321.4. Analysis of Line-Haul Capacity and Level of Service

An analysis of line-haul capacity addresses the ability of trains to accommodate passenger loads. The analysis determines whether there is sufficient capacity per car per train to handle existing and projected future transit loads.

Line-haul capacity analyses are based on per-car practical capacity standards used by the MTA and NYCTA. The practical capacities of subway cars are as follows:

Car Length	Number of Seats	Practical Capacity per Car	Number of Cars per Train
51 feet	44	120	10*
60 feet	50	180	10
75 feet	75	220	8

* Generally 10 cars per train. The IRT No. 7 operates with 11-car trains, and the No. 3 line operates with 9-car trains.

The line-haul capacity of a given subway line is determined by multiplying the number of scheduled trains per hour by the number of cars per train and times the practical capacity per car. The volume of riders passing a given point can then be compared with the line haul capacity of the subway line. Another means of evaluating a line's conditions is to utilize the same information differently—that is, divide the volume of riders passing a given point by the number of train cars serving that point, and determine the passenger load per car. The resulting per-car passenger load can then be compared with practical capacity standards to determine the acceptability of conditions.

322. Existing Bus Transit Conditions

The analysis of existing bus transit conditions presents bus load level and loading conditions on the routes serving the site of the proposed action to determine whether or not there is capacity available to accommodate additional project-generated trips.

For the routes and stops identified as the bus transit study area, these analyses will entail the assembly and/or collection of bus ridership data at the bus stops most closely serving the project site and at the route's "maximum load point," and an analysis of bus load levels vs. their physical capacities. The bus transit analyses may also include an analysis of queuing and loading conditions at bus stops at the project site if they are currently characterized by lengthy lines of passengers waiting to board, which could be significantly affected in the future.

322.1. Assembly and Collection of Bus Ridership Data

Data may be obtained from the NYCTA (Surface Transit Operations) regarding the number of persons per bus at the peak load point on each route. In addition, field counts can help determine the average and maximum number of riders per bus as the bus arrives at and leaves the bus stop closest to the project site. These counts would be conducted on a typical day, as described earlier for the other traffic and transit analyses. These counts can be taken either by: a) getting on the bus and conducting a quick count of the number of riders; b) asking a dispatcher, if one is present at the bus stop (providing approval has been obtained from the NYCTA); or c) estimating the number of persons on the bus by a visual estimate from off the bus looking through its windows (often called a "windshield count"). If the windshield estimate method is used, care needs to be exercised that bus windows are not tinted, which would preclude the surveyor from getting an accurate reading from off the bus. The field count effort would also note the bus route number (at multiple-route bus stops) and the number of persons waiting at the bus stop and boarding and alighting from each bus.

322.2. Analysis of Bus Load Levels

The NYCTA generally operates two types of routes: feeder routes, for which most passengers have a common origin or destination; and grid routes, which are characterized by much on/off activity along the route and with many riders transferring to and from other routes. NYCTA's service guidelines permit somewhat heavier loads on feeder routes, while the grid routes require more frequent service to facilitate transferring at many locations and ease passenger movements within the bus itself.

During rush hours, buses on feeder routes are scheduled to operate up to a maximum of 70 passengers per bus at the maximum load point. Grid routes, which constitute 80 to 85 percent of all the local bus routes operated, are scheduled to operate at up to 60 persons per bus at the maximum load point.

Typically, the number of persons per bus at the maximum load point and at the bus stop closest to the project site are quantified and then compared with NYCTA standards so as to identify the extent to which bus capacity is utilized, overutilized, or underutilized under existing conditions. On/off activity are also be quantified and presented for general informational purposes.

323. Existing Pedestrian Conditions

The analysis of existing pedestrian conditions determines whether key pedestrian routes and corner reservoir areas expected to be traversed by pedestrians under the proposed action are currently operating at acceptable levels of service, and provides an overview of general pedestrian conditions within the study area.

323.1. Assembly and Collection of Pedestrian Counts

In general, the only source of available pedestrian count data and level of service analyses is previously completed, recent environmental assessments, since independent pedestrian studies are generally not prevalent. There are some exceptions to this in areas of the City with heavy pedestrian activity, and the Department of City Planning should be contacted regarding the availability of any pedestrian study reports.

As is the case for the other technical areas addressed previously, new pedestrian counts would also be conducted on a typical day and during representative peak hours, which generally also include the noontime hours, when pedestrian traffic is often heaviest. Traditionally, these counts have been taken on a single, typical day. Counts are taken over the course of the full peak hour and be recorded in 15-minute increments, since the level of service analyses to be conducted utilize a 15-minute analysis framework for their evaluations.

The pedestrian counts to be conducted depend on the pedestrian elements identified as constituting the pedestrian study area. They may include counts at intersection crosswalks, corner reservoirs at intersections where pedestrians queue up while waiting to cross the street, midblock sidewalk locations, and other important routes if such are applicable. Two-directional counts are needed to conduct the subsequent level of service analyses.

323.2. Analysis of Pedestrian Levels of Service

The *1985 Highway Capacity Manual* is the basic analytical tool used to analyze pedestrian conditions and should be referred to for detailed information on analytical procedures. For midblock sidewalk locations or other midblock walkways, the most important parameters in the analyses are the volume of pedestrians passing a given point during the peak 15 minutes, total sidewalk width, and obstacles in the sidewalk. Pedestrian level of service standards—measured as the pedestrian flow rate per foot of width per minute (PFM)—are indicators of the quality of pedestrian movement and

comfort, and are defined in a density-comfort relationship reported as follows:

LOS A	(Unrestricted)	2 PFM or less
LOS B	(Slightly restricted)	3 to 7 PFM
LOS C	(Restricted, but fluid)	8 to 10 PFM
LOS D	(Restricted, necessary to continuously alter walking stride and direction)	11 to 15 PFM
LOS E	(Severely restricted)	16 to 25 PFM
LOS F	(Forward progress only by shuffling; no reverse movement possible)	greater than 25 FM

The midblock analyses determine both the average flow rate's level of service, as well as the "platoon" level of service, which usually occurs when transit vehicles release a large group of pedestrians in a short period of time, when applicable.

Street corners and crosswalks are also analyzed via the *1985 HCM* procedures, with pedestrian flow rate, effective street corner/crosswalk areas, and pedestrian signal timings comprising the most important analysis parameters. Level of service standards are measured in terms of square feet of space per pedestrian, as defined below, with the same definitions for LOS A through F as indicated for sidewalks and other walkways.

LOS A 130 or more square feet per pedestrian
LOS B 40-130 square feet
LOS C 24-40 square feet
LOS D 15-24 square feet
LOS E 6-15 square feet
LOS F less than 6 square feet

Crosswalk analyses are conducted for average pedestrian flow conditions over the 15-minute analysis period as well as for "maximum surge" conditions, i.e., the point at which the maximum number of pedestrians are in the crosswalk. This maximum surge condition usually occurs shortly after pedestrian signals change to green, when the lead pedestrians in opposing crossing platoons reach the opposite corner.

330. FUTURE NO ACTION CONDITION

The future no action conditions account for general background growth within or through the study area, plus tripmaking expected to be generated by major proposed projects that are also likely to be in place by the proposed action's build year. Background growth rates typically used in conducting the technical analyses are presented in this section of the Manual, as are the methodologies to be used in accounting for trips from expected development projects. In general, the procedures and approach used are similar to those reviewed previously for traffic analyses.

331. Background Growth Rates

For rail and bus transit analysis purposes, the MTA's Planning Department can be consulted for modeled projections that may be available on a per line, or possibly per station, basis. In the absence of such information for a given transit study area, the following annual growth percentages suggested for use in the traffic and parking analyses may be used or an independent estimate of a reasonable growth rate may be developed.

- Manhattan 0.50%
- Bronx 0.50%
- Downtown Brooklyn 0.50%
- Other Brooklyn 1.00%
- Long Island City 0.50%
- Other Queens 1.00%
- St. George (Staten Island) 1.00%
- Other Staten Island 1.50%

Future no action pedestrian analyses use either the traffic or the transit growth rates, depending on the nature of travel within the study area. For example, Midtown Manhattan pedestrian growth would be more closely linked to transit tripmaking and use its growth rate, while in an area like eastern Queens the traffic growth rate would be more appropriate.

332. No Build Development Project Tripmaking

In addition to the background growth rate that is applied evenly throughout the study area (i.e., at all intersections for the traffic analysis, at all subway station elements for the rail transit analysis), the analysis also accounts for trips to and from major development projects that are not assumed to be part of an area's general growth. The determination of whether a no build project is considered part of the general background or superimposed on top of the general background growth will call for considerable judgment, with the following guideline suggested:

- A no action project that generates less than about 100 peak hour transit trips should be considered as part of the general background. Two such projects, situated on the same block and generating 200 new riders at the same station, should generally not be considered as part of the background. For pedestrian analyses, this determination should follow the lead of the traffic and transit analyses.

There are several ways to determine the amount of tripmaking associated with a no action project. The best way is to use the trip projections cited in that project's EIS or transit analysis, if such exists. An alternative is to use the same methodologies described in the next section of the Manual on trip generation and trip assignment for build analyses.

333. Preparation of Future No Action Volumes and Levels of Service

Pedestrian flow maps and transit and pedestrian level of service analyses are prepared following the same methodologies outlined for the existing conditions analyses. Documentation of the analyses would provide for a full description of future no action conditions and include text and tabular comparisons of how conditions are expected to change from existing conditions in the future no action scenario.

This assessment should also account for any programmed transit or pedestrian network changes that could affect passenger/pedestrian flows or levels of service. For example, for subways, if the NYCTA has programmed the closure of a stairwell at a particular subway station or plans to implement an automatic fare collection (AFC) system at a station, the effects of such measures on station access and level of service would be accounted for in the no action analyses. In certain cases, a major transit initiative—such as the construction of a new terminal/station or an intermodal transfer facility—could affect subway, bus, and pedestrian trips.

340. ANALYSIS OF FUTURE ACTION CONDITION

The objective of these analyses is to determine projected future conditions with the proposed action in place and fully operational. These future action conditions are then compared with the future no action scenario to determine whether or not the proposed action would likely significantly affect the study area's transit and pedestrian facilities and require mitigation.

The assessment of projected future action conditions consists of a series of analytical steps, namely:

- *Trip generation*. The determination of the volume of trips generated by a project on a daily basis and during peak travel hours. The hourly distribution of a project's generated trips is also referred to as its "temporal distribution."

- *Modal split*. The determination of the percentage of all generated trips that would occur by travel mode. That is, how many trips would be made by auto, taxi, subway, bus, walk, or other modes.

- *Trip assignment*. The routing, or "assignment," of trips by each travel mode to specific streets and highways, parking facilities, subway lines and stations, bus routes, and sidewalks en route from their origin to their destination.

- *Capacity and level of service analysis*. The evaluation of conditions within the study area with project-generated trips superimposed on the future no action condition, as a representation of the projected future build condition.

Once these steps have been completed, a determination of significant impacts—based on a comparison of future action conditions with no action conditions and with thresholds of acceptability—can be made.

The technical guidelines used to make each of these analyses and determinations are described in Section 30 on traffic and parking. Key definitions and elements of that description pertaining to transit and pedestrian analyses are repeated in this section, although it is advisable to refer to Section 30 for a full review. Generally, the analyses of transit and pedestrians are performed in coordination with those of traffic.

341. Trip Generation

The trip generation analyses provide the estimated volume of *person* trips expected to be generated by the proposed action over the course of the entire day as well as during peak analysis hours. There has been considerable trip generation analysis work done in the City to date as part of EISs and other studies, so rates for certain land use types in specific parts of the City have been developed for use on previous projects. Table 30-2 in Section 30 presents a partial list of previously researched rates that may be used, as appropriate. Potential modifications to these rates are discussed in the section on traffic and parking.

For land uses not having previously researched trip generation rates, two courses of action are available. One would be to review similar land uses in the ITE *Trip Generation Manual* and modify those rates for the local New York City setting and modal split of the proposed action. The second would be to conduct trip generation surveys of the same land use in a comparable setting of the City. Additional guidelines are provided in Section 30.

342. Modal Split

Modal split analyses provide information on those travel modes likely to be used by persons going to and from the proposed action, including autos, taxis and car services, subways, buses, ferries, commuter rail, walking, and other modes. These modes are considered in terms of percentages—i.e., what percent of the total number of people traveling to and from the site would be via each mode. The modal split percentages are then applied to the hourly trip generation estimates to determine the volume of persons traveling to and from the site for each of the analysis hours by mode—by rail and bus transit, by private vehicle to nearby parking facilities, by walking, etc. It is then advantageous to summarize in a table the volume of trips by mode for each of the analysis hours, both as a tool to document the volume of trips generated and to facilitate the subsequent trip assignment task. It is important to remember that "walking" as the travel mode identified above refers to people who walked all the way from their starting point to the project site. People arriving at the project site by subway, bus, auto, and other modes must also walk to the specific building after getting off the subway or bus or after parking their car. Thus, the volume of pedestrian trips to be included in the pedestrian analyses must include all of these walkers as well.

Similar to the discussion on trip generation above, there is a substantial body of modal split data available within previous EISs and other databases, including the U.S. Census. For many combinations of land use types and geographical locations within the City, there are previously researched modal splits available for use (a partial list is presented in Table 30-3 in Section 30). For other combinations, there may be other sources of information that can be investigated, or the conduct of original surveys will be needed.

343. Trip Assignment for Rail and Bus Transit

This element of the build analysis entails the routing, or "assignment," of transit trips to the various lines and stations being analyzed. The first step is to determine the extent to which trips to the project site will be made from various parts of the metropolitan region. The best source of this information, if available, is origin-and-destination (O&D or O/D) data, or data about the beginning and end points of a trip. For certain parts of the City that have been studied or surveyed before, such data may be readily available. An example of this is Midtown Manhattan office space, for which there exists a body of information on what percentage of midtown employees typically come from each of the boroughs, New Jersey, Long Island, etc. This information has been derived either from the most recent U.S. Census or from other O&D surveys. The U.S. Census also contains information on where residents of individual census tracts work, which gives the same information for home-to-work trips, and which can be used.

As noted in the detailed guidelines for traffic assignments within Section 30, it is also possible to survey O&D patterns of a comparable type of site, similar to the types of surveys outlined regarding trip generation and modal split. Yet, it is also important to note that the O&Ds—or regional distribution—of transit trips can be very different from that for traffic activities. For example, a project located in Midtown Manhattan may draw 30 percent of its total trips, or even 30 percent of its transit trips, from the borough of Manhattan, but only 1 or 2 percent of its auto trips from that same borough since Manhattan residents are unlikely to drive to work in the same borough.

Once the regional distribution of transit trips is determined, the assignment of rail trips to specific subway lines (or subway and commuter rail lines) is conducted. This can generally be accomplished by reviewing the subway lines that are available in each borough to serve these travelers and then assigning the rail trips to the most logical routes. In cases where more than one subway line is available in a given area, appropriate percentages can be assigned to each of the lines.

Once rail trips have been assigned to particular lines and stations, the passenger arrivals and departures are then routed through the station to the exit or exits most likely to be used to access the proposed project site. This routing or assignment typically covers the various platforms, stairwells, passageways or corridors, turnstile banks, and token booth/control areas extending between the subway car and the street level. There may be several alternative stairwells or street exits that can be used, and the routing assignments should be based on the most reasonable, logical routes likely to be used. The presence of congestion on a given stairwell or through a given bank of turnstiles is less likely to affect a subway rider's movement through the station than a traffic "choke" point is likely to affect a motorist's decision on driving routes to their destination. Therefore, in general, the most direct paths are generally used for transit trips.

In assigning rail trips as part of the platform and line-haul analyses, such trips are generally not allocated evenly to *all* sections of the platform while awaiting the arrival of incoming trains, nor to *all* cars, but only to those platform zones and subway cars that can

reasonably be expected to be used. These platform and per-car assignments reflect the entry points to the station that would be used by project-generated trips, the location of stairwells to the platforms, and possibly even the destination of riders at the end of their trip.

A similar approach is used for bus trips. The analysis considers the particular routes stopping near the project site and assign bus riders to these routes in accordance with their general destinations. This analysis need not be as detailed as the traffic or rail transit analysis, and is generally less time-consuming. It is usually possible to review the general service areas of the various bus routes serving a project site (which are themselves often a very limited number) and make a general percentage assignment of bus travelers to the various routes.

344. *Trip Assignment for Pedestrians*

The trip assignment for pedestrians basically picks up where the traffic and transit assignments leave off. For the AM and PM peak hour arrivals and departures of persons to the project site by auto, taxi, and transit, pedestrian trips from parking facilities, subway or rail stations, and bus stops are traced to the main entrances of the site, and through the sidewalk, crosswalk, and corner reservoir areas that will be evaluated as part of the impact analyses. There may be additional all-walk trips that need to be assigned through the area, as well. The same guidelines that preceded this section also apply to pedestrians—the most logical walking paths are used.

For midday trips, it is more likely that pedestrian trips will focus on local eateries, shopping facilities, and other retail establishments. For this set of analyses, connectivity to parking lots and garages and to subway stations and bus stops will be far less pronounced. Therefore, a broader-brushed assignment of these off-peak pedestrian patterns can be made as part of the midday analysis.

345. *Preparation of Future Action Volumes and Levels of Service*

The build analyses continue with the preparation of pedestrian flow maps within subway stations and at the street level. Capacity and level of service analyses are completed, using the same guidelines described previously. Should the proposed action include design changes to subway stations or the alteration of pedestrian paths, their effect on flow patterns and capacities would be incorporated within the build analyses.

Findings of the future action analyses are presented in a clear tabular format that facilitates the subsequent comparison of no action and action conditions as part of the determination of significant impacts.

346. *Assessment of Construction Phase Impacts*

In addition to the assessment of impacts when the project is fully operational in its build year, the transportation analyses may also address projected impacts during a proposed action's construction phase. Because construction phase impacts are temporary in nature, they are typically analyzed in a primarily qualitative fashion. Therefore, the determination of construction phase impacts entails an abbreviated version of the impact assessment framework described above. It focuses on depicting the key locations that are likely to be impacted and the general magnitude and duration of the impacts expected, rather than on all potential impact locations analyzed within the regular Build analyses.

For pedestrian analyses, the extent to which any sidewalks will be closed or narrowed to allow for construction-related activity would be identified, along with a definition of how pedestrian access to adjacent land uses and through the area would be maintained. Such plans would also need to be approved by the Mayor's Traffic Construction Coordination Council (MTCCC), located at 51 Chambers Street in Manhattan. Should any bus stops or bus routes need to be relocated or subway station access be affected, such impacts are to be identified and also reviewed with the MTA and the New York City Department of Transportation (NYCDOT).

400. Determining Impact Significance

The comparison of expected conditions in the future with and without the proposed action in place determines whether any significant impacts, or changes in prevailing future conditions, are to be expected. In general, the determination of significant transit and pedestrian impacts must respond to several important questions:

- Would the volume of project-generated subway trips likely cause congestion, delays, or unsafe conditions on station stairwells, platforms or corridors, or through its turnstiles?

- Would the volume of project-generated bus passengers cause overcrowding either on buses or at key bus stops? Would it necessitate the Transit Authority's adding more service?

- Could the volume of pedestrian trips generated by the proposed action be accommodated on study area sidewalks and within its crosswalks and corners at key intersections?

The sections that follow provide current suggested guidelines for making this determination. In some cases, there may be more specific guidelines, such as in the operation of subway trains at their design limits. In other cases—such as pedestrian elements on the streets—more general guidelines are provided.

410. SIGNIFICANT RAIL TRANSIT IMPACTS

The determination of significant impacts differs for stairways, passageways/corridors, turnstiles, and platform conditions. The MTA is the agency in New York responsible for the implementation of transit mitigation measures, should they be needed. Therefore, the guidelines presented below are essentially those followed by the MTA at the current time, with some additional considerations noted. There may be cases where alternative assessments may be warranted to cover either unique conditions or alternative build analysis methodologies.

411. *Stairways*

The MTA has defined significant stairway impacts in terms of the number of inches of effective width needed to restore future no action conditions. Significant stairway impacts are typically considered to occur once the following thresholds are reached: for a build LOS D condition, a required widening of 6 inches or more is considered significant; for a build LOS E condition, 3 to 6 inches is considered significant; and, for build LOS F, a 1- to 3-inch widening is considered significant. Reference can be made to Figure 3P-1 to visualize incremental crowding conditions, especially at LOS E and F. If the build analyses show that less than 1 inch of widening is needed, this impact is not considered significant.

To determine the amount of widening required, the following formula should be used:

$$\frac{X}{We} = \frac{Vp}{Vna}$$

where X = required inches of widening
We = effective width in the no action
Vp = project-induced pedestrian volume
Vna = no action pedestrian volume

412. *Station Passageways and Corridors*

The criteria for determining significant impacts for station corridors and passageways are different than those defined above for stairways, since the width of corridors is considered less critical than the width of stairways that extend up to the train platform level (where safety considerations occur if backups there become significant). But, The overall definition, however, is the same—the number of inches of effective width needed to restore the no action condition. For corridors and passageways at LOS D, 12 inches of widening or more is considered significant; at LOS E, 6 to 12 inches is considered significant; and at LOS F, a 3- to 6-inch widening is considered significant (refer to Figure 3P-2 for illustrations on conditions at LOS E or F). If less than 3 inches is needed, this impact is not considered significant under MTA guidelines.

413. *Turnstiles*

Since a volume-to-capacity ratio of 1.00—at the threshold of levels of service C and D—is considered the theoretical capacity of a turnstile by the Transit Authority, any measurable increase in a turnstile's v/c ratio above that would begin to cause queuing and potentially constitute a significant impact.

414. *Platforms*

As with other station elements, the MTA guidelines define the objective of maintaining LOS C/D conditions along platforms. For platforms (and for station mezzanine or concourse levels, as well), there are two concerns—capacity for passenger movement and waiting, and passenger safety. However, platform widths and configurations are also the most difficult of the station elements to modify or enlarge.

At this time, there are no definitive MTA guidelines regarding acceptable/unacceptable conditions along platforms, mezzanines, etc. Level of service C/D conditions or better are sought and, considering MTA objectives, deterioration of future no action conditions from better than C/D to worse than C/D, or deterioration from no action conditions already expected to be worse than C/D may be considered potential significant impacts.

Significant impact conditions are disclosed to public sector decision-makers assessing the overall merits and concerns regarding the proposed action, along with a full description of what deterioration between or within given levels of service mean to passengers and train operations.

415. Line-Haul Capacity

In the area of line-haul capacity, there are also constraints on what service improvements are potentially available to the Transit Authority. The comparison of future build load levels per car with future no action levels would indicate the extent that ridership per car would increase. General guidelines are discussed below with the understanding that they may be superseded when official guidelines are established by the MTA.

First, any increases in per car load levels that remain within practical capacity limits are generally not considered significant impacts. However, projected increases from a no action condition within practical capacity to a build condition that exceeds practical capacity may be considered a significant impact, if the proposed action is generating five more transit riders per car. This is based on a general assumption that at practical capacity, the addition of even five more riders is perceptible.

420. SIGNIFICANT BUS TRANSIT IMPACTS

The build evaluations provide an analysis of projected load levels per bus at the closest bus stop to the project site and at the route's maximum load point, and determine whether this future load level would be within a typical bus's seated capacity or within its total capacity, or above total capacity. As previously noted, buses operating along feeder routes are scheduled to operate at a maximum load of 70 passengers per bus—their maximum seated-plus-standee load—at the bus's maximum load point. Buses operating along grid routes, which constitute 80 to 85 percent of all local bus routes, are scheduled by the NYCTA to operate at 60 passengers per bus at their maximum load point. According to current MTA/NYCTA guidelines, increases in bus load levels to above their maximum capacity at any load point is defined as a significant impact since it necessitates the NYCTA's adding more bus service along that route.

It may also be advisable to report other changes in conditions generated by the proposed action that are perceptible but that may not constitute significant impacts—for example, the loss of available seats, requiring patrons to stand, even if it would not necessitate the addition of buses to the affected route. This information can be useful to the lead agency in its assessment of an action's effects. Increases in bus load levels within *seated* capacity at either of the two analysis locations would generally not be considered significant impacts in any case. Increases in load levels from within seated capacity in the no action condition to above seated capacity (but within maximum capacity), should be identified without being cited as a significant impact. Although the proposed action in this case would cause some travelers to stand, it would not cause travelers to miss buses because they could not get on them, nor would it necessitate the NYCTA adding more buses to the line.

430. SIGNIFICANT PEDESTRIAN IMPACTS

The guidelines described below may be helpful in determining significant pedestrian impacts. The determination of a significant pedestrian impact is generally based on both comfort/convenience characteristics of pedestrian flow and safety considerations. As defined previously, pedestrian level of service D refers to restricted flow conditions for sidewalks and crosswalks and to "no touch" zones for corner reservoir areas, LOS E refers to severely restricted conditions for sidewalks and crosswalks and to "touch zones" for corner reservoir areas, and LOS F refers to conditions where movement is extremely difficult if not impossible. LOS D through F all, therefore, have implications regarding comfort and convenience; only LOS F would appear to have potential safety implications under normal conditions.

When evaluating pedestrian impacts, the location of the area being assessed is an important consideration. For example, sections of Midtown and Lower Manhattan have historically had a substantially higher level of pedestrian activity than anywhere else. Pedestrians there have, to some extent, become acclimated to and tolerant of restricted level of service conditions that might not be considered acceptable elsewhere. The guidelines that follow offer some sensitivity to local areas' current pedestrian usage levels.

For *corners and crosswalks* within the Manhattan central business district (CBD) and downtown Brooklyn, significant impacts may be considered for decreases in pedestrian area occupancies of 1 square foot per person under the build projection when the no action condition has average occupancies under 15 square feet per pedestrian (the threshold of LOS D and E). For crosswalks, maximum surge conditions should be used for assessing significant impacts. Increments of 1 square foot or more applied to no action conditions within LOS D may be perceptible, but not necessarily be considered significant impacts.

Elsewhere in the City, significant impacts may be considered for decreases of 1 square foot per person when the no action condition has average occupancies under 20 square feet per pedestrian (mid-LOS D). Increments of 1 square foot or more applied to no

action conditions within LOS D or any deterioration from LOS C or better to LOS D may be perceptible, but not necessarily significant impacts.

For *sidewalks and other midblock locations* within the Manhattan CBD and downtown Brooklyn, a significant impact may occur with an increase in the pedestrian flow rate of 2 pedestrians per foot per minute (PFM) over no action conditions characterized by flow rates over 15 PFM (the threshold of LOS D and E). Platoon conditions are used for assessing significant impacts. Increases of one to two PFM under this no action scenario may be perceptible, but not necessarily considered significant impacts. Also, increases of at least 1 PFM within mid-LOS D (a no action condition with 13 to 15 PFM) may also be considered perceptible, but not necessarily be considered significant impacts, since it would be "pushing" future build conditions closer to LOS D's threshold with LOS E.

Elsewhere in the City, a significant impact may be defined as an increase in the pedestrian flow rate of 2 PFM for no action conditions with flow rates of 13 PFM or more (mid-LOS D). Increments of one PFM may be perceptible, but not necessarily significant impacts.

It is also suggested that pedestrian analyses consider one additional criterion based on general experience, namely that projected pedestrian volume increases of less than 30 pedestrians within 15 minutes (i.e., one induced pedestrian trip every 30 seconds) at any pedestrian element analyzed would not typically be considered a significant impact, since that level of increase would not generally be noticeable.

500. Developing Mitigation

The identification of significant impacts leads to the need to identify and evaluate feasible and practicable mitigation measures, i.e., measures that mitigate the impact or return projected future conditions to what they would be if the proposed action were not in place. In general, the analysis begins by identifying those measures that would be effective in mitigating the impact and then proceeds to measures that may be less easily implemented only if the first set of measures are deemed insufficient. In doing so, care should be exercised that the implementation of a given measure not mitigate impacts in one area—either geographic or technical—only to create new significant impacts or aggravate significant impacts already projected elsewhere.

For example, for a significantly impacted stairwell from a subway station, stairwell widening could be appropriate mitigation, but such widening should not narrow the adjacent street-level sidewalk to where it does not have sufficient capacity to process pedestrians passing along it. Creation of a bus "lay-by"—where the sidewalk is cut into to provide an exclusive berth for buses stopping to pick up and drop off passengers outside of the main traffic stream—should also not reduce sidewalk width or corner reservoir area by an amount that creates significant impacts there.

Each of the separate transportation services and facilities need to be considered as part of a system, wherein changes in one could affect activity patterns and/or levels of service in another. This is a very important point that needs to be viewed comprehensively. It is possible that recommendation of a major new transit service—such as institution of ferry service at a new waterfront site—that is generally viewed as a major benefit would also have secondary impacts that need to be evaluated as to whether they are significant and themselves require mitigation. Would pedestrian flows to and from the ferry landing have impacts? If buses are rerouted to connect with the ferry, would intersection capacity be affected? Would there be sufficient parking for ferry users? This does not mean that broader, more effective, or desirable mitigation measures should not be considered, but rather that a comprehensive look and evaluation is needed.

510. RAIL TRANSIT MITIGATION

There is a range of rail transit measures available to mitigate certain types of significant impacts that may be projected for a proposed action. These measures are primarily related to the station elements that are analyzed and could be affected by a proposed action. Significant line-haul impacts, on the other hand, can be extremely difficult to mitigate. For some mitigation measures for significant adverse impacts on rail transit, the MTA may choose to improve conditions beyond the measures necessary to mitigate a given action's significant impacts. For example, an action may need to widen a stairway at the entrance/exit of a subway station by 2 inches to mitigate significant adverse impacts. As discussed below, however, MTA generally will not disrupt service on the stairway to complete a 2-inch widening; instead, it may choose to widen the stair by 2 feet. In these cases, the applicant generally identifies the cost associated with that percent of the construction required to mitigate the action's significant adverse impacts.

511. Stairways

Stairway widenings are the most common form of mitigation for projected significant impacts, providing

that the MTA deems it practicable, i.e., that it is worthwhile to disrupt service on an existing stairway to widen it by the prescribed amount and that a given platform affected by such mitigation is wide enough to accommodate the stairway widening. In general, the MTA does not implement a widening of less than 6 inches, and, at times, not less than 1 foot.

It may also be possible to mitigate stairway impacts by adding an escalator, opening a closed stairway elsewhere to/from the station or, for a large enough project, providing new stairways, preferably directly into the proposed building itself. As stated earlier, MTA/NYCTA approval will be needed. (As described in Chapter 1, this approval can be granted conceptually for inclusion in the FEIS or Findings.)

512. Station Passageways and Corridors

The consideration of appropriate mitigation measures for station passageways and corridors is very similar to that for the station stairways. Here, too, widening of a congested passageway or the construction of a new passageway to divert some passenger activity away from the existing one may be considered. Both of these types of measures are extremely costly. They are likely to be considered only for severe impacts.

It is important to note that there is a close physical and analytical relationship between stairways connecting station platforms with passageways over or under the platforms. For cases where both stairways and passageways would be characterized by significant impacts, the provision of widened stairways might increase the pedestrian flow rate feeding the passageway, thereby exacerbating levels of service there. Mitigation analyses for all these elements need to be conducted simultaneously.

513. Turnstiles

The most logical and readily available measure to mitigate projected turnstile v/c ratios in excess of 1.00 is to add more turnstiles, providing there is sufficient space within the station—near the appropriate stairways and token booths—to accommodate them. The analysis also needs to consider whether there are impacts associated with the addition of turnstiles—i.e., will it necessitate the relocation of newsstands, will it reduce the amount of platform space or token booth queuing space at critically constrained-width locations, etc.? As mentioned above, transit station mitigation should consider the entire station as a system and make sure that improvements in one area do not affect operations in another.

514. Token Booths and Control Areas

Mitigation of excessive queuing and/or delays at token booths may entail the provision of larger token booths that could be manned by an additional token clerk to reduce waiting lines and waiting times, and/or by creating more physical space in the token booth control area for waiting token purchasers or for others to circulate around the lines en route to the turnstiles. As mentioned above for turnstiles, the analysis of mitigation measures may need to consider potential effects on other elements of the station as well.

515. Platforms

Mitigation of platform impacts is a difficult exercise since the lengths and widths of existing platforms are generally fixed. There are relatively minor measures that can be considered, including the relocation of trash receptacles and other platform paraphernalia that reduce platform width at critical locations, which may be helpful in certain instances. It is also possible that the opening of new stairways at underutilized sections of a platform that is congested at one particular area will draw riders there and thus alleviate problem conditions at the congested location. The "station-as-a-system" approach should also be used vis-a-vis platform impact mitigation.

516. Line-Haul Capacity

The generation of significant line-haul impacts can only be mitigated by operating additional trains over a given subway line, which is generally considered either impossible operationally for most lines, or not practicable financially for the MTA/NYCTA. It is generally accepted that the determination of significant line-haul capacity impacts is made for disclosure purposes rather than to provide mitigation; these impacts usually remain unmitigated.

520. BUS TRANSIT MITIGATION

Significant bus impacts generally can be mitigated by increasing the frequency of service on existing bus lines. This must be approved by the Transit Authority's Surface Transit Operations Division. (As described in Chapter 1, this approval can be granted conceptually for inclusion in the FEIS or Findings.)

530. PEDESTRIAN MITIGATION

Available measures to mitigate significant pedestrian impacts may include:

- Removing or relocating street furniture, newsstands, or other obstacles that reduce pedestrian

capacity at either midblock sidewalk locations or at corner reservoirs.

- Widening the sidewalk or other pedestrian path that has been determined to be significantly impacted.

- Widening intersection crosswalks to provide additional pedestrian crossing capacity. Such widening should not significantly reduce the amount of street space available for vehicles queuing at the next traffic light.

- Providing additional green signal time or new signal phases for pedestrians crossing at signalized intersections. Signal timing changes should still leave vehicular traffic with sufficient green time without causing a significant traffic impact.

- Providing direct connections from adjacent transit stations to major proposed projects that reduce the need for transit patrons to traverse overtaxed pedestrian street elements.

- Creating a pedestrian mall by closing streets to vehicular traffic.

- Constructing a pedestrian bridge to separate pedestrian and vehicular flows.

Again, the relationship between traffic, transit, and pedestrian needs must be fully considered in developing and evaluating alternative mitigation measures.

600. Developing Alternatives

The alternatives analysis of the EIS is intended to depict and analyze alternatives to the proposed action that are likely to eliminate or reduce expected significant impacts. Since transit or pedestrian impacts may be among those determined to be significant, there are attributes of a proposed action that, if changed, can result in a reduction of expected impacts. This section provides an overview of developing and evaluating such alternatives, although a more comprehensive review is included in Section 30 on traffic and parking.

610. DEVELOPMENT OF ALTERNATIVES

Alternatives to the proposed action can include the following:

- Reducing the size of the proposed action to reduce its overall trip generation. This will generally lead to a proportional reduction in the amount of trips generated, but not necessarily in the magnitude of its impacts.

- Replacement of a high trip-generating land use component of the proposed action with a lesser trip generator. In this case, trips are reduced during those times when significant impacts are expected. Also note that different types of land uses may tend to have different modal splits, and a land use that has a lower overall trip-generation rate may not necessarily generate fewer trips by all modes.

- Redesign of the site plan to improve access and circulation patterns and effectively move vehicular or pedestrian traffic to locations or routes that would not be significantly affected. For example, relocation of a project's main entrance can alter pedestrian patterns or increase utilization of a particular subway station or station entrance over another one.

Potentially, there may be other alternatives that are tailored to a specific proposed action at a specific site that could be developed. In general, to be effective, they would either reduce the overall level of tripmaking, shift tripmaking to non-critical hours or to non-critical modes, or alter the physical design of a project to relocate trips away from identified significant impact locations.

620. EVALUATION OF ALTERNATIVES

In evaluating the impacts of the alternatives versus those of the proposed action, it is generally not necessary to conduct a full reanalysis of transit and pedestrian conditions. Other approaches exist.

For alternatives that reduce the size but not the land use mix of the proposed action, it may be possible to scale down the proposed action's trip-generation projection and then pro-rate the findings of the transit and pedestrian analyses accordingly. It is generally possible to reanalyze just the locations where significant impacts were projected and report these findings along with the overall trip reduction that would occur.

For alternatives that alter the mix of land uses or replace a more intensive trip generator with a less intensive generator, it would generally be necessary first to quantify the changes in the trip generation by travel mode for the peak analysis hours, and then determine the likelihood that new impacts could be created from those determined for the proposed action. Afterwards, the technical analysis could follow the guidelines provided above.

For alternatives that contain physical design changes that alter access and circulation patterns, the analysis would evaluate the likely access routes expected and where these changes would affect transportation conditions. If this review indicates that transit or pedestrian increases would occur along routes and at locations that are likely not to be significantly impacted, this evaluation would be documented. If it encompasses locations that have not been analyzed before and it is readily apparent that conditions there are not problematic, that evaluation would suffice and be reported. If this evaluation cannot be made with a reasonable degree of certainty, other available sources of data should be sought to make a preliminary evaluation. If the evaluation indicates that adverse levels of service currently exist, or that significant impacts may occur in the future with background growth and the project-generated trips factored in, these findings would be documented based on the data at hand.

700. Regulations and Coordination

710. REGULATIONS AND STANDARDS

There are no specific City, State, or Federal statutory regulations or standards governing the conduct of transit and pedestrian analyses. Therefore, the procedures and methodologies that are described in this Manual are intended to provide assistance in the structuring and conduct of EIS and EAS transit and pedestrian impact analyses.

720. APPLICABLE COORDINATION

It may be necessary to seek approval for mitigation measures from agencies that would be responsible for implementing those measures, namely the MTA and NYCTA for rail, subway, and bus analyses; and NYCDOT for pedestrian analyses. NYCDOT is also responsible for the designation of bus stops in the City. Coordination with these agencies is often advisable for the analyses as well. (See Chapter 1 for more information on the timing of required approvals for mitigation.)

730. LOCATION OF INFORMATION

Much, but certainly not all, of the information needed to conduct the transit analyses may be obtained from the MTA; pedestrian data availability, however, is very limited. Although it is likely that a significant amount of data will need to be collected via field surveys and passenger or pedestrian counts, OEC, NYCDOT, MTA, NYCTA, DCP, and other agencies that may possess information that would be helpful should be contacted to determine whether relevant data are available. In some cases, use of a specific set of available data may be preferable to conducting new counts or new surveys. This may be true, for example, where a recent similar study has been completed in the same or neighboring area, and it is considered important for the data and findings of that study and the analysis of the proposed action to be consistent.

An initial listing of the location of primary sources of available transit and pedestrian data is presented below, followed by an indication of those technical areas in which original research or surveys are often required.

731. Sources of Available Rail Transit Data

- EISs that contain appropriate ridership or capacity utilization information. The key guideline rests with how representative the counts or data are of existing conditions. Historically, this has included data not more than three years old at the time the draft EIS was completed, but it could include somewhat older data for areas that have undergone very little change and for which the data still represent conditions there.

  Sources: OEC, 52 Chambers Street, Manhattan; DCP, Environmental Assessment and Review Division, 22 Reade Street, Manhattan; DEP, Office of Environmental Planning, 59-17 Junction Boulevard, Elmhurst, Queens; and NYCDOT, 40 Worth Street, Manhattan.

- Transit studies with volumes or analyses that are relatively recent.

  Source: MTA, 347 Madison Avenue, Manhattan.

- New York City subway system turnstile registration counts, which detail the volume of riders entering each subway station by turnstile bank.

  Source: NYCTA, 130 Livingston Street, Brooklyn.

- Biannual survey of system riders indicating the number of subway riders entering the central business district by line.

  Source: MTA, 347 Madison Avenue, Manhattan.

732. Sources of Available Bus Transit Data

- EISs that contain bus ridership information for the specific study area and bus routes affected, provided the data are reasonably recent and bus service has not changed appreciably.

  Sources: OEC, DCP, or DEP, as cited above.

- Bus studies that are recent enough to be valid.

  Source: NYCTA, 130 Livingston Street, Brooklyn.

- NYCTA Bus Guide for bus routes, hours of operation, and frequency of service.

  Source: NYCTA, as cited above.

- Bus ridership, or load levels, for the maximum load points on each route. This information is helpful in identifying the bus stop at which bus occupancy levels are highest, thereby also defining the amount of bus capacity remaining for additional riders.

  Source: NYCTA, as cited above. Also, private bus operators who provide service, generally not in Manhattan or between Manhattan and the other boroughs.

733. Sources of Pedestrian Data

- EISs that contain pedestrian volume information and/or pedestrian level of service findings for a particular study area, providing such information is reasonably recent.

  Source: OEC, DCP, or DEP, as cited above.

Pedestrian volume is generally one of the more difficult technical areas in which to obtain readily usable data, and new pedestrian counts are almost always needed for detailed analyses.

Q. Air Quality

For air quality, the goal of CEQR is to determine a proposed action's effects on ambient air quality, or effects on the project because of ambient air quality. Ambient air quality, or the quality of the surrounding air, can be affected by air pollutants produced by motor vehicles, referred to as "mobile sources;" and by fixed facilities, usually referenced as "stationary sources." This can occur during operation and/or construction of a proposed action. This section of the manual discusses how to assess those impacts. This assessment typically uses computer models to predict pollutant concentrations. Because models are periodically revised and updated, the lead agency or analyst should check to be sure the most recent appropriate editions are being used before performing the analysis. Note that certain large stationary sources could require a review through the U.S. Environmental Protection Agency's (EPA) New Source Review procedures (see Section 710 below). The techniques described in this Manual do not replace those assessments, which have their own guidelines.

100. Definitions

110. SOURCES OF POLLUTANTS

111. Mobile Sources

Vehicular traffic, both on the roads and in parking garages, can affect air quality. Other moving sources, such as planes, helicopters, boats, trains, etc., can also affect air quality. All of these sources of pollution are termed "mobile sources."

For CEQR, mobile source analyses consider actions that add new vehicles to the roads or change traffic patterns by diverting vehicles, either of which can have significant adverse air quality impacts. Actions that include parking lots or garages can also have significant air quality impacts from emissions within the facility affecting the surrounding environment. In addition, actions that do not even add any cars can have significant air quality impacts from mobile sources, if new uses are added near sources of pollutants, such as when a park is proposed beside a highway.

112. Stationary Sources

Other sources of pollutants are fixed in location, rather than mobile. These are termed "stationary sources." Stationary sources that can cause air quality impacts include exhaust from boiler stack(s) used for the heating/hot water, ventilation, or air conditioning systems of a building; the process exhaust points of a manufacturing or industrial operation; the stack emissions from a nearby power generating station; or the emissions from incinerators or medical or chemical laboratory vents.

A proposed action could have significant stationary source air quality impacts if it creates new stationary sources that affect the air quality in the surrounding community, such as a large new boiler that exhausts pollutants into the air. Conversely, stationary source impacts can also result when a proposed action adds new uses that would be affected by emissions from existing fixed facilities, such as might occur if a new residential building were built beside a power generating station. Proposed buildings can also cause stationary source impacts by changing the building geometry or topography of an area, so that existing fixed facilities begin to adversely affect other existing structures in the area.

Odors can also result from stationary sources. Significant odor impacts can occur when a new, odor-producing facility is created by an action, or when an action adds sensitive uses close to such a facility that would be affected by it.

113. Construction Activities

Potential air quality impacts from construction activities include the dust emissions generated by the construction of a new facility (or, likewise, the demolition of an existing structure that contains asbestos—see the hazardous materials section of the Manual for further discussion on this issue); dust emissions related to sandblasting; the emissions from construction equipment (typically only an issue of concern for very large, multiphase actions); and the emissions from construction-generated traffic or diversions of traffic because of the project or its construction activities. Because these impacts are only temporary, they usually need to be assessed only when the action's construction period would be relatively long-term. However, the magnitude of construction activities is also considered—an analysis may be appropriate for certain activities, even if temporary, such as concrete batching plants.

120. POLLUTANTS OF CONCERN

National and State regulations identify a number of air pollutants that are of concern nationwide and Statewide. These include seven key pollutants of general concern, and numerous other pollutants of concern primarily for industrial activities. Some pollutants, such as lead, may be present in the soil or groundwater as well. A discussion of the potential impacts associated with soil and groundwater contamination is included in Section 3J.

121. National and State Ambient Air Quality Standards

121.1. National Ambient Air Quality Air Quality Standards (NAAQS)

Seven air pollutants have been identified by the U.S. Environmental Protection Agency (EPA) as being of concern nationwide: carbon monoxide, hydrocarbons, nitrogen oxides, photochemical oxidants, lead, particulate matter, and sulfur oxides. As required by the Clean Air Act, NAAQS have been established for six major air pollutants: carbon monoxide, nitrogen dioxide, ozone (photochemical oxidants), inhalable particulate matter, sulfur dioxide, and lead. (National standards for the seventh pollutant, hydrocarbons, have been rescinded because this pollutant is primarily of concern only in its role as ozone precursors.) Table 3Q-1 shows the standards for these pollutants. These standards have been promulgated as primary and secondary standards. The primary standards protect the public health, and represent levels at which there are no known significant effects on human health. The secondary standards are intended to protect the nation's welfare, and account for air pollutant effects on soil, water, visibility, materials, vegetation, and other aspects of the environment. For carbon monoxide, nitrogen dioxide, ozone, and inhalable particulates, the primary and secondary standards are the same.

121.2. Other National Standards

EPA has also published the National Emission Standards for Hazardous Air Pollutants (NESHAP), which limit the emission rates of certain highly toxic compounds, in most cases for specifically selected processes or operations. The NESHAP are listed in 40CFR61, and include emissions limitations for arsenic, asbestos, benzene, beryllium, mercury, radionuclides, and vinyl chloride. In addition, the U.S. Occupational Safety and Health Administration's (OSHA) Short-Term Exposure Levels (STELs) can be used as a guideline for emissions typically present for short periods of time, such as chemical spills.

121.3. State Standards

New York State Ambient Air Quality Standards. The NAAQS have also been adopted as the ambient air quality standards for the State of New York. In addition to the NAAQS, there are New York State Ambient Air Quality Standards (NYAAQS) for total suspended particulates, hydrocarbons, hydrogen sulfide, fluorides, and beryllium. These pollutants are generally associated with industrial actions.

Noncriteria Pollutants. The New York State Department of Environmental Conservation (DEC) also publishes maximum allowable guideline concentrations for certain pollutants for which the EPA has no established standards, known as "noncriteria pollutants." The DEC's proposed guidelines are reported in *Draft Guidelines for the Control of Toxic Ambient Air Contaminants*, Air Guide-1, 1991 Edition. Air Guide-1 presents Annual and Short-Term Guideline Concentrations (AGCs and SGCs, respectively) for contaminants that range in toxicity from high to low. The SGCs and AGCs are 1-hour and annual guideline concentrations, respectively, for potentially toxic or carcinogenic air contaminants. SGCs and AGCs are guideline concentrations for noncriteria pollutants that are considered acceptable concentrations below which there should be no adverse effects on the general public's health.

Odors. DEC enforces regulations that generally state that no facilities should emit measurable amounts of airborne pollutants that result in the detection of malodorous smells by the general public at any off-site locations. These regulations are found in the New York Codes, Rules and Regulations, Title 6, Chapter III-Air Resources, Subchapter A-Prevention and Control of Air Contamination and Air Pollution, Part 211-General Prohibitions. Part 211.2 prohibits "emissions of air contaminants to the outdoor atmosphere of such quantity, characteristic or duration which ... unreasonably interfere with the comfortable enjoyment of life or property. Notwithstanding the existence of specific air quality standards or emission limits, this prohibition applies, but is not limited to, any particulate, fume, gas, mist, odor, smoke, vapor, pollen, toxic or deleterious emission, either alone or in combination with others."

122. Regulated Pollutants

The air pollutants for which national or State air quality standards exist, and the potential actions for which they would be of concern, are described below. In addition, Table 3Q-2 lists the air pollutants that might be of concern for different types of actions. (In addition, as described above, some pollutants, such as lead, may be present in the soil or groundwater as well. A discussion of the potential impacts associated with soil and groundwater contamination is included in Section 3J.)

122.1. Carbon Monoxide

Carbon monoxide (CO) is produced from the incomplete combustion of gasoline and other fossil fuels. In New York City, about 80 percent of carbon

Table 3Q-1
National and New York State Ambient Air Quality Standards

Pollutant	Primary		Secondary	
	PPM	Micrograms Per Cubic Meter	PPM	Micrograms Per Cubic Meter
Carbon Monoxide (CO)				
Maximum 8-Hour Concentration[1]	9		9	
Maximum 1-Hour Concentration[1]	35		35	
Lead (Pb)				
Maximum Arithmetic Mean Averaged Over 3 Consecutive Months		1.5		
Nitrogen Dioxide (NO_2)				
Annual Arithmetic Average	0.05	100	0.05	100
Ozone (Photochemical Oxidants—O_3)				
1-Hour Maximum	0.12	235	0.12	235
Inhalable Particulates (PM_{10})				
Annual Geometric Mean		50		50
Maximum 24-Hour Concentration[1]		150		150
Sulfur Dioxide (SO_2)				
Annual Arithmetic Mean	0.03	80		
Maximum 24-Hour Concentration[1]	0.14	365		
Maximum 3-Hour Concentration[1]			0.50	1.300

Note:

1 Not to be exceeded more than once a year. A violation of standards would occur if these are exceeded more than once.

Sources: 40 CFR Part 50—National Primary and Secondary Ambient Air Quality Standards 40 CFR 50.12 "National Primary and Secondary Standard for Lead," 43 CFR 46245

Table 3Q-2
Potential Pollutants of Concern for Typical Kinds of Actions or Uses Surrounding Those Actions

Type of Action/Use	Potential Issue of Concern	CO	PM	SO_2	NO_2	O_3	Pb	NC
Office, Retail, Mixed-Use, or Residential Building	Induced Traffic	●						
	Induced Trucks or Buses	●	●					
	Boilers		●	●	●			
	Near Elevated Highway/Bridge	●						
	Near Large Stacks (e.g., Con Edison)		●	●	●			
Manufacturing or Industrial	Induced Traffic	●						
	Induced Trucks	●	●					
	Boilers		●	●	●			
	Process	●	●	●	●	●	●	●
Hospital, Medical Center, and Laboratories	Induced Traffic	●						
	Boilers		●	●	●			
	Incinerators	●	●	●	●	●	●	●
	Process	●	●	●	●	●	●	●
Parking lots/garages	Induced Traffic	●						
Bus or Truck Depots, Garages, Parking Lots, or Franchises	Induced Bus or Truck Traffic	●	●					
New or Modified Roadway	Induced Traffic	●	●					
Cogeneration/Power Plant	Process	●	●	●	●	●		
Demapping Built Streets	Traffic Diversion	●	●					
Asphalt/Concrete Plants	Induced Traffic	●	●					
	Process		●	●	●			●

Notes:
- CO - Carbon monoxide
- PM - Particulate matter (PM_{10})
- SO_2 - Sulfur dioxide
- NO_2 - Nitrogen dioxide and/or nitrogen oxides
- O_3 - Ozone (i.e.,volatile organic compounds or nitrogen oxides that lead to ozone formation)
- Pb - Lead
- NC - Noncriteria or malodorous pollutants

monoxide emissions are from motor vehicles. Because this gas disperses quickly, carbon monoxide concentrations can vary greatly over relatively short distances. Elevated concentrations are usually limited to locations near congested intersections and along heavily traveled and congested roadways. Consequently, it is important to evaluate concentrations of carbon monoxide on a localized, or "microscale" basis. For proposed actions that would generate (or divert) a significant number of motor vehicles, it is appropriate to examine the potential incremental impact on carbon monoxide levels from this traffic.

122.2. Hydrocarbons, Nitrogen Oxides, and Ozone (Photochemical Oxidants)

Hydrocarbons and nitrogen oxides (NO_x) are of concern because of their role as precursors in the formation of ozone. Ozone is formed through a series of reactions that take place in the atmosphere in the presence of sunlight. Because the reactions are slow and occur as the pollutants are diffusing downwind, elevated ozone levels are often found many miles from sources of the precursor pollutants. The effects of nitrogen oxides emissions from mobile sources are therefore generally examined on a regional basis. The change in regional mobile source emissions of these pollutants is related to the total number of vehicle miles of travel throughout the New York metropolitan area. Actions that would significantly increase the number of vehicle miles traveled throughout New York City would require an analysis of impacts on ozone levels from mobile sources. There is also a standard for average annual nitrogen dioxide (NO_2) concentrations. For proposed actions that could create large new sources of nitrogen dioxide, it may be appropriate to perform a stationary source analysis to determine the impact on nitrogen dioxide levels on the surrounding community.

122.3. Lead

Lead emissions are principally associated with industrial sources and motor vehicles that use gasoline containing lead additives. Most U.S. vehicles produced since 1975, and all produced after 1980, are designed to use unleaded fuel. As these newer vehicles have replaced the older ones, motor-vehicle-related lead emissions have decreased. As a result, ambient concentrations of lead have declined significantly. Nationally, the average measured atmospheric lead level in 1985 was only about one-quarter the level in 1975.

In 1985, the EPA announced new rules drastically reducing the amount of lead permitted in leaded gasoline. The maximum allowable lead level in leaded gasoline was reduced from the previous limit of 1.1 grams per gallon to 0.5 grams per gallon effective July 1, 1985, and to 0.1 grams per gallon effective January 1, 1986. Monitoring results indicate that this action has been effective in significantly reducing atmospheric lead levels. Even at locations in the New York City area where traffic volumes are very high, atmospheric lead concentrations are far below the national standard of 1.5 micrograms per cubic meter (three-month average). As part of the 1990 Clean Air Act Amendments, no lead will be allowed in gasoline effective January 1, 1996. For proposed actions that could produce significant new sources of lead (e.g., lead smelters), resulting ambient lead levels in the surrounding community should be examined. For actions that promote the development of new structures that could be affected by existing stationary lead emitters (i.e., a new residential building proposed to be located near or in a manufacturing zone), it may be appropriate to perform an impact analysis of ambient lead levels on these structures.

122.4. Total Suspended and Inhalable Particulates (PM_{10})

Particulate matter is emitted into the atmosphere from a variety of sources: industrial facilities, power plants, construction activity, concrete batch plants, etc. The primary concern is with those particulates that are less than 10 μm in diameter (referred to as PM_{10}) and therefore inhalable. Gasoline-powered vehicles do not produce any significant quantities of particulate emissions, but diesel-powered vehicles, especially heavy trucks and buses, do emit particulates, and inhalable particulate concentrations may, therefore, be locally elevated near roadways with high volumes of heavy diesel-powered vehicles. Parking garages or lots that would accommodate large numbers of diesel-powered vehicles could also elevate PM_{10} levels in the surrounding area, as could stationary sources that burn large volumes of fuel oil. Vehicular traffic also contributes to background levels of airborne particulate matter through brake and tire wear and by disturbing dust on roadways.

122.5. Sulfur Dioxide

Sulfur dioxide (SO_2) emissions are primarily associated with the combustion of sulfur-containing fuels: oil and coal. No significant quantities are emitted from mobile sources. For actions that result in the development of stationary sources, evaluation of the potential impacts on ambient SO_2 levels may be appropriate.

122.6. Noncriteria Pollutants

Noncriteria pollutants include hundreds of toxic pollutants, ranging from high-toxicity contaminants, which are demonstrated or potential human carcinogens

(cancer-causing); moderate-toxicity contaminants, including animal carcinogens, mutagens (causing mutations), and other substances posing a health risk to humans; and low-toxicity contaminants, which are of primary concern as irritants and have not been confirmed as carcinogens, mutagens, or teratogens (causing malformations). Noncriteria pollutants can be a concern for actions that would promote new airborne sources of such compounds (e.g., hospital waste incinerators), or actions that induce development of residential facilities within manufacturing zones with sources of these compounds. Examples of such instances include an action that would result in the development of a tall, residential building near a manufacturing area that has several low-level sources (one- to two-story industrial facilities with multiple exhaust stacks) of airborne toxic compounds; or new industrial sources, such as a solid waste facility, that could emit such compounds in potentially significant quantities.

122.7. Odors

In addition to the noncriteria pollutants described above, certain other pollutants are also of concern because of their odor, rather than their toxicity. These are of concern primarily because of the discomfort they can cause people, rather than the harm they do to the body. As an example, uncontrolled emissions of ammonia or sulfide compounds can result in detectable malodorous off-site pollutant levels, depending on the processes in which they are being used or from which they are a byproduct. Other compounds that can cause odors include amines, diamines, mercapatans, and skatoles. Activities that have the potential for releasing malodorous emissions in significant quantities include light and heavy industrial facilities and waste management facilities, including solid waste management facilities, water pollution control plants (i.e., sewage treatment plants), and landfills.

123. Compliance with Standards

Historical monitoring data for New York City indicate that the ozone 1-hour standard is still exceeded several days a year during hot, bright sunny days when the air movement is relatively stagnant. Monitoring data have also shown that in New York City, the CO 1-hour standard has not been exceeded in many years. No violations of the 8-hour CO standard were recorded in New York City in 1992; the number of monitored violations of the 8-hour CO standard throughout the City has been significantly reduced over the past several years partially as a result of the introduction of newer, cleaner vehicles into the general mix of vehicles traveling in the City. This trend of gradually declining CO levels is expected to persist into the future because of continual vehicle turnover from older to newer vehicles, and adoption of tighter "tailpipe" emission standards mandated by the 1990 Clean Air Act Amendments. Under the 1990 Clean Air Act, New York State is required to attain compliance with the CO standard by December 31, 1995, and the ozone standard by 2007. The State is required to submit a State Implementation Plan to demonstrate how this compliance can be achieved and maintained in the future (see Section 711).

Air quality monitoring in Manhattan indicates that the annual average concentration of inhalable particulates is above the national ambient air quality standard. Monitoring data for the other three national criteria pollutants demonstrate that New York City is in compliance with the corresponding NAAQS for these pollutants.

The limited monitoring data available for noncriteria compounds indicate that annual monitored arsenic, cadmium, and nickel concentrations are greater than the proposed AGCs for these substances in New York City.

It is recommended that the lead agency check with appropriate expert agencies—the New York City Department of Environmental Protection (DEP) as well as DEC and EPA—for the latest background levels and compliance status to determine whether analyses of different pollutants are appropriate.

130. AIR QUALITY ANALYSES

131. Microscale Analyses

All the pollutants typically analyzed, except nitrogen oxides and total hydrocarbons (discussed below), may be of concern on a localized, or microscale, level: elevated concentrations can occur at particular locations. Therefore, these pollutants are assessed on a microscale level, which considers pollutant concentrations at particular sites.

For these microscale analyses, air quality impacts are assessed by considering the pollutant source—specifically, the type and magnitude of pollutants being emitted from the mobile or stationary sources—and dispersion, or the way these pollutants mix with the ambient air and become dispersed before reaching the analysis locations, given meteorological conditions (such as wind speed, wind direction, atmospheric stability, and temperature), the distance between the source and the receptor, roadway and building geometry, and other factors. Often, mathematical models are used to make these predictions of emissions; mathematical or physical models, such as wind tunnels, are always used to evaluate dispersion. Calculating the emissions and their

dispersion provides the particular source's contribution of pollutants to the ambient air at a given location (called a "receptor"). This value is added to the general background concentrations of that pollutant to find the total concentration of the pollutant at the receptor being assessed.

For use in the dispersion models, mobile and stationary sources of air pollutants can be considered either line sources, area sources, or point sources, as follows:

- *Line sources.* A source of pollutant emissions that can be simulated as a continuous or segmented group of lines in a mathematical model is considered to be a "line" source. Typical examples of line sources include emissions from vehicular traffic traveling along a roadway that is curved, elevated, at-grade, or below grade with an opening above (otherwise know as a "cut-section"); particulate emissions from traffic traversing an unpaved or dusty roadway; and emissions from industrial operations, such as conveyor belt operations.

- *Area sources.* Emissions that can be simulated over a small region are "area" sources. Typical area sources include the following: emissions from vehicles traveling in a parking lot or multilevel parking facility; pollutants discharged through multiple exhaust stacks around the rooftop of a building or several buildings; particulate emissions from an outdoor storage area of fine particulate material; and pollutant emissions from an industrial process that is distributed over large sections of a manufacturing plant.

- *Point sources.* "Point" sources are pollutant discharges from a relatively small, restricted area. Sample applications of point sources are pollutants released through boiler exhaust stacks; emissions from power generating station stacks; release of chemicals discharged through the exhaust vents from a medical laboratory; effluent from an incinerator; carbon monoxide released through an exhaust vent for a parking garage; and discharge from the vent for a spray booth.

The models should generally conform with the EPA's *Guideline on Air Quality Models*, which is periodically updated.

132. Mesoscale Analyses

Nitrogen oxides and hydrocarbons are concerns on a regional, or mesoscale, level. They are of concern because they are precursors to ozone (both can react in sunlight to form photochemical oxidants, also known as ozone, or smog). This reaction takes occurs relatively slowly and takes places far downwind from the site of the actual pollutant emission, and therefore cannot be related to localized changes. Consequently, the effects of these two pollutants are examined on an areawide, or mesoscale, basis. The area for examination would typically be large, such as an entire borough, or the entire City of New York, or even the tri-state metropolitan area. Such an analysis is rarely performed, however, because few actions have the potential to affect ozone over such large regions. CO and PM_{10} are also analyzed on a regional basis if the action could significantly affect background levels of these pollutants.

200. Determining Whether An Air Quality Assessment is Appropriate

The following guidelines for determining whether air quality analyses are needed were developed using a combination of examination of historical air quality data in New York City and prototypical air quality modeling.

210. MOBILE SOURCES

Actions—whether site-specific or generic—can result in significant mobile source air quality impacts when they increase or cause a redistribution of traffic, create any other mobile sources of pollutants (such as diesel trains, helicopters, etc.), or add new uses near mobile sources (roadways, garages, parking lots, etc.). The following actions may result in significant adverse air quality impacts from mobile sources and therefore require further analyses, which may include microscale analyses of mobile sources (complete the assessment section of Section 30 of this Manual, "Traffic and Parking," before reviewing this checklist):

- Actions that would result in placement of operable windows, balconies, air intakes, or intake vents generally within 200 feet of an atypical (e.g., not at-grade) source of CO, such as a highway or bridge with a total of more than two lanes.

- Actions that would result in the creation of a fully or partially covered roadway, would exacerbate traffic conditions on such a roadway, or would add new uses near such a roadway.

- Actions that would generate peak hour traffic or divert existing peak hour traffic, resulting in the following:

10 or more trips in Manhattan between 30th and 61st Streets, downtown Brooklyn, Long Island City, and the immediate area near the intersection of Bruckner Boulevard and Hunts Point Avenue in the Bronx (see Figures 3Q-1 and 3Q-2); or

65 or more trips in all other areas of the City.

- Actions that would result in a parking facility located within 100 feet of an intersection in Manhattan between 30th and 61st Streets, downtown Brooklyn, Long Island City, and the immediate area near the intersection of Bruckner Boulevard and Hunt's Point Avenue in the Bronx.

- Actions that would result in a parking facility located within 100 feet of an intersection *and* that would generate 30 or more trips in all other areas of the City.

- In addition, applications to the City Planning Commission requesting the grant of a special permit or authorization for parking facilities pursuant to Section 13-43 of the Zoning Resolution must be referred to DEP for its report on air quality at the proposed location.

- Actions that would result a sizable number of other mobile sources of pollution, such as a heliport, new railroad terminal, or trucking.

In addition, actions that would substantially increase the vehicle miles traveled in a large area (a borough, the City, or larger) may require mesoscale analyses of the effects on ozone.

220. STATIONARY SOURCES

Actions can result in stationary source air quality impacts when they create new stationary sources of pollutants—such as emission stacks for industrial plants, hospitals, or other large institutional uses, or even a building's boilers—that can affect surrounding uses; when they add uses near existing (or planned future) emissions stacks, and the new uses might be affected by the emissions from the stacks; or when they add structures near such stacks and those structures can change the dispersion of emissions from the stacks so that they begin to affect surrounding uses. (Note that the Building Code of the City of New York regulates the placement of chimneys and vents and of buildings relative to nearby chimneys and vents, and that the Zoning Resolution contains performance standards for emissions from manufacturing uses. These regulations are independent of CEQR, but may apply to actions that are being assessed under CEQR. See Section 713, below.) The following actions could result in significant adverse impacts related to stationary sources, and therefore require stationary source analyses:

- Actions that would use any fossil fuels (fuel oil or natural gas) for their heating/hot water, ventilation, and air conditioning systems (note that single-building projects may be able to perform a screening analysis rather than detailed stationary source analyses; see Section 322.1, below).

- Actions that would create large emission sources, including but not limited to the following: solid waste or medical waste incinerators, cogeneration facilities, asphalt and concrete plants, or power generating plants.

- Actions that would result in sensitive uses (particularly schools, hospitals, parks, and residences) located within 1,000 feet of a large emission source (see above).

- Actions that would include medical, chemical, or research labs.

- Actions that would result in sensitive uses being located near medical, chemical, or research labs.

- Actions that would include operation of manufacturing or processing facilities.

- Actions that would result in sensitive uses (such as residences, schools, hospitals, parks, etc.) within 400 feet of manufacturing or processing facilities.

- Actions that would result in sensitive uses within 400 feet of a stack associated with commercial, institutional, or large-scale residential developments, *and* the height of the new structures would be similar to or greater than the height of the emission stack.

- Actions that would result in potentially significant odors. This includes, but is not limited to, solid waste management facilities, water pollution control plants (i.e., sewage treatment plants), and incinerators.

- Actions that would result in sensitive uses within 1,000 feet of an odor-producing facility (see above).

Figure 3Q-1

Area of Concern in Downtown Brooklyn

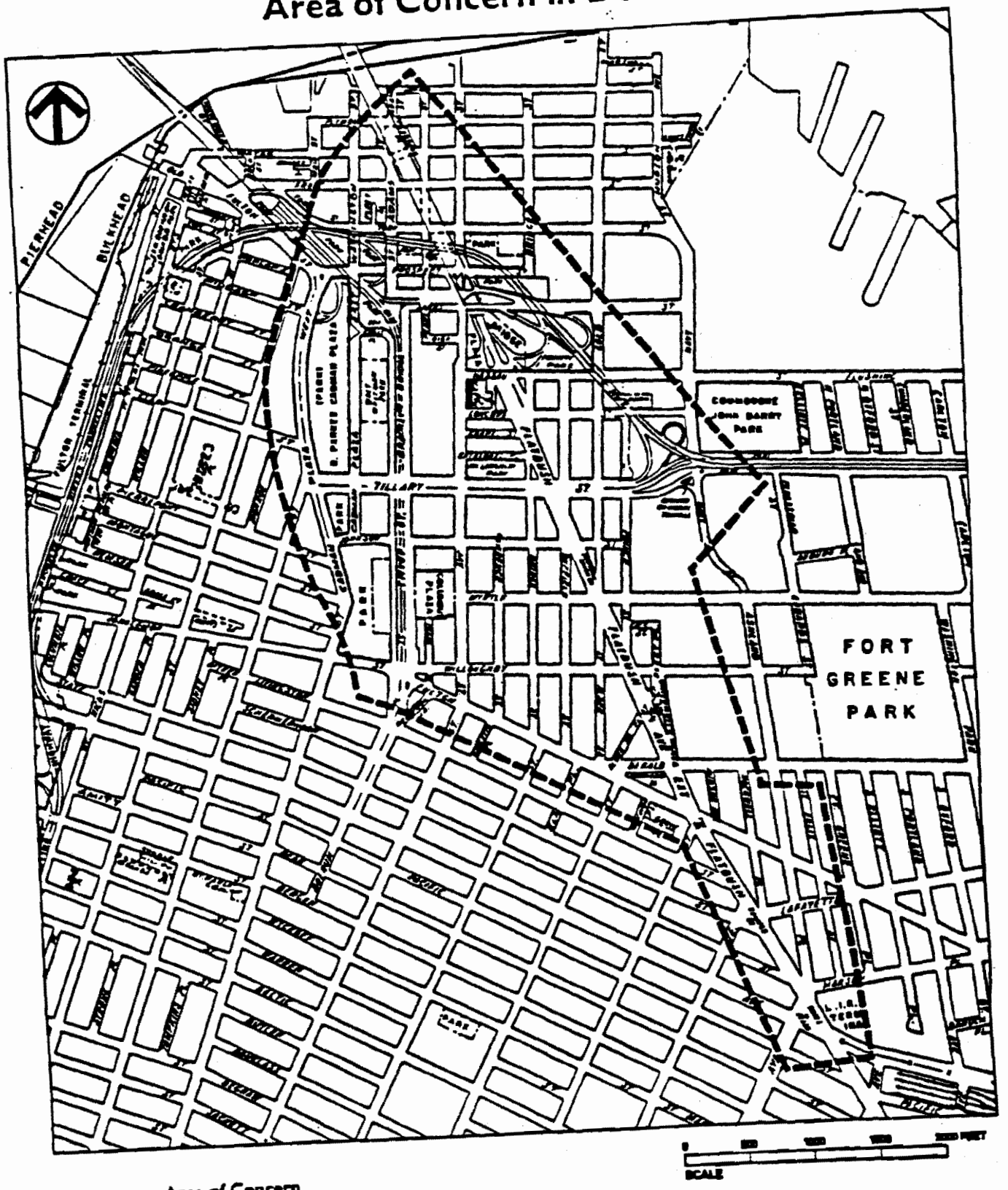
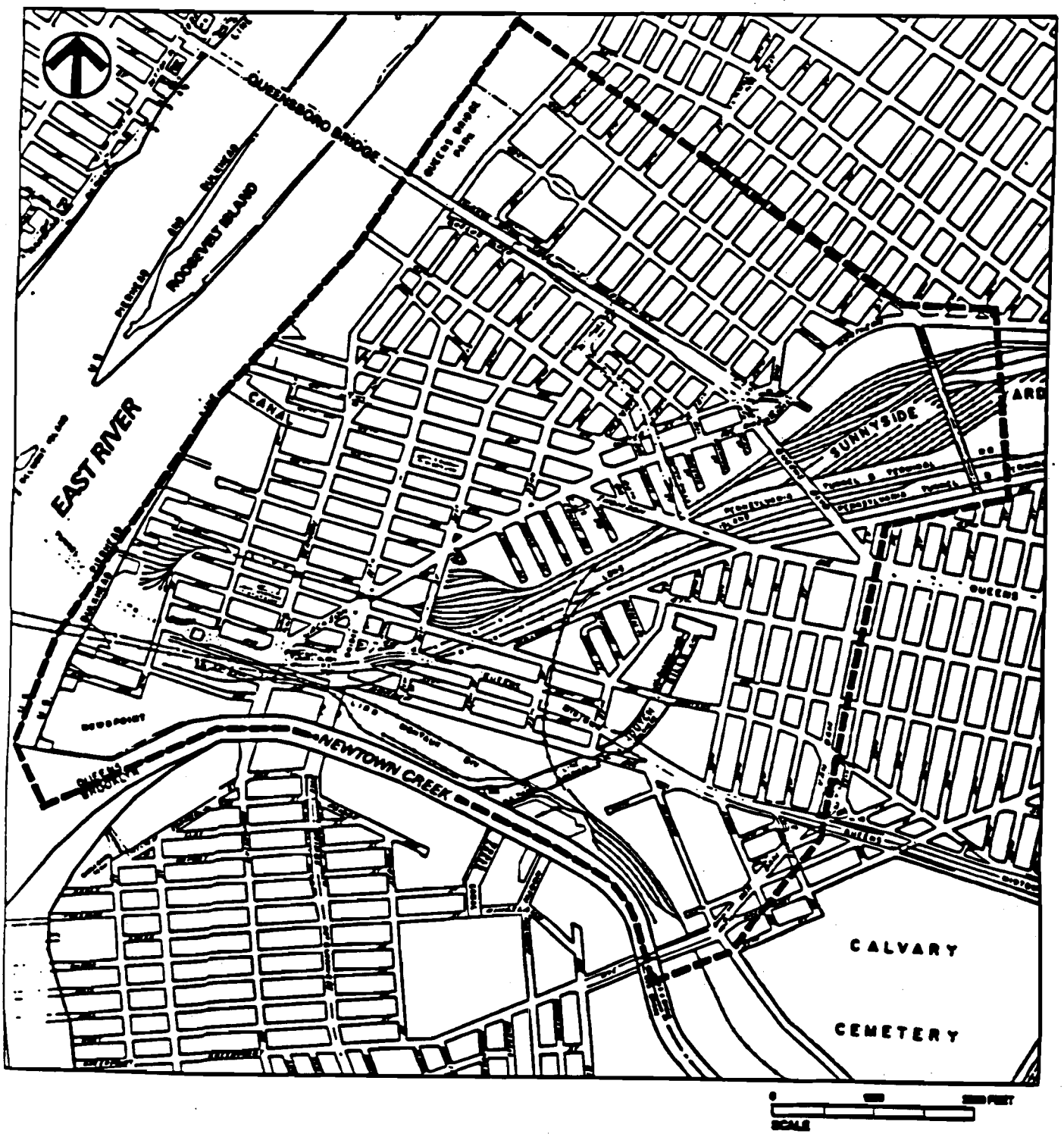


Figure 3Q-2
Area of Concern in Long Island City



Area of Concern

- Actions that would create "non-point" sources, such as particles from unpaved surfaces and storage piles. These particles are also known as fugitive dust.

- Actions that would be affected by non-point sources (see above).

Stationary sources can also be an issue for generic or programmatic actions that would change or create a stationary source (as described above) or that would expose new populations to such a stationary source.

300. Assessment Methods

310. STUDY AREAS AND RECEPTOR LOCATIONS

The first step in performing air quality analyses is to determine the appropriate study area. This is the region and/or locations where there is the potential for a significant air quality impact resulting directly or indirectly from the action. Thus, the extent of the study area depends on the action proposed (and therefore, the pollutants of concern).

For mesoscale analyses, which are rarely performed for CEQR, the study area is the area that would be affected by the large-scale change in pollutant sources. For example, if an action would result in a large increase in the number of vehicle miles traveled in the City, the study area would be the entire City. This delineation can be difficult, however—the analysis must consider the origins and destinations of those vehicle trips to assess whether a larger area should be studied. On the other hand, choosing a study area that is too large will make the relative effects of one action seem insignificant (for example, if the action would greatly increase the number of vehicle miles traveled in the City, but the analysis considered the tri-state metropolitan area, the action's effect might be inappropriately considered insignificant).

For microscale, or localized, analyses, air quality predictions are not made for an entire study area; they are made instead for specific locations, such as intersections, and at those locations, for specific geographic points. These prediction locations, called "receptor locations," or simply "receptors," are, from among all the locations to which people will have continuous access when the action is implemented, those where the worst air quality impacts are expected. For mobile source analyses, the study area often consists of intersections where congestion is expected; receptors are sited at numerous locations at these intersections. Median strips or crosswalks in roadways are not appropriate receptor locations, since the public would not be in those locations for more than a few minutes; sidewalks and other ground-level locations alongside roadways and highways are often receptor locations. Sometimes, particularly for stationary source analyses, elevated receptors are located high up on the faces of buildings, either existing or proposed, if there is or will be an operable window or air intake vent at that location. An elevated location without an operable window would not be a receptor location, however. Different study areas and receptor locations will be appropriate depending on whether mobile or stationary sources are being examined, as follows.

311. Mobile Sources

311.1. Roadways

Locations for Study. The study area for mobile sources is directly related to the action's traffic study area (explained in Section 30). It usually includes those intersections where traffic congestion is expected, since this is where air quality impacts are likely to occur. The choice of which intersections to include in the mobile source air quality analysis is based on the estimates of incremental vehicular traffic associated with the action, following the guidance provided in the traffic and parking section of this Manual. The study area should include at least any of the following locations:

- Based on peak hour traffic assignments, intersections in the traffic study area to which the action would add the following incremental traffic:

  10 or more induced vehicular trips in Manhattan between 30th and 61st Streets, downtown Brooklyn, Long Island City, and the immediate area near the intersection of Bruckner Boulevard and Hunts Point Avenue in the Bronx; or

  65 or more induced vehicular trips in the rest of the City.

- Critical intersections in the traffic study area. Examples of critical intersections are listed in Table 3Q-3.

- When covered roadways are a concern (e.g., when the action would create, exacerbate traffic conditions on, or add new uses near a fully or partially covered roadway), locations within and adjacent to the fully or partially covered roadway.

Table 3Q-3
Some Critical Intersections in New York City

Manhattan
Broadway from Fulton to John/Dey Street
Broadway from Rector Street to Exchange Place
Broadway at 65th Street and Columbus Avenue
34th Street from Eighth to Tenth Avenue
34th Street and Sixth Avenue/Broadway
37th Street from Sixth to Eighth Avenue
42nd Street and Route 9A
47th Street from Fifth to Sixth Avenue
52nd Street from Lexington to Third Avenue
53rd Street from Lexington to Third Avenue
57th Street and Third Avenue
57th Street and Route 9A
59th Street from Second to Fifth Avenue
Second Avenue and 36th Street
Lexington Avenue from 53rd to 52nd Street
Fifth Avenue from 54th to 50th Street
Sixth Avenue from 31st to 32nd Street
Seventh Avenue/Broadway and 45th Street
Seventh Avenue from 55th to 54th Street
Eighth Avenue and 42nd Street
Tenth Avenue and 57th Street
West End Avenue and 66th Street
West End Avenue and 57th Street
Delancey Street and Allen Street
Canal Street from Church Street to West Broadway

Brooklyn
Flatbush Avenue and Tillary Street
Flatbush Avenue and Atlantic Avenue
Flatbush Avenue and 4th Avenue
Flatbush Avenue and Fulton Street
Flatbush Avenue from Atlantic Avenue to Pacific Street
Flatbush Avenue from Tillary Street to Johnson Street
Flatbush Avenue and 5th Avenue
Tillary Street from Cadman Plaza to Adams Street
Tillary Street from Flatbush Avenue to Gold Street
Tillary Street from Cadman Plaza to Washington Street
Atlantic Avenue from Flatbush to 4th Avenue
Atlantic Avenue and Jay Street
Adams Street from Johnson to Tillary Street
Boerum Place and Atlantic Avenue
Linden Boulevard and Pennsylvania Avenue
Havemeyer Street and South 5th Street

Bronx
Bruckner Boulevard and Hunts Point Avenue
Bruckner Boulevard and Leggett Avenue
Leggett Avenue and Garrison Avenue
Grand Concourse and 161st Street

Queens
Rockaway Boulvevard and Brookville Boulevard
Woodhaven Boulevard and Rockaway Boulevard
Woodhaven Boulevard and Liberty Avenue
Woodhaven Boulevard and Union Turnpike
Woodhaven Boulevard and Metropolitan Avenue
Woodhaven Boulevard and Cooper Avenue and Yellowstone Boulevard
Woodhaven Boulevard and Queens Boulevard
Queens Boulevard and Jackson Avenue
Queens Boulevard and 27th Street
Queens Boulevard and Crescent Street
Queens Boulevard and Van Dam Street/ Thomson Avenue
Jackson Avenue and 49th Avenue/11th Street
Hillside Avenue and Van Wyck Expressway

Staten Island
Hyland Boulevard and New Dorp Lane
Victory Boulevard and Richmond Avenue

- Locations adjacent to an atypical (e.g., not at-grade) source of CO (if those receptors or the source is created by the action), such as a multi-lane highway or bridge.

For some actions, following the criteria for determining the study area listed above will result in too many or too few intersections to be analyzed. After determining the general study area, the following procedure may be used to choose intersections for further study:

- Choose three or four of the above intersections for a preliminary analysis. These intersections should be those with the worst conditions—those that would process the largest traffic volumes if the action is implemented or would be severely congested under the no action scenario (and will be affected by the action-generated or diverted vehicular traffic), and/or those at which the greatest traffic impacts would result from the action.

- Perform a mobile source analysis for these intersections (following the procedures set forth later in this section). This initial analysis will provide an indication of the magnitude of the action's impacts.

- If any significant impacts are predicted, review the study area to consider whether additional intersections with less severe traffic conditions should be added.

- This procedure may need to be repeated several times until enough receptor locations have been chosen to accurately characterized the action's mobile source air quality impacts.

Therefore, when initially collecting traffic data to be used for air quality analyses, it may be prudent to collect data from additional intersections that may be of some concern. Returning to collect these data on a different day, should those intersections be added to the air quality study area later, can lead to data inconsistencies that are difficult to resolve. Traffic data are collected for all roadway segments ("links") within 1,000 feet of the intersection of concern. It is generally not necessary to collect traffic data for links that begin beyond 1,000 feet of the intersection, unless a link between 1,000 and 1,600 feet is a large contributor of CO (see Section 321.1, below).

For generic or programmatic actions, the study area would depend on the nature of the action proposed and the amount of information that exists about its implementation. The air quality analyses can follow the same procedure used for the traffic analyses in these cases. Typically, depending on the size of the proposed action, certain areas are chosen as representative of all the types of areas that may be affected, and within those areas, intersections are selected as representative critical analysis locations. The air quality assessment would then be performed in the same way as for any other intersections.

Receptor Locations. For each of the intersections selected for study, receptor locations are chosen. Numerous receptors are sited at each intersection studied, to accurately characterize the ambient air quality there. As described above, receptors are generally located where the maximum total pollutant concentrations with the action or incremental pollutant concentrations resulting from the action are likely to occur and where people are likely to have continuous access. This usually means that receptors are located near those approaches of the intersection where traffic is likely to be the greatest or the most congested (e.g., where vehicles are delayed waiting at traffic signals). Examples of reasonable receptor sites are:

- Sidewalks near roadways;

- Edge of right-of-way for roadways without sidewalks, if publicly accessible;

- Property lines of all residences, hospitals, schools, playgrounds, and the entrances and air intakes to all other buildings;

- Portions of a parking lot to which pedestrians have continuous access;

- Parks proximate to roadways; and

- All air intakes or operable windows adjacent to elevated CO emission sources such as elevated highways or bridges for vehicular traffic.

Receptors are *not* located in places that are not considered ambient air (in other words, places where the public does not have continuous access). Some locations, such as tollbooths, are not considered accessible to the public although particular people may work there all day. The air quality at these locations is regulated by the U.S. Occupational Safety and Health Administration (OSHA), which has promulgated various workplace standards. Examples of unreasonable receptor sites according to EPA guidelines are:

- Median strips of roadways;

- Locations within the right-of-way on limited access highways;
- Locations within intersections or on crosswalks at intersections; and
- Tunnel approaches.

When analyzing CO levels near an intersection, at least one receptor at each corner of the intersection and one or two receptors adjacent to each queue (line of vehicles waiting at a traffic signal) on an approach link (the segment of roadway between two intersections, approaching the intersection being analyzed) to the primary intersection under analysis is analyzed. Multiple receptors are used to determine the location of both the highest total pollutant concentration and the highest increment caused by the action. Therefore, a series of receptors at different locations are assessed. Depending on the analysis results at these receptors, additional receptor locations may be appropriate. For example, if significant impacts are predicted at the receptors farthest from the intersection, additional receptors are added still farther away, until no impact is predicted. Receptors should be placed at midsidewalk, generally 6 to 7½ feet from the curbline of the sidewalk (for wider sidewalks, no more than 7½ feet from the curb), and set back from the corner of the intersection. If this results in receptors in the mixing zone (for the CAL3QHC2.0 model, discussed below), the mixing zone should be narrowed so that receptors are 1 foot from the edge of the mixing zone.

311.2. *Parking Facilities*

The locations where the worst potential air quality impacts might result from parking facilities' emissions (and, therefore, the locations where receptors should be placed in an air quality analysis of these facilities) vary depending on whether the facility would be open and at-grade (a parking lot), multilevel and open-sided (therefore, naturally ventilated), or totally enclosed (parking garage). Each of these is discussed below.

Parking Lots and Open-Sided Garages. The greatest potential pollutant concentrations from at-grade, unenclosed parking lots or multilevel, open-sided parking facilities would be immediately adjacent to such facilities, with the additional potential for cumulative impacts from pollutant emissions from the facility and from nearby on-street sources. Therefore, receptor locations are placed on sidewalks adjacent to and across the street from the garage.

Enclosed Garages. In the case of parking garages that are to be totally enclosed and mechanically ventilated, potential impacts from the exhaust vent(s) are assessed. The greatest impacts from the exhaust vent(s) might occur at a nearby residential building if the vent(s) are exhausted above the rooftop of the garage, or at pedestrian height if the vent(s) are near ground level. (The exhaust vents are actually stationary sources—even though the exhaust is from cars within the garage, the emissions emanate from a fixed location—and are assessed in the same way as other stationary sources; see the discussion of analysis techniques, below.) Receptor locations are placed at elevated locations on nearby residential buildings when rooftop exhaust vents are being assessed, and at sidewalk locations adjacent to and across the street from the vent(s) when other, pedestrian-level vents are being examined.

312. *Stationary Sources*

312.1. *Study Area*

Study areas for the analysis of stationary source impacts depend on the magnitude of the pollutant emission rates from the new source(s), the relative harmfulness of the compounds emitted, the characteristics of the systems that would discharge such pollutants (e.g., stack heights, stack exhaust velocities, *etc.*), and the surrounding topography relative to the these sources (e.g., tall residential buildings near shorter stacks). Similar to mobile sources, the study area consists of particular locations chosen for study, although in this analysis, those receptors are not usually located at intersections.

- When the proposed action would result in a new stationary source, the following general guidelines may apply:

  1. For actions that would result in a single building that would use any fossil fuels (fuel oil or natural gas) for the heating/hot water, ventilation, and air conditioning systems, first perform the screening analysis presented below (Section 322.1). If further analyses are required, the study area should generally include nearby tall buildings—particularly any tall buildings of comparable height to the stack.
  2. Actions that would result in more than one building that would use fossil fuels for heating/hot water, ventilation, and air conditioning are typically assessed as area sources. For these actions, the study area would generally include the area within 400 feet from the boundaries of a project site.
  3. For actions that would include operation of manufacturing or processing facilities, or medical, chemical, or research labs, at least

the area within a 400-foot radius should be included in the study area.

4. For actions that would create large emission sources, including but not limited to, solid waste or medical waste incinerators, cogeneration facilities, asphalt and concrete plants, or power generating plants, the study area should include at least the area within a 1,000-foot radius of the new source(s).
5. For actions that would result in potentially significant odors, including, but not limited to, solid waste management facilities, water pollution control plants (i.e., sewage treatment plants), and incinerators, the study area should include at least a 1,000-foot radius.

- When the proposed action would result in the addition of sensitive uses near stationary sources, the analysis considers the effects of those sources on the site of the action.

- For actions that would create "non-point" sources, such as fugitive dust, the effects on the nearest locations to which the public has general access are typically considered.

Generally, a preliminary analysis is performed for the locations chosen using the above criteria. If significant impacts are predicted at all or most of the chosen locations, it may be appropriate to expand the study are so that more distant locations are included. Alternatively, a preliminary screening analysis can be performed for several locations at various distances from the stationary source. The results of this screening analysis will determine the radius where the maximum impacts from the source will be calculated in a more detailed analysis.

For generic or programmatic actions, the first step would be to consider the potential ranges of stationary sources that could be a concern. Then, prototypical worst-case scenarios assuming prototypical stationary sources could be addressed.

312.2. Receptor Locations

Similar to the procedure for mobile sources, numerous receptors are analyzed at each of the locations to be studied in the assessment of stationary sources. These are located where the maximum total pollutant concentrations or incremental pollutant concentrations resulting from the action are likely to occur and where people are likely to have continuous access. When the action would result in a new stationary source, off-site receptor locations are usually modeled; on-site receptors may also be appropriate. For analyses of the effects of heating/hot water, ventilation, and air conditioning systems or other stacks, receptors are placed at elevated locations on nearby buildings (at operable windows or air intake vents). On the other hand, when development related to the action could be affected by existing (or planned) stationary sources, receptors are typically located on the project site. For actions that would result in development that could affect the dispersion of pollutants from an existing emissions source (e.g., power generating station), receptors are placed both on-site and off-site at locations where pollutant levels could increase significantly because of the changes in dispersion of the emissions from the source.

Examples of reasonable receptor sites include the following:

- Pedestrian-height receptors on sidewalks.

- Exterior uses, such as parks and playgrounds, and entrances and air intakes to sensitive interior uses, such as residences, hospitals, nursing homes, schools, and community facilities.

- Buildings with operable windows (i.e., windows that can be opened and closed by the tenant)—usually just residential buildings. Receptors may be at elevated locations, such as at operable windows anywhere on the building. When receptors are placed on a structure with operable windows, such as a tall residential building, multiple receptors should be placed along the building faces (from roof level down along the side of the building) closest to the source(s) under analysis.

- Air intake vent locations of buildings.

- Balconies on buildings and other accessible areas at elevated locations on buildings, such as rooftop decks, etc.

If there are substantial differences between the local grade levels of the source(s) and the receptors, the differences in terrain should be accounted for in the mathematical modeling. When performing either mathematical modeling or physical modeling, such as wind tunnel studies, some initial test runs should be performed with the first set of selected receptor sites. Based on these initial test runs, it will be possible to determine the specific locations or general regions where additional receptors should be added to ensure that the locations where the maximum total pollutant levels and incremental changes in concentration from the action are included in the complete analysis.

320. MODELS AND ANALYSIS TECHNIQUES

For CEQR analyses, air quality is usually assessed at the microscale level, using mathematical models that predict the pollutant concentrations for given locations. The models take into consideration all the different elements that can affect air quality—the pollutants being emitted from the mobile sources (usually, vehicle tailpipes) or stationary sources (usually, stacks), and the way these pollutants are dispersed, given meteorological conditions and roadway and building geometry. Generally, models are used to predict the pollutant concentrations for existing and future conditions; field monitoring of air quality is seldom used. Models used for the air quality assessment generally should conform with the U.S. EPA's *Guidelines on Air Quality Models* or should be approved by the lead agency as appropriate on a case-by-case basis.

Predictions are typically made for the future no action condition and the future with the action in place, so those scenarios can be compared and an action's effects on air quality determined. For mobile sources, the predictions for the analysis year are made using mathematical or physical models rather than actual monitoring, and the existing condition does not serve as a baseline for predicting the future (as it does in other technical areas). Predictions of pollutant concentrations are made separately for each of the analysis years chosen. For analyses of the effects of existing stationary sources, information on the existing pollutants being emitted from the source in question is obtained, and the analysis assumes that the future emissions are the same, unless available information indicates otherwise. Existing conditions are typically included in the analysis for illustrative purposes.

The following general procedures are used for microscale analyses of both mobile and stationary sources. These are described in detail in the sections that follow (Section 321 through 324). (Also note that actions that would result in single buildings can complete the stationary source screening analysis in Section 322.1 to determine the potential for significant impact from stationary sources before proceeding to more detailed analysis.)

1. Determine which pollutants will be assessed. This depends on the nature of the proposed action.
2. Choose a preliminary study area and receptor locations (see Section 310, above).
3. Determine the emissions of pollutants from the sources of concern.
4. Estimate the dispersion of those pollutants into the air, using a model.
5. To the predicted pollutant concentrations at the receptor locations resulting from the source, add the appropriate background pollutant concentrations to determine the total concentrations for the pollutants of concern at each receptor site.
6. Compare the predicted concentrations for each pollutant of concern with the appropriate standards and criteria (see Section 400).

Sections 321 and 322 describe the methodology for predicting microscale mobile and stationary source pollutant concentrations, respectively—whether for existing conditions, no action conditions, or the future with the action in place. They describe the various models appropriate for mobile and stationary source analyses, as well as how those models are applied. Input parameters to the models, methodological assumptions, and limitations of the models are also discussed. The approach to assessing construction impacts is discussed in Section 323. Mesoscale analyses are discussed separately in Section 324.

321. Microscale Mobile Source Modeling

Carbon monoxide is the primary pollutant of concern for most microscale mobile source analyses, including the assessments of roadways and automobile parking lots and garages. For parking lots and garages used primarily by heavy-duty diesel-powered trucks and buses, and for actions generating bus or truck traffic, inhalable particulates may also be of concern.

The basic tool for analyzing pollutant concentrations from mobile sources is the air pollutant dispersion model. These models estimate CO concentrations under given conditions of traffic, meteorology, and roadway configuration, as follows. First, traffic data for the analysis years are input into the model. Then, emissions from vehicle exhaust systems, and their distribution over the roadway, are estimated for that year, using a separate mathematical model. However, for areas with complex topography or actions that propose or would affect a fully or partially covered roadway, it may be more appropriate to use physical rather than mathematical models to assess the potential for significant impacts. The way these emissions are dispersed because of meteorological conditions, roadway geometry, and other factors is then considered.

321.1. Roadways

Mobile source analyses related to roadways are performed for actions that change traffic patterns, add traffic to an area's roadways, or reconfigure roadways, or for actions that could be affected by pollutants from roadways. Typically, they assess at-grade intersections

or street corridors with adjoining sidewalks. Sometimes, analyses are needed for major sources of CO, such as multilane highways or bridges, or partially or fully covered roadways.

Traffic Data Requirements. Before any mobile source impact analysis can be performed, input data on the vehicular traffic conditions on the roadways near the receptor sites under analysis will be required. Data are generally collected, and analyses performed, for roadway "links." A link is the section of roadway between two traffic signals. The links leading to a particular intersection are also called "approaches." At a minimum, the following information is required for each signalized street segment approach included in the mobile source modeling of at-grade roadways for each time period analyzed:

- Vehicle classifications—the relative mix of autos, taxis, trucks, etc. For air quality modeling, vehicles are divided into the following classifications: autos, taxis, light-duty trucks (those with four wheels, including vans and ambulances), heavy-duty gasoline-powered trucks and buses (heavy duty trucks have six or more wheels), and heavy-duty diesel-powered trucks and buses. Documentation on the procedures used to distinguish among the different vehicle types and weight categories when field surveys are performed is provided in the appendix.
- Hourly traffic volume.
- Width of traveled roadway (the effective width of the roadway).
- Average speed of base traffic.
- Stopped delay at the intersection.
- Number of moving lanes.
- Signal cycle length.
- Red time length per cycle.

In addition, the following information, derived from the 1985 *Highway Capacity Manual* (see Section 30, "Traffic and Parking"), is also needed:

- Saturation flow rate (a measure of each lane's vehicular capacity per hour of green time).
- Arrival type—the way traffic arrives at a light (e.g., in a constant stream or in platoons), which depends on how lights at the adjacent intersections are timed (and, particularly, the extent of signal timing progression for those lights).
- Signal type—pretimed, actuated (a signal that changes in response to the presence of a vehicle), or semi-actuated.

These data are collected for at least 1,000 feet from the intersection to be analyzed. Traffic data should also be gathered for all links within 1,000 feet of the intersection. Those links should be modeled in their entirety. It is generally not necessary to collect traffic data and model links that begin beyond 1,000 feet of the intersection, unless a link between 1,000 and 1,600 feet is a large contributor of CO. These links should also be modeled in their entirety. The traffic and parking section of the Manual provides more information on many of these traffic parameters. Others are parameters used only for air quality analyses (and not for traffic impact analyses); coordination with the traffic task will be required to ensure that the appropriate data are collected in the field.

Estimates of Mobile Source Emissions. Emissions models predict the distribution of pollutants emitted from vehicles' exhaust systems over the roadway (for both idling and moving vehicles). The primary pollutant of concern from mobile sources on roadways is CO. Emissions models used to analyze CO from mobile sources are a series of computer programs developed by EPA and periodically updated to account for the most recent test data on new vehicles under production (and any revised standards for emissions from new vehicles, also called "tailpipe" standards). At the issuance of this manual, EPA's MOBILE5A program was the most recent version of the mobile emissions factor model. However, because of City concerns about the accuracy of the MOBILE5A emission factor model used in conjunction with the CAL3QHC air quality dispersion model, EPA has agreed to allow a one-year grace period, during which the use of MOBILE4.1 with CAL3QHC for modeling CO at intersections is acceptable. During this grace period, EPA will be developing a refined procedure for use of CAL3QHC with MOBILE5A and exploring other alternatives as well. During this grace period as well as after its conclusion, the lead agency should ascertain from DEP which models are most appropriate, since these programs are periodically updated. DEP will also be able to provide recommended values for the numerous input options that are specific to the mobile source model and the credits associated with the latest New York State Inspection and Maintenance program.

The various factors to be considered when using mobile emissions models are described below.

- *Ambient temperature.* Estimates of CO emissions should be computed with a mobile model at 45°F, unless an action would generate a significantly larger number of (or only) vehicle trips during the summer period, when a higher ambient temperature for CO emissions calculations might be prudent. In this case, the appropriate ambient temperature would be determined by examining meteorological data for the period of concern.

- *Vehicle operating conditions (auto thermal states).* For automobiles and light-duty gasoline-powered trucks, emission estimates account for three possible vehicle operating conditions: cold-vehicle operation, hot-start operation, and hot-stabilized operation. It is important to distinguish between these three operating categories, because vehicles emit CO at different rates depending on whether they are cold or warmed up—cold vehicles emit significantly higher CO emissions than hot vehicles. The following assumptions are generally appropriate when determining thermal states:

  1. All action-generated taxis and heavy-duty gas trucks are assumed to be operating in a hot-stabilized mode.
  2. All arriving action-generated autos are, in general, assumed to be operating in a hot-stabilized mode (unless the arriving induced trips are from the immediate community, such as a local supermarket, where this assumption may not be valid).
  3. All departing action-generated autos are assumed to be operating in a cold mode.
  4. Recommended auto thermal states for existing traffic have been compiled both on a regional basis and at some of the more congested street locations in Manhattan, Queens (Long Island City), and downtown Brooklyn. DEP can be contacted to obtain the most up-to-date list of recommended auto thermal states. DEP's *Report #34, Revised* can be used to estimate auto thermal states where site-specific data are not available. In most instances, no action thermal states are assumed to be the same as those in the existing condition. However, for large future no action projects located in the study area, it may be appropriate to consider that project's vehicles separately. Vehicles generated by such projects are modeled individually as hot stabilized, cold start, taxis, or trucks based on that project's traffic assignment.
  5. Light-duty truck operating conditions are, in general, be based on compiled data originally supplied by the Tri-State Regional Planning Association.

Dispersion Modeling. The necessary traffic data for each roadway segment and the emission outputs from the recommended mobile emissions model (both discussed above) are analyzed together, using a dispersion model. Mobile source dispersion models estimate the way CO concentrations resulting from given traffic conditions are dispersed because of meteorological conditions, roadway geometry, and other factors, and predict resultant pollutant concentrations at given receptor sites.

For most locations adjacent to at-grade signalized roadways, the CAL3QHC2.0 dispersion model, as described in *User's Guide to CAL3QHC2.0*, Research Triangle Park, North Carolina, is usually most appropriate. The CAL3QHC2.0 model is a microcomputer-based modeling methodology developed by EPA to predict the concentration of CO from motor vehicles traveling near or through roadway intersections. Based on the assumption that vehicles at an intersection are either in motion or idling, the program is designed to predict air pollution levels by combining the emissions from both moving and idling vehicles.

The CAL3QHC2.0 model requires a coordinate system corresponding to the roadway geometries under study as part of the input to the program. For each street approach to a signalized intersection, a "free flow" link simulates the CO emissions from vehicles over the block that are not delayed by traffic signals. A second "queue" link length is calculated by the algorithms within the program, using input parameters supplied to the model for each approach of a signalized intersection. Emission factors for idling vehicles from the mobile model are input into the CAL3QHC2.0 mode to estimate CO emission rates from these queued links.

Generally, the following assumptions are employed for the various input parameters to the CAL3QHC2.0 model for assessments of CO concentrations:

1. Surface roughness of 3.21 meters in Manhattan south of 96th Street, downtown Brooklyn, and Long Island City; for other areas, the CAL3QHC *User's Guide* can be used to determine surface roughness, based on the area's building geometry

2. Wind speed of 1 meter/second
3. Settling and deposition velocities of 0
4. Source height of 0 (for at-grade roadways)
5. Mixing height set at 1,000 meters
6. Neutral atmospheric stability (unless along an undeveloped shoreline area where a stable atmospheric stability may be appropriate, based on Aeur's technique—see the ISC2 *User's Guide*)
7. Time averaging period of 60 minutes
8. Wind angle search over 360° with default wind angle search routine
9. Receptor height of 1.8 meters (approximately 6 feet)
10. Clearance interval time of 2 seconds per approach
11. Saturation flow rate as determined by the traffic model used (e.g., the 1985 *Highway Capacity Manual*)
12. Add 6 meters to the width of the effective roadway for free flow links

In some instances, irregular applications of a dispersion model may be required to simulate unique roadway configurations (i.e., estimating potential CO levels at receptors on a new residential structure adjacent to an elevated highway or a raised entrance/exit to a bridge crossing). For these situations, CAL3QHC2.0 may be used to simulate these line sources by treating these roadways as unsignalized, free flow links (if travel speeds warrant such an assumption). An alternative model that might be used under such circumstances is the HIWAY-2 dispersion model (*User's Guide for HIWAY-2, A Highway Air Pollution Model*, Publication No. EPA-600/8-80-018, Research Triangle Park, North Carolina). HIWAY-2 may also be appropriate for analysis of highways. Either CAL3QHC or HIWAY-2 can be used to assess unsignalized intersections; however, air quality is not typically a concern at these intersections, so such an analysis is seldom needed. For areas with complex topography or fully or partially covered roadways, physical models, such as wind tunnel modeling, may be appropriate. It is prudent to check with DEP before using other models, to determine their appropriateness.

Time Averaging Periods. Predictions of pollutant concentrations are made to be comparable with the National Ambient Air Quality Standards, so they are made for the same time periods as the standards (for example, the NAAQS for carbon monoxide are for 1-hour and 8-hour concentrations; the PM_{10} standards are for an annual geometric mean and a 24-hour average concentration). These standards are for the *average* concentration during each of those time periods. Annual standards pertain to the average pollutant concentrations either predicted or measured in a calendar year, while 24-hour standards pertain to pollutant concentrations occurring in a calendar day.

As discussed in the traffic and parking section of the Manual, peak hour periods are commonly used to evaluate the potential impacts of traffic generated by an action. Peak 1-hour traffic data gathered as part of the traffic analysis are used as the basis for predicting the maximum 1-hour carbon monoxide levels near a roadway. These peak 1-hour traffic data are also typically used to develop the maximum predicted 8-hour carbon monoxide levels. To derive the 8-hour CO level, the maximum 1-hour concentration calculated from local sources for the peak hour is multiplied by a "persistence" factor, based on historical air quality monitoring data in New York City. The persistence factor takes account of the fact that over 8 hours (as distinct from a single hour), vehicle volumes will fluctuate downward from the peak hour, traffic speeds may vary, and wind directions and speeds will change to some degree relative to the conservative assumptions used for the single highest hour. As presented in the State Implementation Plan, the following persistence factors can be used: for Midtown Manhattan, 0.75; for Downtown Manhattan, 0.68; for downtown Brooklyn, 0.76; and for the rest of the City, 0.70.

Background Concentrations. Mobile source modeling of CO concentrations at sidewalk locations accounts solely for emissions from vehicles on the nearby streets, but not for overall pollutant levels. Therefore, background pollutant concentrations must be added to modeling results to obtain total pollutant concentrations at a prediction site. Background pollutant concentrations are usually derived from recorded pollutant concentrations throughout New York City at elevated monitors, maintained by the DEC, that are not unduly influenced by local sources of pollutants. These monitors are indicative of pollutant levels associated with pollutants emitted throughout the nearby region.

The primary application of mobile source modeling is to evaluate maximum predicted 1- and 8-hour CO concentrations at places of public access. Therefore, background CO levels for 1- and 8-hour averaging periods are required for each of the analysis years (existing and the build year(s), as appropriate). Future year background concentrations are based on measured CO levels at the nearest DEC monitoring stations, adjusted to reflect the reduced vehicular emissions expected in the future (because, as older vehicles on the road are replaced by newer ones, more and more vehicles have stringent emissions controls—see below). For purposes of these adjustments, it is typically assumed

that 20 percent of the background CO value is caused by non-roadway emissions that have remained relatively unchanged with time, and that 80 percent of the background CO value is caused by mobile sources, and will decrease in time. This decrease reflects the increasing numbers of Federally mandated lower-emission vehicles that are projected to enter the vehicle fleet as older, higher polluting vehicles are retired (i.e., vehicle turnover), and the continuing benefits of the New York State Inspection & Maintenance (I&M) program. DEP will provide the most up-to-date monitored CO background levels for the various regions within New York City.

Future No Action Condition. The future no action condition accounts for general background traffic growth in the study area, new trips and other changes expected because of other proposed developments, and changes in emissions because of vehicle turnover, etc. Traffic that would be generated by development on "soft" sites may also need to be considered. Generally, the no action scenario analyzed is similar to that assessed for the land use task. More information on determining the future no action condition is provided in Chapter 2 of this Manual, and in Section 3A, "Land Use, Zoning, and Public Policy."

Future Action Condition. The future action condition adds any changes resulting from the action to conditions predicted in the future without the action. The differences between these two conditions and the potential for significant impacts are then assessed.

321.2. Parking Facilities

Analyses of parking facilities are similar to those for roadways (Section 321.1, above), but the assumptions used in estimating emissions (or, the inputs to the emission model) will differ, and so will the dispersion model.

Parking Lots. CO is the primary pollutant of concern for unenclosed, at-grade parking lots used by automobiles; PM_{10} is the primary pollutant of concern for parking lots used by heavy-duty diesel vehicles. The modeling procedures for both types of parking lots are explained below.

- For automobile parking lots, the following techniques are appropriate:

  1. *Estimates of mobile source emissions.* Emissions estimates for CO are calculated at an ambient temperature of 45°F with a mobile emissions model (such as the EPA's MOBILE model; see the discussion in Section 321.1, above). Information required for the mobile emissions model includes the following: the dimensions (i.e., length and width) of the parking lot, CO idle emission factors for cold autos, CO emission factors at 5 miles per hour for both cold and hot autos, and hour-by-hour vehicular entrances to and exits from ("ins and outs") the parking lot (typically, the eight hours with the highest volumes). Peak 1-hour and 8-hour averaging periods' emission rates are typically calculated for the build year assuming that autos idle for 1 minute before starting to travel to the parking lot exit(s), and the traveling distance within the lot by vehicles entering and exiting the lot is usually conservatively estimated by calculating this mean travel distance as two-thirds of the maximum travel distance from the entrance/exit of the lot to the farthest parking space. The 1-hour and (in most cases) 8-hour averaging periods with the largest total number of departing autos will yield the highest CO emission rates for these respective time averaging periods.
  2. *Dispersion estimates.* Potential cumulative concentrations from on-street sources and emissions from the parking lot at a receptor location adjacent to the lot can be calculated by adding the CO levels calculated from the parking facility at this location to the contribution of on-street sources. It is advisable to analyze receptor locations on the near and far sidewalks adjacent to the parking lot, to ensure that maximum cumulative effects from on-street and parking lot emissions are disclosed. Appropriate background concentrations also must be added. Contribution of on-street source emissions at this receptor location can be calculated either through microscale modeling for the same wind directions that cause the parking lot emissions to affect this location. Procedures outlined in EPA's *Volume 9 (Revised)* (see the discussion in Section 321.1, "Dispersion Modeling," above) for estimating air quality impacts from parking facilities can be followed to estimate potential CO concentrations from parking lots. A sample air quality analysis of potential CO impacts from an automobile multilevel, naturally ventilated parking facility is included in the appendix.

     An alternative method is to simulate the parking lot as multiple line sources adjacent to the on-street source in a dispersion model, such as HIWAY-2. A third method is to use the area source algorithm in the PAL model. The

EPA's *Guideline on Models* provides more information.

- For parking lots used by large numbers of diesel trucks or buses, where PM_{10} is the primary pollutant of concern, a procedure analogous to that used for automobile parking lots (see above) can be used to determine PM_{10} concentrations near the lot:

  1. Idle emissions of PM_{10} from heavy-duty diesel trucks are insignificant when compared with PM_{10} emission rates for accelerating heavy-duty diesel trucks. Therefore, only PM_{10} emission rates from trucks traveling within the lot are estimated, usually from factors listed in EPA's *Compilation of Air Pollutant Emission Factors (AP-42)*, for this kind of analysis.
  2. Analyses are performed to determine the maximum potential PM_{10} 24-hour concentrations adjacent to the lot, based on the hourly average (over a 24-hour period) for the diesel trucks entering and exiting the parking lot.
  3. Twenty-four-hour PM_{10} background values are then added to the localized contribution.

Multilevel, Naturally Ventilated Parking Facilities. Multilevel parking facilities with at least three sides partially open are, for air quality analyses, considered in a similar manner to at-grade parking lots. As for at-grade lots, CO is the primary pollutant of concern for facilities used by automobiles, and PM_{10} is of concern when diesel trucks or buses use the facility. The CO impact analyses for these facilities are almost identical to those performed for parking lots, except that CO emissions from arriving and departing vehicles are distributed over the various levels and ramps of the parking facility. It is usually appropriate to adjust the calculation of CO impacts at a ground-level receptor from the above-grade levels of the facility following calculations presented in EPA's *Workbook of Atmospheric Dispersion Estimates (AP-26)*. A PM_{10} analysis for a multilevel, naturally ventilated facility used by diesel trucks or buses could be similarly modified. A sample air quality analysis of potential CO impacts from a multilevel, naturally ventilated automobile parking facility is in the appendix.

Parking Garages. These include any parking facilities, whether multi- or single-level, below- or above-grade, that would be enclosed and include a ventilation system. Similar to at-grade lots and multilevel, naturally ventilated facilities, CO is the primary pollutant of concern for automobile parking garages, and PM_{10} is of concern when heavy-duty diesel trucks or buses use the garage. In either case, pollutants would be present within the garage and would be exhausted by the garage's vent(s) for the mechanical ventilation system. Thus, pollutant levels could be elevated near the vents outside of the garage. The vents are stationary sources, similar to stacks. The analysis of pollutant concentrations within and outside parking garages is described below.

- For automobile garages, the following procedures are generally appropriate:

  1. For CO concentrations within the garage, it is recommended that CO emissions within the facility be conservatively estimated at an ambient temperature of 45°F. Total CO emissions rates (for 1- and 8-hour averaging periods) within the garage are calculated following the same procedures for the multilevel, naturally ventilated garage, and all of the emissions from the different levels are summed together.
  2. The appropriate background concentrations are then added to the predicted concentrations.
  3. These total emission rates are then divided by the minimum ventilation rate required by the New York City Building Code (i.e., 1 cubic foot per minute of fresh air per gross square foot of garage area), to determine the maximum 1- and 8-hour CO levels within the garage.
  4. For concentrations near the garage vents, the CO concentrations predicted within the garage are then used in the calculations. The garage vent(s) are converted into "virtual point sources" using equations listed in EPA's *AP-26*, and the concentrations within the garage are used to estimate the initial dispersion at the garage vent(s). These equations can be used to estimate CO impacts at nearby elevated receptors (e.g., tall residential buildings nearby) if the effluent is exhausted at an elevated height, or at pedestrian-level height (for lower exhaust stacks).
  5. Potential cumulative CO impacts on the near and far sidewalks adjacent to the garage vent(s) can be calculated by adding the impact from the garage exhaust to on-street sources following a methodology similar to that employed for naturally ventilated parking facilities. A sample air quality analysis of potential CO impacts from an automobile parking garage is in the appendix.

- For garages that would be used by heavy-duty diesel trucks or buses, the following procedures can be used:

  1. Estimates of PM_{10} emissions are calculated following procedures similar to those for parking lots.
  2. These total PM_{10} emissions should be divided by the minimum ventilation rate required by the New York City Building Code to determine maximum PM_{10} levels within the facility.
  3. The PM_{10} concentrations within the facility should be compared with the U.S. Occupational and Safety Health Administration's (OSHA's) guideline worker exposure levels for various time averaging periods. These are available in *Air Contaminants—Permissible Exposure Limits* available from the U.S. Department of Labor, OSHA.
  4. Off-site PM_{10} concentrations can be calculated by following the same methodology employed for CO exhaust from automobile garages, or if there would be numerous exhaust points, such as exhaust vents all along the rooftop of the structure, off-site PM_{10} impacts can be calculated treating these emissions as an "area source" (see discussion on area source analyses in Section 322.2, below).

Time Averaging Periods. The anticipated hourly vehicular entrances and exits to the facility are usually reviewed to determine the hour that would yield the largest amount of CO emitted from the parking facility. Peak 1-hour concentrations adjacent to the facility (and peak 1-hour concentrations within the facility if it is an enclosed garage), are then determined for this hour. The hourly vehicular entrances to and exits from the garage are also used to determine the period that would generate the largest amount of CO over an 8-hour period. Off-site concentrations calculated with the average hourly CO emission rate over this 8-hour interval are also multiplied by a persistence factor when determining 8-hour CO incremental impacts from parking facilities.

Future No Action Condition. Similar to the assessment of roadways, analyses of parking facilities will consider conditions in the future without the action. This assessment considers any new developments expected by the action's build year (see discussion above), but does not include the proposed parking facility.

Future Action Condition. The future action condition assesses the proposed parking facility, and compares the results of that analysis with conditions expected in the no action condition to determine the potential for significant impacts.

322. *Stationary Source Modeling*

Stationary source modeling is typically required to evaluate the potential impacts of emissions from the following:

- Boilers for heating/hot water, ventilation, and air conditioning systems in new buildings or building expansions.
- Ventilation exhaust systems for new manufacturing or industrial facilities or medical, chemical, or research laboratories.
- Large emissions sources, such as power generating stations, which could affect surrounding uses, or could be affected by new structures nearby.
- Existing (or future planned) manufacturing and industrial facilities, which could affect sensitive uses nearby.
- Industrial facilities that could potentially discharge malodorous pollutants into the nearby neighborhood.

For actions with potential impacts related to boilers for heating/hot water, ventilation, and air conditioning systems for a single building, a preliminary screening analysis can be performed to determine the potential for significant stationary source air quality impacts. Many such actions will not require any further analysis. This screening analysis is presented in Section 322.1, below.

All other actions with potential stationary source air quality impacts will require detailed analyses, described in Section 322.2, below.

In general, for actions that would result in or facilitate the development of either new significant fossil fuel burning sources or new facilities that could be adversely affected by airborne emissions from nearby existing (or planned) major fossil fuel burning sources, SO_2, NO_2, and PM_{10}, are the primary pollutants of concern. If such sources under study would exclusively burn natural gas, NO_2 is the primary pollutant of concern. For actions that would result in or facilitate the development of either new significant industrial sources or new facilities that could be adversely affected by airborne emissions from existing (or planned) industrial sources, the six national criteria pollutants (with the possible exception of ozone) and noncriteria pollutants will have to be taken into

consideration before identifying the pollutants of concern for the more detailed stationary source impact analysis. The existing or potential new stationary source(s) under review should be examined on a case-by-case basis to appropriately determine the pollutants of concern. This is also applicable for proposed industrial facilities that could potentially discharge malodorous pollutants into the nearby neighborhood, or existing facilities that discharge malodorous pollutants that may affect new development resulting from or facilitated by an action.

322.1. Screening Analyses for Heat and Hot Water Systems

Impacts from boiler emissions are a function of fuel oil type, stack height, minimum distance from the source to the nearest receptor (building), and square footage of development resulting from the action. This section describes a preliminary screening analysis that can be performed to determine an action's potential for significant impacts, and to avoid preparing a more detailed analysis if it is not necessary. The preliminary screening analysis uses Figures 3Q-3 to 3Q-7, which were specifically developed through detailed mathematical modeling to predict the threshold of development size below which an action would not likely have a significant impact. These figures indicate type of fuel, use of the proposed building(s), and distance to nearest building of a height similar to or greater than the stack height of the proposed building(s). The step-by-step methodology outlined below explains how to use these figures. This methodology is only appropriate for single buildings or sources. For other situations, refer to the discussion below on area sources. It is also only appropriate for buildings at least 30 feet from the nearest building of similar or greater height.

1. First, consider the type of fuel that would be used to provide heat/hot water. If the type of fuel is unknown, generally assume No. 4 fuel oil (a conservative assumption for air quality purposes).
2. Then, determine the maximum size and type of development that would use the boiler stack. For residential or mixed-use commercial and residential actions, refer to the figures indicating "maximum residential development size." For nonresidential uses, refer to the "maximum commercial and other uses development size" figures.
3. Using a Borough President's map, Sanborn atlas, or equivalent, determine the minimum distance (in feet) between the building(s) resulting from or facilitated by the proposed action and the nearest building of similar or greater height.
   If this distance is less than 30 feet, more detailed analyses than this step-by-step screen are required. If the distance is greater than 350 feet, assume 350 feet.
4. Determine the stack height of the building resulting from the proposed action, in feet above the local ground level. If unknown, assume 3 feet above the roof height of the building.
5. Then, select from the heights of 20, 100, and 160 feet, the number closest to but NOT higher than the proposed stack height.
6. Based on steps 1 through 6 above, select the appropriate figure (by fuel and type of development) and curve (by stack height) for the proposed action. Locate a point on the appropriate chart by plotting the size of the development against the distance in feet to the edge of the nearest building of height similar to or greater than the stack of the proposed action.
7. If the plotted point is on or above the curve corresponding to the height recorded in step 6, there is the potential for a significant air quality impact from the action's boiler(s), and detailed analyses must be conducted. If it is not, a potential significant impact due to boiler stack emissions is unlikely and no further analysis is needed.

In some cases, it may be possible to pass this screening analysis by restricting the type of fuel that could be used to supply heat and hot water. As illustrated in Figures 3Q-3 through 3Q-7, No. 4 and No. 6 oils have greater emissions than No. 2 oil or natural gas. Limiting the fuel used by the proposed action to No. 2 oil or natural gas (which is the cleanest of all the fossil fuel types used for heating, ventilation, and air conditioning systems) may eliminate the potential for significant impacts and also the need for further analyses. This can be determined using steps 1 through 8, above. The action, however, would have to include the restriction on the boiler fuel type (and indicate the mechanism that would ensure the use of a specific fuel type) if this option is selected.

If these screening methods indicate that further analysis is necessary, then detailed stationary source analysis is required as described below in Section 322.2.

322.2. Detailed Analyses

Estimates of Stationary Source Emissions. The method for estimating the pollutant emissions from a stationary source depends on whether the source is existing or planned for the future.

- For existing large fossil-fuel burning sources, emissions rates can be obtained as follows:

Figure 3Q-3

No. 4 and 6 Fuel Oils

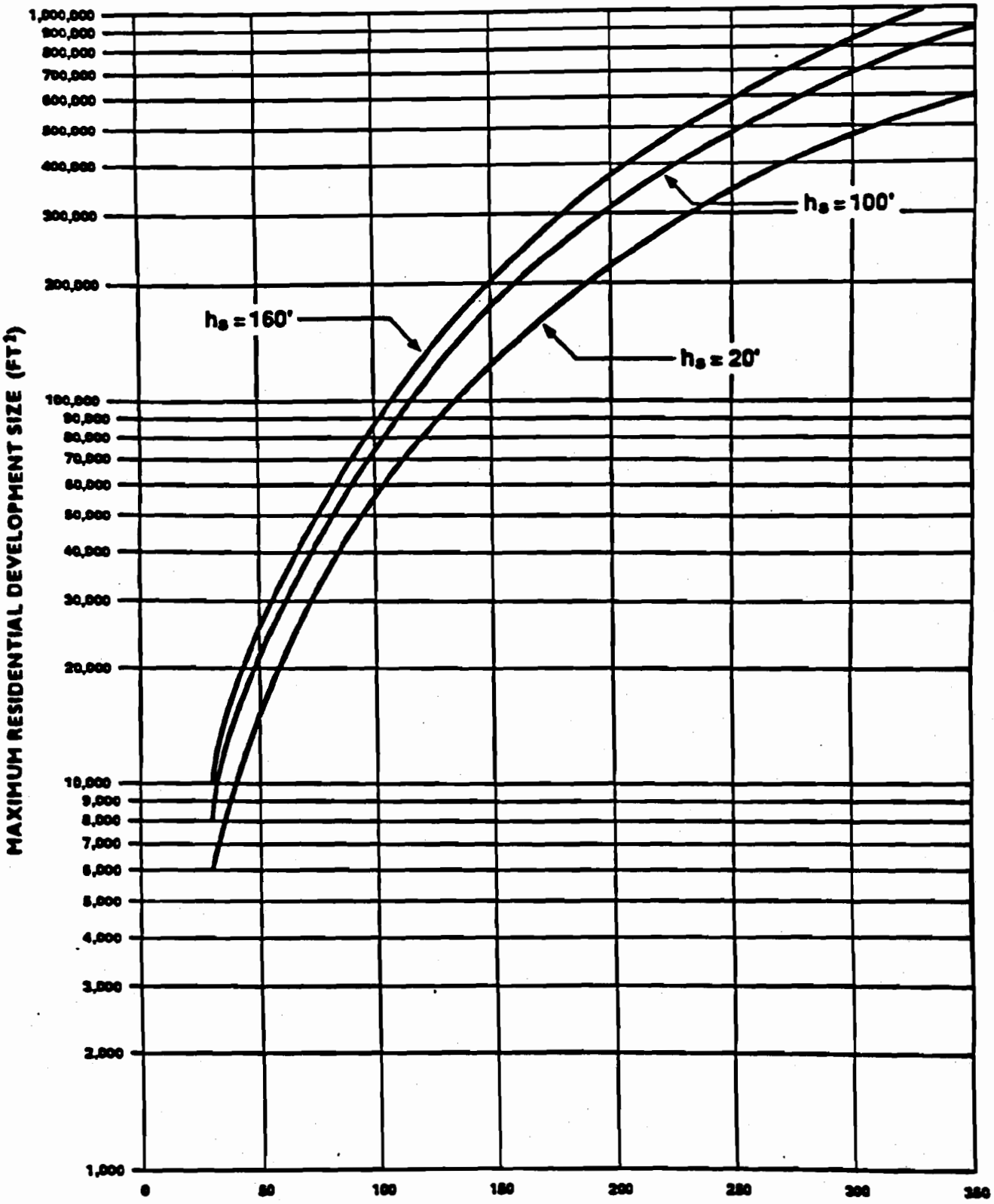


Figure 3Q-4

No. 4 and 6 Fuel Oils

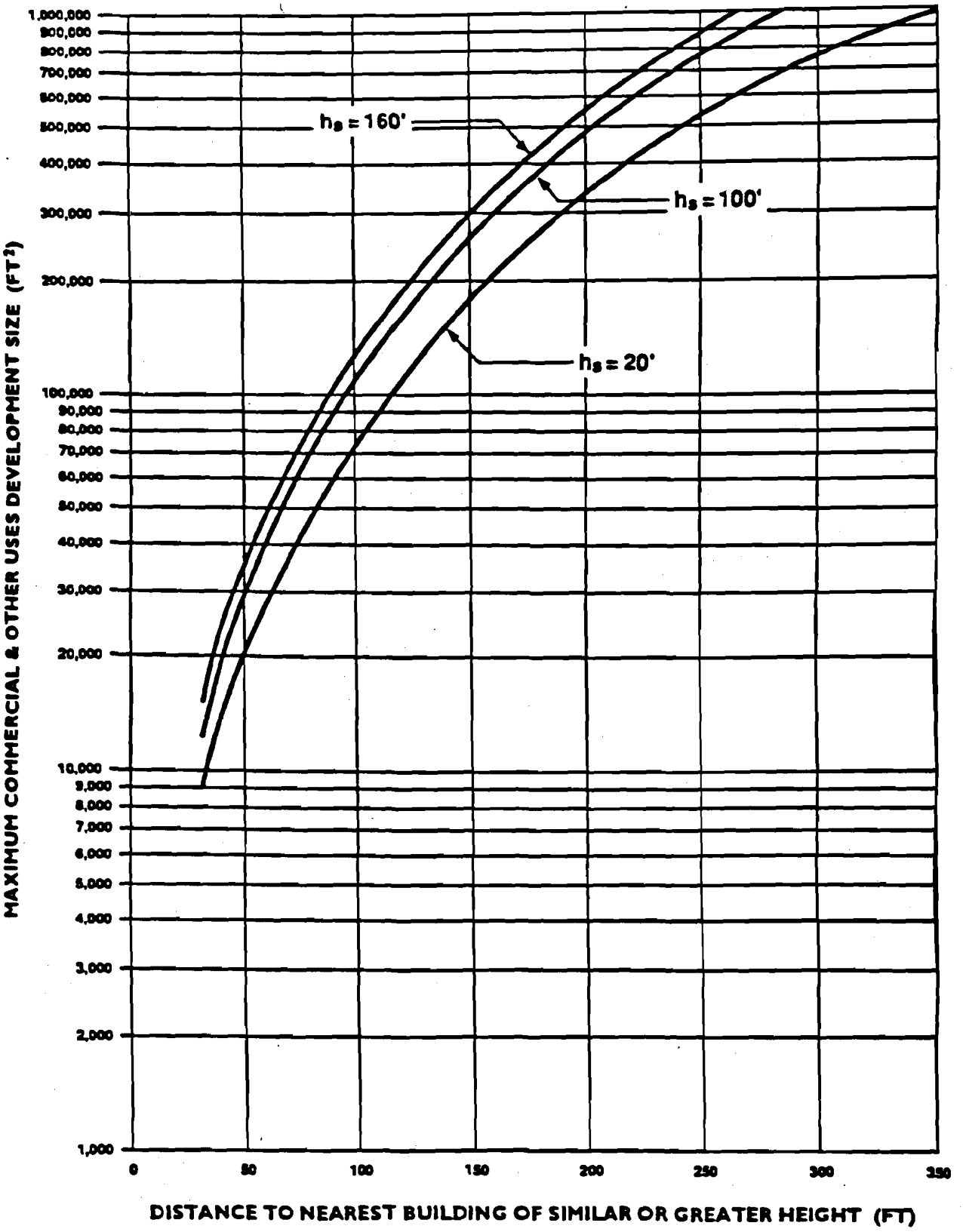


Figure 3Q-5
No. 2 Fuel Oil

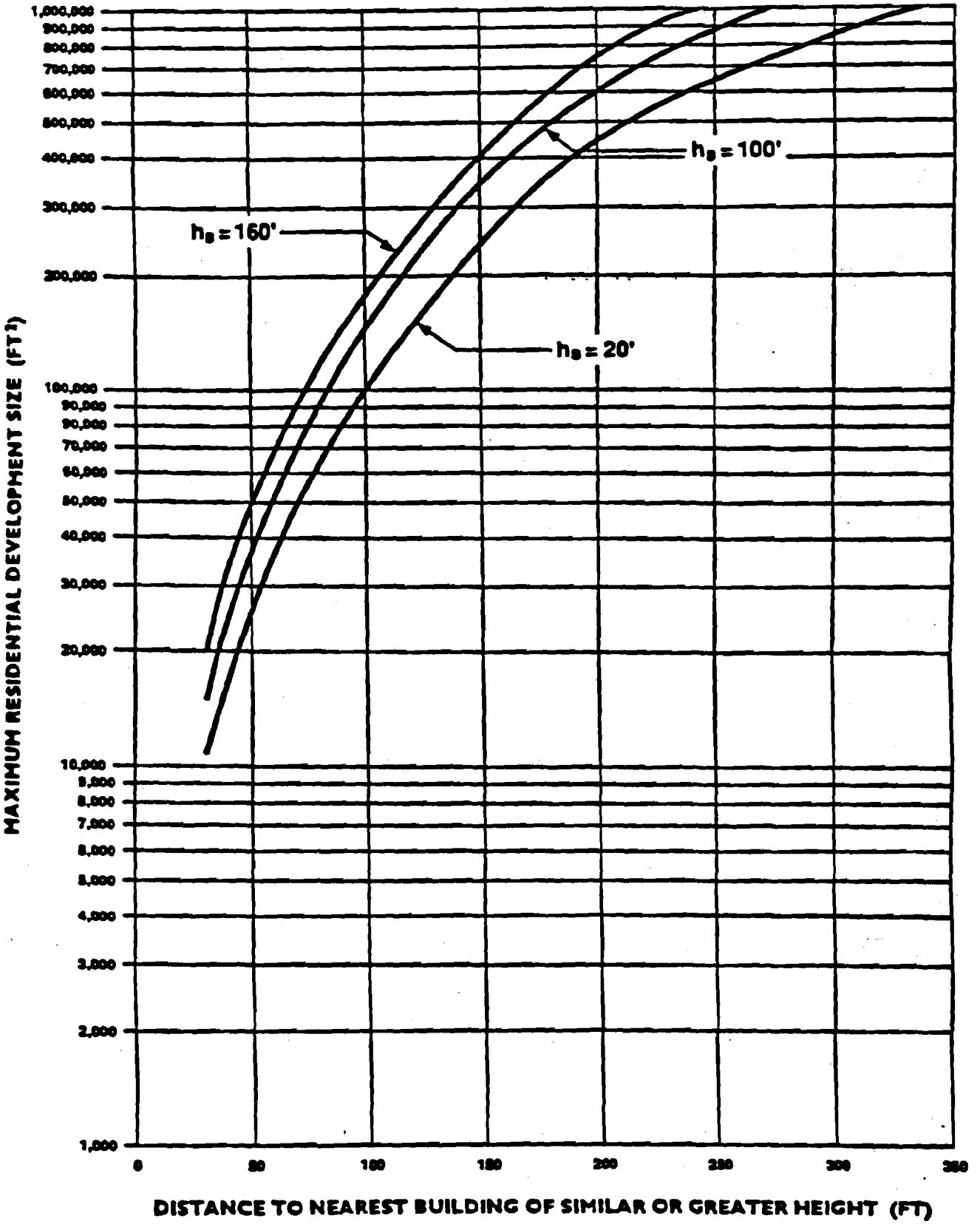


Figure 3Q-6

No. 2 Fuel Oil

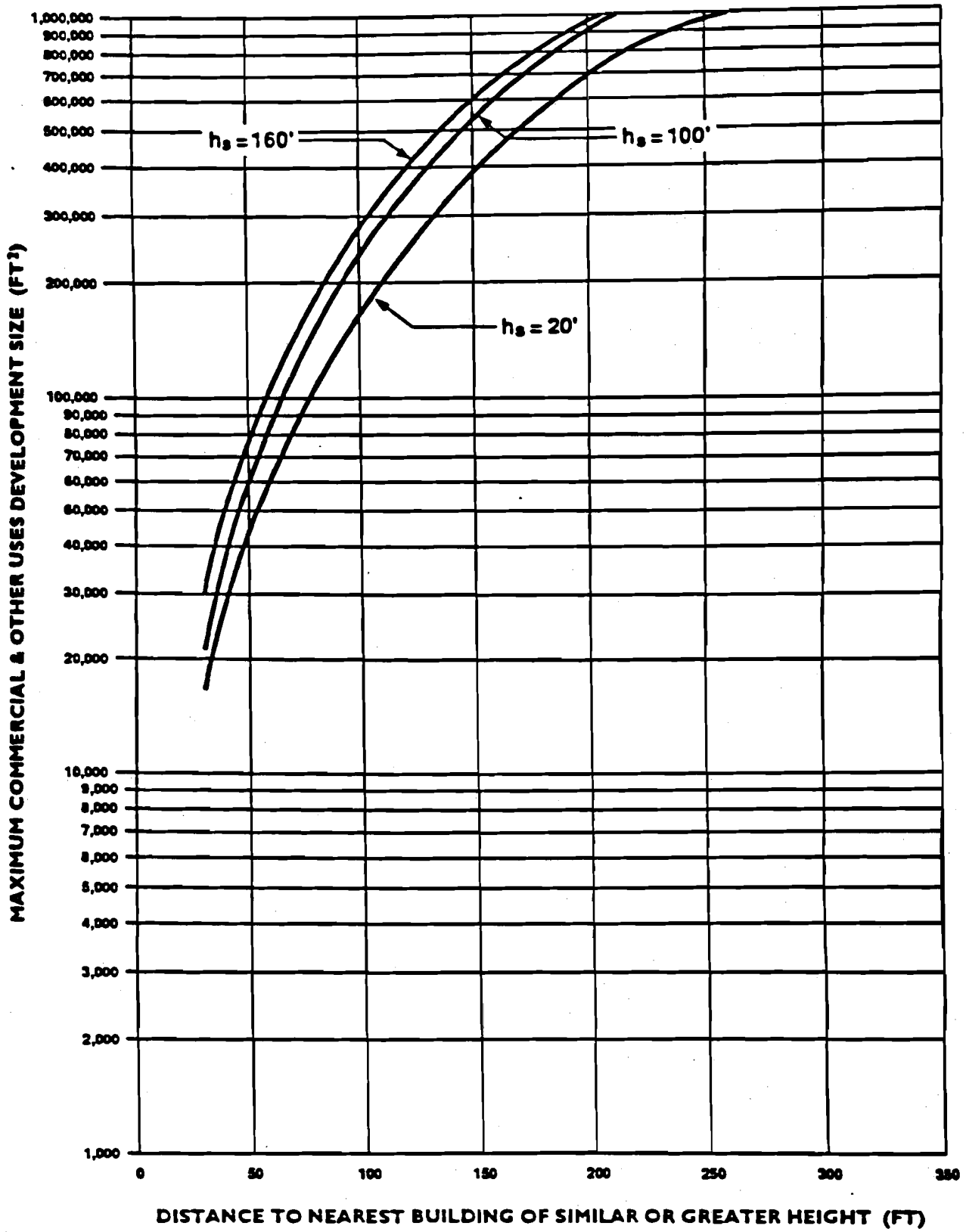
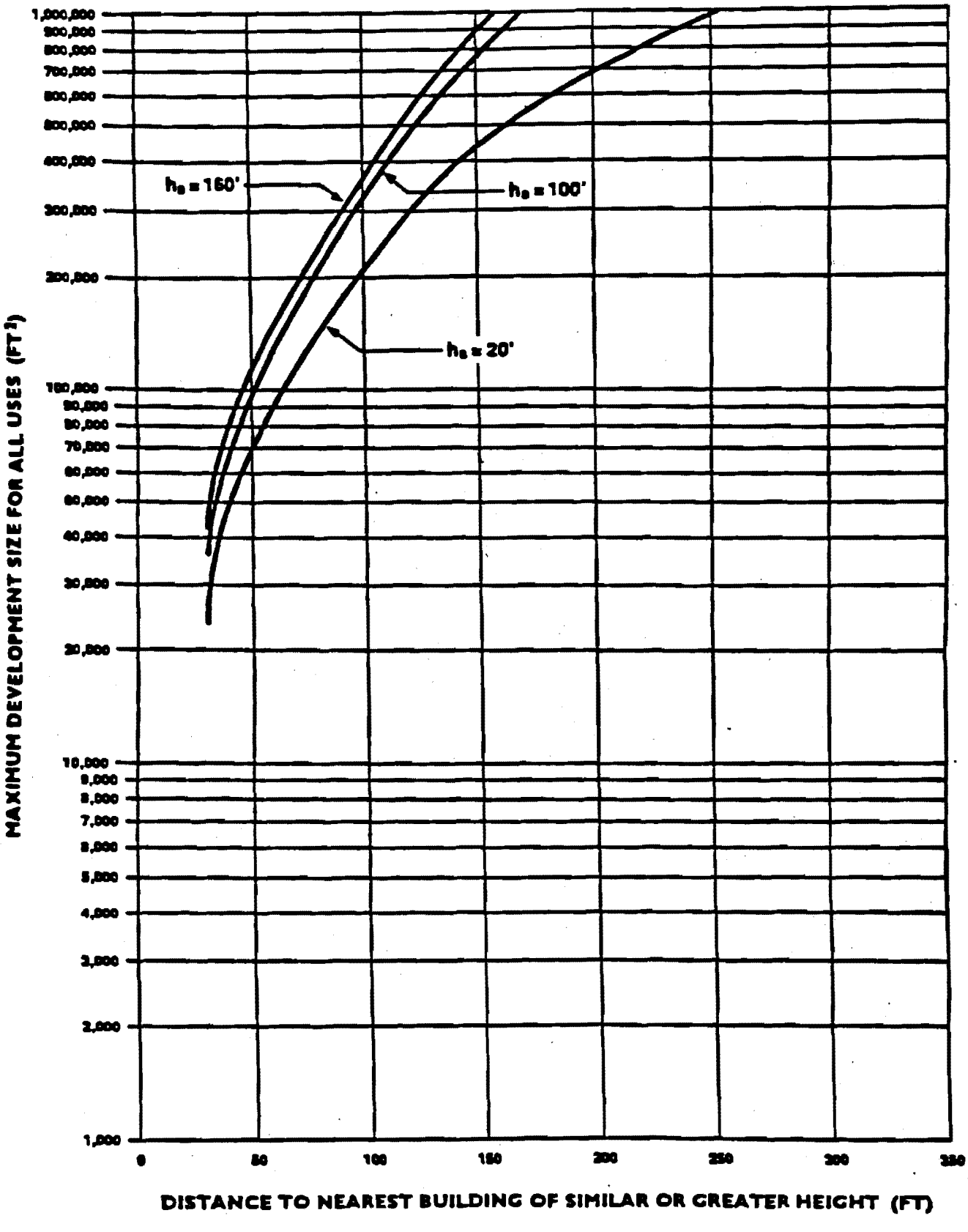


Figure 3Q-7

Natural Gas



1. Almost all existing large fossil-fuel burning sources will have certificate-to-operate permits from either DEP Bureau of Air Resources (BAR) or DEC that limit the amount and type of fuel to burned and/or pollutants that can be emitted through the exhaust stacks. "Major" sources (those large sources that require Prevention of Significant Deterioration permits) and City-owned sources (e.g., large boilers for a facility owned by the Health and Hospitals Corporation) will have permits issued by DEC, while all other facilities will probably have permits filed with BAR. Even if an existing source discharges less than the prescribed limits in a permit, the limits specified in the permits should still be considered as the basis for estimating the maximum emissions from this source. In addition to the permits issued by the City, BAR usually has copies of DEC permits for these types of facilities, and the procedures for obtaining copies of permits from DEC are discussed under item 2, below, for existing manufacturing uses.
2. In cases where only the fuel consumption rates (or refuse burning rates) are supplied, emission factors for the criteria pollutants of concern—which can usually be obtained from EPA's *Compilation of Air Pollutant Emission Factors (AP-42)*—are multiplied by the consumption rates to yield estimates for pollutant emission rates. Sulfur dioxide emission factors reported in *AP-42* for oil-burning boilers are directly proportional to the percentage of sulfur in the oil. New York City limits the sulfur contents of distillate (No. 2) oil to no more than 0.2 percent (by weight) sulfur, and to no more than 0.3 percent sulfur for residual (No. 4 and No. 6) oils. Therefore, these percent sulfur limits should be used for the respective fuel types to estimate sulfur dioxide emission factors for oil-burning boilers.

- For existing manufacturing uses, the following steps may be performed:

  1. Perform field observations of manufacturing uses within the study area to identify the existing manufacturing uses with exhaust stacks (or points) that may have the potential to adversely affect the structure(s) that could be developed as a result of the action.
  2. After preparing a list of these facilities with their corresponding addresses, a formal request can be made to BAR for a copy of any air contaminant permits for these facilities. BAR should also be able to supply any permits for nearby major source emitters of concern. In some instances, such as a facility operated by a New York City agency, DEC issues the air contaminant permits, but BAR should still have a copy of such permits in its files. BAR will assess a charge for each address in a search request, unless a waiver of the fees (which is normally done for actions sponsored by governmental agencies) is first approved by DEP's counsel. Requests for copies of the BAR air contaminant permits should be addressed to the New York City Department of Environmental Protection, Bureau of Air Resources, 59-17 Junction Boulevard, Elmhurst NY 11373, and requests for fee waivers for BAR searches should be addressed to DEP Bureau of Legal & Legislative Affairs at the same address as BAR. The permits can be used to ascertain the pollutants being emitted from the facility in question. The analysis considers the maximum emissions allowable under the permit, even if actual operating conditions are different.
  3. When no permits are available from BAR for a given location, but emissions are apparent there, a conservative emissions analysis based on the likely manufacturing process may be appropriate. This may entail examining material safety data sheets (MSDS), available from the manufacturer, to ascertain details of the pollutants involved in the particular manufacturing process. Contact DEP for assistance with this analysis.

- For new sources associated with proposed actions (and for future sources that may affect or be affected by an action), estimates of pollutant emission rates will depend on the type of sources and the pollutants emitted from such sources. Generally, the following procedure may be used:

  1. For new fuel burning sources, estimates of fuel consumption rates can either be based on "rule of thumb" fuel consumption rates estimated by mechanical engineers designing the facility, or default emission factor values for residential and commercial facilities. Such values are available in DEP's *Report #12, Fuel Factors for New York City*, but those values should be reduced by 30 percent for new facilities. This is because the default values listed in *Report #12* were developed a number of years ago, when buildings were not as energy efficient as they are today.

2. For buildings with interruptible gas systems (these are systems that use natural gas for most of the year, but during the coldest days, use fuel oil; such energy systems are chosen because of the more economical rates available from the power utility), analyses of short-term effects are typically performed for fuel oil, while analyses of annual emissions are performed for natural gas. More information on this is provided below in the section that discusses time averaging periods.

- Estimates of malodorous pollutant emission rates are evaluated on a case-by-case basis. Odor thresholds of specific pollutants (i.e., pollutant levels in ambient air that result in a malodorous smell that is recognized by the general populace) can vary by several orders of magnitude, depending on the pollutants. To evaluate the potential for malodorous emissions, the following general procedures can be used:

  1. Perform a rigorous evaluation of the processes at the facility in question to determine the potentially malodorous substances emitted and their respective emission rates.
  2. For those substances, perform a literature search for odor thresholds and other characteristics.
  3. Of all the chemical compounds emitted, the one that will result in the greatest potential for malodorous emissions is usually defined as the "indicator" compound. This is the compound with correct combination of these elements: (1) the lowest odor threshold (the minimum concentration at which the odor is detectable), and/or (2) the highest emission rate. An identified malodorous pollutant that has the largest potential emission rate of all potential malodorous pollutants discharged from a facility may not be the appropriate indicator compound for evaluating potential odor impacts, because other malodorous compounds emitted from the facility may have tremendously smaller odor threshold concentrations. Published test data on malodorous emission rates for specific operations with corresponding odor control mechanisms (if any) can provide information for preparing estimates of malodorous pollutant emission rates.

Time Averaging Periods. SO_2, NO_2, and PM_{10}, principal pollutants of concern for fuel-burning stationary sources, are examined for oil or interruptible gas burning facilities, while NO_2 is the only pollutant analyzed in any refined study of a natural gas burning source. Peak daily emission rates are typically employed in the modeling to calculate the maximum 3- and 24-hour pollutant concentrations. Peak daily emission rates are calculated by determining the total amount of pollutants emitted in the peak day and dividing by 24 hours. However, in instances when oil-burning equipment is used irregularly (e.g., only 8 hours per day at a manufacturing facility), peak hourly emission rates are used to evaluate the maximum potential 3-hour SO_2 concentrations, while 24-hour SO_2 and PM_{10} levels should be calculated with emission rates based on the total amount of fuel burned in a peak day and dividing by 24 hours. The average hourly annual emission rates (e.g., the anticipated or permitted total amount of a pollutant emitted in a year divided by 8,760 hours—the approximate number of hours in a year) are used in the modeling to determine the annual average pollutant concentrations at selected locations. Some simple stationary source models, such as EPA's SCREEN (revised), only simulate maximum 1-hour impacts. Persistence factors of 0.9 and 0.4 are recommended for adjusting 1-hour impacts to 3- and 24-hour time averaging periods, respectively, with these simple models.

In an analysis of potential noncriteria pollutant impacts from new sources on the surrounding community or from existing sources on a proposed facility, comparisons are ultimately required between the maximum predicted pollutant levels and the corresponding SGCs and AGCs listed in DEC's *Air Guide-1*. Since SGCs and AGCs are intended for time-averaging periods of 1 hour and 1 year, respectively, suitable noncriteria emission rates for these scenarios are needed. Maximum 1-hour concentrations for noncriteria pollutant sources are usually calculated with the maximum hourly pollutant emission rates from these sources through modeling (described below). Maximum hourly pollutant emission rates are estimated either through the permitted values or estimates generated for new sources. Annual average pollutant emission rates are used to determine maximum annual impacts, which are then compared to the AGCs. Annual average hourly emission rates are estimated by dividing the total amount permissible, as listed in a permit, or the pollutant amount estimated for a proposed facility by 8,760 hours. In addition, certain pollutants—specifically, air toxics that could be released during chemical spills—have shorter averaging periods. These are discussed below under "Puff Modeling."

Dispersion Modeling. Modeling of potential pollutant concentrations from stationary sources can be performed either through the use of dispersion or fluid (i.e., physical, or wind tunnel) modeling. In most

instances where a refined stationary source impact analysis would be required, mathematical dispersion modeling is the most suitable choice for performing these evaluations. A discussion on the conditions that may warrant fluid (i.e., physical, or wind tunnel) modeling over mathematical modeling is included below under "Suitability of Fluid Modeling Versus Mathematical Modeling." A detailed discussion on the procedures involved and input parameters needed for the various typical types of mathematical dispersion modeling scenarios is provided below.

- *Emission rates for pollutants of concern.* Before modeling is performed, determine the pollutants of concern and the respective emission rates following the procedures discussed above. In the cases of sources emitting pollutants through an exhaust stack, pollutant emission rates and stack exhaust parameters for multiple potential operating loads (e.g., operation of large fossil fuel burning facility at 100 percent capacity, 75 percent capacity, and annual average conditions) should be prepared for input into the dispersion modeling. The analysis of all three conditions is appropriate in a prediction of worst-case impacts for the following reasons. Although the 100 percent capacity load usually results in the greatest amount of pollutants discharged by such an operation, it may not result in the worst-case analysis, because the exit velocity of the pollutants through the stack is also at its greatest in this condition, so that greater plume rise would result. In this case, the bulk of the pollutants can be ejected to a height greater than nearby receptor locations. On the other hand, if a nearby receptor location is of near or equal height to the exhaust stack(s) under analysis, maximum pollutant concentrations at the receptor from the local source may occur with a lower load, and therefore a lower exit velocity. In addition, pollutant emission rates and stack exhaust velocities under annual average operating conditions are normally much lower than the 100 percent load conditions. Since maximum annual pollutant levels are sometimes required for comparison to either applicable criteria pollutant standards or non-criteria pollutant AGCs, estimations of pollutant levels on an annual average basis at receptor locations should be determined by modeling annual average operating conditions of the source(s).

- *ISC2 model.* For most actions, the EPA's ISC2 computer program model is the most suitable mathematical dispersion model for performing a refined air quality impact analysis. The ISC2 model, which is described in *User's Guide for the Industrial Source Complex (ISC2) Dispersion Model (EPA-450/4-92-008a)*, calculates pollutant concentrations from one or more sources using hourly meteorological data. The ISC2 model can simulate impacts from point, area, and volume sources, and can also account for building-induced turbulence, or "wake" effects, that nearby structures can cause on the dispersion of pollutants from nearby stacks that do not meet GEP, or Good Engineering Practice, heights.

GEP stack height is defined as the sum of the height of the structure (or nearby structure) plus 1½ times the lesser dimension (height or width) of the structure (or nearby structure). Both the height and width of the structure used to determine if the GEP stack height criterion is fulfilled are determined from the frontal area of the structure projected onto a plane perpendicular to the direction of the wind. According to EPA guidelines, a building is sufficiently close to a stack to cause wake effects when the distance between the stack and nearest part of the building is less than or equal to five times the lesser of the height or the maximum projected width of the building. For directionally dependent building wake effects (which is a modeling option within the ISC2 model), wake effects are assumed to occur if the stack is within a rectangle composed of two lines perpendicular to the wind direction, one line at $5L_B$ downwind of the building and the other at $2L_B$ upwind of the building, and by two lines parallel to the wind, each at $0.5L_B$ away from each side of the building (where L_B is the lesser of the height and projected width of the building). See ISC2 *User's Guide*, Volume II, page 1-21, for further information on this issue.

The following information is required to execute the ISC2 computer program model:

1. When modeling potential pollutant concentrations emitted from stacks (i.e., point sources) with the ISC2 model, the following information is needed: the appropriate pollutant emission rates, dimensions of a building that could induce wake effects, local grade elevations, stack exhaust parameters (i.e., stack exhaust velocity, inner stack diameter, stack exhaust temperature, stack height), and representative meteorological data.
2. Computations with the ISC2 model are usually be made assuming stack tip downwash, buoyancy-induced dispersion, gradual plume rise, RAM urban dispersion coefficients and wind

profile exponents, no collapsing of stable stability classes, and elimination of calms.

3. The ISC2 model should be run both with and without building downwash (i.e., wake effects option) if the exhaust from the stack(s) could be affected by the building the stack is on or a nearby structure.
4. In cases where the sources and receptors are in a relatively undeveloped, coastal area of New York City (i.e., less than 50 percent of the land area within a 1.9-mile radius from the source is developed into non-park uses), RAM rural dispersion coefficients and wind profile exponents should be selected in the ISC2 modeling of such facilities.
5. The meteorological data set used with the ISC2 model should consist of five consecutive years of meteorological data in order to ensure that an adequate number of hours are simulated to determine compliance with applicable standards and guideline concentrations. It is recommended that surface data collected at La Guardia Airport and upper air data collected at Atlantic City, N.J., be used for this 5-year meteorological data set. This meteorological data set includes wind speeds, wind directions, ambient temperatures, and mixing height data for every hour of a year. In instances where potential short-term (e.g., odor) impacts are of concern, it may be more appropriate to use five years of meteorological data with surface and upper air data collected concurrently. DEP can provide the recommended meteorological data set before performing any analyses.
6. Ideally, estimates of stack exhaust parameters (i.e., stack exhaust velocity at 100 percent load, inner stack diameter, exhaust temperature, and stack height) for new significant stationary sources will be available. If this information is unavailable for a new source that would be located on top of a structure, in most applications, the following assumptions can be used as conservative estimates in a stationary source analysis:
   - exhaust velocity at all loads: 0.001 meter/sec
   - inner stack diameter: 0 meters (no plume rise)
   - stack exhaust temperature: 293 °K
   - stack height: 3 feet above rooftop level
7. Since dispersion modeling uses meteorological data in the computation of pollutant levels at selected receptor locations, the coordinate system in the modeling must be developed with consideration of true north and the corresponding directions of the compass. A critical component of the hourly meteorological data used in these computations is wind direction. When the meteorological data are initially compiled, all hourly wind directions are referenced to true north. Therefore, contrary to coordinate systems developed for mobile sources mathematical modeling, stationary source modeling must simulate sources and receptor locations using a coordinate system that is consistent with the meteorological data set.

- *Other models.* In some limited circumstances, the MPTERU model, as described in *User's Guide for MPTER, A Multiple Point Gaussian Dispersion Algorithm with Operational Terrain Adjustment (PB 80/1973/61)*, can also be used to determine pollutant impacts from a stack at selected receptor sites. However, this model is limited in its applicability for New York City conditions, because the MPTERU algorithms cannot simulate the effects of nearby buildings for non-GEP (Good Engineering Practice) stack heights. Other models may also be appropriate.

- *Cavity regions.* Under certain meteorological conditions, the exhaust from a stack on top of or proximate to a structure may be entrapped for short periods in the cavity regions adjacent to the structure. For these cases, additional analysis may be appropriate.

  The predicted concentrations in a cavity zone are inversely proportional to the surface area of the building (perpendicular to the wind direction) and to the wind speed required to entrap most of the exhaust plume. It should be assumed in this type of analysis that all of the exhaust would be entrapped in the cavity zone.

  Maximum predicted pollutant short-term (e.g., 1-, 3-, and 24-hour) averaging periods are calculated for at least two of the perpendicular cross-sectional areas of the structure producing the cavity effect. Maximum potential cavity concentrations are calculated using the SCREEN model (revised) recommended by EPA in *Screening Procedures for Estimating the Air Quality Impact of Stationary Sources*, EPA-450/4-88-010. Meteorological persistence factors of 0.9 and 0.4 are used to calculate the maximum 3- and 24-hour cavity pollutant concentrations, respectively, from 1-hour concentrations yielded from the SCREEN modeling.

- *Volume and area sources.* If a proposed action would result in development of a facility that would emit pollutants through a series of stacks along the rooftop edges of a structure, or over an area on top of or adjacent to the facility, a volume or area source analysis is used. Pollutant emission rates through the multiple stacks or over the area can be estimated following the procedures discussed above, and concentrations at selected receptor sites should be determined following the procedures outlined starting on pages 1-38 of *User's Guide for the ISC2 dispersion models, Volume II—Description of Model Algorithms.* Conservative estimates of concentrations can be calculated using the recommended algorithms for these applications, assuming a wind speed of 1 meter per second, neutral atmospheric stability, and (if needed) meteorological persistence factors of 0.9 and 0.4 for 3- and 24-hour time averaging periods, respectively. For a more refined analysis, the ISC2 model can be run for these area or volume source analyses using five years of meteorological data.

Suitability of Fluid (Physical) Modeling Versus Mathematical Modeling. For most actions, screening (for single residential buildings) or full-scale mathematical modeling is appropriate for evaluating air quality impacts from stationary sources. The mathematical expressions and formulations that constitute the various models attempt to describe an extremely complex physical phenomenon as closely as possible. However, because all mathematical models contain simplifications and approximations of actual conditions and interactions, and because a worst-case condition is of most interest, these models are conservative and tend to overpredict pollutant concentrations, particularly under adverse meteorological conditions. Typically, these models are too conservative to accurately account for such conditions as complex topography, and therefore may predict pollutant concentrations that are too high. Such conservative results are usually adequate in the analyses of small sources, such as residential or commercial boilers, but when larger sources are being considered, physical modeling can yield more accurate results.

Physical modeling, also called fluid or wind tunnel, modeling, involves constructing a scale model of the proposed buildings and any nearby existing and proposed buildings and surrounding terrain. This model is then subjected to wind tunnel studies, in which a tracer gas is emitted from the source. Measurements are taken at different locations (receptors) on the physical model to determine the dispersion of the gas. This method of physical modeling is sometimes selected because of concern that mathematical models do not always adequately account for complex topography. In other cases, fluid modeling is preferred because the dispersion created by either existing or proposed structures on air movement in the area under analysis predominates over the dispersion effects of regional atmospheric factors, such as thermal gradients. Recommended procedures for fluid modeling are outlined in EPA's *Guideline for Fluid Modeling of Atmospheric Diffusion*, (EPA-600/8-81-009), April 1981 and *Guideline for Use of Fluid Modeling to Determine Good Engineering Practice Stack Height* (EPA-450/4-81-003), July 1981. It is recommended that DEP be contacted for assistance before performing any fluid modeling studies.

Background Concentrations. The monitored background levels of the principal pollutants of concern for stationary source air quality modeling—SO_2, NO_2, and PM_{10}—have remained relatively steady for some time. Summaries of the suggested background levels for these pollutants at various DEC monitoring locations throughout New York City can be obtained from DEP. Background pollutant concentrations for lead and non-criteria pollutants (for which there are only a limited amount of data available) should be obtained from DEC monitoring reports on ambient air monitoring. These DEC reports can be examined at the offices of DEP.

Extended Analysis. The calculated maximum total pollutant concentrations at selected receptor locations usually consist of adding background pollutant level estimates (for the applicable time averaging periods and pollutants of concern) and the maximum predicted impacts from nearby significant sources under study. This procedure yields estimates of total pollutant concentrations at these locations. In some cases, it is possible to further refine this procedure, and still yield acceptable conservative estimates of pollutant concentrations. As an example, when the maximum daily (i.e., 24-hour) SO_2 concentration computed from 5 years of meteorological data is added to the recommended conservative 24-hour SO_2 background level, this might result in predicted violations of the 24-hour SO_2 ambient standard. However, the actual SO_2 monitored background levels on the days that resulted in the highest predicted 24-hour concentrations may have been significantly lower than the recommended background values. (Monitored ambient background levels of SO_2 significantly increase during cold weather periods, because the increased use of oil to supply heat for residential and commercial facilities significantly escalates the amount of SO_2 emitted into the local environment.) A limited extended analysis would be to sum the monitored daily SO_2 background values for the one or two days that had

the highest predicted local concentrations (from either wind tunnel or mathematical modeling) to the modeled concentrations for these days, until there are no predicted violations of the SO_2 24-hour ambient standard. If there are many occurrences when the daily SO_2 predicted concentrations from local sources at a selected receptor location are added to the recommended background level and the resultant sums exceed the applicable standard, an acceptable refined extended analysis would be to sum all of the 24-hour local concentrations to the concurrent daily background levels at this receptor location. An analogous procedure may be followed for determining maximum total 3-hour SO_2 concentrations at receptor locations.

Chemical Spills. Some actions would result in the development of facilities that house operations with the potential to accidently emit air toxics as the result of chemical spills. As an example, medical, chemical, or school laboratories with fume hoods are required to have a ventilation system that discharges pollutants released under the hoods or in the laboratories to exhaust points above the rooftop. Since chemicals can be accidently spilled in these facilities, the dispersion of hazardous pollutants from these discharge points and potential impacts on the surrounding community are examined. The techniques described below can be applied to chemical spills or to any other short-term releases of pollutants.

- *Evaporation rates.* Evaporation rates for volatile hazardous chemicals that are expected to be used in the labs can be estimated using a model developed by the Shell Development Company (M.T. Fleisher, *An Evaporation/Air Dispersion Model for Chemical Spills on Land*, Shell Development Company, December 1980). The Shell model, which was developed specifically to assess air quality impacts from chemical spills, calculates evaporation rates based on physical properties of the material, temperature, and rate of air flow over the spill surface. The evaporation rates for such scenarios are usually calculated assuming room temperature conditions (=70°F) and an air flow rate of 0.5 meters/second. A "worst-case" chemical spill is usually determined by reviewing the chemicals that are expected to be frequently used under the hoods, the amount and frequency of use for such chemicals, the container sizes for such chemicals, and the evaporation rates (from Shell model) and relative toxicities of these chemicals.

- *Recirculation.* Analysis of chemical spills or other sources of hazardous pollutants also considers the effects of recirculation of the pollutants from the vent back through nearby windows or air intake vents. This can occur any time exhaust vents are situated near operable windows or intake vents. The potential for recirculation of fume hood emissions or other sources of hazardous pollutants back into the nearest window or fresh air intake vent can be assessed using the method described by D.J. Wilson in *A Design Procedure for Estimating Air Intake Contamination from Nearby Exhaust Vents* ASHRAE TRANS 89, Part 2A, pp. 136-152 (1983). This empirical procedure, which has been verified by both wind tunnel and full-scale testing, is a refinement of the 1981 ASHRAE handbook procedure, and takes into account such factors as plume momentum, stack tip downwash, and cavity recirculation effects.

- *Puff modeling.* Maximum pollutant concentrations at elevated receptors downwind of fume exhausts, or other short-term, instantaneous releases of pollutants, can be estimated using the latest EPA INPUFF model. The EPA INPUFF 2.3 model (Peterson, W.B., *Estimating Concentrations Downwind From an Instantaneous Puff Release*, EPA 600/3-82-078, August 1978) is the most recent release of this model. The INPUFF model is used for such analyses because it considers short-term concentrations. This is appropriate because these types of emissions are typically present only for short periods of time. For example, most chemical spills are completely evaporated in considerably less than an hour. Under these conditions, maximum predicted pollutant concentrations from the recirculation calculations and INPUFF modeling at places of public access should be compared to the Short-Term Exposure Levels (STELs) or ceiling levels recommended by the U.S. Occupational Safety and Health Administration (OSHA) for these chemicals. STELs are usually 15-minute time-weighted average exposures that should not be exceeded at any time during an employee's work day. Ceiling levels are the exposure limits that should never be exceeded in an employee's work day. Stable atmospheric conditions and a 1 meter per second wind speed are usually assumed as input to the INPUFF model.

Future No Action Condition. The assessment of stationary sources in the future without the action takes into consideration expected changes by the action's build year. For existing stationary sources, existing emissions are usually assumed to continue in the future, unless there is reason to expect otherwise. (As noted above, when emissions are determined through a facility's operating permit(s), maximum allowable

concentrations are assumed.) For assessments of the effects of future pollutant emissions on sensitive uses near an existing manufacturing district, it may be appropriate to consider expected future trends in that district, when no known new development is proposed.

Future Action Condition. This assessment considers conditions with the action in place, and compares them with conditions in the future no action scenario to determine the potential for significant impacts.

323. Construction Impacts

Construction impacts on air quality can occur because of fugitive dust raised by construction activities or sandblasting, exhaust and emissions from construction equipment, and increased traffic to local roadways because of vehicles traveling to and from the construction site or because of temporary road closings. Because these impacts are only temporary, they usually need to be assessed quantitatively only when the action's construction period would be relatively long-term. However, the magnitude of construction activities is also considered—an analysis may be appropriate for certain activities, even if temporary, such as concrete batching plants.

For construction activities, the assessment of air quality impacts is an analysis, using the techniques described in Sections 321 and 322, above, of all the locations that may be affected by the construction activities. Usually, this will include intersections where traffic may be increased because of diversions from construction activity or congested due to capacity restrictions.

When appropriate, the effects of fugitive dust from the construction site and earthmoving equipment can also be considered. The EPA's *Compilation of Air Pollutant Emission Factors (AP-42)* can be used for this analysis. If the action would involve an on-site concrete batching plant, this plant would be assessed as a new stationary source, using the methodologies described for stationary sources describe above and appropriate models, such as ISC2, and emission factors such as from *AP-42*.

324. Mesoscale Analyses

As described earlier, nitrogen oxides and hydrocarbons are examined on a regional level. These pollutants are of concern because they are precursors to ozone (both can react in sunlight to form photochemical oxidants, also known as ozone, or smog). The area for examination would typically be large, such as an entire borough, or the entire City of New York, or even the tri-state metropolitan area. Such an analysis is rarely performed, because few actions have the potential to affect ozone precursors over such large regions.

Actions that could affect nitrogen oxides or hydrocarbons in such a large region would be those that greatly increased the total number of vehicle miles traveled in the region (for example, a major roadway improvement or construction of new bridges), or changes in regulations that affect numerous stationary sources (such as changes in the type of fuel burned throughout the City). Most often, these analyses are performed for large transportation projects.

In a mesoscale analysis, the action's contributions to the total emissions over the area are considered. In the example of a major roadway improvement that greatly increased the total number of vehicle miles traveled, the analysis would consider whether the total amount of carbon monoxide, nitrogen oxides, and hydrocarbons emitted in the region would increase (because of the increased vehicle miles) or decrease (because the new roadway would alleviate existing congestion).

400. Determining Impact Significance

To determine whether an action would have a significant impact on ambient air quality, the analysis techniques described above are used to predict future concentrations in the chosen study area for the receptor locations, if the action is not implemented (the "no action" scenario). Then, concentrations predicted for the future with implementation of the action are compared to the no action levels using the impact criteria described below.

410. IMPACT CRITERIA

411. Comparison with Standards

The predicted pollutant concentrations for the pollutants of concern associated with a proposed action are compared with either the National Ambient Air Quality Standards (NAAQS) for criteria air pollutants, or ambient guideline concentrations for noncriteria pollutants. For all pollutants causing the standards to be exceeded generally constitutes a significant adverse impact. In addition, for carbon monoxide from mobile sources, the *de minimis* criteria (described below in Section 412) are also used to determine significant impacts.

To evaluate the potential air quality impacts for criteria pollutants and noncriteria pollutants from stationary sources, predictions for these pollutant concentrations must correspond to the appropriate NAAQS

time averaging periods. These standards are for the *average* concentration during each of those time periods. Annual standards pertain to the average pollutant concentrations either predicted or measured in a calendar year, while 24-hour standards pertain to pollutant concentrations occurring in a calendar day. For short-term standards (i.e., 1-, 3-, 8-, and 24-hour averaging periods), two exceedances of the corresponding short-term standard in one calendar year (at the same location) constitute a violation of the standard. Recommended SGCs and AGCs for noncriteria pollutants correspond to time-averaging periods of 1-hour and annual averages, respectively.

412. De Minimis Criteria

For carbon monoxide from mobile sources, the City's *de minimis* criteria are used to determine the significance of the incremental increase in CO concentrations that would result from a proposed action. These set the minimum *change* in 8-hour average carbon monoxide concentration that constitutes a significant environmental impact. According to these criteria, significant impacts are defined as follows:

- An increase of 0.5 parts per million (ppm) or more in the maximum 8-hour average carbon monoxide concentration at a location where the predicted no action 8-hour concentration is equal to 8 ppm or between 8 ppm and 9 ppm; or

- An increase of more than half the difference between baseline (i.e., no action) concentrations and the 8-hour standard, when no action concentrations are below 8 ppm.

413. Odors

A significant odor impact would occur if an action results in maximum predicted 1-hour average malodorous pollutant levels above the applicable odor threshold at places of public access, or if it results in the development of a structure that would be subject to such malodorous pollutant levels from nearby sources of these pollutants. This determination depends on the odor thresholds for the substances of concern, and on the emission rates for those substances (see discussion above in Section 322.2). While odors could still be detected for time periods from a few seconds to several minutes long, it would be unrealistic to define this as a significant impact unless the odor persisted, on average, for at least an hour. Generally, there are no other specific standards for odors as there are for other regulated pollutants.

420. TYPES OF POTENTIAL IMPACTS

For both mobile and stationary sources, significant impacts, as defined by the criteria above, can occur on surrounding uses because of the proposed action, or on the proposed action because of the surrounding uses. Both scenarios must be considered under CEQR and both constitute significant adverse air quality impacts.

421. Mobile Sources

An action would result in significant mobile source air quality impacts when the incremental increases in carbon monoxide concentrations with the action in place, relative to those in the no action scenario, would exceed the *de minimis* criteria or when an action would result in the creation or exacerbation of a predicted violation of the NAAQS. For example, if an action would add vehicles to a particular intersection and thereby change the 8-hour CO concentration at that intersection from 6 ppm in the no action condition to 7 ppm with the action, no significant impact would occur, because the increase caused by the project (1 ppm) is not equal to more than half the difference between the baseline and the 8-hour standard of 9 ppm. The action would have to increase the concentration by more than 1.5 ppm at that location to have a significant adverse impact. If the action raised the 8-hour CO concentrations at an intersection from 8 ppm to 9 ppm, a significant impact would occur because this increase would be greater than the *de minimis* criterion (of 0.5 ppm or greater when the no action concentration is 8 ppm or between 8 ppm and 9 ppm. In another example, a violation of the NAAQS would occur if an action causes an increase in the 8-hour CO concentration from 8.9 to 9.2 ppm, and this would constitute a significant adverse impact even though the increase would be within the *de minimis* creation.

422. Stationary Sources

Sulfur dioxide, nitrogen dioxide, and inhalable particulate matter are the principal pollutants associated with an action that could result in a significant stationary source impact, although significant impacts for lead and other toxic contaminants also could occur. A proposed action would have a significant adverse stationary source air quality impact if it results in the creation or exacerbation of a violation of the NAAQS for criteria pollutants or it causes the guidance values for noncriteria pollutants to be exceeded.

When a proposed action would cause the NAAQS to be exceeded at sensitive receptors, such as air intake vents, balconies, or operable windows, the potential for a significant adverse impact at such locations should be

disclosed. Further analysis may be performed to determine the expected range of indoor concentrations. The indoor values could be lower, depending on the magnitude of the predicted concentration, the time of year, the outside temperature, and how the ventilation system operates (e.g., whether it mixed with other air intake locations). In this case, judgment is required to determine whether it is reasonable to assume the indoor concentration is the same, or lower than, the outdoor concentration. If the predicted range of indoor values would be lower than those outside, the potential for significant impacts resulting from exceeding standards outside is still disclosed.

Actions that cause the NAAQS or guidance values to be exceeded at locations to which the public will *not* have ongoing access, such as at elevated locations on a residential building that are not near operable windows, balconies, or air intake vents, would not result in significant adverse impacts. These locations are not considered ambient air and therefore are not valid receptors.

423. Odors

Most often, odor impacts result from stationary sources. Like other air quality impacts, these can occur because the proposed action would cause odors, or because the proposed action would add a sensitive use in an area subject to odors.

430. PRESENTATION OF RESULTS

As described above in Section 300, a typical air quality analysis considers a large number of receptors. Generally, the environmental assessment can limit its report on the analysis results to those receptors where the maximum predicted CO concentrations and maximum incremental impacts from the action are calculated. The results for all other receptors may be reported in an appendix, or be made available on request. Typically, the CO values presented are rounded off to the nearest tenth of a part per million (ppm). For example, an 8-hour CO level at a receptor site would typically be reported as 6.5 ppm, not 6.464 ppm, nor 7 ppm. In many cases, only the 8-hour average CO values are reported, because the maximum predicted 1-hour CO concentrations are well below the applicable NAAQS. Comparisons to the *de minimis* criteria of 0.5 ppm are made to the nearest hundredth of a ppm (i.e., an increment of 0.49 ppm in the 8-hour CO average would not be a significant *de minimis* impact, but 0.51 ppm would be a significant adverse impact if the 0.5 ppm criterion was applicable in this instance).

500. Developing Mitigation

When a significant air quality impact (as defined above) is likely to result from an action or development facilitated as a result of the action, potential mitigation measures to eliminate such adverse impacts must be investigated.

510. MOBILE SOURCES

Measures that would mitigate the full increment of CO resulting from the action should be identified. If potential concentrations would exceed the 8-hour CO standard of 9 ppm, further measures that would allow the City to attain compliance should be identified.

511. Roadways

Significant mobile source impacts due to CO concentrations would usually occur at a sidewalk adjacent to an intersection that encounters a significant amount of congested vehicular traffic. In many instances, the mitigation measures that would be recommended to eliminate a predicted significant traffic impact at an intersection would also eliminate any predicted significant air quality impacts at this location. Potential mitigation measures for eliminating adverse traffic impacts are presented in the traffic and parking section of the Manual.

At the same time, traffic mitigation measures, such as those that would increase the number of moving lanes at an approach to an intersection, increase red time at an intersection, or divert traffic to other intersections, may result in increasing CO levels near the affected intersections. All traffic mitigation measures, and any other measures to eliminate the action's impacts in other technical areas, should be assessed for their potential air quality impacts.

512. Parking Facilities

Significant air quality impacts from parking facilities can usually be mitigated using the same sort of options available to mitigate traffic impacts and significant air quality impacts related to roadways. If the vent(s) for an enclosed, mechanically ventilated parking facility could result in significant air quality impacts, restrictions on the placement of such vent(s) can be employed to mitigate these actions, and these restrictions would become part of the action.

520. STATIONARY SOURCES

There are several options available to mitigate the significant adverse impacts caused by stationary sources when the NAAQS are exceeded for the criteria pollutants of concern. One typical example of a significant stationary source impact would be the result of the emissions from a large boiler stack that would result in a violation of standards at a nearby, taller building. Examples of potential mitigation measures available for alleviating this adverse impact include the following:

- Restricting the fuel type burned and exhausted from this stack;
- Limiting the location of the new stack to ensure that there would be no significant impacts from the new stack exhaust on the nearby building(s); and
- Restricting the operating parameters and physical dimensions of the new stack (i.e., make the stack height taller or increasing the stack exhaust velocity, which may lessen the impact on a nearby structure).

These measures may be difficult to implement if the stack that would cause the impact is not part of the action, and is owned by another party than those involved in the action. As noted in Chapter 1 of this Manual, commitments to mitigation measures must be obtained before those measures can be considered adequate to mitigate an action's significant impacts.

Stationary source impacts ensuing from an action that facilitates the development of an industrial facility that would emit significant amounts of air toxics or malodorous pollutants could be mitigated by actions such as:

- Restricting the processing capacity at the facility;
- Requiring commitments on odor control mechanisms for the facility that ensure elimination of potential impacts; or
- Restrictions similar to those discussed for the new boiler stack impact example.

530. GENERIC ACTIONS

For generic actions, site-specific mitigation measures are often inappropriate, since the intersections or stationary sources assessed are often only prototypes. In these cases, mitigation would typically involve changes to the proposed action that would avoid the resulting significant impact.

600. Developing Alternatives

Alternatives that incorporate the potential mitigation options discussed above would also reduce or avoid significant impacts associated with an action. In addition to these mitigation measures, there are alternative options available that could also reduce or eliminate significant air quality impacts in these respective areas.

610. MOBILE SOURCES

Mobile source air quality impacts are usually directly related to the size and type of development, and consequently, the amount of traffic generated by development facilitated by such action. Therefore, alternatives that would diminish the magnitude of the action-generated traffic should also, in general, lessen the mobile source impacts associated with such actions.

In instances where the action-generated traffic would create significant parking facility impacts due to locations of the egress points at the site affected by the action, these impacts may be reduced by developing alternatives with relocated or multiple access/egress points.

620. STATIONARY SOURCES

In the cases where significant stationary source impacts would result from the structure facilitated by the action, alternatives that modify the dimensions of the structure could eliminate these adverse impacts (e.g., lower the maximum height of the structure if it is impacted by a nearby emission source, such as a power generating station).

700. Regulations and Coordination

710. REGULATIONS AND ADMINISTRATIVE RECORD

711. Federal Regulations

711.1 Clean Air Act

The Clean Air Act, which was first enacted in 1955 and later amended in 1963 and 1967, changed significantly with the passage of the 1970 amendments. That year, Congress passed amendments that significantly broadened the Federal role in air pollution control. In addition to establishing national ambient air quality standards (NAAQS) for six criteria pollutants (sulfur dioxide, particulates, carbon monoxide, photo-

chemical oxidants, nitrogen dioxide, and hydrocarbons), the 1970 amendments also established the new source performance standard (NSPS) program and the national emission standards for hazardous air pollutants (NESHAP). These programs gave EPA the authority to regulate emissions from new stationary sources as well as the ability to regulate hazardous air pollutants not covered by NAAQS. EPA added an NAAQS for lead in 1978 and rescinded the hydrocarbon NAAQS in 1983. In the 1977 amendments, two new programs were added: a nonattainment program was adopted for areas in violation of specific NAAQS and a prevention of significant deterioration (PSD) program was established for areas meeting NAAQS.

For CEQR, the most significant aspect of the Clean Air Act and its amendments has been the State Implementation Plan (SIP) program begun in 1970. Under this program, each state must demonstrate in a SIP the manner in which it will attain compliance with the NAAQS. Once a SIP has been approved by EPA it becomes Federally enforceable and subject to citizen suits. With the passage of the 1990 Clean Air Act Amendments, the current SIP For New York State is required to demonstrate compliance with the CO standard by December 31st, 1995 and with the ozone standard by the year 2007. In practical terms, for actions with analysis years after 1995, measures should be examined to demonstrate that the action would not cause pollutant concentrations to exceed the standard.

EPA has developed many air quality regulations, which are reported in the Code of Federal Regulations (CFR). The most pertinent air quality regulations reported in the CFR are as follows:

- 40CFR50: National Primary and Secondary Ambient Air Quality Standards
- 40CFR51: Preparation of Implementation Plans
- 40CFR52: Approval and Promulgation of Implementation Plans (which includes Prevention of Significant Deterioration)
- 40CFR53: Ambient Air Monitoring Methods
- 40CFR60: Standards of Performance for New Stationary Sources
- 40CFR61: National Emission Standards for Hazardous Air Pollutants

In addition, as part of the 1990 Clean Air Act Amendments (CAAA), EPA has also established a list of 189 air toxics to be regulated (this list is found in Title III of the CAAA). This list is regulatory in nature: it is used to determine the levels of controls and permits required for different actions rather than to assess an action's impacts.

Other relevant Clean Air Act Amendment issues include provisions for attainment and maintenance of NAAQS (Title I); provisions relating to mobile sources—these promulgated emission reductions are accounted for in the latest mobile source emission models (Title II); and provisions relating to stratospheric ozone protection (Title VI). The last title, relating to ozone protection, contains regulations governing various chlorofluorocarbons (commonly referred to as "CFCs"), including prohibitions against the use of certain CFCs and controls for the recycling and disposal of others.

711.2 OSHA Standards

The U.S. Occupational Safety and Health Administration regulates air pollutants in the workplace. OSHA has promulgated standards for many air contaminants in the workplace. These standards are identified in 29 CFR 1910.1000, as amended. Permissible Exposure Limits include Short Term Exposure Limits (the employee's 15-minute time-weighted average exposure that shall not be exceeded), 8-hour Time Weighted Average limits (the employee's average airborne exposure in any 8-hour work shift of a 40-hour work week that shall not be exceeded), and ceiling levels (the employee's exposure that shall not be exceeded during any part of the work day).

712. New York State Regulations

DEC provides applicable New York State air quality regulations under the New York Codes, Rules and Regulations, Title 6, Chapter III-Air Resources, Subchapter A-Prevention and Control of Air Contamination and Air Pollution:

- Part 200: General Provisions
- Part 201: Permits and Certifications
- Part 203: Indirect Sources of Air Contamination
- Part 211: General Prohibitions
- Part 212: General Process Emission Sources
- Part 218: Emissions Standards for Motor Vehicles and Motor Vehicle Engines
- Part 219: Incinerators

- Part 222: New Incinerators for New York City
- Part 231: New Source Review in Nonattainment Areas
- Part 232: Dry Cleaning
- Part 257: Air Quality Standards

713. New York City Regulations

- New York City Air Pollution Control Code, Section 1402.2-9.11, "Preventing Particulate Matter from Becoming Airborne; Spraying of Asbestos Prohibited; Spraying of Insulating Material and Demolition Regulated." These regulations govern fugitive dust.
- Building Code of the City of New York (Local Law No. 76 of 1968 and amendments), Title 27, Chapter 1, Subchapter 15, governs chimneys and gas vents.
- New York City Zoning Resolution, Article IV (Manufacturing Districts), Chapter 2, Section 42-20, provides performance standards in manufacturing districts that address smoke, dust, and other particulate matter, and odorous matter.

720. APPLICABLE COORDINATION

Consistency with the New York State Implementation Plan for air quality (SIP) is of critical importance to New York City. If the State is found to be inconsistent with this plan by the EPA, this could result in a suspension of Federal transportation funding for the City. DEP is the designated City agency for coordinating with EPA for SIP consistency. Therefore, under certain circumstances, the lead agencies will need to coordinate detailed air quality analyses with DEP.

Coordination between the lead agency and DEP is strongly recommended and DEP should be notified if the air quality analysis for a CEQR action indicate in either of the following results: a violation of the 8-hour carbon monoxide ambient air standard predicted from mobile sources at any location in the project's build year(s); or an exceedance of any of the criteria ambient air quality standards due to stationary sources at any location.

The data used for any refined air quality impact studies for a proposed action should be examined for consistency with recent air quality studies performed in the same region affected by the proposed action. In addition, the air quality analysis requires careful coordination with the traffic and transportation analyses, both for data collection and for certain analysis techniques.

730. LOCATION OF INFORMATION

- DEP, Office of Environmental Planning is the main source that compiles readily available data that is commonly required to perform detailed mobile and stationary source air quality analyses. DEP can also provide sample air quality analyses for various types of applications.
- Requests for copies of the BAR air contaminant permits should be addressed to DEP's Bureau of Air Resources, 59-17 Junction Boulevard, Elmhurst NY 11373; requests for fee waivers for BAR searches should be addressed to DEP Bureau of Legal and Legislative Affairs at the same address as BAR.

R. Noise

Noise, in its simplest definition, is unwanted sound. This is the basis for environmental noise concerns. While high noise levels may cause hearing loss, the levels usually associated with environmental noise assessments are below the hazardous range. However, noise levels in this range should not be overlooked, since they can cause stress-related illnesses, disrupt sleep, and interrupt activities requiring concentration. In New York City, with its high concentration of population and commercial activities, such problems are common.

This section of the manual discusses the topic of noise as it relates to regulations and guidelines governing activities in New York City. Technical terms are defined, regulations summarized, and guidelines from outside New York City are discussed for comparative purposes. Relative to noise, the goal of CEQR is to determine a proposed action's potential effects on sensitive noise receptors, including the effects on the interior noise levels of residential, commercial, and institutional uses (if applicable).

100. Definitions

110. TYPES OF NOISE

For CEQR purposes, the three principal types of noise sources that affect the New York City environment are mobile sources, stationary sources, and construction sources.

111. Mobile Source Noise

Mobile sources are those noise sources that move in relation to a noise-sensitive receptor—principally automobiles, buses, trucks, aircraft, and trains. Each has its own distinctive noise signature. Consequently, each has an associated set of noise assessment descriptors. The details of these signatures and descriptors is discussed in following sections.

112. Stationary Source Noise

Stationary sources of noise, as the name implies, do not move in relation to a noise-sensitive receptor. Typical stationary noise sources of concern for CEQR include machinery or mechanical equipment associated with industrial and manufacturing operations or building heating, ventilating, and air-conditioning systems. This category also includes crowds of people within a defined location, such as children in playgrounds or spectators attending concerts or sporting events.

113. Construction Noise

Construction noise sources comprise both mobile (e.g., trucks, bulldozers, etc.) and stationary (e.g., compressors, pile drivers, power tools, etc.) sources. Construction noise is examined separately because, even though the duration of construction activities may be years, it is temporary. The duration of each phase of construction is a factor that should be considered when assessing noise from construction activities.

120. BACKGROUND DISCUSSION FOR NOISE ANALYSIS

This section is included to provide the reader with a background of the terminology used in noise assessment discussions, the basic physical characteristics of noise, the types and appropriate use of noise descriptors, and what are considered receptors (receptors are noise-sensitive locations) in the conduct of noise analyses.

121. Characteristics of Noise

Sound perception and control is considered as source, path, and receptor The source is the equipment or process directly responsible for the sound generation. The path is the medium of sound propagation, such as air, water, or solid materials. The receptor is the final destination of concern for the sound in question. For CEQR purposes, the receptor is usually persons being affected; the hearing mechanism of an affected person is the final destination of the noise source of concern. Each of the three links of the sound chain interact to produce a final result, which are sound pressure levels at the receptor.

122. Sound Levels: Propagation Velocity, Wavelengths and Frequencies, and Diffraction

Sound pressure is the parameter that is normally measured in noise assessments. People's hearing mechanisms respond to "acoustic" pressures that represent the range from the threshold of hearing to the threshold of pain. This vast range is represented as a logarithmic scale.

A basic measure of sound is the sound pressure level (SPL), which is expressed in decibels (denoted dB). When the SPL = 0 dB, the acoustic pressure is the same as the threshold of hearing. Therefore, 0 dB corresponds to the threshold of hearing, or the SPL at which people with healthy hearing mechanisms can just begin to hear a sound.

Sound is propagated as a wave of varying length and frequency. A higher frequency sound is perceived

as a higher pitch—for example, the characteristic sound of the flute. A lower frequency is perceived as a lower pitch—for example, the sound of the bass drum. The frequency is expressed in cycles per second and expressed in Hertz (Hz): one Hz is one cycle per second. Just as the human ear cannot perceive some sound pressure levels, it cannot perceive some frequencies. The normal range is 20 Hz to 20,000 Hz or 20 kilo-Hertz (kHz). The velocity of sound, which is constant in any medium, is governed by the relationship: velocity equals wave length times the frequency. Therefore, since sound travels at a constant velocity in a medium, the longer the wavelength, the smaller the frequency, and vice versa.

In general, human sound perception is such that a change in 3 dB is just noticeable, a change in 5 dB is clearly noticeable, and a change in 10 dB is perceived as a doubling or halving of sound level. In a large open area with no obstructive or reflective surfaces, it is a general rule that SPL from a point source of noise drops off at a rate of 6 dB with each doubling of distance away from the source. For "line" sources (such as vehicles on a street), the SPL drops off at a rate of 3 dBA with each doubling of the distance from the source. Over distances longer than 1,000 feet, this rule of thumb may not hold true, as atmospheric conditions cause changes in sound path and absorption. The drop-off rate will also vary with both terrain conditions and the presence of obstructions in the sound propagation path. In the urban canyon type of environment present in New York City, drop-off rates along City streets generally range from 2 to 4 dB per doubling of distance from the source, because of sound reflections from buildings. It is important to note that whenever ideal open situations do not exist, and a drop-off rate is required in the analysis, the rate should be verified by field measurements.

Since sound is a wave phenomenon, it is also subject to "diffraction," i.e., it "bends" around corners. This is why a person continues to hear some sound from a source on the other side of a wall that is higher than the individual in question.

123. Noise Descriptors

Many descriptors are commonly used in environmental noise assessment. The choice of specific descriptors is related to the nature of the noise "signature" (SPL, frequency, and duration) of the source and the potential effect it may have on the surrounding environment.

123.1. Sound Weighting

An overall measurement of sound results in a single decibel value that describes the sound environment, taking all frequencies into account. However, because the human ear does not sense all frequencies in the same manner, people do not hear the sounds the same way a typical microphone would. Over the normal hearing range, humans are most sensitive to sounds with frequencies between 200 Hz and 10 kHz. Therefore, noise measurements are often adjusted or weighted to account for human perception and sensitivities. The most common weighting networks used are the A- and C-weighting networks.

The A-weighted scale was developed as a set of filters in sound level meters that simulate the frequency sensitivity of the human hearing mechanism. Since human reaction is normally the reason for an environmental noise assessment, A-weighted decibels (symbolized in units of dBA) are usually the units of choice. A table of common noise sources with their associated typical dBA values is shown in Table 3R-1. Note in that table that 0 dBA corresponds to the threshold of hearing and 110 dBA corresponds to maximum levels at the rear seats of rock concerts, as a representative range of noise levels.

Table 3R-1
Noise Levels of Common Sources

Sound Source	SPL (dBA)
Air Raid Siren at 50 feet	120
Maximum Levels at Rock Concerts (Rear Seats)	110
On Platform by Passing Subway Train	100
On Sidewalk by Passing Heavy Truck or Bus	90
On Sidewalk by Typical Highway	80
On Sidewalk by Passing Automobiles with Mufflers	70
Typical Urban Area Background/Busy Office	60
Typical Suburban Area Background	50
Quiet Suburban Area at Night	40
Typical Rural Area at Night	30
Isolated Broadcast Studio	20
Audiometric (Hearing Testing) Booth	10
Threshold of Hearing	0
Notes: A change in 3 dBA is a just noticeable change in SPL. A change in 10 dBA is perceived as a doubling or halving in SPL.	

The C-weighted network provides essentially the unweighted microphone sensitivity over the frequency

range of maximum human sensitivity. C-weighted decibels (denoted in units of dBC) are used in some ordinances and standards, usually when dealing with stationary mechanical noise sources; however, dBA are normally used for environmental assessments. Since C-weighting does not attenuate frequency levels below 1,000 Hz the way A-weighting does, inspection of dBA versus dBC readings can give a quick estimate of the low frequency contribution of the sound source in question.

The most common descriptors used in environmental noise assessments are (1) time-equivalent level (L_{eq}); (2) day-night level (L_{dn}); (3) percentile level (L_n); (4) sound exposure level (SEL); and (5) maximum instantaneous level (SPL). Each is expressed in units of dBA and described briefly below.

1. L_{eq} is the continuous equivalent sound level, defined as the single SPL that, if constant over the stated measurement period, would contain the same sound energy as the actual monitored sound that is fluctuating in level over the measurement period. L_{eq} is an energy-average quantity that must be contrasted with an average or median sound level. L_{eq} must be qualified in terms of a time period to have meaning. The normal representation for the time period is placing it in parentheses in terms of hours, e.g., $L_{eq(1)}$ refers to a 1-hour measurement and $L_{eq(24)}$ refers to a 24-hour measurement. L_{eq} is most widely recognized as the descriptor of choice for most environmental noise assessments. In addition to its simplicity of use, it is easy to combine with other readings or predictions to derive a total noise level.

2. L_{dn} is the day-night equivalent sound level, defined as a 24-hour continuous L_{eq} with 10 dBA added to all signals recorded between the hours of 10 PM and 7 AM. This 10 dBA addition accounts for the extra sensitivity people have to noise during typical sleeping hours. Aircraft noise around airports is usually mapped out in terms of L_{dn} contours, which are constant lines of L_{dn} mapped similarly to elevations on topographical maps.

3. L_x is the percentile level, where x is any number from 0 to 100. Here x corresponds to the percentage of the measurement time that the stated sound level has been exceeded. For example, L_{10} = 80 dBA means that SPL measurements exceeded 80 dBA 10 percent of the measurement period. As with L_{eq}, the measurement time period must be specified and is denoted in parentheses (i.e., $L_{10(1)}$ corresponds to the SPL exceeded 10 percent of the time during a one-hour period).

   The most commonly quoted L_n values are L_1, L_{10}, L_{50}, and L_{90}. L_1, the SPL exceeded 1 percent of the time, is usually regarded as the average maximum noise level when readings are an hour or less in duration. L_{10} is usually regarded as an indication of traffic noise exposure with a steady flow of evenly spaced vehicles. L_{50} provides an indication of the median sound level. L_{90} is usually regarded as the residual level, or the background noise level without the source in question or discrete events.

4. SEL is the sound exposure level, defined as a single number rating indicating the total energy of a discrete noise-generating event (e.g., an aircraft flyover) compressed into a 1-second time duration. This level is handy as a consistent rating method that can be straightforwardly combined with other SEL and L_{eq} readings to provide a complete noise scenario for measurements and predictions.

5. The maximum instantaneous SPL is the highest single reading over the measurement period. It is useful to note this level because if it is very high, it will elevate the L_{eq}, perhaps making it appear spurious. In instances where uses may be particularly sensitive to single event noise events, the lead agency should also consider analyzing potential noise impacts on a single event basis, particularly if the single event would be entirely new to the receptor, or where the receptor would experience a significant increase in the number of these single events.

Described below are recommended descriptors for characterizing various types of noise. The discussion includes a notation of major agencies that use different descriptors for noise analysis purposes. It should be noted that the CEPO-CEQR standards used by DEP (see Section 420, below) are expressed in terms of L_{10} for vehicular noise, daily L_{dn} for rail sources, and yearly L_{dn} for aircraft. The New York City Noise Code uses L_{eq} for the ANQZ standards (for on-site stationary sources). In addition, the New York City Zoning Resolution uses maximum instantaneous octave band sound pressure levels, in dBC, as its noise

descriptor for industrial noise sources. Detailed analyses in these areas, if required, will need to include these descriptors for those assessments.

123.2. Descriptors for Mobile Sources

Each type of mobile source noise generator produces a distinct noise signature. The use of different descriptors for each is appropriate, as described below.

Vehicular Traffic. Because vehicular traffic on local streets is not steady—vehicles often move by in groups, or platoons—its noise signature is characterized by fluctuating levels. If the traffic stream is characterized by sporadic heavy vehicles (such as trucks), the noise levels will contain "spikes" associated with these events. For that reason it is generally best to use the descriptors of $L_{eq(1)}$ or $L_{10(1)}$ for purposes of noise analysis. $L_{eq(1)}$ captures an hour's total noise energy at the location, and $L_{10(1)}$ represents the level exceeded 10 percent of the time. The $L_{10(1)}$ descriptor can be considered an average of the peak noise levels at a given location. If the noise fluctuates very little, then L_{eq} will approximate L_{50}, or the median level. If the noise fluctuates broadly, then the L_{eq} will be about equal to the L_{10} value. If extreme fluctuations are present, the L_{eq} will exceed L_{90}, or the background level, by 10 or more decibels. Thus, the relationship between L_{eq} and the levels of exceedance will depend on the character of the noise. In community noise measurements, it has been observed that the L_{eq} generally lies between L_{10} and L_{50}, but generally closer to L_{10} where fluctuating traffic noise is the dominant noise source.

Aircraft. Aircraft noise consists of a series of single events over time. Depending on the location of and ambient noise levels at the receptor, these single events can be easily distinguishable from background noise levels. This is particularly true, for example, where the receptor is close to an airport and in the flight path. The Federal Aviation Administration (FAA) currently averages daily L_{dn} levels to use the yearly L_{dn} as its preferred noise descriptor. The distance from the flight path where various L_{dn} levels occur is measured (or calculated) and then mapped. These L_{dn} "noise contours" constitute the basic form of reference for assessing impacts associated with aircraft noise. Many airports are monitored to derive annual L_{dn} contours, and the FAA has its own computer program to calculate L_{dn} contours. The CEPO-CEQR noise exposure standards also use the annual L_{dn} descriptor, patterned after FAA specifications for descriptor use. Therefore, when it is necessary to conduct a detailed noise analysis involving aircraft noise, the annual L_{dn} descriptor should be used in the analyses. Measured annual L_{dn} values are available from the Port Authority for its facilities in the form of noise contour maps, or these values may be calculated using the Federally approved INM computer model and flight data from the Port Authority of New York and New Jersey.

Based on flight data, it is also possible to establish $L_{eq(1)}$ noise levels for existing and future conditions. Since annual L_{dn} values tend to average out high hourly values, for impact assessment purposes, it is recommended that the $L_{eq(1)}$ descriptor also be used in the noise analysis (see Section 332, below).

Trains. Similar to aircraft noise, train noise comprises a series of single events over time. Depending on the location of and ambient noise levels at the receptor, these single events can be easily distinguishable from background noise levels. This is particularly true, for example, at noise receptors close to elevated rail lines. The Federal Transit Administration (FTA) uses the SEL in conjunction with a choice of $L_{eq(1)}$ or L_{dn} as its principal noise descriptors for mass transit noise. The CEPO-CEQR standards for noise assessment require the use of the daily L_{dn} for impact assessment. Because of these standards, it is recommended the L_{dn} and, again since L_{dn} values tend to average out high hourly values over 24 hours, the $L_{eq(1)}$ descriptors be used for purposes of impact analysis.

123.3. Descriptors for Stationary Sources

Stationary source noise usually is associated with mechanical equipment used for manufacturing purposes, or for building mechanical systems. In addition, stationary source noise must also be examined for crowd noise, such as from playgrounds or spectator events, or for open-air concerts. The nature of this noise is fairly uniform, with spectator events excepted. Therefore, the recommended descriptor for this type of noise source would be the $L_{eq(1)}$ descriptor.

123.4. Descriptors for Construction Sources

Construction source noise is associated with a variety of mobile and stationary sources, each having unique noise characteristics and operating for different time periods. The only noise descriptor that can be used reliably with these noise sources is the L_{eq}. Hourly L_{eq} values should be used because construction operations vary with the time of day.

124. Receptors

Receptors are generally the subject of most noise impact analyses. A noise-sensitive location (known as a "receptor") is usually defined as an area where human activity may be adversely affected when noise levels

exceed predefined thresholds of acceptability or when noise levels increase by an amount exceeding a predefined threshold of change. These locations can be indoors or outdoors. Indoor receptors would include, but would not be limited to, residences, hotels, motels, health care facilities, nursing homes, schools, houses of worship, court houses, public meeting facilities, museums, libraries, and theaters. Outdoor receptors would include, but would not be limited to, parks, outdoor theaters, golf courses, zoos, campgrounds, and beaches. Land use and zoning maps are usually helpful in initially targeting receptors that should be analyzed; however, field inspection of the area in question firsthand is the most appropriate way to identify all receptors that may be affected by the proposed project.

130. NOISE CHARACTERISTICS OF TYPICAL NOISE SOURCES

131. Mobile Sources

131.1. Vehicular Traffic

Vehicular traffic includes automobiles, buses, and trucks. The noise generated by each of these types of vehicles comes from the operation of its engine and the sound of its tires passing over the roadbed. Trucks and cars are quite different in their noise generating characteristics. Buses and trucks are similar in their respective noise characteristics.

Automobiles generally produce noise levels that are independent of vehicle speed but vary with engine speed. With changing gears, the noise levels tend to increase in a sawtooth kind of pattern as vehicular speed increases. The interaction of the road surface with the tires generates noise that increases with vehicle speed. At vehicular speeds below 30 miles per hour, the typical automobile noise spectrum is dominated by engine noise. At speeds higher than 30 miles per hour, the automobile noise signature is composed of a combination of lower frequency engine noise and higher frequency tire noise. The engine and tire noise above vehicular speeds of 30 miles per hour are comparable in noise level.

Noise generated by buses and heavy trucks is also composed of engine and tire noise, but tire noise tends to dominate the noise signature at vehicular speeds above 30 miles per hour in trucks and buses. Cargo load normally does not significantly affect noise levels because increased load usually results in decreased vehicular speed and the effects cancel each other out. Because individual trucks and buses are noisier than individual automobiles, the concept of Passenger Car Equivalents is used (see Section 321.1).

131.2. Aircraft Operations

The principal noise sources from conventional aircraft (airplanes and helicopters) using New York City airspace are the propulsion system and aerodynamic noise. There are generally three types of engines in use on contemporary airplanes—turbojet, turbofan, and propeller. In the turbojet and turbofan models, the dominant noise source is the exhaust, generating the characteristic low frequency roar of the jet engine. Propeller aircraft have combinations of engine exhaust noise and propeller noise, with the propeller component usually dominating. This produces the typical whining sound of propeller-driven aircraft.

Aerodynamic noise is generated by airflow around the fuselage, cavities, control surfaces, and landing gear of the aircraft. Aerodynamic noise is usually only dominant during cruise conditions (frequencies above 600 Hz). Conditions during takeoff and landing normally cause propulsion system noise dominate the aerodynamic component.

Helicopter noise is generated by the engine and main rotor system. The engine noise is similar to that discussed for airplanes yet on a smaller scale. Rotor noise is characterized by slaps or cracks caused by the sharp variations in pressure encountered by the rotating rotor blades as they pass through the aerodynamic wake produced by each adjacent blade. As for propeller noise, the frequency of the rotor noise is proportional to the tip speed and the number of blades in the rotor system.

131.3. Rail Operations

The principal noise sources of rail systems are the interaction between wheels and rails, the propulsion system of the railcars, auxiliary equipment (ventilation and horns), and, in the case of high-speed trains, aerodynamic noise. The dominant cause of railcar noise over most of the typical speed range is interaction between the wheels and rails.

When railcars travel on curves with radii less than about 350 feet, the dominant noise emitted is a high pitched squeal or screech. This is usually caused by metal wheels sliding on the rail and scraping metal on metal when a train negotiates a curve. Electrically powered railcars of the type used in New York City have additional noise sources related to the propulsion system, including the traction motor, reduction gears, the traction motor air-cooling system, and the ventilation system. Another noise source that may be of concern is the horn, which typically generates noise levels of about 85 dBA at 100 feet.

Aerodynamic noise is generated as a result of rapidly fluctuating pressures in the turbulent air on or near the surface of a moving train. The noise levels associated with aerodynamic generation become significant at speeds above roughly 150 miles per hour for smoothly shaped trains.

When a railcar is traveling on an elevated structure, such as a bridge or elevated guideway, noise levels can be as much as 20 dBA higher than those generated by railcars traveling on tracks at grade. This is primarily caused by radiation of sound from vibrating components of the elevated structure.

132. Stationary Sources

The principal stationary noise sources encountered in the City are mechanical equipment associated with industrial and manufacturing operations and building ventilating systems. Another stationary source worth noting is crowd noise, as related to playgrounds or spectator events. The basic characteristics of these sources are described below.

Mechanical equipment generally includes machinery used for industrial purposes, such as motors, compressors, boilers, pumps, transformers, condensers, generators, cooling towers, and ventilating equipment. The machinery commonly generates noise mechanically (through gears, bearings, belts, fans, or other rotating components), aerodynamically (through air or fluid flow), and magnetically (through magnetostriction or periodic forces between rotors and stators).

Assuming proper maintenance, mechanical machinery noise is usually characterized by discrete mid- to high-frequency tones. These tones are usually caused by friction, vibration of components, and aerodynamic flow generation. Even when large machinery is properly maintained, noise levels can exceed 100 dBA within 10 feet of the equipment. Badly maintained machinery can increase mechanical noise levels by as much as 20 dBA; this represents a quadrupling of the noise level.

Common mechanical stationary noise sources in the City are ventilating systems. These usually have fans that generate tones at high operating speeds. These tones can propagate through ducts in a building and produce noise in rooms far away from the original source. Air conditioning units can generate noise that could affect adjacent buildings. If not isolated from the building structure by properly tuned springs or resilient materials, ventilating systems and other machinery can generate vibrations that may be sensed throughout a building and possibly a neighborhood.

Aerodynamic noise usually becomes an issue when the air (or other fluid) flows through ducts in a restrictive, unsmooth path, and turbulence is generated. Boilers and steam turbines have liquids and steam flowing through them at high speeds, generating a hissing noise or roaring noise that can exceed 100 dBA within 10 feet.

While people are not usually thought of as stationary noise sources, children in playgrounds or spectators at outdoor sporting events or concerts can cause annoyance in communities. Instantaneous crowd noise levels at outdoor events can exceed 90 dBA. In addition, measurements taken at 10 school playground sites in 1987 concluded that maximum $L_{eq(1)}$ levels at school playground boundaries in the New York City area are 75 dBA. The equations for calculating playground noise can be obtained from DEP.

133. Construction Sources

Construction equipment can be defined as machinery used, at a specified site, for the fabrication, erection, modification, demolition, or removal of any structure or facility, including all related activities such as land clearing, site preparation, excavation, cleanup, and landscaping.

Table 3R-2 shows typical ranges of instantaneous noise levels for construction equipment. These values represent the full range of equipment sizes and operational modes as measured at 50 feet from test sites and actual construction sites.

200. Determining Whether a Noise Analysis is Appropriate

In many instances, it is possible to determine that a proposed action would not have the potential for a significant noise impact simply from its proposed physical characteristics, and that it is not necessary to conduct any detailed noise analyses. Recommended guidelines for this screening assessment and the rationale behind these guidelines are presented below for mobile and stationary sources and for construction activities.

The initial impact screening would consider whether the action would generate any mobile or stationary sources of noise or be located in an area with high ambient noise levels. Areas with ambient noise levels typically include those near highly trafficked thoroughfares, airports, rail, or other loud activities.

Table 3R-2

SPL Ranges of Construction Equipment (dBA at 50 feet)

Equipment	SPL Range
Compactors	72-88
Front Loaders	72-97
Backhoes	72-93
Tractors	73-96
Scrapers, Graders	77-95
Pavers	82-92
Trucks	70-96
Cement Mixers	71-90
Cement Pumps	75-84
Cranes	76-95
Pumps	70-80
Generators	70-82
Compressors	68-86
Pneumatic Wrenches	82-88
Jackhammers, Drills	76-98
Pile Drivers (Peak levels)	89-104
Vibrators	70-81
Saws	67-93
Tamper (at 1 meter)	94-100

Source: Harris, C., *Handbook of Noise Control*, Second Edition. New York: McGraw-Hill Book Company, 1979.

210. MOBILE SOURCES

211. Vehicular Traffic Noise

If a proposed action would generate or reroute vehicular traffic, a noise assessment may be appropriate. Additionally, if the action would be located near a heavily trafficked thoroughfare, noise assessment may be appropriate.

212. Aircraft Noise

If the proposed action would be a receptor and would be within one mile of an existing flight path, or cause aircraft to fly through existing or new flight paths over or within one mile (horizontal distance parallel to the ground) of a receptor, a more detailed analysis may be appropriate.

213. Train Noise

If the proposed action would be within 2,000 feet of existing rail activity and have a direct line of sight to that rail facility, or if the proposed action would add rail activity to existing or new rail lines within 2,000 feet of and have a direct line of site to a receptor, a more detailed analysis may be appropriate.

220. STATIONARY SOURCES

If the proposed project would cause a stationary source to be operating within 1,250 feet of a receptor, with a direct line of site to that receptor, or if the proposed action would include unenclosed mechanical equipment for manufacturing or building ventilation purposes, a more detailed analysis may be appropriate. In addition, if the action would be located in an area with high ambient noise levels resulting from stationary sources, such as unenclosed manufacturing activities or other loud uses, noise assessment may be appropriate.

230. CONSTRUCTION SOURCES

If the proposed action would cause construction equipment to be operating within 1,000 feet of a receptor for an extended period of time, a more detailed analysis should be performed. Otherwise, qualitative analysis is typically appropriate.

300. Assessment Methods

Even if it is not possible to conclude that a proposed action would not have a significant noise impact through its physical characteristics (see Section 200, above), it is sometimes possible to make that determination through an examination of its operational characteristics and, often, very little field work. Presented below is a discussion of how this initial level of assessment can be made for mobile, stationary, and construction sources of noise that may be related to a proposed action. Where they are available, the screening analyses recommended by Federal, State, and local agencies for environmental noise assessment are described as well.

Following the discussion on impact screening are guidelines for the conduct of detailed noise analyses. Methods used by agencies for projects in New York City and accepted industry practices for environmental noise assessments applicable to New York City projects are discussed in this section. Some methods used by other states and municipalities are also included for reference and comparison. This discussion provides background information related to detailed noise analyses, study area definition, technical subareas, and models and analysis techniques used.

310. NOISE IMPACT SCREENING

The initial impact screening noise analysis identifies whether a potential exists for the action to generate a significant noise impact at a receptor, or be significantly affected by high ambient noise levels. If the

basic analysis does not identify the potential for significant impacts, no further noise analysis would be necessary and it can be stated that the proposed action would not result in a significant noise impact.

311. Mobile Sources

311.1. Vehicular Noise

In coordination with the traffic studies (see Section 30), traffic volumes should be estimated for the worst-case expected hour at the receptors likely to be most affected by the proposed action. If passenger car equivalent (PCE) values are at least doubled between existing and action conditions at any of these times and locations, a detailed analysis is generally performed. The method for assigning PCEs to vehicle type is discussed under Section 321.1, below.

311.2. Aircraft Noise

Yearly L_{dn} contours should be obtained or calculated for the build year(s) of the proposed action. The calculations can be performed using the FAA hand-calculation methodology or the Federal INM3 computer model. Neither of these methods are appropriate for helicopter noise modeling, however. Helicopter noise may be calculated using the FAA HNM computer model or other acceptable modeling based on actual noise measurements of helicopter flyovers. Calculation of the yearly L_{dn} contours is seldom necessary, since these contours are updated periodically by the Port Authority of New York and New Jersey for the three major metropolitan airports. If the proposed action would cause a receptor to be located within an L_{dn} 65 contour or greater, or if the proposed action would be a receptor within this area for an existing flight path, a detailed analysis may be appropriate.

311.3. Train Noise

If the proposed action would place a receptor within the distances specified in Table 3R-3, or would cause increased rail traffic where there is a receptor within the distances specified in that table, a detailed analysis may be appropriate.

312. Stationary Sources

Consider whether the proposed action would locate a receptor near a substantial stationary source noise generator or if a substantial stationary source noise generator would be close to the site of a proposed action that is also a sensitive receptor. Examples of substantial stationary source noise generators include unenclosed cooling or ventilation equipment (other than single-room units), truck loading docks, loudspeaker systems, stationary diesel engines (typically more than 100 horsepower), car washes, discos, or other similar types of uses. If this is the case, refer to Table 3R-3. That table shows distance by type of receptor. If the substantial stationary source noise generator is within these distances of the various types of receptors, and there is a direct line of sight between the receptor and the generator, further analysis will likely be needed. The distance between a receptor and a substantial stationary source may be measured from a Sanborn map or similar real estate or insurance atlas.

313. Construction Sources

Generally, a qualitative discussion on construction noise and precautions taken for its control should suffice. A more detailed analysis would only be called for in the event the construction period were to last an extended period of time, as would be experienced at any given receptor.

320. STUDY AREA

Guidelines for determining the appropriate study area size and noise receptor locations are described below. Selection of a study area depends on the noise source. The effect of noises generated as a result of the proposed action on surrounding receptors and the effect of noise generated from surrounding sources on the proposed action need to be considered.

321. Mobile Sources of Noise

321.1. Vehicular Traffic Sources

The study area for potential noise impacts from vehicular sources includes the locations of receptors along traffic routes to and from the site, along which project vehicular trips would be assigned, and the proposed site itself, if a receptor is proposed to be located there. Of particular importance are routes where traffic levels without the proposed actions would be light and made up of lighter vehicles, and where the proposed action would result in a significant number of new trips. Typically, the selection of sensitive noise receptors for analysis goes hand in hand with the traffic and transportation trip generation and assignment process. Once the vehicular trips have been assigned to the roadway network, the potential locations where significant noise impacts could occur can be identified. Typically, this is done by driving the routes to and from the site to identify noise receptors along those routes.

Of particular importance in selecting these locations is the consideration of the existing vehicular mix and the vehicular mix that would be generated by the proposed action. Under noise analysis procedures, vehicles are converted to passenger car equivalents (or

Table 3R-3
Distance from Noise Sources to Receptors Indicating Detailed Assessment is Needed

	Criterion Distances, In Feet									
	Off/On Site Noise Source									
Closest Receptors	Ventilation Equipment	Truck Loading	Parking Garage	Loudspeaker System	Stationary Engine	Arterial Road	Elevated Subway	Commuter Rail Line	Freight Rail Line	Other
Residences	200	150	250	400	700	850	1,000	750	750	500
Outdoor Performance Facilities	350	300	450	650	1,250	1,600	1,750	1,400	1,400	900
Indoor Performance Facilities w/Windows	200	150	250	350	700	850	1,000	750	750	500
Indoor Performance Facilities w/o Windows	50	50	100	100	200	300	300	250	250	150
Parks & Outdoor Facilities	100	100	150	200	400	500	550	450	450	300
Educational Facilities	200	150	250	400	700	850	1,000	750	750	500
Places of Worship	200	150	250	400	700	850	1,000	750	750	500
Health-care Facilities	200	150	250	400	700	850	1,000	750	750	500
Community Ctrs & Libraries	100	100	150	200	400	500	550	450	450	300

A MORE DETAILED ANALYSIS MAY BE APPROPRIATE IF ANY SOURCE-RECEPTOR DISTANCE IS LESS THAN THE CORRESPONDING CRITERION DISTANCE IN THIS TABLE, AS LONG AS DIRECT LINE-OF-SIGHT EXISTS BETWEEN SOURCE AND RECEPTOR.

PCEs), which in turn are used to compute the noise levels for future conditions. (One heavy truck is equivalent to 85 PCEs and one medium truck is equivalent to 16 PCEs.) If a significant increase in the number of PCEs is expected (i.e., more than a doubling of PCEs) along any given route that proposed action-related vehicles would use going to and coming from the site within a given hour, then representative receptors should be selected along that route for analysis. The project itself should also be considered as a receptor if the proposed action would include a noise sensitive use. Usually at this stage, these judgments are made without firm data in hand. It is therefore prudent to be conservative in this judgment as to which should be the analysis locations (i.e., choose any receptor that could conceivably be affected as a noise analysis location). The actual selection of the potential noise receptor sites can be narrowed if more data are available, since potential noise increases along these routes can be calculated with these data.

321.2. *Aircraft Sources*

Three types of actions would require study areas for aircraft-related noise sources: a proposed action that included a new or expanded aircraft facility, renewal of a lease for an existing facility, or a receptor that would be affected by a proposed action within the annual 65 dBA L_{dn} contour of an existing airport. The first condition is highly unlikely within the context of CEQR actions, since the action of constructing an airport would most likely be sponsored by the Port Authority rather than a City agency or private entity. However, the study area for a new/expanded airport and that for a lease renewal (which is more commonly undertaken by a City agency) are essentially the same. In this case, selection of the study area and sensitive receptors within it should be based on preliminary calculations and mapping of noise contours. Representative locations would then be selected from within these areas for detailed noise impact analysis. Every receptor need not be selected for this purpose. For example, if there were a number of residential buildings within this area, then one might be selected within the 60-65 dBA L_{dn} contours, one between the 65 to 70 dBA L_{dn} contour, and so on. The same exercise may be repeated for other types of receptors within the critical contours.

For airport expansions that would include the increase of aircraft at the facility, the study area would include receptors within the *revised* 65 L_{dn} contour, assuming the proposed expansion was fully operational. Representative receptors would then be selected from within this study area for aircraft sources for detailed noise impact analysis.

If the proposed action is within an existing 65 dBA L_{dn} contour, and the proposed action would be a receptor, the study area would be the site of the proposed action itself. It should be noted that Congress has recently passed a bill that requires FAA to conduct an analysis of the social, economic, and health effects of airport noise on populations within the 65, 60, and 55 DNL contours to determine the "actual level" where noise causes an adverse impact on populations. The results of the analysis must be reported to Congress within the year. If 60 dBA contours become available, they should be used in CEQR analysis.

321.3. *Rail Facility Sources*

Two types of actions would generally require study areas for rail-related noise sources: a proposed action with a receptor within the daily 65 dBA L_{dn} contour of an existing rail facility, or a proposed action that would include a new rail facility or that would add trains to an existing facility. If this contour is not known, the study area should be considered to be that within 2,000 feet of such a facility, where such a facility would have a direct line of sight to a receptor. For new rail facilities, the selection of receptors within this study area should follow the same procedure outlined above for aircraft-related noise study areas.

If the proposed action is within the daily 65 L_{dn} contour of an existing facility or within 2,000 feet of, and has a direct line of sight to an existing facility, and the proposed action would be a receptor, the study area should encompass the site of the proposed action itself.

322. *Stationary Sources*

The study area for stationary sources is based on proximity of a receptor to the site of the proposed action, or the proximity of the proposed action to a major noise stationary source in the area, and ambient noise levels at the receptor location that could tend to mask these stationary sources of noise. Receptors closest to a proposed action containing a significant stationary source noise generator are the first candidates for inclusion in the analysis. Generally, receptors within a 2,000-foot radius of the proposed action, for which any part of that receptor would be within a direct line of sight of the proposed action, should be considered for analysis. (As noted below, if there is more than one such receptor within this distance from the site, the analysis can be phased to analyze the closest receptor first—if no significant impact is found at the closest site, then it is reasonable to conclude that receptors farther from the site would also not be affected by the proposed action. Otherwise, it would be necessary

to extend the analysis to the most distant receptor where no significant impact is found.)

A similar relationship between the proposed action and existing and future no action stationary sources should be framed, as appropriate. Although these sources may not have to be analyzed separately (because they are included in ambient noise levels) they should be generally identified. It is possible that one or more may be close enough to the site of the proposed action and loud enough to require consideration of noise mitigation at the project site.

323. Construction Sources

The study area for construction sources is based on the proximity of a noise-sensitive receptor to the construction site and the route of construction traffic traveling to and from the site. The same manner of selecting the study areas for stationary and mobile sources above should be used for the appropriate construction sources. Generally, receptors within a 1,000-foot radius of the proposed action (for stationary construction sources) and along feeder streets to the proposed action (for mobile construction sources) should be considered if a detailed construction assessment is necessary.

330. MODELS AND ANALYSIS TECHNIQUES

The basic analysis techniques used for noise impact analysis follow the same basic procedures as for other impact analysis area—existing conditions are first characterized, then no action conditions are projected and analyzed, and finally the action condition is projected and analyzed. Impact assessments are then made by a comparison of the no action and action conditions. The following discussion traces this procedure through for mobile sources, stationary sources, and construction sources of noise.

331. Noise Measurement Procedures

The first procedure for each of these noise analysis categories is the characterization of existing conditions at selected receptor locations within the noise study areas. As a first step within this process, existing noise levels at receptors are established through a noise measurement program. This noise measurement program follows a method consistent for all sensitive receptors, and is described first below.

331.1. Noise Measurement Instrumentation

The most common instruments used for environmental noise assessment are sound level meters and spectrum analyzers. The American National Standards Institute (ANSI) has published standards on types of meters and methods of sound measurement. ANSI defines three types of meters—Type 0, having the most stringent tolerances, targeted for laboratory use; Type 1, called a precision meter; and Type 2, a general-purpose meter, having the least stringent tolerances acceptable for SPL monitoring. Sound level meters without at least Type 2 tolerances are not appropriate for SPL monitoring.

Most sound level meters have three measurement speeds—slow, fast, and impulsive. The slow speed is usually recommended for environmental noise assessments, such as those performed for CEQR. The fast speed is usually recommended to monitor discrete events to get a clear indication of peak levels.

331.2. Noise Measurement Procedures

ANSI also presents guidelines for SPL measurement practices to provide reliable data. Basic measurement procedures that these standards and accepted industry practices agree on are accounting for wind, calibration, and careful selection of microphone placement. Other guidelines are presented here for reference.

Accounting for Wind. When measurements are performed outdoors or in areas where airflow can be sensed, the movement of air may skew the monitoring results; wind can add 20 dBA or more on the meter to actual noise levels. Therefore, a windscreen designed to fit the specific instrument should be used. These windscreens are designed to block wind noise without attenuating the signal being measured. Even with a windscreen in place, wind speeds above 15 miles per hour can cause erroneous readings. Therefore, wind speed should be monitored in breezy areas and readings should not be taken when wind speeds exceed 15 miles per hour.

Calibration. To be sure that the meter is working properly , the measuring instrument is calibrated before and after each series of readings.. Typical sound level calibrators are hand-held cylinders with adapters to fit the measuring microphone of the meter to be calibrated. With a properly operating meter, manual adjustment should be required infrequently (especially not during a measurement session) and the adjustment should be less than 2 dBA. Calibrators and sound meters should be factory-calibrated at least once a year.

Microphone Placement. To avoid distortion, the measuring microphone is placed minimum of 3 to 4 feet away from any reflecting surfaces, including the ground, walls, and the body of the person performing the measurements. If this is not done, up to 6 dBA can

be erroneously added to the reading from reflected sound. Whenever feasible, the meter should be mounted on a tripod to avoid signal contamination caused by the monitoring personnel. It is also common practice to list the model and serial numbers of all equipment used in the environmental impact assessment so that if necessary, measurements can be consistently repeated where questions arise.

Noise Measurement Periods and Noise Peak Hour Selection. Noise measurements should be made in accordance with the expected times that the proposed activity at the site would be greatest, or when surrounding receptors may otherwise be most likely to be experience significant impacts because of the proposed project. For example, at a location where the primary concern is the potential for a significant mobile source impact from vehicular traffic, hourly PCEs expected to be generated by the project should be tabulated at each of the receptor locations. Peak hours for noise assessment purposes should be assumed whenever there are concentrations of PCEs generated by the project. For most projects, such as an office building, there will generally be two noise peaks—one in the morning and one in the evening. Where the project peak hours are greatest in terms of PCEs generated by the project, the noise analysis should preliminarily assume these as the noise peak hours for the project, for vehicular mobile sources, and noise measurements should be made during these peak hours. After the traffic count program has been completed for existing conditions, the existing PCEs are tabulated on an hourly basis and compared to the hourly tabulation of PCEs expected to be generated by the project. If it is found that the ratio of PCEs from the proposed project to existing PCEs is greater than that for the preliminarily selected noise peak hours, it may be necessary to include these peak hours in the noise analysis periods for the project, and noise measurements may have to be taken for those hours.

Other Activities During the Conduct of the Noise Measurements. While each of the noise measurements is being taken, a traffic counting and classification program should be conducted that records the following: total vehicles; total number of heavy trucks or buses (i.e., over 25,000 pounds gross vehicle weight); total number of medium trucks (i.e., between 9,400 and 25,000 pounds gross vehicle weight); and total number of passenger vehicles or light trucks (i.e., less than 9,400 pounds gross vehicle weight).

If noise from a rail facility or aircraft becomes audible during the measurement program, measurements should be suspended until that sound is no longer audible. Where these noise sources are of concern, they are not measured but calculated because of the extreme variability in measured data from these sources. Measured noise levels for aircraft noise are unreliable because they are highly sensitive to environmental factors, such as atmospheric and terrain conditions.

Duration of Noise Measurements. Noise is relatively insensitive to minor fluctuations in changes in PCEs. For example, it takes a doubling of PCEs to equal a just perceptible (3 dBA) change in sound levels. For that reason, it is generally not necessary to conduct noise measurements for more than a 20-minute period during any hour at any given location, provided that a traffic count and vehicle classification is conducted simultaneously at the measurement site with the noise measurement.

If the proposed action is expected to generate traffic or stationary source noise over a 24-hour period or if the action includes a residential component, it may be necessary to take a 24-hour noise measurement at at least one receptor location. Usually, this location is selected as the most sensitive of the receptor locations in terms of low ambient noise levels during the off-peak periods.

Monitoring Results. At the completion of the measurement, the following noise levels should be recorded from the noise meter: L_{max}, L_{min}, L_1, L_{10}, L_{50}, L_{90}, L_{eq}. Recording of these various noise levels under these descriptors may assist in determining if any anomalous conditions occurred during the measurement, if the measurement is called into question during the detailed analysis.

332. Mobile Sources Analyses

332.1. Vehicular Noise

For most actions reviewed under CEQR, a desktop analysis can be employed using a logarithmic equation (described below). However, when analyzing conditions that result in new or significant changes in roadway or street geometry, the FHWA STAMINA 2.0 Highway Model can be used for the projection of vehicular noise levels where a logarithmic ratio is not possible. However, it should be recognized that the STAMINA computer versions of the FHWA Highway Traffic Model are not valid when the vehicle speeds are less than 30 mph, or the vehicles are less than 25 feet from the receptor, or when stop and go traffic conditions are prevalent. If any of these conditions exist, it may be necessary to employ the methodology contained in the Transportation Research Board's report, "Predicting Stop and Go Traffic Noise Levels." Instances where

new roadways are proposed are not common in CEQR, however, and it is usually possible to use the logarithmic equation described below.

Existing Conditions. Analysis of existing noise conditions uses monitored noise levels and observations made during the monitoring period to assess noise levels and their sources. Most often, it is assumed that all measured noise at the measurement site is associated with the vehicular traffic passing the site. This is a proper assumption as long as vehicular noise levels are at least 10 dBA above levels associated with all other noise sources. The results of the noise monitoring program are reported as existing conditions in the environmental assessment.

Future No Action Condition. To arrive at the no action noise condition, the results of the no action traffic analysis (see Section 30) are used to compute total PCEs passing each receptor site. From the existing and no action traffic data, existing and no action PCEs are calculated in the following manner:

Each Heavy Truck: 85 PCEs
Each Medium Truck: 16 PCEs
Each Automobile or Light Truck: 1 PCE

After the PCEs are calculated and tabulated at each receptor site, the no action noise levels are calculated using the following equation:

FNA NL = 10 log (NA PCE/E PCE)+E NL

where:

FNA NL = Future No Action Noise Level
NA PCE = No Action PCEs
E PCE = Existing PCEs
E NL = Existing Noise Level

The calculation is conducted using the $L_{eq(1)}$ noise measurement results. The results of this calculation can be reported as a noise level using the $L_{10(1)}$ descriptor by adding the difference between the two descriptors found to exist in the measurement program to the calculated no action $L_{eq(1)}$ noise level. The results of the no action noise level calculation are then reported in the environmental assessment.

Action Condition. The identical analysis procedure is used to determine the action condition, with calculated total PCEs derived from the action traffic analysis. To determine potential significant impacts, the action condition noise levels are compared with the no action noise levels, to applicable standards and impact thresholds at each receptor (see Sections 410 and 710, below).

332.2. Aircraft Noise

Existing Conditions. FAA L_{dn} contours, if available, are used for this analysis. If annual FAA L_{dn} contours are not available for the area of the proposed action, calculation methodologies developed by HUD for aircraft sources, or the Federal INM3 computer model (or for helicopters, the Federal HNM computer model or other acceptable model based on actual noise measurement), are used to derive these noise levels. These methodologies would provide $L_{eq(1)}$ or L_{dn} values that can be converted to $L_{eq(1)}$.

No Action Condition. The same analysis methods used to estimate existing aircraft noise levels are to be used in the no action scenario using the no action aircraft mix.

Action Condition. The same analysis methods used to estimate existing aircraft noise levels are to be used in the action scenario using the action aircraft mix. To determine potential significant impacts, the action condition noise levels are compared with the no action noise levels, applicable standards and impact thresholds at each of the receptors (see Sections 410 and 710, below).

332.3. Train Noise

Existing Conditions. If L_{dn} contours are not available for the area of the proposed action, calculation methodologies developed by HUD for rail sources should be used to derive their noise levels. As for aircraft sources, L_{dn} values can be converted to $L_{eq(1)}$ by the generally accepted conversion of $L_{dn} = L_{eq(1)}$ at the daily peak hours.

No Action Condition. The same analysis methods used to estimate existing train noise levels are to be used in the no action scenario using the no action train mix.

Action Condition. The same analysis methods used to estimate existing train noise levels are to be used in the action scenario using the action train mix. To determine potential significant impacts, the action condition noise levels are compared with the no action noise levels, applicable standards and impact thresholds at each of the receptors (see Sections 410 and 710, below).

333. Stationary Sources

333.1. Existing Conditions

Noise levels of existing stationary sources should be measured at the closest noise-sensitive receptors. If the stationary source in question would be part of the proposed action and does not currently exist, noise measurements should be performed at the property line of the proposed action closest to the proposed stationary source(s) and at the closest noise-sensitive receptors.

333.2. No Action Condition

In cases where new stationary sources are to be introduced into the study area in the future without the project, the noise contribution from these facilities is predicted at the noise-sensitive receptors and/or the project site and added to existing noise levels to obtain no action conditions. The calculations are based on operational information from the entity responsible for the new stationary noise sources.

333.3. Action Condition

Stationary source noise levels with the proposed action are estimated based on information from the equipment manufacturer or supplier. The results are expressed in terms of maximum $L_{eq(1)}$, from the source(s) in question at the closest property line and noise-sensitive receptor. To determine potential significant impacts, the action condition noise levels are compared with the no action noise levels, applicable standards and impact thresholds at each of the receptors (see Sections 410 and 710, below).

334. Combined Effects of Mobile and Stationary Noise Sources

Each mobile and stationary source analysis will yield a maximum $L_{eq(1)}$ noise level. These values are logarithmically added together to yield a total maximum-possible $L_{eq(1)}$ level. To determine the potential for significant impacts caused by the entire proposed action, the totals with the proposed action are compared with the no action total noise levels at the respective receptor locations, applicable standards and impact thresholds.

335. Construction Sources

Construction sources for the proposed action occur only in the action condition. The methodology for construction noise prediction takes each significant noise source, with its time duration of operation per peak hour, into account in calculating a maximum $L_{eq(1)}$ at the closest noise-sensitive receptor to the proposed action. To determine potential significant impacts caused by the construction activity, these levels are compared to the no action noise levels and to applicable standards.

400. Determining Impact Significance

The following section provides guidelines and recommendations for the determination of impact significance. Depending on the action, one or both of two approaches to significant impact determination may be appropriate. The first approach deals with using absolute noise level limits (absolute noise impact criteria). The second approach deals with using an incremental change from no action conditions (relative impact criteria). Within these two approaches, two considerations must be made:

- Are the existing and future receptors experiencing noise levels above absolute limits? (Absolute limits, in this case, would relate to published standards (see Section 710, below.))
- Will the proposed action become a sensitive receptor in the area?

410. IMPACT THRESHOLDS AT RECEPTORS

The selection of incremental values and absolute noise levels should be responsive to the nuisance levels of noise and critical time periods when nuisance levels are most acute. During daytime hours, nuisance levels for noise are generally accepted to be more than 45 dBA indoors and 70 to 75 dBA outdoors. Indoor activities are subject to task interference above this level, and 70 to 75 dBA is the level at which speech interference occurs outdoors. Typical construction techniques used in the past (including typical single-glazed windows) provide a minimum of approximately 20 dBA of noise attenuation, from outdoor to indoor areas. In view of these factors, it is reasonable to establish the daytime cut-off at 65 dBA. Hence, if daytime noise levels with the proposed action exceed 65 dBA ($L_{eq(1)}$), then the incremental change in noise levels, as compared with the no action condition, at which a significant impact occurs would be reduced.

Nighttime (defined in the CEPO-CEQR standards—see Section 710—as being between 10 PM and 7 AM) is a particularly critical time period relative to potential nuisance values for noise level increases. Therefore, it reasonable that the 65 dBA cut-off not apply to incremental noise level changes during these periods, and that the more restrictive increment apply to these hours irrespective of the total nighttime noise level.

For significant impact during daytime hours, 65 dBA $L_{eq(1)}$ may be considered as an absolute noise level that should not be significantly exceeded. For example, if the no action noise level would be 60 dBA $L_{eq(1)}$ or less, a 5 dBA $L_{eq(1)}$ or greater change would be considered significant. If the no action noise level would be 62 dBA $L_{eq(1)}$ or more, a 3 dBA $L_{eq(1)}$ or greater change should be considered significant. (If the no action noise level is 61 dBA $L_{eq(1)}$, the maximum incremental increase would be 4 dBA, since an increase higher than this would result in a noise level higher than the 65 dBA $L_{eq(1)}$ threshold.)

For significant impact during nighttime hours, a change of 3 dBA $L_{eq(1)}$ would typically be considered significant.

420. IMPACT THRESHOLDS FOR PROPOSED ACTIONS THAT ARE SENSITIVE RECEPTORS

Impact thresholds for proposed actions that are also sensitive receptors are more straightforward. Because the proposed action did not exist in the past, there is no applicable incremental noise increase that can be calculated. Typically, potential significant impacts on the newly created receptor relate to absolute noise limits. The CEPO-CEQR standards have been followed by City lead agencies for this purpose, in their officially adopted form. If a proposed action is within an area where the action noise levels exceed the marginally acceptable limit established by the CEPO-CEQR standards (as measured at the proposed building line, or if that is not known, at the property line), a significant impact would occur. Then, the project would be subject to mitigation measures necessary to bring its interior noise levels down to a level of 25 dBA or more below the maximum marginally acceptable levels (by receptor type) for external exposure shown in Table 3R-4. If the proposed action is an outdoor area requiring serenity and quiet (such as a public park), mitigation measures necessary to bring exterior noise levels to below 55 dBA $L_{(10)}$ would be appropriate.

Discussed below is how these typical significant impact thresholds would be applied for mobile and stationary sources.

421. Mobile Sources

421.1. Vehicular Noise

The impact assessments for vehicular noise compare the proposed action $L_{eq(1)}$ noise levels to those calculated for the no action condition, for receptors potentially affected by the project. If the no action levels are less than 60 dBA $L_{eq(1)}$ and the analysis period is not a nighttime period, the threshold for a significant impact would be an increase of at least 5 dBA $L_{eq(1)}$. In order for the 5 dBA threshold to be valid, the resultant action condition noise level would have to be equal to or less than 65 dBA. If the no action noise level is equal to or greater than 62 dBA $L_{eq(1)}$, or if the analysis period is a nighttime analysis period, the incremental significant impact threshold would be 3 dBA $L_{eq(1)}$. (If the no action noise level is 61 dBA $L_{eq(1)}$, the maximum incremental increase would be 4 dBA, since an increase higher than this would result in a noise level higher than the 65 dBA $L_{eq(1)}$ threshold.)

If the proposed action would be a sensitive receptor, build noise levels in dBA L_{10} would be compared to the CEPO-CEQR standards. If these noise levels would exceed the marginally acceptable levels, a significant impact would occur unless the building design as proposed was sufficient to reduce these levels to an acceptable interior noise level, as provided in Table 3R-5.

421.2. Aircraft Noise

If the proposed action is an aircraft facility (heliport or airport), or causes a change in flight paths or flight frequency at an aircraft facility, the above impact criteria discussed would apply. If the proposed action is subject to aircraft noise, aircraft noise levels expressed in annual dBA L_{dn} would be compared to the CEPO-CEQR standards. If these levels exceed the marginally acceptable level, a significant impact would occur, requiring that building design achieve acceptable interior noise levels.

421.3. Train Noise

If the proposed action is a rail facility, or causes a change in frequency of trains along the rail facility, the above impact criteria discussed under Section 410 would apply. If the proposed action is subject to rail noise, rail noise levels expressed in daily dBA L_{dn} would be compared to the CEPO-CEQR standards. If these levels exceed the marginally acceptable level, a significant impact would occur.

422. Stationary Sources

If the proposed action would cause a noise level increase at a receptor greater than the impact criteria discussed in Section 410, a significant impact would occur.

Table 3R-4

CEPO-CEQR Noise Exposure Standards for Use in City Environmental Impact Review[1]

Receptor Type	Time Period	Acceptable General External Exposure	Airport[3] Environs	Marginally Acceptable General External Exposure	Airport[3] Environs	Marginally Unacceptable General External Exposure	Airport[3] Environs	Clearly Unacceptable General External Exposure	Airport[3] Environs
1. Outdoor area requiring serenity and quiet[2]		$L_{10} \leq 55$ dBA	$L_{dn} \leq 60$ dBA		$60 < L_{dn} \leq 65$ dBA		(i) $65 < L_{dn} \leq 70$ dBA, (ii) $70 < L_{dn} \leq 75$		$L_{dn} > 75$ dBA
2. Hospital, Nursing Home		$L_{10} \leq 55$ dBA		$55 < L_{10} \leq 65$dBA		$65 < L_{10} \leq 80$dBA		$L_{10} > 80$ dBA	
3 Residence, residential hotel or motel	7 AM to 11 PM	$L_{10} \leq 65$ dBA		$65 < L_{10} \leq 70$dBA		$70 < L_{10} \leq 80$dBA		$L_{10} > 80$ dBA	
	11 PM to 7 AM	$L_{10} \leq 55$ dBA		$55 < L_{10} \leq 70$dBA		$70 < L_{10} \leq 80$dBA		$L_{10} > 80$ dBA	
4 School, museum, library, court, house of worship, transient hotel or motel, public meeting room, auditorium, out-patient public health facility		Same as Residential Day (7 AM—11 PM)		Same as Residential Day (7 AM - 11 PM)		Same as Residential Day (7 AM - 11 PM)		Same as Residential Day (7 AM - 11 PM)	
Commercial or office		Same as Residential Day (7 AM - 11 PM)		Same as Residential Day (7 AM - 11 PM)		Same as Residential Day (7 AM - 11 PM)		Same as Residential Day (7 AM - 11 PM)	
Industrial, public areas only[4]	Note 4	Note 4		Note 4		Note 4		Note 4	

Source: New York City Department of Environmental Protection (adopted by DEP for use in CEQR-1983).

Notes:

(i) In addition, any new activity shall not increase the ambient noise level by 3 dBA or more; (ii) CEPO-CEQR Noise Standards for train noise are similar to the above aircraft noise standards: the noise category for train noise is found by taking the L_{dn} value for such train noise to be an L_{dn} (L_{dn} contour) value (see Table 3R-5).

Measurements and projections of noise exposures are to be made at appropriate heights above site boundaries as given by ANSI Standards; all values are for the worst hour in the time period.

Tracts of land where serenity and quiet are extraordinarily important and serve an important public need and where the preservation of these qualities is essential for the area to serve its intended purpose. Such areas could include amphitheaters, particular parks or portions of parks or open spaces dedicated or recognized by appropriate local officials for activities requiring special qualities of serenity and quiet. Examples are grounds for ambulatory hospital patients and patients and residents of sanitariums and old-age homes.

One may use the FAA-approved L_{dn} contours supplied by the Port Authority, or the noise contours may be computed from the federally approved INM Computer Model using flight data supplied by the Port Authority of New York and New Jersey.

External Noise Exposure standards for industrial areas of sounds produced by industrial operations other than operating motor vehicles or other transportation facilities are spelled out in the New York City Zoning Resolution, Sections 42-20 and 42-21. The referenced standards apply to M1, M2, and M3 manufacturing districts and to adjoining residence districts (performance standards are octave band standards).

Table 3R-5
CEPO-CEQR Exterior Noise Standards and Attenuation Values

Noise Category	Marginally Acceptable	Marginally Unacceptable		Clearly Unacceptable		
Vehicular[a, b]	$65 < L_{10} \leq 70$	$70 < L_{10} \leq 75$	$75 < L_{10} \leq 80$	$80 < L_{10} \leq 85$	$85 < L_{10} \leq 90$	$90 < L_{10} \leq 95$
Train[a, b]	$60 < L_{dn} \leq 65$	$65 < L_{dn} \leq 70$	$70 < L_{dn} \leq 75$	$75 < L_{dn} \leq 80$	$80 < L_{dn} \leq 85$	$85 < L_{dn} \leq 90$
Aircraft[a, b]	$60 < L_{dn}^{y} \leq 65$	$65 < L_{dn}^{y} \leq 70$	$70 < L_{dn}^{y} \leq 75$	$L_{dn}^{y} > 75$	N/A	N/A
Required Attenuation[c]	25 dB(A)	(I) 30 dB(A)	(II) 35 dB(A)	(I) 40 dB(A)	(II) 45 dB(A)	(III) 50 dB(A)

Notes:

a Different descriptors are used for each noise source: L_{10} for vehicular traffic; L_{dn} for train noise; and L_{dn}^{y} (L_{dn} Contour) for aircraft noise.*,†

b The various noise sources at a receptor location are measured and reported separately in accordance with generally accepted procedures for assessing an overall noise level. Cases where there is not a clearly dominant noise source require a judicious decision based on adequate field experience and analysis to determine the final noise category that is deemed appropriate for the overall noise exposure at each noise receptor site.

c The above composite window-wall attenuation values are for residential dwellings. Commercial office spaces and meeting rooms would be 5 dB(A) less in each category. All the above categories require a closed window situation and hence an alternate means of ventilation.

* L_{dn} requires a 24-hour measurement or supportive analysis if a shorter period is employed.

† L_{dn}^{y} = "L_{dn} Contour" is an annual average of L_{dn} values ("y" indicates "yearly average").

423. Construction Sources

The following applies only at sensitive receptors that would be subjected to high construction noise levels for an extensive period of time. If construction noise levels exceed the impact criteria discussed above under vehicular sources, *using existing noise levels as the baseline*, a significant impact would occur.

500. Developing Mitigation

The following section provides guidelines and recommendations for developing mitigation of a significant noise impact. General types of possible mitigation measures that can be used to alleviate significant noise impacts for the different source types are discussed.

510. MOBILE SOURCES

511. Vehicular Noise

The first option considered should be to reroute the traffic that is causing the significant impact. This is generally only possible for facilities that generate traffic that would be under the control of the applicant (for example, a City vehicle storage facility would fit this requirement but an office building would not). Where this mitigation appears appropriate, it is necessary to be sure that the rerouted traffic would not simply relocate the significant noise impact or introduce a significant traffic or air quality impact in another location.

If rerouting is not feasible, the most common mitigation measure used for vehicular noise impacts is to provide adequate window/wall attenuation at the affected receptor to conform with the CEPO-CEQR standard acceptable interior noise levels of 45 dBA. When maximum hourly exterior levels are greater than 70 dBA, alternate means of ventilation should be incorporated into buildings so that windows do not need to be opened at any time of the year. If windows were open, the effect of the window-wall attenuation would be reduced. An alternate means of ventilation would allow for a closed window condition, ensuring that acceptable interior noise levels are achieved. For existing receptors, when the maximum exterior $L_{eq(1)}$ is less than 75 dBA, standard double-glazed or laminated windows are available that would provide adequate noise attenuation. However, when the maximum exterior $L_{eq(1)}$ is equal to or greater than 75 dBA, special designs must be incorporated into the windows and possibly the exterior walls of buildings to conform with CEPO-CEQR standards.

If the proposed action requires mitigation of noise levels, the same measures used above would be appropriate with reference to $L_{10(1)}$ values.

Barrier walls are often used for vehicular traffic noise impact mitigation; however, to be effective in providing attenuation, the barrier wall must interrupt the line of sight between the noise source (the flow of traffic) and the receptor. Buildings taller than the barriers would get no acoustical benefit from their presence. They could also detract from the aesthetics of neighborhoods and therefore may be impractical for most uses in the New York City area. Calculation methods for noise attenuation attributable to noise barriers may be found in *Noise Assessment Guidelines*, HUD, 1984.

512. Aircraft Noise

The first mitigation option investigated should be changing the flight path. If this mitigation is appropriate, it is necessary to be sure that the mitigation does not merely relocate the significant impact to another area. In addition, facility use restrictions (e.g., capacity limitations, lower takeoff angles, curfews, using only certain types of aircraft, etc.) should be investigated. These measures would require commitment from the appropriate agency.

If flight operations adjustment is not feasible, the only possible mitigation measure for aircraft significant noise impacts is treatment of all exterior walls and roofs of buildings to ensure that interior noise levels would be less than 45 dBA. If exterior noise levels are less than 75 dBA, double-glazed or laminated windows (with alternate means of ventilation for levels above 70 dBA) should be provided to achieve adequate attenuation and ensure interior noise levels of 45 dBA. However, if noise levels are equal to or greater than 75 dBA, special designs may have to be incorporated into windows, walls, roofs, and doors.

513. Train Noise

Mitigation measures available for significant noise impacts are the exterior building attenuation measures discussed above (Section 512) for significant vehicular noise impacts, barrier wall construction, treating the vehicles, and providing operational restrictions. Barrier wall attenuation has a practical limit of 10 to 15 dBA, so it would provide complete impact mitigation only when exterior $L_{eq(1)}$ levels (for existing uses) or L_{dn} levels (for proposed action uses) at receptors are less than 75 dBA. It must also be kept in mind that barriers are only effective when the line-of-sight is broken between the source and receiver. Therefore, buildings

having windows higher than the barrier may not receive much benefit from the barriers and exterior wall attenuation, and an alternate means of ventilation would have to be designed into the facades of buildings facing the rail activity.

520. STATIONARY SOURCES

The most common mitigation measures available for stationary sources include exterior building attenuation (as discussed for mobile sources in Section 511 above), barrier erection (as discussed above), and noise control design on the source in question. Caution should be exercised when erecting barriers in New York City given the limitations mentioned above. In many cases, treating the noise source (i.e., placing it within an enclosed structure) may be the least expensive option. Moving the source in question so that receptors would not be significantly accepted is also a potential mitigation measure.

530. CONSTRUCTION SOURCES

Construction noise mitigation measures include locating stationary equipment as far as possible away from receptors, enclosing areas, erecting temporary barriers, limiting the duration of activities, specifying quiet equipment, scheduling of activities to minimize impacts, and locating noisy equipment near natural or existing barriers that would shield sensitive receptors.

600. Developing Alternatives

In developing project alternatives to reduce or avoid significant noise impacts, the simplest and most common way of analyzing the situation is to calculate the conditions that would just avoid an impact and tailor the project alternative to that new scenario. For instance, if a CEPO-CEQR significant vehicular traffic noise impact were identified at a receptor, the project-generated L_{10} worst-hour increase would be at least 3 dBA. If one calculated the project-generated traffic volume that would cause a less than 3 dBA increase in worst-hour L_{10} values, that traffic volume would define the alternative project volume. A change in plan that dispersed traffic differently or reduced the size and thus the trip generation from the project would address this issue. Similar analysis techniques to this can be used for analyzing alternatives from any relative impact criterion.

When dealing with absolute impact criteria, alternative project arrangements can be set by moving, scaling down, or shielding the original project to the point where significant impacts are avoided. For instance, if a manufacturing facility generated a significant impact at a residence, the noise-generating part of the facility could be moved to the distance at which the noise levels at the property line would be low enough not to cause a significant impact. Another possible alternative would be to scale down operations until noise levels reached would not cause a significant impact. Yet another alternative to the project could include a building or barrier between the noise-generating facility and the property line to shield the noise to the point where a significant impact would be avoided. These options would each have to be evaluated in terms of their feasibility and potential impacts on other environmental assessment categories.

700. Regulations and Coordination

710. REGULATIONS AND STANDARDS

Regulations applicable to New York City environmental noise assessments are found in the CEPO-CEQR Noise Standards. These regulations, which apply to all private or City-sponsored projects subject to CEQR in New York City, are described below. When a project to be undertaken in New York City also includes some level of State or Federal involvement, there are additional State or Federal regulations that may also apply.

The New York City Department of Environmental Protection (DEP) in 1983 adopted City Environmental Protection Order-City Environmental Quality Review (CEPO-CEQR) noise standards for environmental impact review. Four categories of acceptability have been established, based on noise level limits and land use, for vehicular traffic, rail, and aircraft noise sources. These acceptability categories include: "generally acceptable," "marginally acceptable," "marginally unacceptable," and "clearly unacceptable." These categories and associated noise limits apply to exterior noise levels only. The levels are shown in Tables 3R-4 and 3R-5. The exterior limitations are based on an acceptable interior noise level of 45 dBA ($L_{10(1)}$ or L_{dn}, depending on the source). Only mobile sources are included in the standards. Each of the three noise source classifications are analyzed separately and in terms of different descriptors. Mitigation requirements are listed according to the noise category. Both absolute and relative impact criteria are presented.

In addition to the CEPO-CEQR noise standards, the New York City Noise Code governs noise emissions in New York City, and the New York City Zoning Resolution includes noise performance standards for any manufacturing activity in manufacturing districts.

These have not traditionally been used for purposes of CEQR environmental assessments.

720. APPLICABLE COORDINATION

Lead agencies may need to coordinate with other agencies when developing an environmental noise assessment for a proposed action in New York City. This could depend on funding sources for the action, and mitigation that may be needed for the proposed action. This is discussed below in terms of City, State, and Federal agencies.

721. City Coordination

The lead agency may need to coordinate with other agencies when developing mitigation measures for significantly impacted facilities under the control of those agencies. Examples of this coordination may include coordination with the Board of Education or the New York City Housing Authority for the installation of double-glazed windows and alternate means of ventilation at a school or residential building experiencing significant noise impacts from a proposed action.

In addition, it may be necessary to coordinate with the Mayor's Traffic and Construction Coordination Council in the event rerouting of truck traffic during construction, or other traffic-related noise mitigation measures are proposed during construction.

For technical assistance in conducting noise analyses, the lead agency may wish to coordinate with DEP.

722. State Coordination

If any part of the proposed action would involve a State-funded highway, coordination concerning analysis methodologies and significant impact thresholds with the New York State Department of Transportation (NYSDOT) would be necessary. In general, NYSDOT follows the guidelines of the Federal Highway Administration (FHWA). Otherwise, no coordination with State agencies on noise issues would be necessary.

723. Federal Coordination

If any part of the proposed project would be financially assisted by HUD, analysis methodologies, significant impact thresholds, and reporting of noise information should be in accordance with HUD (U.S. Housing and Urban Development) noise regulations or in a form acceptable to HUD officials. If any part of the proposed project would involve a Federally funded highway, coordination with FHWA (Federal Highway Administration—usually through the State) for the same items would be necessary. Any part of the proposed project dealing with new aircraft or flight patterns would have to be coordinated with FAA (U.S. Department of Transportation, Federal Aviation Administration). New rail projects funded by FTA (U.S. Department of Transportation, Federal Transportation Administration—formerly UMTA) should be coordinated with that agency for analysis methodologies and significant impact thresholds.

730. LOCATION OF INFORMATION

If some level of environmental noise assessment is required for a proposed action, it is useful to obtain any recent data or information concerning existing noise levels in the area of the proposed action, or information concerning other development proposed in the area that could affect future noise levels. Environmental Impact Statements (EISs) for such other proposals may be available through DEP and DCP for proposed actions reviewed prior to the implementation of the new CEQR regulations, as well as OEC for those projects reviewed after the effective date of those regulations. Other than the identification of future planned projects, however, previous EISs seldom contribute other useful data for analysis purposes.

S. CONSTRUCTION IMPACTS

100. Definitions

Construction impacts, though usually temporary, can include disruptive and noticeable effects of a project. The determination of their significance and, therefore, whether mitigation is required, is generally based on the duration and magnitude of the impact. An action's construction impacts are typically analyzed as part of the assessments performed for each specific technical area. They can be disclosed as part of the specific technical assessments, or in a separate section of the environmental assessment that summarizes those assessments.

For most projects, the construction analysis includes examination of at least the following:

- Traffic-related impacts, which may result from construction-induced traffic (including both construction employees' vehicles and trucks) and impacts associated with lane closings (e.g., where a crane would be placed in a portion of a street);
- Air quality—particularly, mobile source emissions from truck and vehicular traffic and fugitive dust emissions (dust that may occur during demolition or excavation activities or from operation of a concrete batching plant); and
- Noise associated with blasting, pile driving, and other construction activities.

Assessments of other technical areas can also be appropriate for particular actions. For actions that raise specific issues (such as actions that use an open space for a staging area, or actions that are located near historic resources), assessments of those technical areas should be performed. Impacts on historic resources and hazardous materials generally result from in-ground disturbance during construction; these impacts are typically analyzed and disclosed in those technical sections and cross-referenced in the construction impacts section. Natural resources can also be affected during construction, particularly during such activities as excavation; grading; site clearance or other vegetation removal; cutting; filling; installation of piles, bulkheads, or other waterfront structures; dredging; dewatering; or soil compaction from construction vehicles and equipment. Additionally, for actions with lengthy construction periods (such as large-scale actions with 8- to 10-year construction periods), it may be appropriate to examine additional technical areas. Technical areas that may be examined in these cases can include the following:

- Land use and neighborhood character;
- Socioeconomic conditions;
- Community facilities;
- Open space;
- Historic resources; and
- Infrastructure.

200. Determining Whether a Construction Impact Assessment is Appropriate

Construction impacts can be analyzed for any action that would involve construction or could induce construction. In general, for issues not related to ground disturbance the longer the duration of a potential impact, the more significant it becomes and the more detailed the analyses it warrants. If the duration of construction is expected to be short-term, those impacts are considered temporary and, therefore, not significant, and a detailed analysis is not needed. However, there are instances where a potential impact may be of short duration but of great severity, and, therefore, would be significant. (For example, the impacts of dredging contaminated material on an important fisheries habitat, or the effect of vibrations from construction on adjacent historic structures. The impacts of this activity may be considered significant, warranting more detailed assessment.

The range of construction impact issues that may be assessed and circumstances where an assessment may be conducted are described below.

- *Land use and neighborhood character.* A construction impact analysis of land use and neighborhood character would typically be needed if construction requires continuous use of property for an extended duration, thereby affecting the nature of the land use and character of the neighborhood. This may occur, for example, or if construction activity (such as staging) would occur on a particular site in a neighborhood for an extended period of time.

- *Socioeconomic conditions.* If the proposed action would entail construction of a long duration that could affect the access and therefore viability of a number of businesses, and could cause the failure of those businesses and affect neighborhood character, a more detailed analysis may be conducted.

- *Community facilities.* A construction impact analysis may be conducted for any community facility that would be directly affected by construction (e.g., if construction would disrupt services of the

facility, change an entrance, or close the facility temporarily, etc.). In some cases, depending on the community facility and nature of its services, even a limited disruption could trigger the need for more detailed analysis. (For example, the closing of a library branch for a one-month period would not likely be considered as significant, whereas the closing of a community health clinic may be considered significant.)

- *Open space.* A construction impacts analysis for open space may be conducted if an open space resource would be used for an extended period of time for construction-related activities, such as construction staging, or if access to the open space would be impeded during construction activities.

- *Historic resources.* Construction impacts may occur on historic resources if in-ground disturbances or vibrations associated with project construction undermines the foundation or structural integrity of nearby historic resources. These impacts should be assessed for any action involving construction activities within 400 feet of a historic resource. Construction impacts on archaeological resources are the same as those that are analyzed in the archaeological impacts section (see Section 3F of this Manual) and may be cross-referenced in the construction impacts section.

- *Traffic.* A construction impact analysis of traffic is typically conducted when construction activity is expected to be long term and would generate sufficient traffic from employees and trucks to cause potential traffic impacts or would result in lane closings or traffic diversions, disrupting area traffic flow.

- *Air quality.* The air quality analysis for construction looks at stationary sources of fugitive dust and on-site construction equipment and mobile sources from construction traffic. A particular concern would be a concrete batching plant.

  Similar to the approach used for construction traffic, mobile source air quality emissions may be studied in detail if construction trip generation is similar to or greater than that of the proposed action, and significant mobile source impacts were identified for the action. Again, the analysis of these impacts is usually undertaken in detail only if their duration is expected over a long term.

  Additionally, if construction would result in fugitive dust emissions even of a short duration, the effect of those emissions are usually considered. However, this impact would not be considered significant if there is a commitment to implement appropriate measures to control fugitive dust. If substantial fugitive dust emissions are expected during construction, a more detailed analysis may be necessary. The stationary source analysis also examines emissions from on-site vehicles and equipment.

- *Noise.* Construction noise, generated by pile driving, truck traffic, blasting, demolition, etc., is generally analyzed in detail only when it would affect a sensitive receptor over a long period of time. In some circumstances, however, even a shorter term construction phase may affect highly sensitive locations (such as schools, hospitals, etc.), warranting further analysis.

- *Natural resources.* If a project or construction staging area is located near a sensitive natural resource (such as wetlands, etc., as defined in Section 3I of the Manual), construction impacts may result from the disruption of these areas. Projects located on the waterfront may also have construction impacts on water quality relating to construction work in the water. An assessment of construction-related runoff is often appropriate, particularly focused on the potential destruction of resources and the effect of sediment generated during construction. If large land areas are expected to have surface soils exposed to precipitation, a detailed analysis of runoff may be warranted.

- *Infrastructure.* Infrastructure impacts may occur if project construction would disrupt infrastructure service for extended or intermittent periods over a long period of time—for example, if in-ground construction would disturb a water main causing a long-term interruption in service. If such disruptions are expected, a more detailed analysis is usually conducted.

- *Hazardous materials.* Because soils are disturbed during construction and utility placement, any action proposed for a site that has been found to have the potential to contain hazardous materials in its assessment of that technical area should also consider the possible construction impacts that could result from that contamination (this is discussed in more detail in the hazardous materials section, Section 3J).

300. Assessment Methods

310. STUDY AREA

The study areas for construction impact analyses are typically not as formally defined as they are for other analyses. Generally, the areas that could be affected by construction are the uses immediately bordering the site and along major truck routes to and from the site. Baseline data for the construction impact analyses typically draw from the same baseline data as that used for other impact studies, and therefore use the same study areas as those studies.

320. ANALYSIS TECHNIQUES

The construction impact analyses are typically based on the analyses conducted for the different technical areas. When more detailed analyses are called for, the methodology for analysis is the same as that used in conducting impact analyses for the action condition. The only difference in assessing construction impacts is that the nature of the impacts (i.e., fugitive dust, construction noise, etc.) associated with construction are usually unique to construction.

The construction analysis typically considers the anticipated construction activities and phasing of the project, and identifies where construction staging would occur, if applicable. For multiphase projects, the equipment and activities associated with each phase on each portion of the site and the duration of each phase are documented and considered. This information serves as the basis for describing and analyzing construction impacts. For analysis of multiphase construction, the assessment can often be broken into two or three phases, during which different portions of the site would be used in varying phases of construction. (For example, during the first phase, construction may be initiated on the northern portion of the site while the center portion of the site is used for construction staging; during the second phase construction would be completed on the northern end, initiated on the center of the site, and the southern portion of the site used for staging, etc.)

The following technical approaches and analysis methodologies may be useful in preparing construction impact analyses where the potential exists for significant impacts.

- *Land use and neighborhood character.* A land use and neighborhood character assessment for construction impacts looks at the construction activities that would be occurring on the site (or portions of the site) and their duration. The analysis determines whether the type and duration of the activities would constitute a "land use" and could thereby affect land use patterns in the neighborhood, or neighborhood character. (For example, a property may be used for staging for several years. This use of a single piece of property for an extended duration and its compatibility with neighboring properties should be assessed. In this case, the subject site used for construction staging would become industrial in nature. Over an extended period of time, this may be a significant adverse impact if the surrounding area is residential in character and use.) The detailed assessment methodologies are described in the land use and neighborhood character sections of this Manual (Sections 3A and 3H).

- *Socioeconomic conditions.* An analysis of construction impacts on socioeconomic conditions focuses on construction conditions affecting access to existing businesses, the potential consequences concerning their continued viability, and the potential effects of their loss on the character of the area. The detailed analysis methodologies for this type of impact are discussed in the socioeconomic conditions section of this Manual (Section 3B).

- *Community facilities.* The analysis of construction impacts on community facilities examines the service disruption to those facilities that may occur during construction. Detailed assessment methodologies are the same as those described in Section 3C of this Manual.

- *Open space.* Occasionally the use of any usable open space may be proposed for construction staging or other construction activities. If this use would be over an extended period, the assessment of impact follows the same basic guidance provided for open space analyses. The analysis usually documents the amount of open space proposed for use as staging, the length of time that the open space would be used, and the current condition of the open space and current utilization by the community.

- *Historic resources.* The assessment of construction impacts on historic resources considers the possibility of physical damage to any architectural or archaeological resources identified in the action's historic resources assessment (outlined in Section 3F of this Manual).

  Impacts on archaeological resources from construction are assessed as part of the overall evalu-

ation of the action's effect on archaeological resources (see Section 3F).

- *Traffic*. A detailed study of construction traffic is usually undertaken only for proposed actions having a very long construction duration and where construction traffic may have more significant impacts than disclosed in the action's build condition analyses.

  The initial assessment of construction traffic considers vehicles generated by both construction employees driving to and from the site as well as trucks and other vehicles associated with project construction. This assessment can be performed as follows:

  1. Using the data gathered for the traffic analysis, assess whether the peak hour for construction would be comparable to the peak hour for the project or whether construction would occur during off-peak hours (usually, the construction peak hour is in the early AM, and is earlier than the traffic peak).
  2. Estimate the construction employee and truck trips that would be generated by construction during the construction peak hour. This information is usually developed by or in close coordination with the project's engineers.

  If the construction peak would generate fewer trips than the project peak, and would occur during off-peak hours or during hours comparable to the project, and if the project's impacts are not significant or can be easily mitigated, then the conclusion may be drawn that the construction of the project would have lesser impacts than that of the project. In this instance, the analysis may be described qualitatively and further analysis would not be necessary.

  Alternatively, if construction trips would occur during the network peak and if construction would generate a number of vehicular trips similar to or greater than the proposed action, and if the project's action analyses indicate significant impacts, a more detailed traffic assessment may be necessary. This traffic assessment would follow the same steps as described in the traffic and parking section of this Manual (Section 3O).

  If the proposed action would require the installation of a crane or any other activity that could affect the capacity of the roadway network in an area where the project is predicted to result in the potential for a significant impact, a detailed analysis is usually conducted for the same peak hours as that examined under the action analyses. This traffic assessment would follow the same steps as described above in the traffic section of this Manual.

  For projects involving traffic diversions or temporary closings, additional construction traffic analysis may need to examine the traffic diversions that would occur during the construction phasing, until the new roadway system is functioning. This assessment would follow the methodology described in the Section 3O.

- *Air quality*. The air quality analyses for construction may examine mobile sources from construction traffic and stationary sources from activities on-site.

  The mobile source analysis follows the same basic steps outlined for the construction traffic assessment:

  1. Based on the action condition traffic analyses, determine whether the construction peak hour is comparable to the project peak hour or would clearly be during an off-peak traffic hour (which is usually the case).
  2. Determine whether the automobile trips generated during the construction peak hour would be fewer than or greater than the vehicular trips generated by the proposed action in the peak hour.

  If the action condition for the project would not result in significant mobile source impacts, and if the vehicular trip generation from construction would be less than that of the proposed action, then a more detailed assessment is usually not necessary. If this is the case, the analysis may be described qualitatively, describing how the determination of no significant impact was reached.

  Alternatively, if the construction peak would generate significantly more vehicles than the project peak or if significant air quality impacts are expected under the action condition, more detailed analyses may be necessary. These analyses would follow the same methodology detailed in the air quality section (Section 3Q).

  The stationary source air quality analysis for construction impacts usually focuses on emissions of fugitive dust and is done in a qualitative manner.

If a concrete batching plant is proposed, a quantitative analysis would be appropriate. The New York City Air Pollution Control Code regulates fugitive dust under Section 1402.2-9.11, "Preventing Particulate Matter from Becoming Air-Borne; Spraying of Asbestos Prohibited; Spraying of Insulating Material and Demolition Regulated." Documentation of these measures and commitment to adherence to these requirements should be included in the environmental assessment. The analysis usually quantifies the length of time the dust-causing activities are expected to last, and describes the measures that are undertaken to mitigate the emissions of fugitive dust (i.e., watering down of excavation sites, etc.). If the project sponsor has committed to implementation of these measures they may be incorporated into the project description and analyzed as a project component, thereby reducing project impacts. For large projects, where construction vehicles and equipment would operate on-site for an extended duration, a stationary source analysis of emissions from these sources is usually appropriate.

Similarly, the regulations of the New York City Asbestos Control Program include specific procedures that must be adhered to for the control of asbestos during construction. In instances where demolition of existing building could result in the emissions of asbestos, the qualitative analysis should document a commitment to the adherence of these measures and requirements during construction.

- *Noise*. Construction noise is regulated by the New York City Noise Control Code and by EPA noise emission standards for construction equipment. These local and Federal requirements mandate that certain classifications of construction equipment and motor vehicles meet specified noise emissions standards; that, except for special circumstances, construction activities be limited to weekdays between the hours of 7 AM and 6 PM; and that construction material be handled and transported so as not to create unnecessary noise. A statement of adherence to these requirements should generally be included.

  For projects with extended construction duration, such as a multiphase project, a more detailed analysis of construction noise may be necessary. This analysis looks at the specific activities, types of equipment, and duration of activities planned for specific locations and the combined effects of the noise on nearby sensitive receptors. For example, if pile driving would be occurring on one section of the site while building erection would be occurring on another area of a site, the construction noise analysis would logarithmically add the noise from each of these sources to estimate noise levels at nearby sensitive receptors. The detailed analysis would follow the analysis procedures described under the noise section of this manual (Section 3R). A listing of noise levels from construction equipment is included in Table 3S-1.

  If the initial assessment indicates the need to conduct a mobile source noise analysis for construction (associated with heavy truck trips passing sensitive receptors over a long period of time), the detailed analysis procedure would follow that methodology outlined in the noise section of this manual.

- *Natural resources*. The assessment of natural resources generally follows the methodology outlined in Section 3I. To address potential impacts associated with runoff of sediments, the analysis documents the activities that might generate sediments (these may include demolition, excavation, grading, erosion, unpaved and exposed soil areas, etc.). Usually the assessment is more qualitative in nature, since these potential impacts can be mitigated to a great extent. The analysis documents the size of any exposed soil areas and duration that exposed soil areas may be subject to erosion, and the measure that will be undertaken to minimize sediment contributions to nearby surface water features. The analysis of construction's effects on natural resources would also consider the loss or additional destruction of natural resources on the project site or in the staging area. The assessment of such issues is described in Section 3I.

- *Infrastructure*. If construction would cause a disruption of infrastructure, the analysis is usually qualitative. Measures to minimize disruption are generally documented. For example, in an instance where important infrastructure lines run beneath an area of project construction or where significant new infrastructure would be developed with the project, necessitating the rerouting of infrastructure lines, the construction impacts section would disclose these service disruptions and their durations. The discussion would then describe the measures taken to minimize these disruptions in service. These measures may include construction of a bypass connection before services would be interrupted. Close coordination with the appropri-

Table 3S-1
Typical Noise Emission Levels for Construction Equipment

Equipment Item	Noise Level at 50 ft. (dBA)
Air Compressor	81
Asphalt Spreader (paver)	89
Asphalt Truck	88
Backhoe	85
Bulldozer	87
Compactor	80
Concrete Plant	83[1]
Concrete Spreader	89
Concrete Mixer	85
Concrete Vibrator	76
Crane (derrick)	88
Delivery Truck	88
Diamond Saw	90[2]
Dredge	88
Dump Truck	88
Front End Loader	84
Gas-driven Vibro-compactor	76
Hoist	76
Jackhammer (Paving Breaker)	88
Line Drill	98
Motor Crane	83
Pile Driver/Extractor	101
Pump	76
Roller	80
Shovel	82
Truck	88
Tug	85[3]
Vibratory Pile Driver/Extractor	89[4]

Notes:

1 Wood, E.W. and A.R. Thompson, "Sound Level Survey, Concrete Batch Plant: Limerick Generating Station," Bolt Beranek and Newman Inc., Report 2825, Cambridge, MA, May 1974.

2 New York State Department of Environmental Conservation, "Construction Noise Survey," Report No. NC-P2, Albany, NY, April 1974.

3 Bungener, J.H., "Sound Level Survey: Wise's Landing, Kentucky," Bolt Beranek and Newman Inc., Report 2880, Downers Grove, IL, June 1975.

4 F.B. Foster Company, "Foster Vibro Driver/Extractors," Electric Series Brochure, W-925-10-75-5M.

Source: Patterson, W.N., R.A. Ely, and S.M. Swanson, "Regulation of Construction Activity Noise," Bolt Beranek and Newman, Inc., Report 2887, for the Environmental Protection Agency, Washington, D.C., November 1974. Except for footnoted items.

are agency is recommended to ensure that any disruption is temporary.

- *Hazardous Materials*. For any potential construction sites and areas along the routes of proposed utilities that have been found to have a potential to contain hazardous materials, the possible effects on construction workers and the surrounding community during construction should be assessed. This is typically part of the hazardous materials analysis, and is described in the discussion of that technical area (Section 3J).

400. Determining Impact Significance

The determination of the significance of construction impacts is based on the same criteria for technical analyses described for the different technical areas of this Manual. If construction impacts would be short term, in most cases the impacts are described as temporary and not significant. However, determination of significance should be considered for each technical area, because short-term impacts can sometimes be significant. Noise impacts on a school, for example, or disruption of a health care center may be considered significant, even if they are temporary.

500. Developing Mitigation

Significant construction impacts can often be mitigated in the same ways as other impacts in the particular technical area of concern. Such mitigation measures are described in the different technical sections of this Manual and, depending on the impact, may also include such measures as alternative scheduling of construction phases. Other measures that are appropriate specifically for construction impacts are described below.

- *Land use and neighborhood character*. Impacts associated with the use of land for construction staging or for activities associated with construction may be mitigated by fencing, or the use of an alternative site not in a sensitive area.

- *Socioeconomic conditions*. Potential measures for socioeconomic impacts include different phasing of construction to avoid extended periods when existing businesses may have a loss of access.

- *Open space*. If construction staging would require the use of an open space or a loss of access to an open space, mitigation may involve expansion and improvement of another nearby open space or the creation of an open space of similar characteristics at a nearby location, or to mitigate a loss of access, alternative access may be provided.

- *Air quality*. Mitigation for impacts from fugitive dust follows the requirements of the New York City Air Pollution Control Code and includes the use of water to control dust during demolition or excavation, and planting or paving areas where exposed soil would be exposed to wind conditions, including dirt paths and roads and on stock piles.

- *Noise*. Mitigation for construction noise impacts may include adherence to the draft guideline document issued by the DEP Bureau of Air Resources, Division of Noise Abatement, as well as use of low noise emission equipment. Generally, this mitigation is committed to be included in the action's construction contract documents; this commitment may be documented in the project description, thereby reducing project impacts.

- *Natural resources*. Mitigation for impacts from runoff and sedimentation may include planting or temporary paving of exposed soil areas, or similar measures, to minimize erosion because of precipitation.

- *Infrastructure*. If impacts from the disruption of infrastructure service during construction are anticipated, mitigation should be developed in close coordination with the appropriate agency.

600. Developing Alternatives

In general, alternatives to address impacts during construction are focused on the design of the proposed action. For example, if a wetland impact may be expected due to excavation for footing of a proposed project, the alternative would either be a differently designed project to avoid the wetland area, or locating the proposed action at a different location. Alternative scheduling of construction phases can also serve to alleviate impacts, particularly those related to traffic.

700. Regulations and Coordination

710. REGULATIONS AND STANDARDS

Regulations governing air emissions of fugitive dust are found in the New York City Air Pollution Control Code; regulations governing asbestos control during construction and demolition are available from the New York City Division of Asbestos Control Management, 59-17 Junction Boulevard, Elmhurst, NY 11373. Regulations governing noise emissions during

construction are included in the New York City Noise Control Code.

720. APPLICABLE COORDINATION

Depending on the potential impact, it is advisable to coordinate with agencies responsible for implementing required mitigation measures. The agencies that may be contacted are specified within the different technical sections of this Manual.

T. Public Health

100. Definitions

Many of the environmental analyses typically performed under CEQR touch on the issue of public health. These include hazardous materials (Section 3J) and air quality (Section 3Q). The issue of public health is constantly evolving as new research is performed. So far, in CEQR experience, the following issues and topics have been addressed in environmental assessments:

- Emissions or wastes from laboratories
- Diseases, pathogens, and potentially infectious waste
- Hazardous materials
- Radioactive materials
- Electromagnetic fields and microwaves

200. Determining Whether a Public Health Assessment is Appropriate

Assessment of the public health issues listed above may be appropriate when the proposed action has the potential to bring people into contact with any of those items. Typically, emissions or wastes from laboratories and the related issue of diseases, pathogens, and potentially infectious waste are assessed when the proposed project would create a new laboratory. Hazardous materials are assessed when there is the potential for hazardous materials to exist on a site and the action would increase pathways to their exposure, or when the action would introduce new activities or processes using hazardous materials (this is fully described in 3J, "Hazardous Materials," Section 200). Similarly, radioactive materials are typically assessed when the proposed action would introduce activities using these substances—most often, laboratories or processing or handling facilities, hospitals, and medical offices. Assessment of electromagnetic fields may be appropriate if the project would introduce or expand substantial sources or conduits of electricity, such as electric substations, transformers, electrified rail lines, or microwave communication systems. Assessments may also be appropriate when changes in regulations that promote or protect health and safety are proposed.

300. Assessment Methods

Most often, public health is protected through various City, State, and Federal regulations. For example, the New York City Health Code regulates clinical laboratories, the handling of live pathogenic organisms, and the handling of radioactive materials. Hazardous materials are covered by numerous regulations, as described in Section 710 of 3J, "Hazardous Materials." Similarly, microwave communication systems are typically licensed by the Federal Communications Commission. To obtain a license, those systems must comply with Part 1.1307 of 47CFR, which deals with the environmental assessment of microwave communication systems. For such cases, the environmental assessment describes how the proposed action would comply with applicable regulations. To ensure that workers and the general public are not exposed to harmful levels of radiofrequency radiation, the facility should comply with the "Radio Frequency Protection Guides" as recommended in "American National Standards Institute Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 300kHz to 100GHz" (ANSI C95.1 1982). To obtain approval of any new or modified facility, it should be demonstrated that the facility would comply with the applicable ANSI standards. In addition, the New York City Department of Health has recommended a significance threshold for City review purposes of 50 $\mu w/cm^2$, which is a total of background plus project emissions. Should the ANSI standards or City thresholds not be met, a significant impact could result.

For some issues, however, environmental impact analysis can be appropriate despite the presence of such laws. This is most often true for airborne pollutants and for hazardous materials. For example, when a proposed action would result in a laboratory or other facility where air toxics could accidently be emitted as the result of chemical spills, the dispersion of these hazardous pollutants from their discharge points and potential impacts on the surrounding community are often examined. Analysis techniques for this and other public health issues related to air quality can be found in 3Q, "Air Quality" (see Section 322.2 for discussion of chemical spills). The issue of hazardous materials also typically involves some analysis; assessment methods are described in Section 3J.

400. Determining Impact Significance

The many rules and regulations governing issues related to public health were enacted to ensure that adverse impacts to public health do not occur. Thus, in most cases, actions that comply with all applicable rules and regulations protecting public health would not typically result in significant adverse impacts on public health. For actions for which additional analysis was performed (as discussed above in Section 300), the determination of significant impacts would typically consider whether, based on the analysis performed, the action would comply with applicable regulations and

standards protecting public health. More information on hazardous materials and air quality is provided in Sections 3J and 3Q.

500. Developing Mitigation

If the potential for a significant impact on public health is identified, the environmental analysis must assess any feasible and practicable mitigation measures for that impact. Mitigation measures for hazardous materials and air quality are discussed in Sections 3J and 3Q.

600. Developing Alternatives

Alternatives that would reduce or avoid significant adverse impacts related to public health most often include alternative design—e.g., a different location for the laboratory's fume hoods (which exhaust emissions from accidental spills) or alternative site plan or foundation design to avoid hazardous materials (see Section 3J).

700. Regulations and Standards

In addition to the regulations listed in Section 700 of 3J, "Hazardous Materials," and 3Q, "Air Quality," other regulations that pertain to public health include the following.

- Part 1.1207 of 47 CFR. Environmental Assessment of Microwave Communication Systems.
- American National Standards Institute Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields (ANSI C95.1 1982).
- U.S. Occupational Safety and Health Administration (OSHA) regulations to protect laboratory workers. These regulations require that workers using hazardous materials receive training in safety procedures, that laboratories have appropriate safety equipment, and that material safety data sheets for all hazardous chemicals on the site be available for inspection.
- National Institutes of Health Guidelines. The National Institutes of Health, in association with the Public Health Service Centers for Disease Control, has issued guidelines specifying appropriate containment procedures for research activities involving recombinant DNA, pathogenic agents, and other biohazards. These guidelines are mandatory for federally funded research projects.
- New York State Departments of Health and Environmental Conservation, Regulations governing disposal of potentially infectious waste.
- New York City Health Code, Title II, Control of Disease. In this section of the Health Code, the most relevant articles are 13, 15, and 16, covering clinical laboratories, handling of live pathogenic organisms, and handling of recombinant DNA.
- New York City Health Code, Title IV, Environmental Sanitation. In this section of the Health Code, the most relevant articles are 173, governing hazardous substances, and 175, governing radioactive materials.
- New York City Fire Directive 1-66. This directive specifies many safety requirements for chemical laboratories that must be met before an operating permit can be met. Among these are rules governing the construction design and materials, fume hoods, storage of flammable materials, and the location of material safety data sheets.

U. Alternatives

100. Definitions

CEQR requires that alternatives to the proposed action be identified and evaluated in an EIS. EASs do not require alternatives analyses, but examination of alternatives can point to ways to adjust the proposal to reduce or eliminate impacts. As under SEQRA, alternatives considered should reduce or eliminate impacts of the proposed action while substantively meeting the goals and objectives of the action. Alternatives and the rationale behind their selection are important in the disclosure of environmental effects of a proposed action. Alternatives demonstrate to the decision-makers the possible options to the proposed action and provide a framework for comparison of potential impacts and project objectives. The range of alternatives to be considered is determined by the nature of the specific action and its potential impacts. If the environmental assessment and consideration of alternatives identify a feasible alternative that eliminates significant adverse impacts, the lead agency may want to consider adopting that alternative as the proposed action. In some cases, this change could permit the agency to issue a negative declaration on the action.

200. Identification of Alternatives

As discussed above, the selection of alternatives to a proposed action is linked to both the anticipated impacts and the objectives of the project sponsor. The following presents the types of alternatives that may be appropriate and the rationale used to determine their reasonableness.

210. NO ACTION (NO BUILD) ALTERNATIVE

As required by SEQRA, a no action (no build) alternative must be examined. The no action alternative demonstrates environmental conditions that would exist if no action were implemented. This analysis essentially represents the analysis of the future without the project that is undertaken to provide a baseline for the evaluation of impacts associated with the proposed action.

220. ALTERNATIVE USE

Consideration of different uses could be reasonable alternatives to an action with impacts related to the actual proposed use. For example, a local retail use, with daytime hours and moderate associated traffic, might be considered as an alternative to an action that would develop a movie theater resulting in traffic, pedestrian, community character, and noise adverse impacts.

The different use alternative is often considered when the proposed action involves a use change to an existing building. For example, an alternative use of a historic structure more in keeping with the physical and/or historic integrity of the resource could be considered for an action that proposes a use that would cause potentially significant adverse impacts on the resource. Where the proposed action involves demolition of a building, a variation of the no action alternative could include maintaining the building with a different use.

230. AS-OF-RIGHT ALTERNATIVE

Typically, an "as-of-right" alternative is examined under CEQR. This alternative demonstrates the reasonable worst-case development scenario for a given site or area under existing regulatory and land use policy conditions. This alternative is particularly important for actions where a change in zoning is proposed, because it presents the range of development potential on the site without that change.

240. ALTERNATIVE SIZE

This alternative may be reasonable for actions where the degree of potential impact is related to the size of the action. Such an alternative reduces the magnitude of activity generated by a proposed action to a point where objectives of the project sponsors are still met, if possible, but impacts are lessened or eliminated. For example, traffic and associated air quality impacts are often related to the size of the project because of the magnitude of activity generated. An alternative of identical use, but smaller than the proposed action, could result in lesser traffic generation and associated air quality impacts while still meeting the major objectives of the action. Identifying the balance between size and meeting objectives is an integral factor in defining the alternative.

250. ALTERNATIVE DESIGN OR CONFIGURATION

An alternative design or configuration should be considered for actions where potential adverse impacts are related to the proposed action's bulk, visual character, contextual or direct effect on historic or other environmentally sensitive resources, or its physical relationship to another use, such as a power plant stack, a noise generator, or an area of soil contamination. Consideration of alternative designs or configurations

may also be required by other processes, such as the New York City Landmark Preservation Commission's consideration of an application for a Certificate of Appropriateness when a project directly affects a New York City Landmark. Some examples of design or configuration alternatives include changing a building footprint to reduce interference with a historic building; changing the location, orientation, and height of a building in relation to an existing stack to reduce or eliminate a potential air quality impact; altering design elements such as setbacks, materials, and fenestration to relate the building(s) to the surrounding area; or configuring the site plan to avoid excavation in an area containing contaminated soils or archaeological resources.

260. ALTERNATIVE SITE

The consideration of one or more alternative sites for a proposed action is appropriate where the objectives of the proposed action are not site-dependent, and it is required where the action is a site selection. Consideration of alternative sites may not be appropriate for private developments, since the applicants may not own other sites. Actions for which alternate site analyses may be appropriate include proposals for siting public facilities, such as a municipal garage, or actions where identified significant impacts could be reduced or eliminated on a different site without compromising project objectives. For example, if a project would result in significant impacts because of its proximity to a wetland, choosing an alternative site not near any wetlands would eliminate those impacts.

270. ALTERNATIVE TECHNOLOGY

Alternative technology should be considered when potential impacts of the proposed action could be reduced by adopting an alternative technology, and/or the alternative technology would be less costly and adequately efficient to meet the objectives of the project. For example, if significant odor impacts were associated with a technical process of a particular action (e.g., solid waste management), an alternative that applies a different technique that is reasonably effective and reduces the identified impact might be analyzed.

280. PHASING ALTERNATIVE

Phasing alternatives are most often considered when an action is proposed in phases, or is of large magnitude, of uncertain timing, or contains several components with impacts related to the timing of their implementation. For example, an environmental assessment may assume for ease of analysis that half of a large-scale residential and commercial development will be constructed within five years, with full build-out in 10 years. However, it is known that the actual timing of construction could possibly lag or speed up, so that only a quarter or as much as three-quarters of the development would be built in five years. In this case, it may be prudent to consider any differences in impact that might occur within this timing range. Using the same large-scale project as an example, it could be that the commercial component, scheduled for early completion, would create a traffic impact on a nearby congested intersection for which public improvements are planned, but not yet implemented. A project phasing alternative that schedules construction of this project element after implementation of the street improvement would be appropriate to consider in this case, assuming it meets the project's objectives. Finally, on large projects where construction of the second phase will take place during operation of the first phase, it may be appropriate to consider altering phasing to reduce, say, a traffic and air quality impact of combined construction and operation.

290. NO UNMITIGATED IMPACT ALTERNATIVE

When an action would result in significant adverse impacts that cannot be mitigated, it is often CEQR practice to include an assessment of an alternative to the action that would result in no unmitigated impacts. For example, if the proposed action would result in significant adverse impacts on a local subway station because of the new users it would send to the station during rush hour, and physical conditions at that station make mitigation of this impact impracticable, the unmitigated impact alternative would consider a project small enough to avoid that impact. This alternative demonstrates what measures would have to be taken to eliminate all of the action's unmitigated impacts. It can serve as an analytical tool and can sometimes demonstrate effectively that no other action would meet the goals of the proposed action without resulting in unmitigated impacts.

300. Assessment Methods

Evaluation of alternatives comprises three steps: (1) framing and describing the alternatives for consideration; (2) assessing impacts of alternatives; and (3) comparing the effects of the alternatives to those of the proposed action, as discussed below.

310. FRAMING AND DESCRIBING ALTERNATIVES

The selection of alternatives to be considered depends on the nature of the proposed action and its impacts. As noted above, a no action (sometimes called the no build) alternative must be selected and it is CEQR practice to select an as-of-right alternative and, often, a no unmitigated impact alternative where applicable. Other alternatives are selected in response to the significant adverse impacts identified during the technical assessments; to account for a range of possibility, such as the example in the phasing alternative noted in Section 280 above; or to meet the requirements of another Federal, State, or City process as described in Section 250 above.

When the alternatives are selected, each must be described adequately so that its impacts can be considered. The level of detail in the description depends again on the type of alternative and the impacts to be assessed. The no action alternative is well described as "The Future without the Proposed Action" in each technical assessment area and it can be summarized in the alternatives section. Other alternatives to the proposed action should be described using text and graphics including such information as program elements and square footages, site plans, bulk drawings, elevations, axonometric drawings, discretionary actions and approvals additional to or different from those of the proposed action that might be required to implement the alternative, and any other information pertinent to its comparison with the proposed action.

320. ASSESSING IMPACTS OF ALTERNATIVES

In general, impacts of alternatives need not be assessed to the same level of detail as that of the proposed action. In those areas where no significant impact of the proposed action was identified, a qualitative assessment will suffice. However, where a significant impact of the proposed action has been identified or where the alternative may show a significant impact in an area where the proposed action had none, it is usually appropriate to quantify the impact of the alternative, so that a comparison can be meaningful. This is usually accomplished by applying the same methodology as that used for assessment of the proposed action. Sometimes it is possible to estimate the difference between the alternative and the proposed action by applying a ratio; this technique is used where impacts are directly proportional to the size of the project, such as trip generation and transportation analysis. Where the alternative has impacts in different technical areas from those of the proposed action (school impact for a residential alternative to a commercial project, for example), the assessment should follow the techniques set forth in the appropriate technical guidance sections, Sections 3A through 3S, above.

The impacts of the alternatives are assessed for the same Build years as was the proposed project. If the project would be built in phases and the other technical areas consider interim Build years for those phases, it may be appropriate to consider the alternatives for those interim years as well.

330. COMPARING THE EFFECTS OF THE ALTERNATIVES TO THOSE OF THE PROPOSED ACTION

The environmental effects of all alternatives, including the no action alternative, are compared to the proposed action without mitigation. For example, if in the no action alternative, five intersections near the site of the proposed action would have moderately congested traffic conditions, the proposed action would have significant traffic impacts at all five intersections, the as-of-right alternative would have significant adverse traffic impacts at three of those intersections, and a lesser-density alternative would eliminate all significant traffic impacts, the comparison would note that under all alternatives, traffic conditions would be congested at those intersections, and would compare the number of significant traffic impacts that would result in each case. Quantitative information should be presented for each alternative, including the no action—in the example given above, the volume-to-capacity ratios or levels of service for each of the five intersections for each alternative would be compared with those of the project. The comparison does not refer to the difference between the no action alternative and the other alternatives. Also, no alternative is compared with existing conditions.

After addressing relative impacts without mitigation, the comparison may go on to discuss the techniques and level of mitigation required to reduce the significant impact of the proposed action and its alternatives. If the same mitigation would suffice in all cases, then the difference in impact may not be important for decision making. If more mitigation is required for the proposed action, compared with the other alternatives, then that difference may be important to decision-makers.

400. Regulations and Coordination

410. REGULATIONS AND STANDARDS

There are no specific statutory City, State, or Federal regulations or standards governing the analysis of alternatives, other than CEQR's requirement that they be assessed in all Environmental Impact Statements (Executive Order 91).

420. APPLICABLE COORDINATION

The various technical guidance sections provided in Chapter 2 describe the coordination that may be appropriate for each technical area. Because the same technical areas are assessed for the analysis of alternatives as for that of the proposed action, similar coordination will be appropriate for alternatives. The alternatives analysis also requires coordination between the different technical areas, so that appropriate technical assessments can be performed for a given alternative and so that within each technical area analyzed, appropriate methodologies are used and enough information is provided to compare the effects of different alternatives with each other and with those of the proposed action.

V. EIS Summary Chapters

The EIS contains several chapters that summarize the conclusions of the technical assessments and permit the decision-maker to examine the trade-offs between project objectives and identified impacts. These chapters are not required for an EAS, but the lead agency may choose in some instances to include them in the documentation to support the determination of significance. Conversely, if one of the chapters is not appropriate to the proposed action and its analysis in the EIS, then it need not be included.

100. Executive Summary

The executive summary is extremely important and is required in all EISs. It should describe in summary form the proposed action, its positive or adverse significant environmental impacts, required mitigation, alternatives considered, and important trade-offs identified in the other summary chapters. The executive summary should be as short as possible and contain only the information necessary to allow the reader to understand the conclusions of the EIS.

200. Mitigation Measures

Where significant adverse impacts are identified, mitigation to reduce or eliminate the impact to the fullest extent practicable is developed and evaluated. This work, undertaken in conjunction with the technical area impact analyses described in sections 3A through 3S, above, can be presented in a separate chapter along with a summary of the impacts to be mitigated. In the DEIS, options for mitigation must be recommended and assessed. A range of feasible mitigation can be presented for public review and discussion. In the FEIS, the mitigation to be used must be selected and its method of implementation described. Certain mitigation measures that require implementation by or approval from a City agency other than the lead agency should be considered feasible by that agency prior to their selection by the lead agency. In the absence of a written commitment from that agency, the CEQR determination must disclose that there might be an unmitigated significant impact if the mitigation could not be implemented.

300. Unavoidable Adverse Impacts

When significant adverse impacts are unavoidable if the project is implemented regardless of the mitigation employed (or mitigation may be impossible), they are summarized and presented in a separate chapter of the EIS.

400. Growth-Inducing Aspects of the Proposed Action

SEQRA specifies that the assessment of impacts focus on the growth-inducing aspects of a proposed action. These generally refer to "secondary" impacts of a proposed action that trigger further development. Proposals that add substantial new land use, new residents, or new employment could induce additional development of a similar kind or of support uses (e.g., stores to serve new residential uses). Actions that introduce or greatly expand infrastructure capacity (e.g., sewers, central water supply) might also induce growth. This could be an issue only in limited areas of Staten Island and perhaps Queens, since in most areas of New York City infrastructure is already in place and its improvement or expansion is usually proposed only to serve existing or expected (in the future without the action) users.

500. Irreversible and Irretrievable Commitments of Resources

This section summarizes the proposed action and its impacts in terms of the loss of environmental resources, both in the immediate future and in the long term. Resources include man-made and natural resources; examples of losses are removal of vegetation without replacement, use of fossil fuels and materials for construction, etc. The extent to which the proposed action forecloses future options or involves trade-offs between short-term environmental gains and long-term losses should also be addressed. In considering the trade-offs of the project, it is also possible to compare short-term losses with long-term benefits.

Chapter 4

G L O S S A R Y

A-Weighting: The system of modifying measured sound pressure levels to simulate the actual response of the human ear to different sound frequencies.

AADT: Average annual daily traffic, the total volume passing a point or segment of a highway facility, in both directions, for one year, divided by the number of days in the year.

Absolute impact criterion, noise: An absolute noise level at a receptor, above which a significant impact would occur (see also **relative impact criterion**).

Accessory parking: Parking spaces restricted for use only by employees or patrons of specific local businesses, schools, organizations, etc.

Acoustics: The science or study of sound.

Action condition: Scenario of the future with the proposed action in place, used for environmental assessment purposes. Also referred to as "build condition."

Adaptive reuse: The fitting of new requirements, functions, or uses into an existing historic space; may be a mitigation option.

AGC: Annual Guideline Concentrations for **noncriteria air pollutants** listed in DEC's **Air Guide-1**.

Air Guide-1: *Draft 1991 Guidelines for the Control of Toxic Ambient Air Contaminants*, published by the New York State Department of Environmental Conservation, in which are listed maximum allowable guideline concentrations for certain air pollutants for which EPA has no established standards.

Ambient air: The surrounding air, to which the public is exposed on a regular basis.

Ambient noise level: The total noise level in the acoustical environment, excluding the proposed project. Whenever measurements are made, each noise source (e.g., traffic noise, aircraft noise) is measured separately.

American National Standards Institute (ANSI): A voluntary federation of U.S. organizations concerned with the development of standards. ANSI standards are drafted by committees of industry experts and published only after board review and determination of national consensus.

ANQZ: Ambient Noise Quality Zones established by the New York City Noise Code.

ANSI: American National Standards Institute.

AP-42: *Workbook of Atmospheric Dispersion Estimates*, EPA document that provides air pollutant emission factors for many sources.

Aquifer: A subsurface rock or sediment formation that contains sufficient saturated permeable material to transmit significant quantities of groundwater.

Archaeological testing: A systematic process, involving a controlled series of excavations, conducted to establish the physical presence or absence of the resource(s) identified during a Phase I evaluation; procedure of a Phase II archaeological assessment.

Archaeological potential or sensitivity: The likelihood that a location or site contains significant archaeological resources; potential is usually characterized as low, moderate, or high.

Archaeological resource: Physical remains, usually subsurface, of the prehistoric (Native American) and historic periods, such as burial hearths, foundations, artifacts, wells, and privies.

Archaeology: The study of prehistoric and historic cultures through excavation and analysis of physical remains.

Architectural resource: Historically or architecturally important buildings, structures, objects, sites, and districts.

Archival research: The retrieval and evaluation of historical documents, including local histories, cartographic materials, and deeds and other instruments. Archival research is necessary for predicting the existence of and assessing the significance of a historic

resource and determining archeological potential/ sensitivity.

Area Sources: Sources of air pollutants distributed over a large area such as a parking lot.

Arterial: Signalized streets that serve primarily through traffic and provide access to abutting properties as a secondary function.

Artifact: The physical or tangible result of human action or behavior, commonly associated with archaeological investigation; it may be complete, incomplete, intentional or a by-product of the subject action or behavior.

ASHRAE: American Society of Heating, Refrigeration and Air Conditioning Engineers.

Assignment: The routing of vehicle trips to and from a project site.

Associative values: Attributes of a historic resource that link it with historic events, activities, or persons, and contribute to a property's significance.

AST: Above-ground storage tank.

ATR counts: ATR, or automatic traffic recorder, counts are traffic volume counts recorded by machines with connected tubes placed across the roadway being counted. These counts are generally recorded every 15 minutes for 24 hours per day.

Attenuation, noise: Reduction in noise level.

Automatic fare collection: A system whereby entry to the transit system does not require a token or money, but is activated by a card in the possession of the transit rider that is "read" by a machine at the entry point to the station, either by inserting the card into and through the "reader" or "swiping" it through the reader. Also referred to as "AFC."

Average daily census: Term used by the Health Systems Agency for the annual percent of hospital beds occupied at a given hospital.

Average vehicle occupancy: The total number of occupants in an automobile (or a taxi), on average.

Background concentrations, air pollutants: Ambient air pollutant concentrations that are a function of regional emissions.

Background noise level: Noise levels that exist much of the time and that individual occurrences intrude upon. Usually, this "background" is coming from many directions from a multitude of unrecognizable sources. L_{90} is considered a reasonable indication of this background noise (see also statistical noise levels below).

Background growth factor, traffic: An annual traffic growth percentage to be applied to traffic volumes in an area to account for normal expected traffic volume increases. Generally, it does not account for major new developments that may be proposed for an area.

BAR: DEP's Bureau of Air Resources.

Base flood: See 100-year flood.

Bay: The space between architectural features, such as walls, piers, or columns; used in reference to the way in which windows, doors, and other openings relate to each other.

Beltcourse: A decorative horizontal band of bricks, stone, or other building materials, extending across the facade of a building (see also coursing).

Blockface: The vertical view of the facades of buildings from the street on which the buildings are situated.

Bluffs: Steep formations of soft erodible materials, such as sand and clay.

Bond: The patterning of bricks or stones on a building. Examples of bond types are Flemish bond, common bond, and English bond.

BTUs: British Thermal Units—unit of measurement used for heat inputs and outputs of boilers or other fuel burning equipment.

Build condition: See action condition.

Build year: The year a proposed action would be substantially operational; this is the year for which the action's effects are predicted in environmental analyses.

Building: Structure created to shelter human activity.

Bulk: The size and shape of a building, including height and floor area, relative to the size of its lot.

Bulkhead line: The proposed or actual bulkhead line most recently adopted by the U.S. Army Corps of

Engineers and the New York City Department of City Planning.

C: Celsius or Centigrade—temperature scale in which the freezing point of water is assigned as 0°C and the boiling point of water is assigned as 100° C.

C-Weighting: Electronic filtering in sound level meters that models a flat response (output = input) over the range of maximum human hearing sensitivity.

CAA: Clean Air Act (1970, 1977, 1990); Federal law mandating air pollutant emissions standards for stationary and mobile sources.

CAAA: 1990 Clean Air Act Amendments.

CAL3QHC: Mathematical dispersion model for simulation of carbon monoxide concentrations near roadway intersections.

Capacity: For vehicular traffic, the maximum volume of vehicles that can pass a point on a street or highway during a specified time period, usually expressed as vehicles per hour.For pedestrians, the maximum volume of persons that can be accommodated along a given point of a sidewalk or transit corridor, or that can be accommodated within a crosswalk, intersection corner reservoir, transit vehicle, or turnstile.

Carbon monoxide (CO): An odorless, colorless gas that is a criteria air pollutant, principally associated with motor vehicle exhaust.

Cavity: Region of air recirculation adjacent to a solid structure.

CEPO-CEQR: City Environmental Protection Order-City Environmental Quality Review; the New York City Department of Environmental Protection has adopted a policy that sets standards on noise exposure and designates mitigation measures. The standards are used for evaluating the noise impact of the environment on the projects described in EASs and EISs. The numbers are in terms of absolute limits.

CERCLA: Comprehensive Environmental Responsibility, Compensation and Liability Act (1980, 1986); also Superfund; Federal law authorizing identification and remediation of uncontrolled hazardous waste sites.

CERCLIS: Comprehensive Environmental Response, Compensation, and Liability Information System; an inventory of abandoned, inactive, or uncontrolled sites (including Federal facilities) known to EPA. It contains site identification data, financial expenditure data, and site tasks plans. CERCLIS also includes some enforcement data on milestones and clean-up schedules.

CFM: Cubic feet per minute—unit of measurement for flow rates through exhaust stacks.

Channelization: Physical roadway improvements that "channel", or direct, the traffic flow into one or more lanes via either painted striping or physical means such as curbs or raised "islands" in the roadway.

Coastal fresh marsh: A tidal wetland zone consisting of the vegetated area of land located primarily along the tidal portions of rivers and streams, and subject to inundation by tidal and freshwater flows every day.

Coastal shoals, bars, and flats: A tidal wetland zone consisting of the unvegetated area along the shore that is covered by water at high tide and exposed or covered by water of less than 1 foot at low tide.

Coastal Zone: As mapped in the City's *Coastal Zone Boundaries* maps, a geographic area of New York City's coastal waters and adjacent shorelines, generally to including islands, tidal wetlands, beaches, dunes, barrier islands, cliffs, bluffs, estuaries, flooding- and erosion-prone areas, port facilities, and other coastal locations.

Cold start: Vehicle started after not operating within the last hour.

Combined sewer: Sewer system that collects both dry-weather wastewater and storm water.

Combined sewer overflow (CSO): Wastewater in excess of the combined sewer system's capacity that is discharged into the nearest waterway rather than being sent to a water pollution control plant for treatment.

Comprehensive Waterfront Plan: A report prepared by the Department of City Planning identifying goals and objectives for the City's waterfront.

Conditional Negative Declaration: A lead agency's determination that an action may have a significant adverse effect on the environment, but that all such effects can be eliminated or avoided by specific changes in the action or mitigation that can be implemented.

Confined aquifer: An aquifer bounded above and below by more impermeable materials in which the pore water pressure is greater than atmospheric pressure.

Cordon line: An imaginary line drawn around an area, usually used to define an area being studied or an area through which traffic volumes are being counted or surveyed.

Corner reservoir: The sidewalk area at the corner of an intersection within which pedestrians wait for a green light to cross the intersection.

Cornice: A projecting horizontal band that tops the element to which it is attached, particularly above the frieze and below the roofline on a building.

Coursing: The placement of bricks, stone, or other building materials in a horizontal row.

Criteria air pollutants: Air pollutants with corresponding national or State ambient air quality standards.

Critical Environmental Area: An specific geographic area designated by a State or local agency as having exceptional or unique characteristics that make it environmentally important.

Cruise speed: Travel speed along block without any stopped delay.

Cycle length: The length of time it takes a traffic light to pass through a full sequence of green, yellow, and red signal indications for all traffic movements.

Data recovery: Systematic retrieval of information from a cultural resource through excavation, analysis, recordation (e.g., drawings, photographs), and reporting.

Day-night sound level (L_{dn} or DNL): A 24-hour continuous L_{eq} with 10 dBA added to levels occurring between 10 PM and 7 AM to account for greater sensitivity during typical sleeping hours.

dB: Decibel.

dBA: A-weighted unit of sound pressure level in decibels.

dBC: C-weighted unit of sound pressure level.

De Minimis: Minimum incremental increase in 8-hour average carbon monoxide levels that would constitute a significant adverse air quality impact under CEQR.

Decibel (dB): A unit of sound level or pressure level. It implies 10 multiplied by a logarithmic ratio of power or some quantity proportional to power. The logarithm is to the base 10.

Decorative elements: Ornamental features of a structure, such as cornices, lintels, and bracketing. The existence or absence of a building's original decorative elements, particularly exterior features, is considered in the assessment of a building's significance.

Density, zoning: The number of dwelling units or zoning rooms permitted on a site.

Descriptors: Units of measurement for noise analysis, such as L_{eq}, L_{dn}, etc.

Designated resource: Resource or properties recognized and protected under local, State, and Federal historic preservation programs.

Dispersion model: Mathematical model that estimates dissipation of air pollutant concentrations from line, area, or point sources.

Displacement, direct: Involuntary displacement or residents or businesses from the site of an action. Also referred to as "primary displacement."

Displacement, indirect: Involuntary displacement of residents, businesses, or employees that results from a change in socioeconomic conditions created by an action. Also referred to as "secondary displacement."

Diverted-linked trips: Trips attracted to a proposed project from streets near the project site but not immediately adjacent to the site. Thus, these trips need to "divert" to other streets to access the site.

Dormer: An opening, usually a window, that projects from the main roof of a building and has a separate roof.

Downstream: The direction toward which traffic is headed.

Downwash: When emissions from stationary sources are rapidly transported toward the ground because of building-induced turbulence.

Dunes: Recent accumulations of sand formed by sea winds and waves.

Effective width: The width of a walkway that is usable by pedestrians; the total walkway width minus the width of physical obstacles and unusable buffer zones at such obstacles.

Elevation: A straight-on view of the exterior face of a building on a vertical plane showing a building's external components.

Eligible resource: Historic resource meeting the criteria for listing on the State and/or National Registers of Historic Places or for designation as a New York City Landmark.

Emission model: Mathematical model that estimates emissions from vehicle exhaust systems.

Entering angle: A shadow's angle from true north when it enters an open space.

EPA: U.S. Environmental Protection Agency.

Equivalent sound level (L_{eq}): The level of continuous sound containing the same amount of acoustical energy as the fluctuating sound over the same period of time. The reference time period is usually specified in terms of hours in parentheses (e.g., $L_{eq(1)}$ refers to a 1-hour L_{eq} value).

Erosion: The loss or displacement of land along the coastline because of the action of waves, currents running along the shore, tides, wind, runoff of surface waters, or groundwater seepage, winddriven water or waterborne ice, or other effects of coastal storms.

Erosion hazard areas: Erosion-prone areas of the shore designated under the State Erosion Hazard Areas Act, that are likely to be subject to erosion within a 4-year period and that constitute natural protective features (i.e., beaches, dunes, shoals, bars, spits, barrier islands, bluffs and wetlands, natural protective vegetation).

Estuary: Any area where fresh and salt water mix and tidal effects are evident, or any partially enclosed coastal body of water where the tide meets the current of any stream or river.

Exit velocity: Rate at which exhaust gas passes through a stack.

Exiting angle: A shadow's angle from true north when it exits an open space.

Extraction well: Pumped well used to remove contaminated groundwater.

Extreme high water: The extreme high water of spring tides is the highest tide occurring during a lunar month, usually near the new or full moon. This is equivalent to extreme high water of mixed semidiurnal tides.

Fabric: The juxtaposition of the physical components of a building.

Facade: The exterior of a building, usually pertaining to the front.

Feature, archaeological: Archaeological evidence that typically cannot be excavated or removed from the site but must be recorded in place, such as floors, walls, pits, postholes, foundation walls, privies, and cisterns.

Federal style: A style of architecture dating to ca. 1790-1820, found in New York City on town houses in Greenwich Village and Brooklyn Heights.

Fenestration: Arrangement of the window and door openings of a building.

Floodplain: The lowlands adjoining the channel of a river, stream, or watercourse, or ocean, lake, or other body of standing water, which have been or may be inundated by floodwater (as established by the National Flood Insurance Act).

Floor area ratio (FAR): The total floor area on a zoning lot divided by the area of that zoning lot.

Flow rate: Total amount of gas that passes through per unit time.

Footprint: The area of the ground occupied by a building.

Form: The shape or ground plan of a building.

Formerly connected tidal wetlands: A tidal wetland zone consisting of lowland areas whose connections to tidal waters have been limited by construction of dikes, roads, or other structures.

Frequency of service: The frequency with which bus or subway service is provided; for example, 10 buses per hour.

Freshwater wetland: Wetland associated with freshwater systems.

Frieze: A horizontal band placed above a wall but below the cornice. Can appear in both the interior and exterior of a building.

g/sec: Grams per second.

Generic action: Program or plan that has wide application or affects a large area or range of future policies. Also referred to as "programmatic actions."

GEP: Good engineering practice—usually refers to stack heights high enough so that no downwash occurs.

Gothic style: A style of architecture that first became popular in the 1840's, commonly used for residential buildings, schools, and churches.

Groundwater: The water contained beneath the surface in soils and rock.

Half-timbering: A form of decorative stickwork, usually set in stucco, simulating a medieval building tradition of an exposed frame of timbers filled in with stucco or, traditionally, wattle-and-daub.

Hazardous waste: Under RCRA, substance that is chemically reactive, ignitable, corrosive, or toxic.

Headway: The amount of time elapsing between the arrival of buses or subway trains on a given route. For example, a bus route may operate at a headway of 6 minutes, meaning buses are scheduled to arrive at a given stop every 6 minutes.

Heavy Truck: A truck with three or more axles weighing more than 25,000 pounds gross weight.

High marsh: A tidal wetland zone consisting of the area periodically flooded by spring and storm tides, usually dominated by salt hay and spike grasses. Also called "salt meadow."

Historic landscape: A geographic area, including both cultural resources and natural resources therein, that has been influenced by or reflects human history, and for which form, layout, and/or designer, rather than significant events or persons, are the primary reasons for its importance.

Historic resource: Districts, buildings, structures, sites, and objects of historical, aesthetic, cultural, and archaeological importance, including designated resources and eligible resources.

Historic significance: A historic resource that retains integrity and has important and meaningful associative values.

Historic district: A geographically definable area that possesses a significant concentration of associated buildings, structures, objects, or sites, united historically or aesthetically by plan and design or historical and/or architectural relationships. This can include historic districts listed on the State or National Register of Historic Places, and New York City Historic Districts. New York City Historic Districts are further defined as distinct sections of the City that contain buildings, structures, places, or objects that have a special character or special historical or aesthetic interest or value, and that represent one or more periods or styles of architecture typical of one or more eras in the history of New York City.

Historic archaeology: Archaeological study of cultures after the advent of written records.

Historic resource or property: Buildings, structures, sites, or objects that provide or may potentially yield important cultural and/or archaeological information.

HIWAY-2: An air pollution roadway dispersion model.

Hot start: A vehicle that has been not operating for less than an hour, and was previously hot stabilized before it had stopped operating.

Hot stabilized: A vehicle that has been on and operating for more that 505 seconds.

HOV lane: HOV, or high occupancy vehicle, lanes are reserved for the exclusive use of buses and other vehicles carrying a minimum of generally three, four, or more occupants.

HSWA: Hazardous and Solid Waste Amendments (1984); amendments to RCRA establishing a timetable for landfill bans and more stringent UST requirements.

HVAC: Heating, ventilation, and air conditioning.

Hz: Hertz, a measurement unit for sound waves.

I&M: Inspection and maintenance program.

Ideal saturation flow rate: The maximum rate of flow at which passenger cars can pass through an intersection under a set of ideal operating conditions.

Incremental shadow: The additional shadow a building would cast, beyond the shadows that would be cast by surrounding buildings.

Industrial archaeology: The study of sites and structures reflecting changing industrial technology, processes, and practices.

Industrial Pretreatment Program (IPP): City program administered by the Department of Environmental Protection, Bureau of Clean Water, Division of Drainage Basin Management, that identifies and monitors industrial uses that discharge pollutants of concern into the sewer system.

Inhalable particulate matter (PM_{10}): A criteria air pollutant.

INPUFF: Mathematical model used to simulate spills and short-term releases of toxic chemicals.

Integrity: The unimpaired ability of a property to convey its historic or archaeological significance, evidenced by the survival of physical attributes that existed during the property's historic or prehistoric period.

Interior Landmark: An interior, or part thereof, any part of which is 30 years old or older, and that is customarily open or accessible to the public, or to which the public is customarily invited, and that has a special historical or aesthetic interest or value as part of the development, heritage, or cultural characteristics of the City, State, or nation, and that has been designated as an Interior Landmark pursuant to the New York City Landmarks Law.

Intermodal transfer: The transfer of passengers between travel modes, e.g., from bus to subway or from railroad to subway, etc.

Intertidal marsh: A tidal wetland zone consisting of the vegetated area of land subject to inundation by tidal flows every day; the area between average high and low tides.

Invasive testing: Testing of groundwater and soils in which the soil surfaces are penetrated for subsurface sample collection.

Inverse square law: The condition in open spherical sound propagation from a point source that intensity drops off as the reciprocal of the square of the distance from the source. This translates to the ideal condition that SPL drops off at a rate of 6 dB per doubling of distance from the source.

Involved agency: Agencies, other than the lead agency, with jurisdiction to fund, approve, or undertake an action.

ISC2: Industrial Source Complex dispersion model, an EPA air pollutant stationary source dispersion model.

Italianate style: A style of architecture that first came into fashion in the mid-19th century in New York City; many buildings in New York City, including tenements, town houses, and commercial structures, are designed in this style.

K: Kelvin—temperature scale in which absolute zero is assigned as 0°K, and the degree size is the same as in the Celsius scale.

L_{dn}: Day-night sound level.

L_{eq}: Equivalent sound level.

$L_{eq(1)}$: The one-hour equivalent sound level (see **Equivalent sound level**).

$L_{eq(24)}$: The 24-hour equivalent sound level.

Landmark: Any building, structure, work of art, or object, any part of which is 30 years old or older, that has a special character or special historical or aesthetic interest or value as part of the development, heritage, or cultural characteristics of the City, State, or nation, and that has been designated a Landmark pursuant to the New York City Landmarks Law.

Landscape, historic: See historic landscape.

Land use: The activity occurring on land and within the structures that occupy it; e.g., residential, commercial, industrial.

Lead agency: The agency principally responsible for carrying out, funding, or approving an action; therefore, the agency responsible for determining whether an environmental review is required.

Level of service (LOS): A qualitative measure describing operational conditions within a vehicular or pedestrian traffic stream.

Light-duty truck: For noise analysis purposes, a truck weighing less than 9,400 pounds gross weight; for air quality analysis purposes, a truck with four wheels, including vans and ambulances.

Line sources: Sources of air pollutant emissions that can be simulated as a group of lines in a mathematical model, such as a roadway.

Line-haul capacity: The capacity of a subway or rail line to transport passengers past a given point.

Link: The section of roadway between traffic signals.

Linked trips: The multidestination characteristic of trips in downtown type areas.

Lintel: A decorative feature of a building's exterior, placed horizontally above a window; corresponds to the sill, a similar horizontal element located underneath a window.

Littoral zone: A tidal wetland zone consisting of that portion of a tidal water that is shallow enough (usually less than 6 feet deep) to let sunlight penetrate to the land on the bottom; in New York City, the land under water adjacent to nearly all the City's shoreline is considered littoral zone.

Load factor: The number of passengers occupying a transit vehicle divided by the number of seats on the vehicle.

Loop detector: A physical electrical loop embedded within a street that allows it to monitor the volume and/or speed of traffic passing over it and which can often communicate with a traffic control system to alter signal timing patterns.

Low-sulfur oil: Number 2 distillate oil, commonly used for boilers.

m/s: Meter(s) per second.

Macroscale: Analysis of air pollutant sources and levels over a very large region.

Malodorous: Ill-smelling; with an offensive odor.

Maximum load point: The geographic location of a subway or bus line that has the highest ridership level.

Maximum surge condition: The point at which the maximum number of pedestrians are in a crosswalk; usually occurs shortly after pedestrian signals change to green, when the lead pedestrian in opposing crossing platoons reach the opposite corner.

Mean low water line: The line where the arithmetic mean of the low water heights observed over a specific 19-year metonic cycle (the National Tidal Datum Epoch) meets the shore and shall be determined using hydrographic survey data of the National Ocean Survey of the U.S. Department of Commerce.

Mean high water line: The line where the arithmetic mean of the high water heights observed over a specific 19-year metonic cycle (the National Tidal Datum Epoch) meets the shore and shall be determined using hydrographic survey data of the National Ocean Survey of the U.S. Department of Commerce.

Medium truck: A truck with two axles and six wheels, weighing between 9,400 and 25,000 pounds gross vehicle weight.

Meteorological data: Measurements of atmospheric parameters such as temperature, wind speed, and wind direction.

µg/kg: One microgram per kilogram, which is equal to one part per billion, ppb.

µg/L: One microgram per liter, which is equal to one part per billion, ppb.

$\mu g/m^3$: Micrograms per cubic meter.

mg/kg: Milligrams per kilogram, which are equal to parts per million, ppm.

mg/L: Milligrams per liter, which are equal to parts per million, ppm.

mg/m^3: Milligrams per cubic meter.

Microscale: Analysis of air pollutant sources and levels on a localized basis.

Mitigation: Measures to minimize or avoid an action's significant adverse impacts to the fullest extent practicable.

Mobile sources: Sources of air pollutant emissions such as motor vehicles, planes, boats, etc.

MOBILE: A series of air pollutant emissions simulation models prepared by EPA and periodically updated, adjusted for use in New York City.

Modal split: The extent to which persons traveling to or from a site or an area utilize specific travel modes, such as autos, taxis, subways, buses, commuter rail, ferries, bicycles, or walk. Usually expressed as a percentage of all travel.

Modal split: The extent to which persons traveling to or from a site or an area utilize specific travel modes, such as autos, taxis, subways, buses, commuter rail, ferries, bicycles, or walk. Usually expressed as a percentage of all travel.

Monitoring well: A tube or pipe set in the ground, open to the atmosphere at the top and to water at the

bottom, usually along an interval of slotted screen, used for taking groundwater samples.

MSDS: Material safety data sheets; documentation provided by manufacturers that details the constituent compounds and their relative proportions in trade products.

Municipal parking: Parking spaces available to the public within a facility (parking lot or garage) operated by or on behalf of the City of New York.

mw: Megawatt(s).

NAAQS: National Ambient Air Quality Standards.

Natural resource: Any area capable of providing habitat for plant and animal species or capable of functioning to support environmental systems—e.g., surface and groundwaters and drainage systems, wetlands, dunes and beaches, grasslands, woodlands, etc.

Negative Declaration: A lead agency's determination that an action will not have a significant adverse effect on the environment.

New York City Noise Control Code: The noise ordinance for New York City that establishes limits and regulations for the enforcement of noise levels within city limits. For construction activity, it requires that all exhausts be muffled, prohibits all unnecessary noise adjacent to schools, hospitals, or courts, and limits construction activity to weekdays between 7 AM and 6 PM. The Noise Code also defines the Ambient Noise Quality Zones (ANQZ), which sets limits on the noise impact of a project on the environment.

NESHAPS: National Emission Standards for Hazardous Air Pollutants.

NIOSH: National Institute for Occupational Safety and Health.

No action condition: Scenario of the future without the proposed action, used as a baseline against which incremental changes generated by an action can be evaluated in environmental review. Also referred to as "no build" condition.

No build condition: See no action condition.

Noise: Unwanted, disturbing sound.

Noise abatement criteria (NAC): Noise level limits, in terms of $L_{eq(1)}$ or $L_{10(1)}$, promulgated by Federal Highway Administration regulations for vehicular traffic noise generated by the construction of new highways or the expansion of existing ones.

Noise level reduction (NLR): The outdoor to indoor attenuation of noise levels afforded by a building's exterior wall. NLR is used only in FAA mitigation recommendations.

Noise reduction coefficient (NRC): A single number rating system for absorption coefficients over the speech frequency range. NRC is defined mathematically as the arithmetic average of the absorption coefficients at 250, 500, 1000, and 2000 Hz.

Noncompliance, zoning: The situation of a building that does not comply with one or more of the zoning district bulk regulations.

Nonconformance, zoning: The situation of a use that does not conform to one or more of the use regulations of the zoning district.

Noncriteria air pollutants: Air pollutants that lack criteria standards by EPA, but are listed by the DEC in Air Guide-1.

Nonpoint sources: Sources of air pollutants that are not emitted from one small, restricted area; these include line sources and area sources.

NO_x: Nitrogen oxides—class of compounds that includes NO and NO_2, which are of concern in their roles as ozone precursors and are criteria air pollutants.

NPL: National Priorities List; official list of uncontrolled hazardous wastes sites to be remediated under CERCLA.

Object, Historic or Archaeological: Item of functional, aesthetic, cultural, historical, or scientific value that may be movable but is related to a given environment or setting.

Octave band: A frequency band with an upper limit that is twice the lower limit, and is identified by a geometric mean frequency, called the center frequency. Standard octave band center frequencies are defined in ANSI Standard S1.6-1984, entitled "Preferred Frequencies, Frequency Levels, and Band Numbers for Acoustical Measurements."

100-year flood: The flood having a 1 percent chance of being equalled or exceeded in a given year.

Open space, designated: Includes both mapped parkland and other land that, although not officially mapped, is under the jurisdiction of the DPR or another official body and has been set aside for public open space purposes. It excludes vacant land not designated for open space purposes.

Open space, improved: Open space that is developed to its intended potential such as a playground, ball field, or promenade.

Open space, mapped: See parkland, mapped.

Open space, private: Property designated for open space use that is under private ownership and that may or may not be publicly accessible.

Open space ratio, zoning: The percentage of total floor area of a building that must be provided as open space on a lot within certain residential districts.

Open space, undeveloped: Natural areas not intended for development, such as wetlands.

Open space, unimproved: Open space that has been acquired or mapped and is planned for further development but has not yet been developed for open space use.

Origin/destination (O/D): The beginning and end point of a trip, used in determining the routing of vehicle trips to and from a project site.

OSHA: U.S. Occupational Safety and Health Administration.

Ozone (O_3): A criteria air pollutant formed by the reaction of hydrocarbons and nitrogen oxides with sunlight over long time periods and large regions.

Package treatment plant: Small, nonmunicipal wastewater treatment plant.

Park: Mapped open space under Federal, State, or City jurisdiction.

Parking enforcement agent (PEA): New York City Department of Transportation personnel, one of whose responsibility it is to maintain clear curb lanes where posted parking regulations mandate it.

Parkland, mapped: Public open space that is denoted as parkland on official City maps and as such cannot be "alienated" from park and open space use without extensive City review and state legislative action.

Parking shortfall: The amount that the parking demand generated by a proposed action exceeds the amount of parking it is proposing to provide.

Pass-by trips: Trips attracted to a proposed project from the streets immediately adjacent to the project site; these trips are usually intermediate stops being made en route from the vehicle's trip origin to its ultimate destination.

Passenger-car equivalent (PCE): The number of passenger cars that a truck or is equivalent to for the purposes of analyzing noise conditions. For noise purposes, one heavy truck or bus (more than 25,000 pounds gross vehicle weight) is equal to 85 PCEs; one medium truck (between 9,400 and 25,000 pounds gross vehicle weight) equals 16 PCEs; all lighter vehicles are considered as 1 PCE.

PCB: Polychlorinated biphenyl; a pathogenic (disease-causing) and teratogenic (causing developmental malformations) industrial compound used as a heat-transfer agent.

PCE: Passenger Car Equivalent.

Peak hour factor: A measure of traffic volume demand fluctuation within the peak hour. It is the peak hour volume divided by four times the peak 15-minute period within that hour.

Percentile levels (L_n, $0<n<100$): The percentage of observation time that a certain SPL has been exceeded. For example, L_{10} corresponds to the SPL exceeded 10 percent of the observation time. The observation time is usually specified in terms of hours in parentheses (e.g., $L_{10(1)}$ refers to a 1-hour L_{10} value).

Persistence Factors: Empirical constants that relate 1-hour air pollutant concentrations to longer time averaging periods.

Photochemical Oxidants: Ozone, a group of criteria air pollutants.

Pierhead line: The proposed or actual pierhead line most recently adopted by the U.S. Army Corps of Engineers and the New York City Department of City Planning.

Piezometer: A tube or pipe, open to the atmosphere at the top and to water at the bottom, and sealed along its length, used to measure the hydraulic head in a geologic unit to determine groundwater flow direction.

Platoon: A group of vehicles traveling together as a group, either voluntarily or involuntarily, due to signal control, geometrics, or other factors; or the movement of a large group of pedestrians through an area, which often occurs, for example, when a large volume of bus or subway riders exit from those travel modes.

Point sources: Sources of air pollutants that are discharged from a small, restricted area, such as boiler exhaust stacks.

Porte cochere: A porch that served as a cover for passengers of carriages, and, later, automobiles.

Positive Declaration: A lead agency's determination that an action may have one or more significant adverse effects on the environment. The issuance of a Positive Declaration commits the lead agency to preparing a Draft Environmental Impact Statement before it approves, undertakes, or funds its action.

ppb: Parts per billion.

ppm: Parts per million.

Prehistoric archaeology: Archaeological study of aboriginal cultures before the advent of written records.

Primary displacement: See displacement, direct.

Programmatic action: See generic action.

Project site: The site that would be directly affected by a proposed action.

Protected turns: Left or right turns made at a signalized intersection with no opposing or conflicting vehicular or pedestrian flows.

PSD: Prevention of Significant Deterioration—Federal permit required for new or significant modifications to major stationary sources of air pollution.

Public access, waterfront: Any area of publicly accessible open space on a waterfront property, as well as pedestrian ways that provide a route from a waterfront public access area to a public street, public park, public place, or public access area.

Public parking: Parking spaces available to the public, rather than restricted to employees or patrons of specific local businesses, schools, or organizations.

Pulsed pumping: Pump-and-treat enhancement where extraction wells are periodically not pumped to allow concentrations in the extracted water to increase.

Pump test: Test for estimating the values of various hydrogeologic parameters in which water is continuously pumped from a well and the consequent effect on water levels in surrounding piezometers or monitoring wells is monitored.

Queue: A line of delayed vehicles.

RCRA: Resource Conservation and Recovery Act (1976, 1984); Federal law regulating management and disposal of hazardous wastes currently generated, treated, stored, disposed, or distributed.

RCRIS: Resource Conservation and Recovery Information system; an inventory of registered hazardous waste generators, transporters, and treatment, storage, and disposal facilities.

Receptor: Location to which the public has access on a more or less continuous basis used for air quality predictions; or a defined area where human activity may be adversely affected when noise levels exceed predefined thresholds of acceptability or when levels increase by predefined thresholds of change, used for noise analyses.

Recirculation: Entrapment of exhaust plumes into operable windows or air intakes.

Reflection: The act of sound bouncing off a partition, usually occurring from smooth, flat, hard surfaces.

Release: Any occurrence in which a regulated substance is emitted into air, soil, or water.

Relative impact criterion, noise: A change in noise levels at a receptor that is great enough to be considered as a significant impact (i.e., a 3 or 5 dBA $L_{eq(1)}$ change at a receptor could be considered a significant change, resulting in a significant impact).

Reserve capacity: The capacity of a traffic lane at an unsignalized intersection minus the volume using that lane. It is the determinant of level of service at unsignalized intersections.

Reverberation: The amplification of sound within an enclosed space caused by multiple reflections off of reflective terminations (i.e., walls, ceilings, floors, or obstacles) of the room.

Ridesharing: Also referred to as carpooling; a means of reducing vehicle trips by increasing the average occupancy of vehicles traveling in a given area.

Risk assessment: Evaluation of the magnitude of effect to human health and the environment posed by the presence of hazardous substances and proposed controls to limit or eliminate effects.

RVP: Reid Vapor Pressure, a measurement of gasoline volatility.

Salinity: The total amount of solid material in grams contained in 1 kg of water when all the carbonate has been converted to oxide, the bromine and iodine replaced by chlorine, and all the organic matter completely oxidized.

Salt meadow: A tidal wetland zone consisting of the area periodically flooded by spring and storm tides, usually dominated by salt hay and spike grasses. Also called "high marsh."

SARA: Superfund Amendments and Reauthorization Act (1986); Federal law reauthorizing and expanding and jurisdiction of CERCLA.

SARA Title III: Section of SARA requiring public disclosure of chemical information and development of emergency response plans.

Saturated zone: A subsurface area that contains sufficient water to fill all interconnected voids or pore spaces.

Scenic Landmark: Any landscape feature or aggregate of landscape features, any part of which is 30 years old or older, which has or have a special character of special historical or aesthetic interest or values as part of the development, heritage, or cultural characteristics of the City, State, or nation, and that has been designated a Scenic Landmark pursuant to the New York City Landmarks Law.

Scope of Work: A document that identifies in detail all topics to be addressed in the EIS, including the methods for study, possible alternatives to the proposed action, and mitigation measures.

scfm: Standard cubic feet per minute.

SCREEN: EPA mathematical model that estimates air pollutant impacts from stationary sources.

Secondary displacement: See displacement, indirect.

Separate sewer: Sewer system in which dry-weather wastewater is sent to a water pollution control plant for treatment, and storm water is sent through separate pipes into the nearest waterway.

Setback: A recession or stepping back of a building's facade.

SGC: Short-term guideline concentrations—for noncriteria air pollutants, listed in DEC's Air Guide-1.

Short-term impact, noise: An impact caused by a temporary noise source, such as construction activity.

Signal phasing: The allocation of a signal cycle into phases that are used by different traffic movements passing through an intersection.

Signal warrant analysis: An analysis of traffic volume, pedestrian volume, and safety conditions at an intersection to determine whether the installation of a traffic signal is warranted.

Significant coastal fish and wildlife habitats: Habitats designated by the New York State Department of State, on the recommendation of DEC, because they (a) are essential to the survival of a large portion of a particular fish and wildlife population; (b) support populations of protected species; (c) support fish and wildlife populations that have significant commercial, recreational, or educational value; and/or (d) are habitat types not commonly found in the State or region.

SIP: New York State Implementation Plan. The Clean Air Act requires each state to demonstrate in a SIP the manner in which it will attain compliance with the National Ambient Air Quality Standards.

Site, historic or archaeological: Location or place where a significant event or sequence of events took place.

Site-specific action: Actions proposed for a specific location.

Slot: Space for one child in a day care center.

Slug test: A test for estimating hydraulic conductivity values in which a rapid water-level change is produced in a piezometer or monitoring well, usually by introducing or withdrawing a "slug" of water or a weight. The resultant rise or decline in the water level is monitored.

Soft site: A site where no particular development is planned or proposed, but where development can reasonably be expected to occur (for example, a property that is underbuilt with respect to its zoning in an area with high development demand).

Soil gas survey: A technique used to obtain air from subsurface cavities (e.g., using a soil gas probe); soil gas sample is analyzed and used as an indicator of volatile organic compounds in groundwater or soil.

Sound exposure level (SEL): A rating, in dB, of discrete events, such as aircraft flyovers or train passbys, that compresses the total sound energy of the event into a 1 second time period.

Sound level: The weighted sound pressure level measured by use of a metering device.

Sound level meter (SLM): An instrument used to measure sound pressure levels.

Sound power level (L_W): 10 log (W/W_{ref}), where W=power and $W_{ref}=1x10^{-12}$ Watts.

Sound pressure level (SPL or L_p): 20 log (p/p_{ref}), where p=root mean square acoustic pressure and $p_{ref}=2x10^{-5}$ Newtons/meter^2. p_{ref} corresponds to the pressure at the threshold of hearing.

Sound transmission class (STC): A single-number rating for a TL spectrum of a partition matched to a standard curve.

SPDES permit: State Pollutant Discharge Elimination System permit, issued by the New York State Department of Environmental Conservation.

Spectrum analyzer: A device that measures and manipulates spectra, available in many bandwidth possibilities. Octave band analyzers are the most common types of spectrum analyzers.

SRO: Single-room occupancy hotel.

Stability: Description of the rate at which air pollutants are dispersed depending on atmospheric conditions.

Stack: Structure through which concentrated airborne pollutants are emitted.

State Historic Preservation Officer: Official within the State, authorized by the State at the request of the U.S. Secretary of the Interior, to act as liaison for purposes of implementing Federal historic preservation requirements and programs, or the said official's designated representative.

Statistical noise levels/percentile levels (L_1, L_5, L_{10}, etc.): The practice to describe several important features of fluctuating or time-varying noise using statistical quantities. These percentile levels represent the percentage of the observed time period during which a given noise level is exceeded. For example, L_{90}, the noise level exceeded 90 percent of the time, is often considered to be the background noise level, while L_{10} gives some indication of the intrusive nature of the noise.

Stationary sources: Sources of airborne emissions from fixed facilities.

STEL: Short-Term Exposure Limits for air pollutants in the workplace, promulgated by the U.S. Occupational Safety and Health Administration.

Stopped delay: Average vehicle delay at signalized intersections.

Streetscape: The character and urban design features of a street or block, including such features as setbacks, architectural styles, and materials.

Streetwall: The wall created by the front face or faces of a building or several buildings.

Structure: Built work made up of interdependent parts or elements in an organized pattern.

Study area: The geographic area likely to be affected by the proposed action for a given technical area, or the area in which impacts of that type could occur. This is the area subject to assessment for that technical area.

Superfund: See CERCLA.

Sympathetic contextual design: A plan for a new building or development that takes into account the setting, landscaping, shadow, and the visual impact that the proposed construction may have on an nearby existing historic resource; a mitigation option.

TCL: Target compound list; list of analytes prepared by EPA, with a variety of corresponding analytical methods.

TCLP: Toxicity Characteristic Leaching Procedure; toxicity test required under RCRA to determine if a waste is considered hazardous.

Temporal distribution: The distribution of trips by hour or by 15-minute periods over the course of a given day.

Thermal state: Term used to describe how long a vehicle has been turned on and operating.

Threshold of hearing (0 dBA): The SPL below which sound cannot be heard by the average person with a healthy hearing mechanism.

Tidal wetland: Wetlands found in and around tidal zones; tidal wetlands can be grouped according to characteristic ecological zones—littoral zone; coastal shoals, bars, and flats; intertidal marsh; coastal fresh marsh; high marsh or salt meadow; and formerly connected tidal wetlands.

Time-space analysis: A methodology for evaluating pedestrian level of service for station platforms, waiting areas, street plazas, and other open space areas.

TLV-TWA: Threshold Limit Value—Time-weighted Average.

TPY: Tons per year.

Traffic enforcement agent (TEA): New York City Department of Transportation personnel generally responsible for maintaining proper traffic flow through problem intersections.

Transit share: The percentage of all person trips made to a given project or area by public transportation.

Transmission Loss (TL): A measure of the sound attenuation effectiveness of a partition, in units of dB.

TRI: Toxic Release Inventory; annual report on chemical releases regulated industries must file with EPA under SARA Title III.

Trip assignment: The assumed routing, or "assignment," of trips (either vehicular or pedestrian) through an area en route to their destination.

Trip generation: The volume of trips generated, or produced, by a particular land use or project. Can be specified in terms of person trips or vehicular trips.

TSCA: Toxic Substances Control Act (1976); Federal law authorizing EPA to gather information on chemical risks; basis for regulation of PCBs and other toxic substances.

Type I action: Action that is more likely to have a significant environmental impact, as defined in SEQRA and Executive Order 91.

Type II action: According to SEQRA, action that is not likely to have a significant effect on the environment; such actions do not require preparation of an Environmental Impact Statement or Environmental Assessment Statement.

Unlisted action: According to SEQRA, actions that are neither Type I nor Type II.

Unsaturated zone: That subsurface region that lies above the saturated zone or water table.

Upstream: The direction from which traffic is coming.

Use: Any activity, occupation, business, or operation carried on, or intended to be carried on, in a building or on a tract of land.

Use Group: Uses that have similar functional and/or nuisance characteristics, as listed in the Zoning Resolution.

UST: Underground storage tank; regulated under RCRA; tank with 10 percent or more of its volume underground, with connected piping; used to store petroleum products or CERCLA-regulated hazardous chemicals.

Vacuum extraction: Including advective-vapor transport by withdrawing or injecting air through wells screened in the unsaturated zone.

Vadose zone: See unsaturated zone.

Vanpool: A grouping of individuals traveling together in a higher-occupancy vehicle than an automobile, such as a van.

Vehicle Classification: Mix of vehicular traffic segmented into autos, taxis, light-duty gas trucks, heavy-duty gas trucks, and heavy-duty diesel trucks.

View corridor: See visual corridor.

Visual corridor: An open area (including streets) provides a continuous view form a public place of the sky or focal object, such as the waterfront. A visual corridor is generally linear and unobstructed from its base to the sky.

VOC: Volatile organic compound; family of highly evaporative organic materials used in a variety of industrial applications, such as paints and solvents.

Volatilization: The change of a chemical from liquid to gas.

Volume sources: Sources of air pollutants distributed over a large volume of space.

Volume-to-capacity (v/c) ratio: The ratio of the vehicular or pedestrian volume passing a point on a street (or transit line) to the capacity of the street (or line).

Wake: Region of air flow that is disturbed by a solid structure.

Water table: The surface in an aquifer at which pore water pressure is equal to atmospheric pressure.

Water table aquifer: An aquifer in which the water table forms the upper boundary.

Water-dependent uses: Uses that require direct access to a body of water to function or that use waterways for transport of materials, products, or people.

Water-enhancing uses: Primarily recreational, cultural, entertainment, or retail uses that, when located at the water's edge, add to the public use and enjoyment of the waterfront.

Waterfront Revitalization Program: New York City's Local Waterfront Revitalization Program, adopted as a 197-a Plan, which applies to all projects in a designated Coastal Zone.

Water Pollution Control Plant (WPCP): Plant used to treat wastewater, including sanitary sewage.

Weaving analysis: An analysis of traffic conditions at a location (generally a length of highway) where different traffic streams cross each other's path without the aid of traffic signals.

Wildlife: All mammals, birds, reptiles, and amphibians, and all vertebrate and invertebrate animal species.

Wind tunnel: Fluid dispersion modeling using physical scale representations.

Zone of influence: Area surrounding a pumping or recharging well within which the water table of an unconfined aquifer or water pressure of a confined aquifer has been changed due to the well's pumping or recharge.

City of New York

Mayor David N. Dinkins

City Environmental Quality Review

TECHNICAL MANUAL

APPENDICES

December 1993

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PROCEDURES AND DOCUMENTATION APPENDIX

PROCEDURES AND DOCUMENTATION APPENDIX 1

State Environmental Quality Review Act (SEQRA)
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6 NYCRR PART 617

STATE ENVIRONMENTAL QUALITY REVIEW
Statutory authority: Environmental Conservation Law,
Section 8-0113

(Applicable to all state and local agencies within New York State including all political subdivisions, districts, departments, authorities, boards, commissions and public benefit corporations)

ADOPTED: March 6, 1987

EFFECTIVE: June 1, 1987

SECTION 617.1 AUTHORITY, INTENT AND PURPOSE.

(a) This Part is adopted pursuant to section 8-0113 of the Environmental Conservation Law to implement the provisions of the State Environmental Quality Review Act (SEQR).

(b) In adopting SEQR, it was the Legislature's intention that all agencies conduct their affairs with an awareness that they are stewards of the air, water, land, and living resources, and that they have an obligation to protect the environment for the use and enjoyment of this and all future generations.

(c) The basic purpose of SEQR is to incorporate the consideration of environmental factors into the existing planning, review and decision-making processes of State, regional and local government agencies at the earliest possible time. To accomplish this goal, SEQR requires that all agencies determine whether the actions they directly undertake, fund or approve may have a significant effect on the environment, and if it is determined that the action may have a significant effect, prepare or request an environmental impact statement.

(d) It was the intention of the Legislature that the protection and enhancement of the environment, human and community resources should be given appropriate weight with social and economic considerations in determining public policy, and that those factors be considered together in reaching decisions on proposed activities. Accordingly, it is the intention of this Part that a suitable balance of social, economic and environmental factors be incorporated into the planning and decision-making processes of State, regional and local agencies. It is not the intention of SEQR that environmental factors be the sole consideration in decisionmaking.

(e) This Part is intended to provide a statewide regulatory framework for the implementation of SEQR by all state and local agencies. It includes:

(1) procedural requirements for compliance with the law;

(2) provisions for coordinating multiple agency environmental reviews through a single lead agency (section 617.6 of this Part);

(3) criteria to determine whether a proposed action may have a significant effect on the environment (section 617.11 of this Part);

(4) model assessment forms to aid in determining whether an

action may have a significant effect on the environment (Appendices A, B and C of section 617.21 of this Part); and

(5) examples of actions and classes of actions which are likely to require an EIS (section 617.12 of this Part), and those which will not require an EIS (section 617.13 of this Part).

617.2 DEFINITIONS.

As used in this Part, unless the context otherwise requires:

(a) "Act" means Article 8 of the Environmental Conservation Law (SEQR).

(b) "Actions" include:

(1) projects or physical activities, such as construction or other activities that may effect the environment by changing the use, appearance or condition of any natural resource or structure, that:

(i) are directly undertaken by an agency; or

(ii) involve funding by an agency; or

(iii) require one or more new or modified approvals from an agency or agencies;

(2) agency planning and policy making activities that may affect the environment and commit the agency to a definite course of future decisions;

(3) adoption of agency rules, regulations and procedures, including local laws, codes, ordinances, executive orders and resolutions that may affect the environment; and

(4) any combinations of the above.

(c) "Agency" means a State or local agency.

(d) "Applicant" means any person making an application or other request to an agency to provide funding or to grant an approval in connection with a proposed action.

(e) "Approval" means a discretionary decision by an agency to issue a permit, certificate, license, lease or other entitlement or to otherwise authorize a proposed project or activity.

(f) "Coastal area" means the State's coastal waters and the adjacent shorelands, as defined in article 42 of the Executive Law, the specific boundaries of which are shown on the coastal area map on file in the

Office of the Secretary of State, as required by section 914(2) of the Executive Law.

(g) "Commissioner" means the commissioner of the New York State Department of Environmental Conservation.

(h) "Conditioned negative declaration" (CND) means a negative declaration issued by a lead agency for an Unlisted action, involving an applicant, in which the action as initially proposed may result in one or more significant adverse environmental effects; however, mitigation measures identified and required by the lead agency, pursuant to the procedures in 617.6(h), will modify the proposed action so that no significant adverse environmental impacts will result.

(i) "Critical environmental area" (CEA) means a specific geographic area designated by a state or local agency, having exceptional or unique characteristics that make the area environmentally important. Any Unlisted action located in a CEA must be treated as a Type I action by any involved agency.

(j) "Department" means the New York State Department of Environmental Conservation.

(k) "Direct action" or "directly undertaken action" means an action planned and proposed for implementation by an agency. "Direct actions" include but are not limited to capital projects, promulgation of agency rules, regulations, laws, codes, ordinances or executive orders and policymaking which commits an agency to a course of action.

(l) "Environment" means the physical conditions which will be affected by a proposed action, including land, air, water, minerals, flora, fauna, noise, resources of agricultural, archeological, historic or aesthetic significance, existing patterns of population concentration, distribution or growth, existing community or neighborhood character, and human health.

(m) "Environmental assessment form" (EAF) means a form used by an agency to assist it in determining the environmental significance or nonsignificance of actions. A properly completed EAF shall contain enough information to describe the proposed action, its location, its purpose and its potential impacts on the environment. The model full and short EAF's contained in Appendices A and C of section 617.21 of this

Part may be modified by an agency to better serve it in implementing SEQR, provided the scope of the modified form is as comprehensive as the model.

(n) "Environmental impact statement" (EIS) means a written document prepared in accordance with sections 617.8 and 617.14 of this Part. An EIS may be either a "draft" or a "final". A draft EIS is the initial statement prepared by either the applicant or the lead agency and circulated for review and comment. The lead agency is responsible for the preparation of the final EIS. An EIS may also be "generic" in accordance with section 617.15 of this Part. An EIS may be a Federal draft and final EIS in accordance with section 617.16 of this Part.

(o) "Environmental Notice Bulletin" ("ENB") means the weekly publication of the Department published pursuant to Section 3-0306 of the Environmental Conservation Law.

(p) "Excluded action" means an action to which the requirements of this Part do not apply. Excluded actions are:

(1) actions undertaken, funded or approved prior to the effective dates set forth in SEQR (see chapters 228 of the Laws of 1976, 252 of the Laws of 1977 and 460 of the Laws of 1978), except:

(i) In the case of an action where it is still practicable either to modify the action in such a way as to mitigate potentially adverse environmental effects, or to choose a feasible or less environmentally damaging alternative, the commissioner may, at the request of any person, or on his own motion, require the preparation of an environmental impact statement; or

(ii) In the case of an action where the responsible agency proposes a modification of the action and the modification may result in a significant adverse effect on the environment, an environmental impact statement shall be prepared with respect to such modification.

(2) actions requiring a certificate of environmental compatibility and public need under Articles VII or VIII of the Public Service Law and the consideration of, granting or denial of any such certificate;

(3) actions subject to the jurisdiction of the Adirondack Park Agency pursuant to section 809 of the Executive Law, including actions of

the Adirondack Park Agency thereunder, and actions subject to the jurisdiction of local governments pursuant to section 808 of the Executive Law and actions of such local governments pursuant thereto.

(q) "Exempt action" means any one of the following:

(1) civil or criminal enforcement proceedings, whether administrative or judicial, including a particular course of action specifically required to be undertaken pursuant to a judgment or order, or the exercise of prosecutorial discretion;

(2) official acts of a ministerial nature, involving no exercise of discretion;

(3) maintenance or repair involving no substantial changes in an existing structure or facility;

(4) emergency actions which are immediately necessary on a limited and temporary basis for the protection or preservation of life, health, property or natural resources, provided that such actions are directly related to the emergency and are performed to cause the least change or disturbance, practicable under the circumstances, to the environment. Any decision to fund, approve or directly undertake other activities after the emergency has expired is fully subject to the review procedures of this Part; and

(5) actions of the Legislature of the State of New York or of any court. Actions of local legislative bodies are not exempt.

(r) "Findings Statement" means a written statement prepared by an involved agency, in accordance with section 617.9 of this Part, after a final EIS has been filed, that certifies that the SEQR requirements have been met and provides written support for the agency decision.

(s) "Funding" means any financial support given by an agency, including contracts, grants, subsidies, loans or other forms of direct or indirect financial assistance in connection with a proposed action.

(t) "Involved agency" means an agency that has jurisdiction by law to fund, approve or directly undertake an action. If an agency will ultimately make a discretionary decision to fund, approve or undertake an action, then it is an "involved agency", notwithstanding that it has not received an application for funding or approval at the time the SEQR process is commenced. The lead agency is also an "involved agency".

(u) "Interested agency" means an agency that lacks the jurisdiction to fund, approve or directly undertake an action but wishes to participate in the review process because of its specific expertise or concern about the proposed action. An "interested agency" has the same ability to participate in the review process as a member of the public.

(v) "Lead agency" means an involved agency principally responsible for carrying out, funding or approving an action, and therefore responsible for determining whether an environmental impact statement is required in connection with the action, and for the preparation and filing of the statement if one is required.

(w) "Local agency" means any local agency, board, authority, district, commission or governing body, including any city, county and other political subdivision of the state.

(x) "Ministerial act" means an action performed upon a given state of facts in a prescribed manner imposed by law without the exercise of any judgment or discretion as to the propriety of the action, such as the granting of a hunting or fishing license.

(y) "Negative declaration" means a written determination by a lead agency that the implementation of the action as proposed will not result in any significant environmental effects. Negative declarations must be prepared and filed in accordance with sections 617.6(g) and 617.10(a) of this Part.

(z) "Person" means any agency, individual, corporation, governmental entity, partnership, association, trustee or other legal entity.

(aa) "Permit" means a permit, lease, license, certificate or other entitlement for use or permission to act that may be granted or issued by an agency.

(bb) "Physical alteration" includes but is not limited to the following activities: vegetation removal, demolition, stockpiling materials, grading and other forms of earth work, dumping, filling or depositing, discharges to air or water, excavation or trenching, application of pesticides, herbicides, or other chemicals, application of sewage sludge, dredging, flooding, draining or dewatering, paving, construction of buildings, structures or facilities, and extraction, injection or recharge of resources below ground.

(cc) "Positive declaration" means a written statement prepared by the lead agency indicating that implementation of the action as proposed may have a significant effect on tne environment and that an environmental impact statement will be required. Positive declarations must be prepared and filed in accordance with section 617.10(b) of this Part.

(dd) "Project sponsor" means any applicant or agency primariiy responsible for undertaking an action.

(ee) "Residential" means any facility used for permanent or seasonal habitation, including but not limited to: realty subdivisions, apartments, mobile home parks, and campsites offering any utility hookups for recreational vehicles. It shall not include such facilities as hotels, hospitals, nursing homes, dormitories or prisons.

(ff) "Scoping" means the process by which the lead agency identifies the significant issues related to the proposed action which are to be addressed in the draft EIS including, where possible, the content and level of detail of the analysis, the range of alternatives, the mitigation measures needed to minimize or eliminate adverse impacts, and the identification of nonrelevant issues. Scoping is intended to promote the efficiency of the lead agency's review of the draft EIS, to provide an applicant with guidance on matters which must be considered, and to provide an opportunity for early involved agency and public awareness of the proposal.

(gg) "Segmentation" means the division of the environmental review of an action such that various activities or stages are addressed under this Part as though they were independent, unrelated activities, needing individual determinations of significance.

(hh) "State agency" means any State department, agency, board, public benefit corporation, public authority or commission.

(ii) "Type I action" means an action or class of actions listed in section 617.12 of this Part, or in any involved agency's procedures adopted pursuant to section 617.4 of this Part.

(jj) "Type II action" means an action or class of actions which is listed in section 617.13 of this Part. When the term is applied in reference to an individual agency's authority to review or approve a particular proposed project or action, it shall also mean an action or class

of actions listed as Type II actions in that agency's own procedures to implement SEQR adopted pursuant to section 617.4 of this Part. The fact that an action is listed as a Type II action in any agency's procedures does not mean that it is to be treated as a Type II action by any other involved agency not listing it as a Type II action in its procedures.

(kk) "Unlisted action" shall mean all actions not excluded or exempt, not listed as a Type I or Type II action in this Part, or in the case of a particular agency action, not listed as a Type I or Type II action in the agency's own SEQR procedures.

617.3 GENERAL RULES.

(a) No agency involved in an action shall carry out, fund or approve the action until it has complied with the provisions of SEQR. No physical alteration related to an action shall be commenced by a project sponsor until the provisions of SEQR have been complied with except as provided under sections 617.3(c) or 617.13(d)(18) of this Part. No agency shall issue a decision on an action that it knows any other involved agency has determined may have a significant effect on the environment until a final EIS and findings statement have been filed except as provided under section 617.8(e)(1) of this Part.

(b) SEQR does not change the existing jurisdiction of agencies nor the jurisdiction between or among State and local agencies. SEQR provides all involved agencies with the authority, following the filing of a final EIS and written findings statement, or pursuant to section 617.6(h) of this Part to impose substantive conditions upon an action to ensure that the requirements of this Part have been satisfied. The conditions imposed must be practicable and reasonably related to impacts identified in the EIS or the conditioned negative declaration.

(c) Nothing in this Part shall prevent an agency or an applicant from:

(1) conducting concurrent environmental, engineering, economic, feasibility and other studies and preliminary planning and budgetary processes necessary to the formulation of a proposal for action, provided those activities do not commit the agency to commence, engage in or approve such action; or

(2) engaging in review of any part of an application to determine compliance with technical requirements, provided that no such determination shall entitle or permit the applicant to commence the action unless and until all requirements of this Part have been fulfilled.

(d) An agency which must make a legislative decision, such as rezoning, need not apply SEQR to its legislative decision process if the agency determines that the action will not be entertained.

(e) An agency may waive the requirement for an EAF if a draft EIS is prepared or submitted.

(f) An application for agency funding or approval of a Type I or Unlisted action shall not be complete until:

(1) a negative declaration has been filed; or

(2) until a draft EIS has been accepted by the lead agency as satisfactory with respect to scope, content and adequacy. Commencing upon such acceptance, the SEQR process shall run concurrently with other procedures relating to the review and approval of the action, if reasonable time is provided for preparation, review and public hearings with respect to the draft EIS.

(g) The lead agency shall make every reasonable effort to involve applicants, other agencies and the public in the SEQR process. Early consultations initiated by agencies can serve to narrow issues of significance and to identify areas of controversy relating to environmental issues, thereby focusing the issues requiring in-depth analysis in an EIS.

(h) The effect of an applicant or agency exercising due diligence in identifying all other agencies having funding or approval authority over the action, and of the agency or applicant providing written notice of the agency's determination of environmental significance to such other involved agencies, shall be that unless an involved agency formally objects to the establishment of lead agency pursuant to section 617.6(e) of this Part, no other involved agency may later require the preparation of an EIS in connection with the action.

(i) Each agency involved in a proposed action has the responsibility to provide the lead agency with information it may have which may assist the lead agency in making its determination of significance, to identify

issues in the scoping process, to comment in a timely manner on the EIS if it has concerns which need to be addressed and to participate as may be needed in any public hearing. Other agencies interested in a proposed action are strongly encouraged to make known their views on the action, particularly with respect to their areas of expertise and jurisdiction.

(j) No SEQR determination of significance, EIS or findings statement is required for actions which are Type II, Excluded or Exempt from SEQR.

(k) Actions commonly consist of a set of activities or steps (e.g. for capital projects the activities may include planning, design, contracting, demolition, construction and operation). The entire set of activities or steps shall be considered the action, whether the agency decisionmaking relates to the action as a whole or to only a part of it.

(1) Considering only a part or segment of an action is contrary to the intent of SEQR. If a lead agency believes that circumstances warrant a segmented review, it must clearly state in its determination of significance and any subsequent EIS the supporting reasons and must demonstrate that such review is clearly no less protective of the environment. Related actions should be identified and discussed to the fullest extent possible.

(2) If it is determined that an EIS is necessary, only one draft and one final EIS need be prepared on the action if the statement addresses each part of the action at a level of detail sufficient for an adequate analysis of environmental effects. Except for a supplement to a generic environmental impact statement (see section 617.15 of this Part), a supplement to a draft or final EIS will only be required in the circumstances prescribed in section 617.8(g) of this Part.

(l) Agencies shall carry out the terms and requirements of this Part with minimum procedural and administrative delay, shall avoid unnecessary duplication of reporting and review requirements by providing, where feasible, for combined or consolidated proceedings, and shall expedite all SEQR proceedings in the interest of prompt review.

(m) Time periods in this Part may be extended by mutual agreement between an applicant and the lead agency, with notice to all other involved agencies by the lead agency.

617.4 INDIVIDUAL AGENCY PROCEDURES TO IMPLEMENT SEQR.

(a) Article 8 of the Environmental Conservation Law requires all agencies to adopt and publish, after public hearing, any additional procedures which may be necessary for them to implement SEQR. Until an agency adopts these additional procedures, its implementation of SEQR shall be governed by the provisions of this Part. If an agency rescinds its additional SEQR procedures, it shall continue to be governed by this Part. The agency shall promptly notify the commissioner, and the commissioner shall publish a notice in the "Environmental Notice Bulletin" ("ENB"), of the adoption of additional procedures or the rescission of agency SEQR procedures.

(b) To the greatest extent possible, the procedures prescribed in this Part shall be incorporated into existing agency procedures. An agency may by local law, code, ordinance, executive order, resolution or regulation vary the time periods established in this Part for the preparation and review of SEQR documents and for the conduct of public hearings in order to coordinate the SEQR environmental review process with other procedures relating to the review and approval of actions. Such time changes shall not impose unreasonable delay. Individual agency procedures to implement SEQR shall be no less protective of environmental values, public participation and agency and judicial review than the procedures contained in this Part. This Part shall supersede any SEQR provisions promulgated or enacted by an agency which are less protective of the environment.

(c) Agencies may find it helpful to seek the advice and assistance of other agencies, groups and persons on SEQR matters, including the following:

(1) advice on preparation and review of EAF's;

(2) recommendations on the significance or non-significance of actions;

(3) preparation and review of EIS's and recommendations on the scope, adequacy, and contents of EIS's;

(4) preparation and filing of SEQR notices and documents;

(5) conduct of public hearings; and

(6) recommendations to decisionmakers.

(d) Agencies are strongly encouraged to enter into cooperative agreements with other agencies regularly involved in carrying out or approving the same actions for the purposes of coordinating their procedures.

(e) All agencies are subject to the lists of Type I and Type II actions contained in this Part, and must apply the criteria provided in section 617.11 of this Part. In addition, agencies may adopt their own lists of Type I actions, in accordance with section 617.12 of this Part and their own lists of Type II actions in accordance with section 617.13 of this Part. They may also develop criteria in addition to those listed in section 617.11 of this Part for determining the significance and non-significance of actions.

(f) Every agency which adopts, has adopted or amends SEQR procedures must, after public hearing, file them with the commissioner, who shall maintain them to serve as a resource service for agencies and interested persons. The commissioner shall provide notice in the "ENB" of such procedures upon receipt. All agencies that have promulgated their own SEQR procedures shall review and bring them into conformance with this Part. Until agencies do so, their procedures, where inconsistent or less protective, shall be superseded by this Part.

(g) Upon request, the commissioner shall review individual items in an agency's Type II list to determine whether they meet the criteria for Type II actions contained in section 617.13 of this Part.

(h) A local agency may designate a specific geographic area within its boundaries as a critical environmental area (CEA). A State agency may also designate as a CEA a specific geographic area which is owned or managed by the State or is under its regulatory authority. Designation of a CEA must be preceded by written public notice and a public hearing. Any Unlisted action located in a CEA must be treated as a Type I action by any involved agency.

(1) To be designated as a CEA, an area must have an exceptional or unique character covering one or more of the following:

(i) a benefit or threat to human health;

(ii) a natural setting (e.g., fish and wildlife habitat, forest and vegetation, open space and areas of important aesthetic or scenic quality);

(iii) social, cultural, historic, archaeological, recreational, or educational values; or

(iv) an inherent ecological, geological or hydrological sensitivity to change which may be adversely affected by any change.

(2) Notification that an area has been designated as a CEA must be filed with:

(i) the commissioner;

(ii) the appropriate regional office of the Department; and

(iii) any other agency regularly involved in approving, undertaking or funding actions in the municipality in which the area has been designated.

(3) This designation shall take effect 30 days after such filing. The filing must contain a map at an appropriate scale to readily locate the boundaries of the CEA. Each designation of a CEA shall be published in the ENB by the Department and the Department shall serve as a clearinghouse for information on CEA's.

617.5 INITIAL REVIEW OF ACTIONS.

(a) As early as possible in an agency's formulation of an action it proposes to undertake, or as soon as an agency receives an application for a funding or approval action, it shall do the following:

(1) Determine whether the action is subject to SEQR. If the action is an exempt, an excluded, or a Type II action, the agency shall have no further responsibilities under this Part.

(2) Determine whether the action involves a Federal agency. If the action involves a Federal agency, the provisions of section 617.16 of this Part shall apply.

(3) Determine whether the action may involve one or more other agencies.

(4) Make a preliminary classification of an action as Type I or Unlisted, using the information available and comparing it with the thresholds set forth in section 617.12 of this Part. Such preliminary classification will assist in determining whether a full EAF and coordinated review is necessary.

(5) For all actions subject to SEQR, determine whether a full or short EAF will be required.

(b) For Type I actions, a full EAF (see section 617.21, Appendix A, of this Part) must be used to determine the significance of such actions that are funded, approved, or directly undertaken by an agency unless a draft EIS has been prepared on the action. The project sponsor must complete Part 1 of the full EAF, including a list of all other involved agencies which the project sponsor has been able to identify, exercising all due diligence. The lead agency is responsible for preparing Part 2 and, as needed, Part 3.

(c) For Unlisted actions, the short EAF (see section 617.21, Appendix C, of this Part) must be used to determine the significance of such actions that are funded, approved or directly undertaken by an agency. However, an agency may instead use the full EAF for Unlisted actions if the short EAF would not provide the lead agency with sufficient information on which to base its determination of significance. The lead agency may require other information necessary to determine significance.

(d) For state agencies only, determine whether the action is located in the coastal area. If the action is either Type I or Unlisted and is in the coastal area, the provisions of 19 NYCRR 600 also apply. This provision applies to all state agencies, whether acting as a lead or involved agency.

617.6 ESTABLISHMENT OF LEAD AGENCY AND DETERMINATION OF SIGNIFICANCE

(a) Lead agency procedures when a single agency is involved:

(1) An agency will be the lead agency when it proposes to undertake or receives an application for funding or approval of a Type I or Unlisted action that does not involve another agency.

(i) If the agency is directly undertaking the action, it shall determine the significance of the action as early as possible in the design or formulation of the action.

(ii) If the agency has received an application for funding or approval of the action, it shall determine the significance of the action within 20 calendar days of its receipt of the application, an

EAF, or any additional information reasonably necessary to make that determination.

(b) Lead agency procedures when more than one agency is involved:

(1) For all Type I actions and for coordinated review of Unlisted actions involving more than one agency, a lead agency must be established prior to a determination of significance. For Unlisted actions where there will be no coordinated review, the procedures in section 617.6(d) of this Part must be followed.

(2) When an agency has been established as the lead agency for an action involving an applicant and has determined that an EIS is required, it must, in accordance with section 617.10(b) of this Part, promptly notify the applicant and all other involved agencies, in writing, that it is the lead agency and that an EIS is required.

(3) The lead agency shall continue in that role until either a negative declaration is filed, a findings statement is filed, or a lead agency is re-established in accordance with section 617.6(f) of this Part.

(c) Time periods for coordinated review:

(1) When an agency proposes to directly undertake or receives an application for funding or approval for a Type I action or an Unlisted action undergoing coordinated review in which other agencies are involved, it shall, as soon as possible, mail the EAF, with Part I completed by the project sponsor, or a draft EIS and a copy of any application it has received to all involved agencies notifying them that a lead agency must be agreed upon within 30 calendar days of the date the EAF or draft EIS was mailed to them.

(2) The lead agency shall determine the significance of the action within 20 calendar days of its establishment as lead agency, or within 20 calendar days of its receipt of all information it may reasonably need to make the determination of significance, whichever occurs later, and shall immediately file the determination in accordance with section 617.10 of this Part.

(d) Uncoordinated review for Unlisted actions involving more than one agency:

(1) As early as possible in the formulation of plans for an Unlisted action, and before any authorization is granted which commits an

agency to a particular action, or within 20 calendar days of its receipt of an application and an EAF, and other reasonably necessary information, an agency shall make a determination of significance.

(2) When an agency determines that an Unlisted action may have a significant effect on the environment, coordinated review and notification in accordance with subdivisions (b) and (c) of this section is required.

(3) When an agency determines that an Unlisted action will not have a significant effect on the environment, the coordinated review and notification procedures set forth in subdivisions (b) and (c) of this section are optional. For uncoordinated review of Unlisted actions, each involved agency must make its own determination of significance. Each involved agency is considered a lead agency when making its determination. At any time prior to an agency's final decision, that agency's negative declaration may be superseded by a positive declaration issued by any other involved agency.

(e) Actions for which lead agency cannot be agreed upon:

(1) If, within the 30 calendar days allotted for establishment of lead agency, the involved agencies are unable to agree upon which agency shall be the lead agency, any involved agency or the applicant may request, by certified mail or other form of receipted delivery to the commissioner, that a lead agency be designated. Simultaneously, copies of the request must be sent by certified mail or other form of receipted delivery to all involved agencies and the applicant. Any agency raising a dispute must be ready to assume the lead agency functions if such agency is designated by the commissioner.

(2) The request must identify each involved agency's jurisdiction over the action, and all relevant information necessary for the commissioner to apply the criteria in paragraph (5) of this subdivision, and must state that all comments must be submitted to the commissioner within 10 calendar days after receipt of the request.

(3) Within 10 calendar days of the date a copy of the request is received by them, involved agencies and the applicant may submit to the commissioner any comments they may have on the issue. Such comments must contain the information indicated in paragraph (2) of this subdivision.

(4) The commissioner shall designate a lead agency within 20 calendar days of the date the request is received, or within 20 calendar days of the receipt of any supplemental information the commissioner has required, based on a review of the facts, the criteria below, and any comments received.

(5) The following criteria, in order of importance, shall be used by the commissioner to designate lead agency:

(i) whether the anticipated impacts of the action being considered are primarily of statewide, regional, or local significance, (i.e., if such impacts are of primarily local significance, all other considerations being equal, the local agency involved shall be lead agency);

(ii) which agency has the broadest governmental powers for investigation of the impact of the proposed action; and

(iii) which agency has the greatest capability for providing the most thorough environmental assessment of the proposed action.

(6) Notification of the commissioner's designation of lead agency shall be mailed to all involved agencies and the applicant.

(f) Re-establishment of lead agency:

(1) Re-establishment of lead agency may occur by agreement of all involved agencies in the following circumstances:

(i) for a supplement to a final EIS or generic EIS;

(ii) upon failure of the lead agency's basis of jurisdiction;

(iii) upon agreement of the applicant, prior to the acceptance of a draft EIS.

(2) Disputes concerning re-establishment of lead agency for a supplement to a final EIS or generic EIS are subject to the designation procedures contained in section 617.6(e) of this Part.

(3) Notice of re-establishment of lead agency must be given by the new lead agency to the applicant within 10 days of its establishment.

(g) Determining significance:

(1) The lead agency must determine the significance of any Type I or Unlisted action in writing in accordance with this section and section 617.11 of this Part.

(i) To require an EIS for a proposed action, the lead agency must determine that the action may include the potential for at least one significant environmental effect.

(ii) To determine that an EIS will not be required for an action, the lead agency must determine either that there will be no environmental effect or that the identified environmental effects will not be significant.

(2) For all Type I and Unlisted actions the lead agency making a determination of significance must:

(i) consider the action as defined in sections 617.2(b) and 617.3(k) of this Part;

(ii) review the EAF, the criteria contained in section 617.11 of this Part and any other supporting information to identify the relevant areas of environmental concern;

(iii) thoroughly analyze the identified relevant areas of environmental concern to determine if the action may have a significant effect on the environment; and

(iv) set forth its determination of significance in a written form containing a reasoned elaboration and providing reference to any supporting documentation.

(h) Conditioned negative declarations:

(1) For Unlisted actions involving an applicant, a lead agency has the option to issue a conditioned negative declaration of significance (CND) provided that:

(i) a full EAF has been prepared;

(ii) a coordinated review has been completed in accordance with section 617.6(b) of this Part;

(iii) the SEQR conditions imposed pursuant to section 617.3(b) of this Part have eliminated or adequately mitigated all significant environmental impacts and are supported by the full EAF and any other documentation;

(iv) notice of a CND has been published in the "ENB" and a minimum 30-day public comment period has been provided. The notice must state what conditions have been imposed. An agency may also use its own public notice and review procedures, provided the notice states that

a CND has been issued, states what conditions have been imposed and allows for a minimum 30-day public comment period; and

(v) the CND has been prepared and filed in accordance with sections 617.6(g) and 617.10(a)(2) of this Part.

(2) A draft EIS must be prepared if comments are received regarding the proposed CND which would support a positive declaration concerning:

(i) the previously identified or newly raised significant environmental impacts; or

(ii) the need for the examination of the adequacy of the proposed mitigation measures.

(3) The lead agency must require an EIS if requested by the applicant.

(i) Rescission of Negative Declarations:

At any time prior to its decision to undertake, fund or approve an action, a lead agency must rescind a negative declaration if it determines that a significant environmental effect may result from a project modification or that there exists a change of circumstances which was not previously addressed. Prior to any rescission, the lead agency must inform other involved agencies and the applicant and must provide a reasonable opportunity for the applicant to respond.

617.7 SCOPING.

(a) Formal scoping is optional. It may occur either at the initiation of the lead agency or at the request of the applicant, prior to the acceptance of a draft EIS. If the action involves an applicant, either a written scope of issues to be addressed in the draft EIS must be provided by the lead agency to the applicant and all involved agencies, within 30 calendar days following the filing of the positive declaration, or an applicant may initiate the process by providing the lead agency with a draft scope of issues. Scoping may be accomplished through meeting(s), exchanges of written material, or other methods that will allow the lead agency, the applicant, and involved agencies to agree upon a written scope of issues in a timely manner. In the event that the lead agency fails to provide a written scope of issues within 30

calendar days following the filing of a positive declaration, the applicant may submit a draft EIS.

(b) Involved agencies should provide input for the scoping statement reflecting their agency's concerns, permit jurisdictions and information needs sufficient to make their respective SEQR findings. Failure of an involved agency to participate in the scoping process will not delay completion of the written scope of issues. At the discretion of the lead agency, other interested agencies and the public may be invited to participate in the scoping process. The lead agency's methods for obtaining scoping information should reflect the complexity of the project, the degree of public concern and the significance of the environmental impacts.

(c) When scoping occurs, the lead agency shall try to identify each relevant issue during the scoping process and provide the preparer of the EIS with the greatest possible specificity so that the environmental review process may proceed in an efficient manner. If the lead agency later determines that issues not included within the scoping document should be included in the EIS, it must provide the applicant and the involved agencies with a written statement explaining the need for additional analysis.

(d) Scoping should identify the extent and quality of information needed for the preparer to properly address each concern. Scoping may also be used to determine which issues are not relevant for further consideration or have been covered by prior environmental review. Scoping should also identify the reasonable alternatives to the proposed action.

(e) The lead agency may utilize the Scoping Checklist in section 617.21, Appendix D, of this Part and may modify the checklist as needed to adequately assess potential environmental impacts.

617.8 ENVIRONMENTAL IMPACT STATEMENT PROCEDURES.

(a) The applicant or the lead agency, at the applicant's option, shall prepare the draft EIS. If the applicant does not exercise the option to prepare the draft EIS, the lead agency shall prepare it, cause it to be prepared, or terminate its review of the action. A fee may be

charged by the lead agency for preparation or review of an EIS pursuant to section 617.17 of this Part.

(b) When the applicant prepares the draft EIS:

(1) it shall be submitted to the lead agency which, using the written scope of issues, if any, and the standards contained in section 617.14 of this Part, shall determine within 30 days of receipt of the draft EIS, whether to accept it as satisfactory with respect to its scope, content and adequacy for the purpose of commencing public review.

(2) Upon written notice to the applicant, a lead agency may have one additional 30-day period to determine the adequacy of the draft EIS.

(3) If the draft EIS is determined to be inadequate, the lead agency must identify in writing the deficiencies and provide this information to the applicant.

(4) The lead agency must determine whether to accept the resubmitted draft EIS within 30 days of its receipt.

(c) When the lead agency has completed a draft EIS or when it has determined that a draft EIS prepared by an applicant is adequate for public review, the lead agency shall file a notice of completion of the draft EIS and a copy of the draft EIS in accordance with the requirements set forth in section 617.10(c) and (d) of this Part. Agencies shall provide a public comment period on the draft EIS, to be not less than 30 calendar days from the first filing and circulation of the notice of completion.

(d) When the lead agency has completed a draft EIS or when it has determined that a draft EIS prepared by an applicant is adequate for public review, the lead agency shall determine whether or not to conduct a public hearing concerning the action. In determining whether or not to hold a SEQR hearing, the lead agency shall consider: the degree of interest in the action shown by the public or involved agencies; whether substantive or significant environmental issues have been raised; the adequacy of the mitigation measures proposed and the consideration of alternatives; and the extent to which a public hearing can aid the agency decisionmaking processes by providing a forum for, or an efficient mechanism for the collection of, public comment. If a hearing is to be held:

(1) the lead agency shall file a notice in accordance with section 617.10(e) of this Part. Such notice may be contained in the notice of completion of the draft EIS. The notice of hearing must be published, at least 14 calendar days in advance of the public hearing, in a newspaper of general circulation in the area of the potential impacts and effects of the action;

(2) the hearing shall commence no less than 15 calendar days or no more than 60 calendar days after the filing of the notice of completion of the draft EIS by the lead agency pursuant to section 617.10(c) of this Part. When a SEQR hearing is to be held, it should be conducted with other public hearings on the proposed action, whenever practicable; and

(3) comments will be received and considered by the lead agency for no less than 30 calendar days from the first filing and circulation of notice of completion, or no less than 10 calendar days following a public hearing at which the environmental impacts of the proposed action are considered, whichever is later.

(e) Except as provided in paragraphs (1) and (2) of this subdivision, the lead agency shall prepare or cause to be prepared and shall file a final EIS, within 45 calendar days after the close of any hearing or within 60 calendar days after the filing of the draft EIS, whichever last occurs.

(1) No final EIS need be prepared if:

(i) the proposed action has been withdrawn or;

(ii) on the basis of the draft EIS, and comments made thereon, the lead agency has determined that the action will not have a significant effect on the environment. A negative declaration must then be prepared and filed in accordance with this Part.

(2) The last date for preparation and filing of the final EIS may be extended:

(i) where it is determined that additional time is necessary to prepare the statement adequately; or

(ii) where problems with the proposed action requiring material reconsideration or modification have been identified.

(f) Notice of completion of the final EIS and copies of the final EIS shall be filed in accordance with section 617.10(f) and (g) of this Part.

(g) Supplemental EIS's

(1) Prior to the filing of a findings statement, the lead agency may require a supplemental EIS, limited to specific issues not addressed or inadequately addressed in the EIS, in the following circumstances:

(i) changes are proposed for the project which may result in a significant adverse environmental effect; or

(ii) newly discovered information arises about significant adverse effects which was not previously addressed; or

(iii) a change in circumstances arises which may result in a significant adverse environmental effect.

(2) The decision to require preparation of a supplemental EIS, in the case of newly discovered information, shall be based upon the following criteria:

(i) the importance and relevance of the information;

(ii) its probable accuracy; and

(iii) the present state of the information in the EIS.

(3) If a supplement is required, it will be subject to the full procedures of this Part.

617.9 DECISION-MAKING AND FINDINGS REQUIREMENTS.

(a) Prior to the lead agency's decision on an action which has been the subject of a final EIS, it shall afford agencies and the public a reasonable time period (not less than 10 calendar days) in which to consider the final EIS.

(b) In the case of an action involving an applicant, the lead agency's filing of a written findings statement and decision on whether or not to approve or fund an action which has been the subject of a final EIS shall be made within 30 calendar days after the filing of the final EIS.

(c) No involved agency shall make a final decision to commence, engage in, fund, or approve an action that has been the subject of a final EIS, either under SEQR or the National Environmental Policy Act (NEPA), until the time period provided in subdivision (a) has passed and the agency has made and filed, in accordance with section 617.10(i) of

this Part, a written finding that:

(1) the agency has given consideration to the final EIS;

(2) the requirements of this Part have been met;

(3) consistent with social, economic and other essential considerations from among the reasonable alternatives thereto, the action to be carried out, funded or approved is one which minimizes or avoids adverse environmental effects to the maximum extent practicable; including the effects disclosed in the relevant environmental impact statement;

(4) consistent with social, economic and other essential considerations, to the maximum extent practicable, adverse environmental effects revealed in the environmental impact statement process will be minimized or avoided by incorporating as conditions to the decision those mitigative measures which were identified as practicable; and

(5) contains the facts and conclusions in the EIS relied upon to support its decision and indicates the social, economic and other factors and standards which formed the basis of its decision.

(d) No agency shall make a decision to disapprove an action which has been the subject of a final EIS until it has prepared a written findings statement in accordance with this section, of the facts and conclusions in the draft and final EIS relied on to support its decision. Such statement shall be filed in accordance with section 617.10(i) of this Part.

(e) State agency actions in the coastal area must be consistent with the applicable policies of article 42 of the Executive Law, as implemented by 19 NYCRR 600.5. No state agency shall make a final decision on an action in the coastal area which has been the subject of a final EIS until it has made a written finding that it is consistent with applicable policies set forth in 19 NYCRR 600.5. When the Secretary of State has approved a local government waterfront revitalization program, no state agency shall make a final decision on an action which is likely to affect the achievement of the policies and purposes of such program, until it has made a written finding that it is consistent to the maximum extent practicable with that program.

617.10 NOTICE AND FILING REQUIREMENTS.

The following SEQR documents shall be prepared, filed, published and made available as prescribed in this section.

(a) "Negative declarations".

(1) "Unlisted actions". Agencies must maintain a file readily accessible to the public containing the negative declaration or conditioned negative declaration. Conditioned negative declarations shall be filed in accordance with Type I procedures.

(2) "Type I actions". Agencies must maintain a file, readily accessible to the public, of all negative declarations for Type I actions. The negative declaration for a Type I action must state that it has been prepared in accordance with Article 8 of the Environmental Conservation Law and must contain: the name and address of the lead agency; the name and telephone number of a person who can provide further information; the location of the action; and the determination and documentation required by section 617.6(g) of this Part. Notice of all negative declarations for Type I actions shall be published in the "ENB" in a manner prescribed by the Department. Agencies may provide for filing of these determinations with agencies which may be affected by the action, and provide for public notice by posting on sign boards, or by other appropriate means. The negative declaration must be filed simultaneously as follows:

(i) with the commissioner at 50 Wolf Road, Albany, New York 12233-0001 for publication in the "ENB";

(ii) with the appropriate regional office of the department;

(iii) with the chief executive officer of the political subdivision in which the action will be principally located;

(iv) in the main office and appropriate regional office, if any, of the lead agency;

(v) if the action involves an applicant, with the applicant;

(vi) if other agencies are involved in approval of the

action, with each other agency.

(3) For both Type I and Unlisted actions, notice of the filing of a negative declaration must be incorporated into any other subsequent notice otherwise required by law. This requirement could be satisfied by indicating the SEQR classification of the action and the agency's determination of significance.

(b) "Positive declarations". Positive declarations for all Type I and Unlisted actions must be prepared, filed, published and made available in accordance with this subdivision. The positive declaration must state that it has been prepared in accordance with Article 8 of the Environmental Conservation Law and contains: the name and address of the lead agency; the name and telephone number of a person who can provide further information; the location of the action; and a brief description of the possible significant environmental effects that have been identified and the reasons supporting the determination. Agencies must maintain a file of the facts, written analyses and conclusions leading to their determinations. The positive declaration shall be filed in the same manner as prescribed for negative declarations in paragraph (a)(2) of this section. Notice of the positive declaration shall be published in the "ENB" in a manner prescribed by the Department.

(c) "Notices of completion of draft EIS's". Whenever a lead agency has determined that a draft EIS is adequate for public review, it shall prepare and file a notice of completion. The notice shall state the name and address of the lead agency and the name and telephone number of a person who can provide further information. The notice must also contain the following:

(1) a brief and precise description of the action covered by the statement, its location and the nature of its potential environmental impacts and effects;

(2) a statement indicating where and how copies of the draft EIS can be obtained from the lead agency; and

(3) a statement that comments are requested and will be received and considered by the agency at a given address for a stated period (not less than 30 calendar days from the first filing and circulation of the notice of completion, or not less than 10 calendar days following a public hearing at which the environmental impacts of the proposed action are considered, whichever is later).

The notice of completion shall be filed as prescribed for negative declarations in paragraph (a)(2) of this section. The department shall publish all notices of completion of all draft EIS's in the "ENB".

(d) "Draft EIS's". The draft EIS, with any appendices, together with the notice of its completion, shall be filed and made available for copying as follows:

(1) one copy with the commissioner at 50 Wolf Road, Albany, New York 12233-0001;

(2) one copy with the appropriate regional office of the department;

(3) one copy with the chief executive officer of the political subdivision in which the action will be principally located;

(4) if other agencies are involved in the approval of the action, one copy with each such agency;

(5) one copy with persons requesting it. The lead agency may charge a fee to persons requesting the statement to cover its copying costs. Where sufficient copies of a statement are not available to meet public interest, the lead agency may provide an additional copy to the local public library; and

(6) for State agency actions in the coastal area, one copy with the Secretary of State.

(e) "Notices of hearing". A notice of hearing, if the lead agency determines that one is to be held, shall be prepared by the lead agency. It shall specify the time, place and purpose of the hearing, and shall contain a summary of the information contained in the notice of completion of the draft EIS. The notice of hearing shall be filed, published, and made available, as prescribed in paragraph (a)(2) of this section. A notice of hearing may be given in the notice of completion of the draft EIS and shall be published, at least 14 calendar days in advance of the hearing date, in a newspaper of general circulation in the area of the potential impacts and effects of the action.

(f) "Notices of completion of final EIS's". When a lead agency has determined that a final EIS is complete, it shall prepare and file a notice of completion. The notice shall state the name and address of the lead agency and shall contain the items prescribed in paragraphs (c)(1)

and (2) of this section. The notice of completion shall be filed as prescribed in paragraph (a)(2) of this section. The Department shall publish all notices of completion of all final EIS's in the "ENB".

(g) "Final EIS's". The final EIS, together with the notice of its completion, shall be filed in the same manner as a draft EIS.

(h) Each agency subject to this part shall retain copies of required notices, accepted draft EIS's, final EIS's and findings statements in files which are readily accessible for public inspection.

(i) SEQR findings statements made pursuant to section 617.9 of this Part must be filed with all involved agencies and the applicant at the time they are adopted.

617.11 CRITERIA FOR DETERMINING SIGNIFICANCE.

(a) To determine whether a proposed Type I or Unlisted action may have a significant effect on the environment, the impacts which may be reasonably expected to result from the proposed action must be compared against the criteria in this section. Agencies may also develop criteria in addition to those listed in this section to assist them in determining significance. Such criteria must be adopted in accordance with the procedures in section 617.4 of this Part. The following list is illustrative, not exhaustive. These criteria are considered indicators of significant effects on the environment:

(1) a substantial adverse change in existing air quality, ground or surface water quality or quantity, traffic or noise levels; a substantial increase in solid waste production; a substantial increase in potential for erosion, flooding, leaching or drainage problems;

(2) the removal or destruction of large quantities of vegetation or fauna; substantial interference with the movement of any resident or migratory fish or wildlife species; impacts on a significant habitat area; substantial adverse effects on a threatened or endangered species of animal or plant, or the habitat of such a species; or other significant adverse effects to natural resources;

(3) the encouraging or attracting of a large number of people to a place or places for more than a few days, compared to the number of people who would come to such place absent the action;

(4) the creation of a material conflict with a community's current plans or goals as officially approved or adopted;

(5) the impairment of the character or quality of important historical, archeological, architectural, or aesthetic resources or of existing community or neighborhood character;

(6) a major change in the use of either the quantity or type of energy;

(7) the creation of a hazard to human health;

(8) a substantial change in the use, or intensity of use, of land including agricultural, open space or recreational resources, or in its capacity to support existing uses;

(9) the creation of a material demand for other actions which would result in one of the above consequences;

(10) changes in two or more elements of the environment, no one of which has a significant effect on the environment, but when considered together result in a substantial adverse impact on the environment; or

(11) two or more related actions undertaken, funded or approved by an agency, none of which has or would have a significant effect on the environment, but when considered cumulatively, would meet one or more of the criteria in this section.

(b) For the purpose of determining whether an action will cause one of the foregoing consequences, the lead agency must consider reasonably related long-term, short-term and cumulative effects, including other simultaneous or subsequent actions which are:

(1) included in any long-range plan of which the action under consideration is a part;

(2) likely to be undertaken as a result thereof; or

(3) dependent thereon.

(c) The significance of a likely consequence, (i.e., whether it is material, substantial, large or important) should be assessed in connection with:

(1) its setting (e.g., urban or rural);

(2) its probability of occurence;

(3) its duration;

(4) its irreversibility;

(5) its geographic scope;

(6) its magnitude; and

(7) the number of people affected.

617.12 TYPE I ACTIONS.

(a) The purpose of the list of Type I actions in this section is to identify, for agencies, project sponsors and the public, those actions and projects that are more likely to require the preparation of an EIS than Unlisted actions. All agencies are subject to this Type I list.

(1) This Type I list is not exhaustive of those actions that an agency determines may have a significant effect on the environment and require the preparation of an EIS. However, the fact that an action or project has been listed as a Type I action carries with it the presumption that it is likely to have a significant effect on the environment and may require an EIS. For all individual actions which are Type I, the determination of significance must be made by comparing the impacts which may be reasonably expected to result from the proposed action with the criteria listed in section 617.11 of this Part.

(2) Agencies may adopt their own lists of additional Type I actions, may adjust the thresholds to make them more inclusive, and may continue to use previously adopted lists of Type I actions to complement those contained in this section. Designation of a Type I action by one involved agency requires coordinated review by all involved agencies. An agency may not designate as Type I any action defined as Type II in section 617.13 of this Part.

(b) The following actions are Type 1 if they are to be directly undertaken, funded, or approved by an agency:

(1) the adoption of a municipality's land use plan, the adoption by any agency of a comprehensive resource management plan or the initial adoption of a municipality's comprehensive zoning regulations;

(2) the adoption of changes in the allowable uses within any zoning district, affecting 25 or more acres;

(3) the granting of a zoning change, at the request of an applicant, for an action that meets or exceeds one or more of the

thresholds given elsewhere in this list;

(4) the acquisition, sale, lease, annexation or other transfer of 100 or more contiguous acres of land by a State or local agency;

(5) construction of new residential units which meet or exceed the following thresholds:

(i) 10 units in municipalities which have not adopted zoning or subdivision regulations;

(ii) 50 units not to be connected (at commencement of habitation) to existing community or public water and sewerage systems including sewage treatment works;

(iii) in a city, town or village having a population of less than 150,000: 250 units to be connected (at the commencement of habitation) to existing community or public water and sewerage systems including sewage treatment works;

(iv) in a city, town or village having a population of greater than 150,000 but less than 1,000,000: 1,000 units to be connected (at the commencement of habitation) to existing community or public water and sewerage systems including sewage treatment works; or

(v) in a city or town having a population of greater than 1,000,000: 2,500 units to be connected (at the commencement of habitation) to existing community public water and sewerage systems including sewage treatment works;

(6) activities, other than the construction of residential facilities, which meet or exceed any of the following thresholds; or the expansion of existing nonresidential facilities by more than 50 percent of any of the following thresholds:

(i) a project or action which involves the physical alteration of 10 acres;

(ii) a project or action which would use ground or surface water in excess of 2,000,000 gallons per day;

(iii) parking for 1,000 vehicles;

(iv) in a city, town or village having a population of 150,000 persons or less: a facility with more than 100,000 square feet of gross floor area;

(v) in a city, town or village having a population of

more than 150,000 persons: a facility with more than 240,000 square feet of gross floor area;

(7) any structure exceeding 100 feet above original ground level in a locality without any zoning regulation pertaining to height;

(8) any non-agricultural use occuring wholly or partially within an agricultural district (certified pursuant to Agriculture and Markets Law, article 25, section 303 and 304) which exceeds 25 percent of any threshold established in this section;

(9) any Unlisted action (unless the action is designed for the preservation of the facility or site) occurring wholly or partially within, or substantially contiguous to, any historic building, structure, facility, site or district or prehistoric site that is listed on the National Register of Historic Places, or that has been proposed by the New York State Board on Historic Preservation for a recommendation to the State Historic Preservation Officer for nomination for inclusion in said National Register, or that is listed on the State Register of Historic Places (The National Register of Historic Places is established by 36 Code of Federal Regulation (C.F.R.) Parts 60 and 63, 1986 (see section 617.19 of this Part).);

(10) any Unlisted action, which exceeds 25 percent of any threshold in this section, occurring wholly or partially within or substantially contiguous to any publicly owned or operated parkland, recreation area or designated open space, including any site on the Register of National Natural Landmarks pursuant to 36 C.F.R. Part 62, 1986 (see section 617.19 of this Part);

(11) any Unlisted action which exceeds a Type I threshold established by an involved agency pursuant to section 617.4 of this Part; or

(12) any Unlisted action which takes place wholly or partially within or substantially contiguous to any critical environmental area designated by a local or state agency pursuant to section 617.4(h) of this Part.

617.13 TYPE II ACTIONS.

(a) Actions or classes of actions which have been determined not to have a significant effect on the environment are classified as Type II

actions, and do not require environmental impact statements or any other determination or procedure under this Part. All agencies are subject to the Type II actions contained in this section. No agency is bound by a Type II action on another agency's list. An agency that lists an action as Type II is not an involved agency.

(b) Each agency may adopt its own Type II list provided that it finds that each of the actions:

(1) is no less protective of the environment than the actions listed in this section; and

(2) will, in no case, have a significant effect on the environment based on the criteria contained in section 617.11 of this Part and any additional criteria contained in its procedures adopted pursuant to section 617.4 of this Part.

(c) No agency may designate as Type II any Type I action as defined in section 617.12 of this Part.

(d) The following actions are Type II actions:

(1) replacement of a facility, in kind, on the same site unless such facility meets or exceeds any of the thresholds in section 617.12 of this Part;

(2) the granting of individual setback and lot line variances;

(3) agricultural farm management practices, including construction, maintenance and repair of farm buildings and structures, and land use changes consistent with generally accepted principles of farming;

(4) repaving of existing highways not involving the addition of new travel lanes;

(5) street openings for the purpose of repair or maintenance of existing utility facilities;

(6) installation of traffic control devices on existing streets, roads, and highways;

(7) public or private forest management practices, other than the removal of trees or the application of herbicides or pesticides;

(8) construction or placement of minor structures accessory or appurtenant to existing facilities, including garages, carports, patios, home swimming pools, fences, barns or other buildings not changing land use or density, including upgrading of buildings to meet building or fire codes;

(9) maintenance of existing landscaping or natural growth;

(10) mapping of existing roads, streets, highways, uses and ownership patterns;

(11) inspections and licensing activities relating to the qualifications of individuals or businesses to engage in their business or profession;

(12) purchase or sale of furnishings, equipment or supplies, including surplus government property, other than land, radioactive material, pesticides, herbicides, or other hazardous materials;

(13) collective bargaining activities;

(14) investments by or on behalf of agencies or pension or retirement systems, or refinancing existing debt;

(15) routine or continuing agency administration and management, not including new programs or major reordering of priorities;

(16) license, lease and permit renewals, or transfers of ownership thereof, where there will be no material change in permit conditions or the scope of permitted activities;

(17) routine activities of educational institutions not involving capital construction, including school closings, but not changes in use related to such closings;

(18) information collection including basic data collection and research, water quality and pollution studies, traffic counts, engineering studies, surveys, subsurficial investigations and soils studies that do not commit the agency to undertake, fund or approve any Type I or Unlisted action;

(19) minor temporary uses of land having negligible or no permanent effect on the environment;

(20) the extension of utility distribution facilities to serve new or altered single or two-family residential structures or to render service in approved subdivisions; and

(21) promulgation of regulations, policies, procedures and legislative decisions in connection with any Type II action in this Part.

617.14 PREPARATION AND CONTENT OF ENVIRONMENTAL IMPACT STATEMENTS.

(a) An EIS provides a means for agencies to give early consideration to environmental factors and facilitates the weighing of social, economic

and environmental issues in planning and decisionmaking. Therefore, the preparation of an EIS is to be integrated into existing agency review processes and should occur at the same time as other agency reviews are being undertaken. The EIS provides a means for project sponsors to systematically consider environmental effects along with other aspects of their project planning and design, and to identify and mitigate identified adverse environmental effects.

(b) An EIS should assemble relevant and material facts upon which an agency's decision is to be made, should identify the essential issues to be decided, and should evaluate all reasonable alternatives. EIS's shall be analytical and not encyclopedic. The lead agency and other involved agencies shall cooperate with applicants who are preparing EIS's by making available to them information contained in their files relevant to the EIS.

(c) EIS's shall be clearly and concisely written in plain language that can be read and understood by the public. Within the framework presented in subdivision (f) of this section, EIS's should address only those specific adverse or beneficial environmental impacts which can be reasonably anticipated and/or have been identified in the scoping process. EIS's should not contain more detail than is appropriate considering the nature and magnitude of the proposed action and the significance of its potential impacts. Highly technical material should be summarized and, if it must be included in its entirety, should be referenced in the statement and included in an appendix.

(d) All draft and final EIS's shall be preceded by a cover sheet stating:

(1) whether it is a draft or final EIS;

(2) the name or descriptive title of the action;

(3) the location (county and town, village or city) and street address, if applicable, of the action;

(4) the name and address of the agency which required its preparation, and the name and telephone number of a person at the agency who can provide further information;

(5) the names of individuals or organizations that prepared any portion of the statement;

(6) the date of its acceptance by the agency responsible for its preparation; and

(7) in the case of a draft EIS, the date by which comments must be submitted.

(e) A draft or final EIS shall have a table of contents following the cover sheet and a precise summary which adequately and accurately summarizes the statement.

(f) The body of all draft EIS's shall contain the following:

(1) a concise description of the proposed action, its purpose, public need and benefits, including social and economic considerations;

(2) a concise description of the environmental setting of the areas to be affected, sufficient to understand the effects of the proposed action and alternatives;

(3) a statement and evaluation of the environmental impacts of the proposed action, including the reasonably related short-and long-term effects, cumulative effects and other associated environmental effects;

(4) an identification and brief discussion of any adverse environmental impacts which cannot be avoided, or adequately mitigated if the proposed action is implemented;

(5) a description and evaluation of the range of reasonable alternatives to the action which are feasible, considering the objectives and capabilities of the project sponsor. The description and evaluation of each alternative should be at a level of detail sufficient to permit a comparative assessment of the alternatives discussed. The range of alternatives must include the no-action alternative and may include, as appropriate, alternative:

(i) sites;
(ii) technology;
(iii) scale or magnitude;
(iv) design;
(v) timing;
(vi) use; and
(vii) types of action.

For private applicants, any alternative for which no discretionary approvals are needed may be described. Site alternatives may be limited to

parcels owned by, or under option to, a private applicant;

(6) an identification of any irreversible and irretrievable commitments of resources which would be associated with the proposed action should it be implemented;

(7) a description of mitigation measures to minimize the adverse environmental impacts;

(8) a description of any growth-inducing aspects of the proposed action, if applicable and significant;

(9) a discussion of the effects of the proposed action on the use and conservation of energy, if applicable and significant;

(10) for State agency actions in the coastal area:

(i) when the action is not in an approved local waterfront revitalization program area, an identification of the applicable coastal policies of Executive Law, article 42 as contained in 19 NYCRR 600.5, and a discussion of the effects of the proposed action on, and their consistency with, such policies;

(ii) when the action is in an approved local waterfront revitalization program area and the action is one identified by the Secretary of State pursuant to section 916(1)(a) of the Executive Law, an identification of the applicable policies of the local program and a discussion of the effects of the proposed action on such policies; and

(11) a list of any underlying studies, reports and other information obtained and considered in preparing the statement.

(g) In addition to the analysis of significant adverse effects required in subdivision (f) of this section, if information about reasonably foreseeable catastrophic impacts to the environment is unavailable because the cost to obtain it is exhorbitant, or the means to obtain it are unknown, or there is uncertainty about its validity, and such information is essential to an agency's SEQR findings, the EIS must:

(1) identify the nature and relevance of unavailable or uncertain information;

(2) provide a summary of existing credible scientific evidence, if available; and

(3) assess the likelihood of occurrence, even if the probability of occurrence is low, and the consequences of the potential impact, using

theoretical approaches or research methods generally accepted in the scientific community.

This analysis would likely occur in the review of such actions as an oil supertanker port, a liquid propane gas/liquid natural gas facility, or the siting of a hazardous waste treatment facility. It should not apply in the review of such actions as shopping malls, residential subdivisions or office facilities.

(n) A draft or final EIS may incorporate by reference all or portions of other documents, including EIS's which contain information relevant to the statement. The referenced documents shall be made available for inspection by the public within the time period for public comment in the same places where the agency makes available copies of such statement. When a statement incorporates by reference, the referenced document shall be briefly described, its applicable findings summarized, and the date of its preparation provided.

(i) A final EIS must consist of: the draft EIS, including any revisions or supplements to it; copies or a summary of the substantive comments received and their source (whether or not the comments were received in the context of a hearing); and the lead agency's responses to all substantive comments. The draft EIS may be directly incorporated into the final EIS or may be incorporated by reference. The lead agency is responsible for the adequacy and accuracy of the final EIS, regardless of who prepares it. All revisions and supplements to the draft EIS shall be specifically indicated and identified as such in the final EIS.

617.15 GENERIC ENVIRONMENTAL IMPACT STATEMENTS.

(a) A generic EIS may be used to assess the environmental effects of:

(1) a number of separate actions in a given geographic area which, if considered singly may have minor effects, but if considered together may have significant effects; or

(2) a sequence of actions, contemplated by a single agency or individual; or

(3) separate actions having generic or common impacts; or

(4) an entire program or plan having wide application or

restricting the range of future alternative policies or projects.

(b) Generic EIS's and their findings should set forth specific conditions or criteria under which future actions will be undertaken or approved, and shall include procedures and criteria for supplements to reflect impacts, such as site specific impacts, which have not been adequately addressed or analyzed in the generic EIS. Such procedures shall include provision for public notice for supplements which allow for public comment on the new material presented by the supplement in the same manner as was provided in respect to the generic EIS. (See section 617.8(g) of this Part)

(c) When a final generic EIS has been filed under this part:

(1) No further SEQR compliance is required if a subsequent site specific action will be carried out in conformance with the conditions and thresholds established for such actions in the findings statement resulting from the generic EIS;

(2) A supplemental findings statement must be prepared if the subsequent proposed action was adequately addressed in the generic EIS but was not addressed or was not adequately addressed in the findings statement for the generic EIS;

(3) A supplement to the final generic EIS must be prepared if the subsequent proposed action was not addressed or was not adequately addressed in the generic EIS and the subsequent action involves one or more significant environmental effects; and

(4) A negative declaration must be prepared if a subsequent proposed action was not addressed or was not adequately addressed in the generic EIS and the subsequent action will not result in any significant environmental effects.

(d) Agencies may prepare generic EIS's on new, existing or significant changes to existing land use plans, development plans and zoning regulations so that individual actions carried out in conformance with these plans or regulations may require only supplemental EIS's as described in subdivisions (b) and (c) of this section.

Generic EIS's may be broader, and more general than site or project specific EIS's and should discuss the logic and rationale for the choices advanced. They may also include an assessment of specific impacts if such details are available.

They may be based on conceptual information in some cases. They may identify the important elements of the natural resource base as well as the existing and projected man-made features, patterns and character. They may discuss in general terms the constraints and consequences of any narrowing of future options. They may present and analyze in general terms a few hypothetical scenarios that could and are likely to occur.

(e) In connection with projects that are to be developed in phases or stages, agencies should address not only the site specific impacts of the individual project under consideration, but also, in more general or conceptual terms, the cumulative effects on the environment and the existing natural resource base of subsequent phases of a larger project or series of projects that may be developed in the future. In these cases, this part of the generic EIS shall discuss the important elements and constraints present in the natural and man-made environment that may bear on the conditions of an agency decision on the immediate project.

617.16 ACTIONS INVOLVING A FEDERAL AGENCY.

(a) When a draft and final EIS for an action has been duly prepared under the National Environmental Policy Act of 1969, an agency shall have no obligation to prepare an additional EIS under this Part, provided that the Federal EIS is sufficient to make findings under section 617.9 of this Part. However, except in the case of excluded, exempt or Type II actions, no agency may undertake or approve the action until the Federal final EIS has been completed and the agency has made the findings prescribed in section 617.9 of this Part.

(b) Where a finding of no significant impact (FNSI) or other written threshold determination that the action will not require a Federal impact statement has been prepared under the National Environmental Policy Act of 1969, the determination shall not automatically constitute compliance with SEQR. In such cases, agencies remain responsible for compliance with SEQR.

(c) In the case of an action involving a Federal agency for which either a Federal FNSI or a Federal draft and final EIS has been prepared, except where otherwise required by law, a final decision by a Federal agency shall not be controlling on any State or local agency decision on

the action, but may be considered by the agency.

617.17 FEES AND COSTS.

(a) When an action subject to this Part involves an applicant, the lead agency may charge a fee to the applicant in order to recover the actual costs of preparing or reviewing the draft EIS, provided such costs do not exceed the amounts allowed under subdivisions (b) through (d) of this section. An applicant may not be charged a separate fee for both the preparation and review of a draft EIS. Scoping shall be considered part of the draft EIS for purposes of determining a SEQR fee.

(b) For residential projects, the total project cost shall be calculated on the cost of the land plus the cost of all required site improvements, not including the cost of buildings and structures. In the case of such projects, the fee charged by an agency may not exceed two percent of the total project cost.

(c) For nonresidential construction projects, the total project cost shall be calculated on the cost of supplying utility service to the project, the cost of site preparation and the cost of labor and material as determined with reference to a current cost data publication in common usage. In the case of such projects the fee charged may not exceed one half of one percent of the total project cost.

(d) For projects involving the extraction of minerals, the total project cost shall be calculated on the cost of site preparation for mining. Site preparation cost shall mean cost of clearing and grubbing and removal of over-burden for the entire area to be mined plus the cost of utility services and construction of access roads. The fee charged by the agency may not exceed one half of one percent of the total project costs. For those costs to be incurred for phases occurring three or more years after issuance of a permit, the value of project cost shall be determined using a present value calculation.

(e) Where an applicant chooses not to prepare a draft EIS, the lead agency shall provide the applicant, upon request, with an estimate of the costs for preparing such statement calculated on the total cost of the project for which funding or approval is sought.

(f) "Appeals procedure". When a dispute arises concerning fees

charged to an applicant by a lead agency, the applicant may make a written request to the agency setting forth reasons why it is felt that such fees are inequitable. Upon receipt of a request the chief fiscal officer of the agency or his designee shall examine the agency record and prepare a written response to the applicant setting forth reasons why the applicant's claims are valid or invalid. Such appeal procedure shall not interfere with or cause delay in the EIS process or prohibit an action from being undertaken.

(g) The technical services of the department may be made available to other agencies on a fee basis, reflecting the costs thereof, and the fee charged to any applicant pursuant to this section may reflect such costs.

617.18 CONFIDENTIALITY.

When an applicant submits a completed EAF, draft or final EIS, or otherwise provides information concerning the environmental impacts of a proposed project, the applicant may request that specifically identified information be held confidential upon a showing by the applicant that such request for confidentiality is consistent with the Freedom of Information Law (FOIL), Article 6 of the Public Officers Law. Prior to divulging any such information, the agency must comply with the requirements of FOIL.

617.19. REFERENCED MATERIAL.

The following referenced documents have been filed with the New York State Department of State. The documents are available from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402 and for inspection and copying at the Department of Environmental Conservation, 50 Wolf Road, Albany, New York 12233-0001.

(a) National Register of Historic Places, (1986), 36 Code of Federal Regulation (C.F.R.) Parts 60 and 63.

(b) Register Of National Natural Landmarks, (1986), 36 Code of Federal Regulation (C.F.R.) Part 62.

617.20. EFFECTIVE DATE

This Part, as revised, applies to actions for which a determination of significance has not been made prior to June 1, 1987. Actions for which a determination of significance has been made prior to June 1, 1987 shall comply with Part 617 of 6 NYCRR, adopted September 1, 1978.

617.21. APPENDICES

Appendices A, B, C, D, E, F, G, H and I are model forms which may be used to satisfy this Part or may be modified in accordance with sections 617.2 and 617.4 of this Part.

PROCEDURES AND DOCUMENTATION APPENDIX 2

Rules of Procedure for City Environmental Quality Review (CEQR)

Rules of Procedure for CITY ENVIRONMENTAL QUALITY REVIEW

David N. Dinkins
Mayor, City of New York

NEW YORK CITY PLANNING COMMISSION
Richard L. Schaffer, Chairman
COMMISSIONERS:
Victor G. Alicea, Vice Chairman
Eugenie L. Birch
Amanda M. Burden
Anthony I. Giacobbe
Maxine Griffith
James C. Jao
Brenda Levin
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Edward T. Rogowsky
Ronald Shiffman
Jacob B. Ward
Deborah C. Wright

DCP# 91-15
September 1991

Contents

Chapter 5: Rules of Procedure for City Environmental Quality Review (CEQR)

as adopted June 26, 1991

§5-01.
Source of authority and statement of purpose.

Section 192(e) of the Charter provides that the City Planning Commission "shall oversee implementation of laws that require environmental reviews of actions taken by the city" and that the Commission "shall establish by rule procedures for environmental reviews of proposed actions by the city where such reviews are required by law." These rules are intended to exercise that mandate by redefining lead agencies within the city in accordance with law, prescribing the relationship of the new Office of Environmental Coordination with those agencies and regulating scoping. The organization and numbering of the various sections of these rules are not intended to correspond precisely to Executive Order 91. [43RCNY Chapter 6, also see Appendix A hereto] Rather, these rules are an overlay on Executive Order 91. Where these rules conflict with Executive Order 91, these rules supersede the Executive Order.

In deciding upon the appropriate lead agency for certain classes of actions taken by the city, the City Planning Commission has selected the involved agency "principally responsible for carrying out, funding or approving" those actions. 6 NYCRR §617.2(v). For private ULURP applications, for section 197-a plans and for all actions primarily involving a zoning map or text change, the City Planning Commission, responsible under the Charter "for the conduct of planning relating to the orderly growth, improvement and future development of the city" (Charter section 192(d)), is the lead agency. For other ULURP applications, the city agency applicant, the agency that will generally be involved with ensuring programmatic implementation of the action, is the lead agency. Most of the remaining lead agency designations in the rules similarly address other approvals required by the Charter by designating the agency charged with ensuring programmatic implementation as the lead agency for those approvals. In appropriate cases, a lead agency designated by the rules may transfer its lead agency status to another involved agency.

The rules ensure that lead agencies have access to the technical and administrative expertise of the Office of Environmental Coordination. Finally, the rules provide for involved and interested agencies, including the City Council, to participate in the environmental review process, and ensure a role for the public in scoping.

§5-02.
General provisions.

(a) CONTINUATION OF EXECUTIVE ORDER NO. 91. [43RCNY §6-01 et seq., Appendix A]

Until the City Planning Commission promulgates further rules governing environmental review of actions taken by the city, Executive Order No. 91 of August 24, 1977, as amended (Executive Order 91), shall continue to govern environmental quality review in the city except where inconsistent with these rules, provided, however, that the following provisions of Executive Order 91 shall not apply: the definitions of "Agency", "Lead Agencies" and "Project Data Statement" defined in §6-02, subdivision (b) of §6-03, subdivision (a) of §6-05, the introductory paragraph of subdivision (b) of §6-05, paragraphs one and two of subdivision (a) of §6-12, §6-14, and subdivision (b) of the TYPE II part of §6-15.

(b) RULES OF CONSTRUCTION.

(1) All functions required by Executive Order 91 to be performed by the "lead agencies," as formerly defined in §6-02 of such Executive Order, shall be performed by the lead agency prescribed by or selected pursuant to these rules or by the Office of Environmental Coordination where authorized by these rules.

(2) Wherever Executive Order 91 explicitly or by implication refers to subdivision (b) of the Type II part of §6-15 of such Executive Order, such reference shall be deemed to be to section 617.13(d) of the SEQRA Regulations.

(3) The reference to "a determination pursuant to §6-03(b) of this Executive Order" contained in Executive Order 91 §6-05(b)(1) shall be deemed to refer to selection of a lead agency pursuant to §5-03 of these rules.

(4) The Office of Environmental Coordination shall succeed to functions performed by the City Clerk pursuant to Executive Order 91 with respect to the receipt and filing of documents.

(5) References in these rules and in Executive Order 91 to specific agencies and provisions of law shall be deemed to apply to successor agencies and provisions of law.

(c) DEFINITIONS.

(1) All definitions contained in Executive Order 91, other than the definitions of "agency" and "lead agencies", shall apply to these rules.

(2) "Action" as defined in §6-02 of Executive Order 91 includes all contemporaneous or subsequent actions that are included in a review pursuant to City Environmental Quality Review.

(3) The following additional definitions shall apply to these rules unless otherwise noted:

Agency."Agency" shall mean any agency, administration, department, board, commission, council, governing body or other governmental entity of the city of New York, including but not limited

to community boards, borough boards and the offices of the borough presidents, unless otherwise specifically referred to as a state or federal agency.

City Environmental Quality Review. "City Environmental Quality Review" (CEQR) shall mean the environmental quality review procedure established by Executive Order 91 as modified by these rules.

Determination of significance. "Determination of significance" shall mean a negative declaration, conditional negative declaration or notice of determination (positive declaration).

Interested agency. "Interested agency" shall mean an agency that lacks jurisdiction to fund, approve or directly undertake an action but requests or is requested to participate in the review process because of its specific concern or expertise about the proposed action.

Involved agency. "Involved agency" shall mean any agency that has jurisdiction to fund, approve or directly undertake an action pursuant to any provision of law, including but not limited to the Charter or any local law or resolution. The City Council shall be an involved agency for all actions for which, as a component of the approval procedure for the action or a part thereof, the City Council has the power to approve or disapprove, regardless of whether the City Council chooses to exercise such power.

Lead agency. "Lead agency" shall mean the agency principally responsible for environmental review pursuant to these rules.

Scoping. "Scoping" shall mean the process by which the lead agency identifies the significant issues related to the proposed action which are to be addressed in the draft environmental impact statement including, where possible, the content and level of detail of the analysis, the range of alternatives, the mitigation measures needed to minimize or eliminate adverse impacts, and the identification of non-relevant issues.

SEQRA Regulations. "SEQRA Regulations" shall mean Part 617 of Volume 6 of New York Codes, Rules and Regulations.

(d) APPLICABILITY.

These rules and Executive Order 91 shall apply to environmental review by the city that is required by the State Environmental Quality Review Act (Environmental Conservation Law, Article 8) and regulations of the State Department of Environmental Conservation thereunder and shall not be construed to require environmental quality review of an action where such review would not otherwise be required by such act and regulations, or to dispense with any such review where it is otherwise required.

§5-03. Establishment of lead agency.

(a) GENERAL RULE.

Where only one agency is involved in an action, that agency shall be the lead agency.

(b) ACTIONS SUBJECT TO ULURP AND CHARTER SECTIONS 197-a, 200, 201, and 668.

(1) For actions subject to the Uniform Land Use Review Procedure of section 197-c of the Charter (ULURP), and for which the applicant is not a city agency, the City Planning Commission shall be the lead agency.

(2) For actions that involve plans for the development, growth and improvement of the city, its boroughs and community districts (Charter section 197-a), the City Planning Commission shall be the lead agency.

(3) For actions that involve zoning map or text changes (Charter section 200 and/or 201), the following rules shall apply:

(i) If the only approval subject to ULURP or to Charter section 200 or 201 is a zoning map or text change, the City Planning Commission shall be the lead agency.

(ii) If the applicant for any action requiring a zoning map or text change is not a city agency, the City Planning Commission shall be the lead agency.

(iii) If the action involves a zoning map or text change, in addition to another approval under Charter section 197-c (ULURP) for which there is a city agency applicant, then the city agency applicant shall be the lead agency, provided, however, that the City Planning Commission shall be the lead agency if:

(A) the action involves a zoning map or text change that covers or may apply to areas substantially larger than the properties covered by the non-zoning approvals required under Charter section 197-c; or

(B) the city agency applicant and the Chair of the City Planning Commission agree that the action involves a zoning map or text change that changes the uses permitted so as to substantially alter the area zoning pattern.

(4) For all other actions subject to section 197-c of the Charter (ULURP) for which the applicant is a city agency, and for actions subject to section 668 of the Charter for which the applicant is a city agency, the city agency applicant shall be the lead agency. Where there is more than one city agency applicant, the city agency applicants shall agree upon which of them will be the lead

(8) prepare standardized forms for notifications of commencement of environmental review, determinations of significance, notices of completion of draft and final environmental impact statements, and, as may be appropriate, other environmental review documents; and

(9) work with appropriate city agencies to develop and implement a tracking system to ensure that mitigation measures are implemented in a timely manner, and to evaluate and report on the effectiveness of mitigation measures.

(d) Any state agency that seeks a determination whether a city agency shall serve as the lead agency for an action that involves city and state agencies should initially communicate with the OEC. Upon receipt of such communication, the OEC shall ascertain the city agency which is designated as lead agency by or pursuant to these rules and shall notify such agency of such communication. Such designated agency may then act pursuant to subdivision (j) of §5-03 of these rules.

(e) Where an action or part thereof has been or will be reviewed by a federal agency, the OEC shall assist city agencies in coordinating review with the appropriate federal agency.

§5-05. Environmental review procedures.

(a) THRESHOLD DETERMINATION.

(1) In the case of any action for which a lead agency is prescribed by §5-03 of these rules, and thus for which no agreement among involved agencies is necessary, only such lead agency may determine that such action, considered in its entirety, requires environmental review, and such determination shall be binding upon the city. The OEC shall, upon the request of such agency, assist in such determination.

(2) In the case of any action for which agreement among involved agencies is necessary for selection of a lead agency, if an agency that could be the lead agency for the particular action pursuant to subdivisions (b) through (g) of §5-03 of these rules determines that such action may require environmental review, then the lead agency shall be agreed upon as provided in §5-03 of these rules, and such lead agency shall determine whether such action, considered in its entirety, requires environmental review. Such determination shall be binding upon the city. The OEC shall assist in any determination made pursuant to this paragraph upon the request of the agency making such determination.

(3) Nothing contained in this subdivision shall be construed to require an affirmative determination, whether formal or informal, that an action is exempt from environmental review, or is a Type II action pursuant to the SEQRA Regulations, where such determination would not otherwise be required by law.

(b) OTHER DETERMINATIONS.

(1) After the determination that an action requires environmental review, the lead agency shall notify the OEC that it is commencing environmental review and complete or cause to be completed the standardized environmental assessment statement provided by the OEC. Such statement shall provide guidance in determining whether the action may have a significant effect on the environment. The OEC and interested and involved agencies shall, upon the request of the lead agency, assist the lead agency in completing such statement.

(2) The OEC and interested and involved agencies shall, upon the request of the lead agency, assist such lead agency with respect to any aspect of a determination of significance and/or a draft, final and/or supplemental environmental impact statement.

(3) Whenever, in the preparation of a draft environmental impact statement, the lead agency identifies a potential significant impact, the lead agency shall consult with any agency that has primary jurisdiction to carry out possible mitigations, and with any city agency that has primary regulatory jurisdiction over the subject matter of such impact.

(4) Lead agencies shall send copies of the following to the OEC upon issuance: notifications of commencement of environmental review, determinations of significance (including completed environmental assessment statements), draft and final scopes, draft and final environmental impact statements. In addition, lead agencies shall forward to the OEC significant supporting documentation comprising the official records of environmental reviews.

§5-06. Involved and interested agencies; required circulation.

(a) The lead agency and the OEC shall make every reasonable effort to keep involved and interested agencies informed during the environmental review process and to facilitate their participation in such process. If the City Council is involved in an action, staff of the lead agency and/or staff of the OEC shall be made available to explain determinations made by the lead agency to the City Council or the appropriate City Council committee or staff.

(b) Any written information submitted by an applicant for purposes of a determination by the lead agency whether an environmental impact statement will be required by law, and documents or records intended to define or substantially redefine the overall scope of issues to be addressed in any draft environmental impact statement required by law, shall be circulated to all affected community or borough boards, where such circulation is required by the Charter.

(c) If the City Council is involved in an action, any written information, documents or records that are required to be circulated to involved agencies or to affected community boards or borough boards shall be circulated to the City Council.

§5-07. Scoping.

Following the issuance of a notice of determination (positive declaration), the lead agency shall coordinate the scoping process, which shall ensure that all interested and involved agencies (including the City Council where it is interested or involved), the applicant, the OEC, community and borough boards, borough presidents and the public are able to participate. The scoping process shall include a public scoping meeting and take place in accordance with the following procedure:

(a) DRAFT SCOPE.

Within fifteen days after issuance of a notice of determination (positive declaration), the lead agency shall issue a draft scope, which may be prepared by the applicant but must be approved by the lead agency. The lead agency may consult with the OEC and other agencies prior to issuance of the draft scope.

(b) PUBLIC NOTICE AND COMMENT.

Upon issuance of the draft scope and not less than thirty nor more than forty-five days prior to the holding of the public scoping meeting, the lead agency shall publish in the City Record a notice indicating that a draft environmental impact statement will be prepared for the proposed action and requesting public comment with respect to the identification of issues to be addressed in the draft environmental impact statement. Such notice shall be in a format provided by the OEC and shall state that the draft scope and the environmental assessment statement may be obtained by any member of the public from the lead agency and/or the OEC. Such notice shall also contain the date, time and place of the public scoping meeting, shall provide that written comments will be accepted by the lead agency through the tenth day following such meeting, and shall set forth guidelines for public participation in such meeting.

(c) AGENCY NOTICE AND COMMENT.

Upon issuance of the draft scope and not less than thirty nor more than forty-five days prior to the holding of the public scoping meeting, the lead agency shall circulate the draft scope and the environmental assessment statement to all interested and involved agencies (including the City Council where it is interested or involved), to the applicant, to the OEC and to agencies entitled to send representatives to the public scoping meeting pursuant to section 197-c(d) or 668(a)(7) of the Charter. Together with the draft scope and the environmental assessment statement, a letter shall be circulated indicating the date, time and place of the public scoping meeting, and stating that comments will be accepted by the lead agency through the tenth day following such meeting. The lead agency may consult with other agencies regarding their comments, and shall forward any written comments received pursuant to this subdivision to the OEC.

(d) PUBLIC SCOPING MEETING.

The lead agency shall chair the public scoping meeting. In addition to the lead agency, all other interested and involved agencies that choose to send representatives (including the City Council where it is interested or involved), the applicant, the OEC, and agencies entitled to send representatives pursuant to section 197-c(d) or 668(a)(7) of the Charter may participate. The meeting shall include an opportunity for the public to observe discussion among interested and involved agencies, agencies entitled to send representatives, the applicant and the OEC. Reasonable time shall be provided for the public to comment with respect to the identification of issues to be addressed in the draft environmental impact statement. The OEC shall assist the lead agency in ensuring that the public scoping meeting is conducted in an effective manner.

(e) FINAL SCOPE.

Within thirty days after the public scoping meeting, the lead agency shall issue a final scope, which may be prepared by the applicant and approved by the lead agency. The lead agency may consult further with the OEC and other agencies prior to issuance of the final scope. Where a lead agency receives substantial new information after issuance of a final scope, it may amend the final scope to reflect such information.

(f) SCOPING OF CITY AGENCY ACTIONS.

For actions which do not involve private applications, nothing contained in these rules shall be construed to prevent a lead agency, where deemed necessary for complex actions, from extending the time frames for scoping set forth in this section, or from adding additional elements to the scoping process.

§5-08. Applications and fees.

(a) APPLICATIONS.

Applications submitted for City Environmental Quality Review for actions that require such review shall be submitted to the lead agency prescribed by these rules, or to an agency that could be the lead agency for the particular action pursuant to §5-03 of these rules. Such applications shall include information required to be obtained from applicants in order for the lead agency to complete or cause to be completed the standardized environmental assessment statement, and such other documents and additional information as the lead agency may require to make a determination of significance. In addition, except as otherwise provided in these rules, such applications shall conform to the requirements of Executive Order 91. Applicants shall file twenty-five copies of each application.

(b) FEES.

Except as otherwise provided by this section, fees in effect on the effective date of these rules pursuant to Executive Order 91 shall continue to govern City Environmental Quality Review applications, unless the City Planning Commission shall by rule modify such fees. Such fees shall be submitted to the lead agency prescribed by these rules, or to an agency that could be the lead agency for the particular action pursuant to §5-03 of these rules, and shall be in the form of a check or money order made out to the "City of New York."

§5-09. Transition section.

(a) An action shall not be subject to these rules, but shall comply with Executive Order 91, as in effect prior to the effective date of these rules, where: (1) a classification as exempt, excluded or Type II has been made prior to the effective date of these rules; (2) a project data statement has been completed more than thirty days prior to the effective date of these rules and a determination of significance has not been made prior to the effective date of these rules; (3) a negative declaration or a conditional negative declaration has been issued prior to the effective date of these rules; or (4) a notice of determination (positive declaration) has been issued more than thirty days prior to the effective date of these rules; provided, however, that if a negative declaration or conditional negative declaration is rescinded, or if a classification as exempt, excluded or Type II is no longer applicable, or if a supplemental environmental impact statement is required, or if a notice of determination (positive declaration) has been issued less than thirty days prior to the effective date of these rules or is issued on or after the effective date of these rules, these rules shall apply, and the lead agency prescribed by or selected pursuant to these rules shall thereupon assume lead agency status at the earliest time practicable.

(b) Except as provided in subdivision (a) of this section, the lead agency prescribed by or selected pursuant to these rules shall assume lead agency status at the earliest time practicable. If a determination of significance has not been made and such lead agency determines that the action requires environmental review, it shall notify the OEC that it is commencing environmental review and shall complete or cause to be completed the standardized environmental assessment statement provided by the OEC, regardless of whether a project data statement has been completed. However, such lead agency shall not be required to engage in scoping pursuant to §5-07 of these rules if a final scope has already been prepared. Until the lead agency prescribed by or selected pursuant to these rules assumes lead agency status, the action shall be subject to Executive Order 91 as in effect prior to the effective date of these rules; however, after the effective date of these rules, the prior lead agency or agencies shall not issue a determination of significance or notice of completion of a draft or final environmental impact statement, classify an action as exempt, excluded or Type II, convene a scoping meeting or conduct a public hearing pursuant to CEQR.

§5-10. Severability.

The provisions of these rules shall be severable and if any phrase, clause, sentence, paragraph, subdivision or section of these rules, or the applicability thereof to any person or circumstance, shall be held invalid, the remainder of these rules and the application thereof shall not be affected thereby.

§5-11. Effective date.

These rules shall take effect on October 1, 1991.

PROCEDURES AND DOCUMENTATION APPENDIX 3

City Environmental Quality Review
Executive Order No. 91 of 1977 as Amended

CITY ENVIRONMENTAL QUALITY REVIEW

Executive Order No. 91 of 1977 as amended

Cross reference to CEQR Rules of Procedure

WHEREAS, the improvement of our urban environment is critically important to the overall welfare of the people of the City; and

Supplemented by new statement of authority and purpose, Rules, §5-01.

WHEREAS, the development and growth of the City can and should be reconciled with the improvement of our urban environment; and

WHEREAS, it is the continuing policy of the City that environmental, social and economic factors be considered before governmental approval is given to proposed activities that may significantly affect our urban environment; and

WHEREAS, subdivision (3) of section 8-0113 of Article 8 of the New York State Environmental Conservation Law (State Environmental Quality Review Act, or "SEQRA") and the regulations promulgated thereunder (6 NYCRR 617) authorizes local governments to adopt rules, procedures, criteria and guidelines for incorporating environmental quality review procedures into existing planning and decision making processes; and

WHEREAS, the procedures formulated in this Executive Order are intended to be integrated into existing agency procedures, including the Uniform Land Use Review Procedure contained in section 197-c of Chapter 8 of the City Charter, in order to avoid delay and to encourage a one-stop review process; and

WHEREAS, section 8-0117 of SEQRA, as amended, provides that only actions or classes of actions identified by the State Department of Environmental Conservation as likely to require preparation of an environmental impact statement shall be subject to this Executive Order until November 1, 1978, after which date non-exempt actions will be fully subject to this Executive Order; and

WHEREAS, the implementation of SEQRA in the City by this Executive Order will accomplish the purposes for which Executive Order No. 87 of October 18, 1973 ("Environmental Review of Major Projects") was promulgated and will continue the policy established therein.

NOW, THEREFORE, by the power vested in me as Mayor of the City of New York, Executive Order No. 87 of October 18, 1973 is, in accordance with the provisions of sections 16 and 18 hereunder, hereby replaced by this Executive Order as follows:

Exec. Order 91 continued except as, otherwise provided, Rules §5-02(a). See new Rules of Construction, Rules §5-02(b).

§6-01. Applicability

Except as modified by Rules §5-02(a) and (d).

No final decision to carry out or approve any action which may have a significant effect on the environment shall be made by any agency until there has been full compliance with the provisions of this chapter.

§6-02. Definitions

As used herein, the following terms shall have the indicated meanings unless noted otherwise:

Additional definitions, Rules §5-02(c).

(a) Action. "Action" means any activity of an agency, other than an exempt action enumerated in §6-04 of this Executive Order, including but not limited to the following:

Subdiv. (a) modified by Rules §5-02(c) (2).

(1) non-ministerial decisions on physical activities such as construction or other activities which change the use or appearance of any natural resource or structure;

(2) non-ministerial decisions on funding activities such as the proposing, approval or disapproval of contracts, grants,

subsidies, loans, tax abatements or exemptions or other forms of direct or indirect financial assistance, other than expense budget funding activities;

(3) planning activities such as site selection for other activities and the proposing, approval or disapproval of master or long range plans, zoning or other land use maps, ordinances or regulations, development plans or other plans designed to provide a program for future activities;

(4) policy making activities such as the making, modification or establishment of rules, regulations, procedures, policies and guidelines;

(5) non-ministerial decisions on licensing activities, such as the proposing, approval or disapproval of a lease, permit, license, certificate or other entitlement for use or permission to act.

Cross reference to CEQR Rules of Procedure

~~(b) Agency. "Agency" means any agency, administration, department, board, commission, council, governing body or any governmental entity of the City of New York, unless otherwise specifically referred to as a state or federal agency.~~

Inapplicable. See Rules §5-02(a), §5-02(c) (3) (i).

(c) Applicant. "Applicant" means any person required to file an application pursuant to this Executive Order.

(d) Conditional negative declaration. "Conditional negative declaration" means a written statement prepared by the lead agencies after conducting an environmental analysis of an action and accepted by the applicant in writing, which announces that the lead agencies have determined that the action will not have a significant effect on the environment if the action is modified in accordance with conditions or alternatives designed to avoid adverse environmental impacts.

(e) DEC. "DEC" means the New York State Department of Environmental Conservation.

(f) Environment. "Environment" means the physical conditions which will be affected by a proposed action, including land, air, water, minerals, flora, fauna, noise, objects of historic or aesthetic significance, existing patterns of population concentration, distribution or growth, and existing community or neighborhood character.

(g) Environmental analysis. "Environmental analysis" means the lead agencies' evaluation of the short and long term, primary and secondary environmental effects of an action, with particular attention to the same areas of environmental impacts as would be contained in an EIS. It is the means by which the lead agencies determine whether an action under consideration may or will not have a significant effect on the environment.

(h) Environmental assessment form. "Environmental assessment form" means a written form completed by the lead agencies, designed to assist their evaluation of actions to determine whether an action under consideration may or will not have a significant effect on the environment.

Retitled Environmental Assessment Statement; see Rules §5-04(c) (3).

(i) Environmental impact statement (EIS). "Environmental impact statement (EIS)" means a written document prepared in accordance with §6-08, §6-10, §6-12 and §6-13 of this Executive Order. An EIS may either be in a draft or a final form.

(j) Environmental report. "Environmental report" means a report to be submitted to the lead agencies by a non-agency applicant when the lead agencies prepare or cause to prepared a draft EIS for an action involving such an applicant. An environmental report shall contain an analysis of the environmental factors specified in §6-10 of this Executive Order as they relate to the applicant's proposed action and such other information as may be necessary for compliance with this Executive Order, including the preparation of an EIS.

Cross reference to CEQR Rules of Procedure

~~(k) Lead agencies. "Lead agencies" means the Department of Environmental Protection and the Department of City Planning of the City of New York, as designated by the Mayor pursuant to section 617.4 of Part 617 of Volume 6 of the New York Code of Rules and Regulations, for the purpose of implementing the provisions of Article 8 of the Environmental Conservation Law (SEQRA) in the City of New York, by order dated December 23, 1976.~~

Inapplicable, Rules §5-02(a). Superseded by Rules §5-02(b) (1) and §5-02(c) (3) (vi); also see Rules §5-03 for choice of lead agency.

(l) Ministerial action. "Ministerial action" means an action performed upon a given state of facts in a prescribed manner imposed by law without the exercise of any judgment or discretion as to the propriety of the action, although such law may require, in some degree, a construction of its language or intent.

(m) Negative declaration. "Negative declaration" means a written statement prepared by the lead agencies after conducting an environmental analysis of an action which announces that the lead agencies have determined that the action will not have a significant effect on the environment.

(n) Notice of determination. "Notice of determination" means a written statement prepared by the lead agencies after conducting an environmental analysis of an action which announces that the lead agencies have determined that the action may have a significant effect on the environment, thus requiring the preparation of an EIS.

See also Rules §5-02(c) (3) (iii).

(o) NYCRR. "NYCRR" means the New York Code of Rules and Regulations.

See also Rules §5-02(c) (3) (viii).

(p) Person. "Person" means an agency, individual, corporation, governmental entity, partnership, association, trustee or other legal entity.

~~(q) Project data statement. "Project data statement" means a written submission to the lead agencies by an applicant on a form prescribed by the lead agencies, which provides an identification of and information relating to the environmental impact of a proposed action. The project data statement is designed to assist the lead agencies in their evaluation of an action to determine whether an action under consideration may or will not have significant effect on the environment.~~

Inapplicable, Rules §5-02(a). Superseded by Environmental Assessment Statement, see Rules §5-04(c) (3). See also Rules §5-05(b) (1) and 5-08(a).

(r) SEQRA. "SEQRA" means the State Environmental Quality Review Act (Article 8 of the New York State Environmental Conservation Law).

(s) Typically associated environmental effect. "Typically associated environmental effect" means changes in one or more natural resources which usually occur because of impacts on other such resources as a result of natural interrelationships or cycles.

(t) ULURP. "ULURP" means the Uniform Land Use Review Procedure (section 197-c of Chapter 8 of the New York City Charter).

§6-03. Actions Involving Federal or State Participation

Cross reference to CEQR Rules of Procedure

See also Rules §5-04(e).

(a) If an action under consideration by any agency may involve a "major federal action significantly affecting the quality of the human environment under the National Environmental Policy Act of 1969," then the following procedures shall apply:

(1) in the case of an action for which there has been duly prepared both a draft EIS and final EIS, no agency shall have an obligation to prepare an EIS or to make findings pursuant to §6-12 of this Executive Order.

(2) in the case of an action for which there has been prepared a Negative Declaration or other written threshold determination that the action will not require a federal impact statement under the National Environmental Policy Act of 1969, the lead agencies shall determine whether or not the action may have a significant effect on the environment pursuant to this Executive Order, and the action shall be fully subject to the same.

~~(b) If an action under consideration by any agency may involve any state action which may have a significant effect on the environment under SEQRA, pursuant to which a state agency is required to comply with the procedures specified in 6 NYCRR 617, then the determination as to whether the state agency or the lead agencies shall be responsible for the environmental review shall be made on the basis of the following criteria:~~

Inapplicable, Rules §5-02(a). Entire subdivision (b) superseded by Rules §5-03(j) and §5-04(d).

~~(1) the agency to first act on the proposed action;~~

~~(2) a determination of which agency has the greatest responsibility for supervising or approving the action as a whole;~~

~~(3) a determination of which agency has more general governmental powers as compared to single or limited powers or purposes;~~

~~(4) a determination of which agency has the greatest capability for providing the most thorough environmental assessment of the action;~~

~~(5) a determination of whether the anticipated impacts of the action being considered are primarily of statewide, regional or local concern, e.g., if such impacts are primarily of local concern, the lead agencies shall conduct the environmental review.~~

~~If this determination cannot be made within 30 days of the filing of an application, the Commissioner of DEC shall be requested, in writing, to make such determination.~~

§6-04. Exempt Actions

The following actions shall not be subject to the provisions of this Executive Order:

See also Rules §5-02(d).

(a) projects or activities classified as Type I pursuant to §6-15 of this Executive Order directly undertaken or funded by an agency prior to June 1, 1977 except that if such action is sought to be modified after June 1, 1977 which modification may have a significant adverse effect on the environment, then such modification shall be an action fully subject to the requirements of this Executive Order;

(1) such actions include, but are not limited to, those actions defined in §6-02 "Action" (1), (2), (3) and (4) of this Executive Order;

(2) an action shall be deemed to be undertaken at the point that:
(i) the agency is irreversibly bound or committed to the ultimate completion of a specifically designed activity or project; or
(ii) in the case of construction activities, a contract for substantial construction has been entered into or if a continuous program of on-site construction or modification has been engaged in; or
(iii) the agency gives final approval for the issuance to an applicant of a discretionary contract, grant subsidy, loan or other form of financial assistance; or
(iv) in the case of an action involving federal or state participation, a draft EIS has been prepared pursuant to the National Environmental Policy Act of 1969 or SEQRA, respectively.

(b) projects or activities classified as Type I pursuant to §6-15 of this Executive Order approved by an agency prior to September 1, 1977 except that if such action is sought to be modified after September 1, 1977, which modification may have a significant adverse effect on the environment, then such modification shall be an action fully subject to the requirements of this Executive Order;

(1) such actions include, but are not limited to, those actions defined in §6-02 "Action" (2) and (5) of this Executive Order;

(2) an action shall be deemed to be approved at the point that:
(i) the agency gives final approval for the issuance to an applicant of a discretionary contract, grant, subsidy, loan or other form of financial assistance; or
(ii) the agency gives final approval for the issuance to an applicant of a discretionary lease, permit, license, certificate or other entitlement for use or permission to act; or
(iii) in the case of an action involving federal or state participation, a draft EIS has been prepared pursuant to the National Environmental Policy Act of 1969 or SEQRA, respectively.

(c) projects or activities not otherwise classified as Type I pursuant to §6-15 of this Executive Order directly undertaken, funded or approved by an agency prior to November 1, 1978 except that if such action is sought to be modified after November 1, 1978, which modification may have a significant adverse effect on the environment, then such modification shall be an action fully subject to the requirements of this Executive Order;

(1) such actions include, but are not limited to, those actions defined in §6-02 "Action" of this Executive Order;

(2) an action shall be deemed to be undertaken as provided in subsections (a)(2) and (b)(2) of this section, as applicable.

(d) enforcement or criminal proceedings or the exercise of prosecutorial discretion in determining whether or not to institute such proceedings;

(e) ministerial actions, which shall appear on a list compiled, certified and made available for public inspection by the lead agencies, except as provided in §6-15(a), Type I, of this Executive Order, relating to critical areas and historic resources;

(f) maintenance or repair involving no substantial changes in existing structures or facilities;

(g) actions subject to the provisions requiring a certificate of environmental compatibility and public need in Articles 7 and 8 of the Public Service Law;

Cross reference to CEQR Rules of Procedure

See Rules §5-02(d).

(h) actions which are immediately necessary on a limited emergency basis for the protection or preservation of life, health, property or natural resources; and

(i) actions of the Legislature of the State of New York or of any court.

Cross reference to CEQR Rules of Procedure

§6-05. Determination of Significant Effect; Applications

~~(a) Each agency shall ascertain whether an application need be filed pursuant to this section, employing lists of actions, classified as either exempt, Type I or Type II pursuant to §6-04 and §6-15 of this Executive Order, respectively, which lists shall be certified by the lead agencies.~~

Inapplicable, Rules §5-02(a). Superseded by Rules §5-05(a). See also Rules §5-02(b) (2) and §5-02(d).

(b) The applicant initiating the proposed action, other than an exempt or Type II action pursuant to §6-04 ~~and §6-15~~ of this Executive Order, shall file an application with the lead agencies, which application shall include a Project Data Statement and such other documents and additional information as the lead agencies may require to conduct an environmental analysis to determine whether the action may or will not have a significant effect on the environment. Where possible existing City applications shall be modified to incorporate this procedure and a one-stop review process developed:

Introductory paragraph inapplicable, Rules §5-02(a). Paragraph (b) superseded by Rules §5-08.

(1) within 20 calendar days of receipt of the application, or of a determination pursuant to §6-03(b) of this Executive Order, if applicable, the lead agencies shall notify the applicant, in writing, whether the application is complete or whether additional information is required;

(2) when all required information has been received, the lead agencies shall notify the applicant, in writing, that the application is complete.

Determination pursuant to §5-03(b) deemed to refer to lead agency selection pursuant to Rules §5-03. See Rules §5-02(b) (3).

(c) Each application shall include an identification of those agencies, including federal and state agencies, which to the best knowledge of the applicant, have jurisdiction by law over the action or any portion thereof.

(d) Where appropriate, the application documents may include a concise statement or reasons why, in the judgment of the applicant, the proposed action is one which will not require the preparation of an EIS pursuant to this Executive Order.

(e) Initiating applicants shall consider the environmental impacts of proposed actions and alternatives at the earliest possible point in their planning processes, and shall develop wherever possible, measures to mitigate or avoid adverse environmental impacts. A statement discussing such considerations, alternatives and mitigating measures shall be included in the application documents.

(f) Nothing in this section shall be deemed to prohibit an applicant from submitting a preliminary application in the early stages of a project or activity for review and comment by the lead agencies.

§6-06. Determination of Significant Effect; Criteria

Cross reference to CEQR Rules of Procedure

(a) An action may have a significant effect on the environment if it can reasonably be expected to lead to one of the following consequences:

(1) a substantial adverse change to ambient air or water quality or noise levels or in solid waste production, drainage, erosion or flooding;

(2) the removal or destruction of large quantities of vegetation or fauna, the substantial interference with the movement of any resident or migratory fish or wildlife species, impacts on critical habitat areas, or the substantial affecting of a rare or endangered species of animal or plant or the habitat of such a species;

(3) the encouraging or attracting of a large number of people to a place or places for more than a few days relative to the number of people who would come to such a place absent the action;

(4) the creation of a material conflict with a community's existing plans or goals as officially approved or adopted;

(5) the impairment of the character or quality of important historical, archeological, architectural or aesthetic resources (including the demolition or alteration of a structure which is eligible for inclusion in an official inventory of such resources), or of existing community or neighborhood character;

(6) a major change in the use of either the quantity or type of energy;

(7) the creation of a hazard to human health or safety;

(8) a substantial change in the use or intensity of use of land or other natural resources or in their capacity to support existing uses, except where such a change has been included, referred to, or implicit in a broad "programmatic" EIS prepared pursuant to §6-13 of this Executive Order;

(9) the creation of a material demand for other actions which would result in one of the above consequences;

(10) changes in two or more elements of the environment, no one of which is substantial, but when taken together result in a material change in the environment.

(b) For the purpose of determining whether an action will cause one of the foregoing consequences, the action shall be deemed to include other contemporaneous or subsequent actions which are included in any long-range comprehensive integrated plan of which the action under consideration is a part, which are likely to be undertaken as a result thereof, or which are dependent thereon. The significance of a likely consequence (i.e. whether it is material, substantial, large, important, etc.) should be assessed in connection with its setting, its probability of occurring, its duration, its irreversibility, its controllability, its geographic scope and its magnitude (i.e. degree of change or its absolute size). §6-15 of this Executive Order refers to lists of actions which are likely to have a significant effect on the environment and contains lists of actions found not to have a significant effect on the environment.

Reference to §6-15(b), Type II list, deemed to be State Type II list of 6 NYCRR Part 617.13. See Rules §5-02(b)(2).

§6-07. Determination of Significant Effect; Notification

Cross reference to CEQR Rules of Procedure

(a) The lead agencies shall determine within 15 calendar days following notification of completion of the application pursuant to §6-05(a) of this Executive Order whether the proposed action may have a significant effect on the environment;

Error. Reference to §6-05(a) should be to §6-05(b).

(1) in making their determination, the lead agencies shall employ the Environmental Assessment Form, apply the criteria contained in §6-06 and consider the lists of actions contained in §6-15 of this Executive Order;

Reference to §6-15(b) Type II list, deemed to be State Type II list of 6 NYCRR Part 617.13. See Rules §5-02(b) (2).

(2) the lead agencies may consult with, and shall receive the cooperation of any other agency before making their determination pursuant to this subdivision (a).

(b) The lead agencies shall provide written notification to the applicant immediately upon determination of whether the action may or will not have a significant effect on the environment. Such determination shall be in one of the following forms:

(1) Negative Declaration. If the lead agencies determine that the proposed action is not an exempt action or a Type II action pursuant to §6-04 and §6-15 of this Executive Order, respectively, and that the action will not have a significant effect on the environment, they shall issue a Negative Declaration which shall contain the following information:

Reference to §6-15(b) Type II list, deemed to be State Type II list of 6 NYCRR Part 617.13. See Rules §5-02(b) (2).

(i) an action identifying number;

(ii) a brief description of the action;

(iii) the proposed location of the action;

(iv) a statement that the lead agencies have determined that the action will not have a significant effect on the environment;

(v) a statement setting forth the reasons supporting the lead agencies' determination.

(2) Conditional Negative Declaration. If the lead agencies determine that the proposed action is not an exempt action or a Type II action pursuant to §6-04 and §6-15 of this Executive Order, respectively, and that the action will not have a significant effect on the environment if the applicant modifies its proposed action in accordance with conditions or alternatives designed to avoid adverse environmental impacts, they shall issue a Conditional Negative Declaration which shall contain the following information (in addition to the information required for a Negative Declaration pursuant to paragraph (l) of this subdivision):

Reference to §6-15(b) Type II list, deemed to be State Type II list of 6 NYCRR Part 617.13. See Rules §5-02(b) (2).

(i) a list of the conditions, modifications or alternatives to the proposed action which supports the determination;

(ii) the signature of the applicant or its authorized representative, accepting the conditions, modifications or alternatives to the proposed action;

(iii) a statement that if such conditions, modifications or alternatives are not fully incorporated into the proposed action, such Conditional Negative Declaration shall become null and void. In such event, a Notice of Determination shall be immediately issued pursuant to paragraph (3) of this subdivision.

(3) Notice of Determination. If the lead agencies determine that the proposed action is not an exempt action or a Type II action pursuant to §6-04 and §6-15 of this Executive Order, respectively, and that the action may have a significant effect on the environment, they shall issue a Notice of Determination which shall contain the following information:

(i) an action identifying number;

(ii) a brief description of the action;

(iii) the proposed location of the action;

(iv) a brief description of the possible significant effects on the environment of the action;

(v) a request that the applicant prepare or cause to be prepared, at its option, a draft EIS in accordance with §6-08 and §6-12 of this Executive Order.

(c) The lead agencies shall make available for public inspection the Negative Declaration, Conditional Negative Declaration or the Notice of Determination, as the case may be, and circulate copies of the same to the applicant, the regional director of DEC, the commissioner of DEC, the appropriate Community Planning Board(s), the City Clerk, and all other agencies, including federal and state agencies, which may be involved in the proposed action.

Cross reference to CEQR Rules of Procedure

Reference to §6-15(b), Type II list, deemed to be State Type II list of 6 NYCRR Part 617.13. See Rules §5-02(b) (2).

See additional circulation provisions, Rules §5-06(b) and §5-06(c). City Clerk function transferred to OEC, Rules §5-02(b) (4).

§6-08. Draft Environmental Impact Statements; Responsibility for Preparation

(a) Non-agency applicants:

(1) after receipt of a Notice of Determination pursuant to §6-07(c)(3) of this Executive Order, a non-agency applicant shall notify the lead agencies in writing as to whether it will exercise its option to prepare or cause to be prepared a draft EIS, and as to whom it has designated to prepare the draft EIS, provided that no person so designated shall have an investment or employment interest in the ultimate realization of the proposed action;

(2) the lead agencies may prepare or cause to be prepared a draft EIS for an action involving a non-agency applicant. In such event, the applicant shall provide, upon request, an environmental report to assist the lead agencies in preparing or causing to be prepared the draft EIS and such other information as may be necessary. All agencies shall fully cooperate with the lead agencies in all matters relating to the preparation of the draft EIS.

(3) if the non-agency applicant does not exercise its option to prepare or cause to be prepared a draft EIS, and the lead agencies do not prepare or cause to be prepared such draft EIS, then the proposed action and review thereof shall terminate.

(b) Agency applicants:

(1) when an action which may have significant effect on the environment is initiated by an agency, the initiating agency shall be directly responsible for the preparation of a draft EIS. However, preparation of the draft EIS may be coordinated through the lead agencies.

Rules add formal scoping, Rules §5-07. Interested and involved agencies assist with DEIS on request. See Rules §5-05(b) (2).

See also Rules §5-05(b) (3) for requirements of lead consultation on mitigations.

(2) all agencies, whether or not they may be involved in the proposed action, shall fully cooperate with the lead agencies and the applicant agency in all matters relating to the coordination of the preparation of the draft EIS.

(c) Notwithstanding the provisions contained in subdivisions (a) and (b) of this section, when a draft EIS is prepared, the lead agencies shall make their own independent judgment of the scope, contents and adequacy of such draft EIS.

Cross reference to CEQR Rules of Procedure

See Rules §5-05(b)(3) for requirements of lead consultation on mitigations.

§6-09. Environmental Impact Statements; Content

Lead to be guided by technical standards and methodologies developed by OEC, Rules §5-04(c).

(a) Environmental impact statements should be clearly written in a brief and concise manner capable of being read and understood by the public. Within the framework presented in subdivision (d) of this section, such statements should deal only with the specific significant environmental impacts which can be reasonably anticipated. They should not contain more detail than is appropriate considering the nature and magnitude of the proposed action and the significance of its potential impacts.

(b) All draft and final EIS's shall be preceded by a cover sheet stating:

(1) whether it is a draft or a final;

(2) the name or other descriptive title of the action;

(3) the location of the action;

(4) the name and address of the lead agencies and the name and telephone number of a person at the lead agencies to be contacted for further information;

(5) identification of individuals or organizations which prepared any portion of the statement; and

(6) the date of its completion.

(c) If a draft or final EIS exceeds ten pages in length, it shall have a table of contents following the cover sheet.

(d) The body of all draft and final EIS's shall at least contain the following:

(1) a description of the proposed action and its environmental setting;

(2) a statement of the environmental impacts of the proposed action, including its short-term and long-term effects, and typical associated environmental effects;

(3) an identification of any adverse environmental effects which cannot be avoided if the proposed action is implemented;

(4) a discussion of the social and economic impacts of the proposed action;

(5) a discussion of alternatives to the proposed action and the comparable impacts and effects of such alternatives;

(6) an identification of any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented;

(7) a description of mitigation measures proposed to minimize adverse environmental impacts;

(8) a description of any growth-inducing aspects of the proposed action, where applicable and significant;

(9) a discussion of the effects of the proposed action on the use and conservation of energy, where applicable and significant;

(10) a list of underlying studies, reports or other information obtained and considered in preparing the statement; and

(11) (for the final EIS only) copies or a summary of the substantive comments received in response to the draft EIS and the applicant's response to such comments.

(e) An EIS may incorporate by reference all or portions of other documents which contain information relevant to the statement. The referenced documents shall be made available to the public in the same places where copies of the statement are made available. When a statement uses incorporation by reference, the referenced document shall be briefly described and its date of preparation provided.

Cross reference to CEQR Rules of Procedure

§6-10. Draft Environmental Impact Statements; Procedures

(a) Notice of Completion. Upon the satisfactory completion of a draft EIS, the lead agencies shall immediately prepare, file and make available for public inspection a Notice of Completion as provided in paragraphs (1), (2) and (3) of this subdivision. Where a proposed action is simultaneously subject to the Uniform Land Use Review Procedure ("ULURP"), the City Planning Commission shall not certify an application pursuant to ULURP until a Notice of Completion has been filed as provided in paragraph (3) of this subdivision.

(1) Contents of Notice of Completion. All Notices of Completion shall contain the following:

(i) an action identifying number;

(ii) a brief description of the action;

(iii) the location of the action and its potential impacts and effects; and

(iv) a statement that comments on the draft EIS are requested and will be received and considered by the lead agencies at their offices. The Notice shall specify the public review and comment period on the draft EIS, which shall be for not less than 30 calendar days from the date of filing and circulation of the notice, or not less than 10 calendar days following the close of a public hearing on the draft EIS, whichever last occurs.

(2) Circulating Notice of Completion. All Notices of Completion shall be circulated to the following:

(i) all other agencies, including federal and state agencies, involved in the proposed action;

(ii) all persons who have requested it;

(iii) the editor of the State Bulletin;

(iv) the State clearinghouse;

(v) the appropriate regional clearinghouse designated under the Federal Office of Management and Budget Circular A-95.

Cross reference to CEQR Rules of Procedure

(3) Filing Notice of Completion. All Notices of Completion shall be filed with and made available for public inspection by the following:

(i) the Commissioner of DEC;

(ii) the regional director of DEC;

(iii) the agency applicant, where applicable;

(iv) the appropriate Community Planning Board(s);

(v) the City Clerk;

(vi) the lead agencies.

(b) Filing and availability of draft EIS. All draft EIS's shall be filed with and made available for public inspection by the same persons and agencies with whom Notices of Completion must be filed pursuant to paragraph (a)(3) of this section.

City clerk function transferred to OEC. Rules §5-02(b) (4).

(c) Public hearings on draft EIS.

(1) Upon completion of a draft EIS, the lead agencies shall conduct a public hearing on the draft EIS.

(2) The hearing shall commence no less than 15 calendar days or more than 60 calendar days after the filing of a draft EIS pursuant to subdivision (b) of this section, except where a different hearing date is required as appropriate under another law or regulation.

(3) Notice of the public hearing may be contained in the Notice of Completion or, if not so contained, shall be given in the same manner in which the Notice of Completion is circulated and filed pursuant to subdivision (a) of this section. In either case, the notice of hearing shall also be published at least 10 calendar days in advance of the public hearing in a newspaper of general circulation in the area of the potential impact and effect of the proposed action.

(4) Where a proposed action is simultaneously subject to ULURP, a public hearing conducted by the appropriate community or borough board and/or the City Planning Commission pursuant to ULURP shall satisfy the hearing requirement of this section. Where more than one hearing is conducted by the aforementioned bodies, whichever hearing last occurs shall be deemed the hearing for purposes of this Executive Order.

§6-11. Final Environmental Impact Statements; Procedures

(a) Except as provided in paragraph (1) of this subdivision, the lead agencies shall prepare or cause to be prepared a final EIS within 30 calendar days after the close of a public hearing.

Interested and involved agencies assist with FEIS on request, Rules §5-05(b) (2).

(1) If the proposed action has been withdrawn or if, on the basis of the draft EIS and the hearing, the lead agencies have determined that the action will not have a significant effect on the environment, no final EIS shall be prepared. In such cases, the lead agencies shall prepare, file and circulate a Negative Declaration as prescribed in §6-07 of this Executive Order.

(2) The final EIS shall reflect a revision and updating of the matters contained in the draft EIS in the light of further review by the lead agencies, comments received and the record of the public hearing.

Cross reference to CEQR Rules of Procedure

(b) Immediately upon the completion of a final EIS, the lead agencies shall prepare, file, circulate and make available for public inspection a Notice of Completion of a final EIS in the manner specified in §6-11(a) of this Executive Order, provided, however, that the Notice shall not contain the statement described in subparagraph (a)(1)(iv) of such section.

(c) Immediately upon completion of a final EIS, copies shall be filed and made available for public inspection in the same manner as the draft EIS pursuant to §6-11(b) of this Executive Order.

§6-12. Agency Decision Making

(a) No final decision to carry out or approve an action which may have a significant effect on the environment shall be made until after the filing and consideration of a final EIS.

~~(1) Except as provided in paragraph (2) of this subdivision where a final decision whether or not to carry out or approve an action is required by law to be made by any agency, such decision shall be made within 30 calendar days of the filing of a final EIS.~~

Inapplicable, Rules §5-02(a).

~~(2) Where a proposed action is simultaneously subject to ULURP, the final decision whether or not to carry out or approve the action shall be made by the Board of Estimate within 60 calendar days of the filing of the final EIS.~~

(b) When an agency decides to carry out or approve an action which may have a significant effect on the environment, it shall make the following findings in a written decision:

(1) consistent with social, economic and other essential considerations of state and city policy, from among the reasonable alternatives thereto, the action to be carried out or approved is one which minimizes or avoids adverse environmental effects to the maximum extent possible, including the effects disclosed in the relevant environmental impact statement;

(2) consistent with social, economic and other essential consideration of state and city policy, all practicable means will be taken in carrying out or approving the action to minimize or avoid adverse environmental effects.

(c) For public information purposes, a copy of the Decision shall be filed in the same manner as the draft EIS pursuant to §6-11(b) of this Executive Order.

§6-13. Programmatic Environmental Impact Statements

(a) Whenever possible, agencies shall identify programs or categories of actions, particularly projects or plans which are wide in scope or implemented over a long time frame, which would most appropriately serve as the subject of a single EIS. Broad program statements, master or area wide statements, or statements for comprehensive plans are often appropriate to assess the environmental effects of the following:

(1) a number of separate actions in a given geographic area;

(2) a chain of contemplated actions;

(3) separate actions having generic or common impacts;

(4) programs or plans having wide application or restricting the range of future alternative policies or projects.

(b) No further EIS's need be prepared for actions which are included in a programmatic EIS prepared pursuant to subdivision (a) of this section. However:

(1) a programmatic EIS shall be amended or supplemented to reflect impacts which are not addressed or adequately analyzed in the EIS as originally prepared; and

(2) actions which significantly modify a plan or program which has been the subject of an EIS shall require a supplementary EIS;

(3) programmatic EIS's requiring amendment and actions requiring supplementary EIS's pursuant to this subsection shall be processed in full compliance with the requirements of this Executive Order.

Cross reference to CEQR Rules of Procedure

§6-14. ~~Rules and Regulations~~

~~The lead agencies shall promulgate such rules, regulations, guidelines, forms and additional procedures as may be necessary to implement this Executive Order.~~

Inapplicable, Rules §5-02(a).

§6-15. Lists of Actions

(a) TYPE I. Type I actions enumerated in §617.12 of 6 NYCRR 617 are likely to, but will not necessarily, require the preparation of an EIS because they will in almost every instance significantly affect the environment. However, ministerial actions never require the preparation of an EIS except where such actions may directly affect a critical area or an historic resource enumerated in paragraphs (22) and (23), respectively, of subdivision (a) of §617.12. In addition, for the purpose of defining paragraph (2) of said subdivision and section, the following thresholds shall apply:

See Rules §5-02(d).

(1) relating to public institutions:

(i) new correction or detention centers with an inmate capacity of at least 200 inmates;

(ii) new sanitation facilities, including:

(A) incinerators of at least 250 tons/day capacity;

(B) garages with a capacity of more than 50 vehicles;

(C) marine transfer stations;

(iii) new hospital or health related facilities containing at least 100,000 sq. ft. of floor area;

(iv) new schools with seating capacity of at least 1,500 seats;

(v) any new community or public facility not otherwise specified herein, containing at least 100,000 sq. ft. of floor area, or the expansion of an existing facility by more than 50 percent ofsize or capacity, where the total size of the expanded facility exceeds 100,000 sq. ft. of floor area.

(2) relating to major office centers: any new office structure which has a minimum of 200,000 sq. ft. of floor area and exceeds permitted floor area under existing zoning by more than 20 percent, or the expansion of an existing facility by more than 50 percent of floor area, where the total size of the expanded facility exceeds 240,000 sq. ft. of floor area.

Cross reference to CEQR Rules of Procedure

See Rules §5-02(d).

(b) TYPE II.

(1) Type II actions will never require the preparation of an EIS because they are determined not to have a significant effect on the environment, except where such actions may directly affect a critical area or an historic resource enumerated in paragraphs (22) and (23), respectively, of subdivision (a) of §617.12 of 6 NYCRR 617.

~~(2) Pursuant to SEQRA, as amended, a list of Type II actions shall be promulgated prior to July 1, 1978, to become effective on September 1, 1978.~~

Inapplicable. Replaced by State Type II list 6 NYCRR Part 617.13. See Rules §5-02(a) and §5-02(b) (2).

§6-16. Related Orders; Repeal

(a) Executive Order No. 87 of October 18, 1973 shall remain in effect prior to the effective dates of this Executive Order pursuant to Article 8 of the Environmental Conservation Law.

(b) In the event of the repeal of Article 8 of the Environmental Conservation Law, Executive Order No. 87 of October 18, 1973 shall replace this Executive Order.

§6-17. Evaluation of Effectiveness

The lead agencies shall conduct a public hearing, not later than June 1, 1979, for the purpose of evaluating the effectiveness of this Executive Order in implementing the State Environmental Quality Review Act, and its impact on the City's physical and economic development process.

§6-18. Effective Date

This Executive Order shall take effect immediately.

See new transition Rules §5-08 and §5-11. New Rules effective Oct. 1, 1991.

ABRAHAM D. BEAME
Mayor, City of New York

HAZARDOUS MATERIALS APPENDIX

HAZARDOUS MATERIALS APPENDIX 1

LIST OF FACILITIES, ACTIVITIES, OR
CONDITIONS REQUIRING ASSESSMENTS
EAS Guidebook
A Guide to Environmental Assessment
Process and Methodologies

New York City
Office of Environmental Coordination

October 26, 1992

List of Facilities, Activities or Conditions Requiring Assessments

1. A facility, on or adjacent to the site, which generates (including small quantity generator), stores, treats or disposes of hazardous waste, as defined by USEPA under the RCRA Law and/or NYS DEC.

2. A facility which manufactures, produces, prepares, compounds, processes uses, repackages or disposes of hazardous chemicals, as defined under the NYC Community Right-to-Know Law (1988).

3. A facility, on or adjacent to the site, which is included on the following list:

Adhesives and sealants manufacture
Advertising displays manufacture
Agricultural machinery manufacture (including repairs)
Aluminum manufacture or aluminum products manufacture
Aircraft manufacture (including parts)
Airports Appliance (electrical) manufacture
Art goods manufacture
Asphalt or asphalt products manufacture
Athletic equipment manufacture
Automobile and other laundries
Automobile manufacture
Automobile rental establishments
Automobile wrecking establishments
Automobile service stations
Battery manufacture
Bicycle manufacture
Blacksmith shops
Blueprinting establishments
Boat repair
Boat fuel sales
Boat storage
Business machine manufacture
Camera manufacture
Canvas or canvas products manufacture
Carpet
Cleaning establishments
Carpet manufacture
Cement manufacture
Ceramic products manufacture
Charcoal manufacture
Chemical compounding or packaging
Chemical manufacture
Cleaning or cleaning and dyeing establishments
Clock manufacture
Clothing manufacture
Coal products manufacture

Coal sales or storage
Coke products manufacture
Coil coating
College, university, trade school laboratories
Construction machinery manufacture
Copper forming or copper products manufacture
Cosmetics or toiletries manufacture
Dental instruments manufacture
Dental laboratories
Disinfectant manufacture
Drafting instruments manufacture
Dry cleaning establishments
Dumps
Electric power or steam generating plants
Electric power substations
Electric and electronic components manufacture
Electric appliance manufacture
Electric supplies manufacture
Electroplating
Electrotyping or sterotyping
Engraving or photo-engraving
Exterminators
Explosives manufacture
Felt products manufacture
Felt products bulk processing, washing or curing
Fertilizer manufacture
Filling stations
Film manufacture
Fire stations
Foundries ferrous or non-ferrous
Fuel sales
Fungicides manufacture
Fur tanning, curing, finishing or dyeing
Furniture manufacture
Garbage incineration, storage or reduction
Gas manufacture, storage
Gasoline service stations
Generating plants, electric or steam
Glass manufacture
Glue manufacture
Golf courses
Graphite or graphite products manufacture
Gum and wood chemicals manufacture or processing
Hair products manufacture
Hardware manufacture
Heliports
Incineration or garbage reduction
Ink or ink ribbon manufacture
Insecticides manufacture
Inorganic chemicals manufacture
Iron and steel manufacture
Jewelry manufacture

Junk yards
Laboratories, medical, dental, research, experimental
Leather tanning, curing, finishing or dyeing
Leather products manufacture
Linoleum manufacture
Luggage manufacture
Lumber processing
Machine shops including tool, die, or pattern making
Machine tools manufacture
Machinery manufacture or repair
Mechanical products manufacture
Medical appliance manufacture
Medical instruments manufacture
Medical laboratories
Metals manufacture including alloys or foil
Metal casting or foundry products
Metal finishing, plating, grinding, polishing, cleaning, rust-proofing, heat treatment
Metal ores reduction or refining
Metal products treatment or processing
Metal reduction, refining, smelting or alloying
Metal treatment or processing
Mining machinery manufacture
Mirror silvering shops
Motor cycle manufacture
Motor freight stations
Musical instrument manufacture
Newspaper publishing
Non-ferrous metals manufacture
Office equipment or machinery repair shops
Oil, public utility stations for metering or regulating oil sales
Oil storage
Optical equipment manufacture
Organic chemicals manufacture
Orthopedic appliance manufacture
Ore mining
Paint and ink manufacture
Paper and pulp mills Paper products manufacture
Pesticides manufacture
Petroleum or petroleum products refining
Petroleum or petroleum products storage and handling
Pharmaceutical products manufacture or preparation
Photographic equipment and supplies manufacture
Plastics and synthetic products manufacture and processing
Plastics raw manufacture
Plumbing equipment manufacture
Porcelain enameling
Precision instruments manufacture
Printing and publishing
Pumping stations, sewage
Radioactive waste disposal services
Railroad equipment manufacture

Railroad rights-of-way, substations
Railroad freight terminals, yards or appurtenances
Refrigerating plants
Rubber processing or manufacture
Rubber products manufacture
Sewage disposal plants, pumping stations
Ship or boat building repair yards
Shipping waterfront
Shoes manufacture
Sign painting shops
Silver plating shops
Silverware manufacture, plate or sterling
Slag piles
Soap and detergent manufacture
Soldering shops
Solvent extraction
Steam electric power plants
Steel products manufacture
Tar products manufacture
Textiles bleaching, products manufacture or dyeing
Textile mills
Thermometer manufacture or assembly
Tile manufacture
Timber products manufacture
Tool or hardware manufacture
Toys manufacture
Trailer manufacture
Transit substations
Truck manufacture
Trucking terminals or motor freight stations
Turpentine manufacture
Varnish manufacture
Vehicles manufacture
Venetian blind manufacture
Welding shops
Wood distillation

HAZARDOUS MATERIALS APPENDIX 2

SITE REMEDIATION PROGRAM
Cleanup Standards for Contaminated Sites
Proposed New Rules: N.J.A.C. 7:26D

NJDEPE Docket Number: 01-92-01.
Proposal Number: PRN 1992-63.
Pages 386 - 389, 399

February 3, 1992

PARTIAL LIST

SUBCHAPTER 3. SOIL STANDARDS

7:26D-3.1 Scope

This subchapter presents the cleanup standards for the soil, except when more stringent cleanup standards are developed pursuant to N.J.A.C. 7:26D-5.

7:26D-3.2 Identification of soil cleanup standards

(a) The surface soil cleanup standards are:

1. The surface soil cleanup standards in Table 3-1 below;

i. For a contaminant not included in Table 3-1, the Department may develop a surface soil cleanup standard pursuant to N.J.A.C. 7:26D-6;

ii. If the subsurface soil cleanup standard for a contaminant, identified pursuant to (b) below, is numerically less than the surface soil cleanup standard for that contaminant identified pursuant to (a)1 above, then that subsurface soil cleanup standard shall apply to both the surface and subsurface soil; and

2. The soil cleanup standards identified pursuant to (c) below.

(b) The subsurface soil cleanup standards are as follows:

1. For organic contaminants in any area where contaminated ground water has migrated to, or has the potential to migrate to, a Class I or Class IIA aquifer the subsurface soil cleanup standards are:

i. Presented in Table 3-1;

ii. For an organic contaminant in areas identified pursuant to (b)1 above, without a subsurface soil cleanup standard in Table 3-1, the Department may develop a subsurface soil cleanup standard pursuant to N.J.A.C. 7:26D-6;

2. For inorganic contaminants the Department will determine the subsurface soil cleanup standard on a site-specific basis through an assessment of contaminant toxicity and potential or demonstrated mobility, including, without limitation, the consideration of such soil chemical and physical characteristics as:

i. Cation exchange capacity (CEC);

ii. ph;

iii. Particle size distribution;

iv. Permeability; and

v. Chemical state of the contaminant; and

3. The soil cleanup standards identified pursuant to (c) below.

(c) The following soil standards apply to both surface and subsurface soil:

1. Total organic contaminants, which includes total petroleum hydrocarbons (TPHC), shall not exceed 10,000 mg/kg;

2. When total volatile organic contaminants are present at concentrations greater than or equal to 1,000 mg/kg, the cleanup standard for total volatile organic contaminants shall be 1,000 mg/kg, except as provided in (c)3 below;

3. When total volatile organic contaminants are present at concentrations greater than 100 mg/kg, but less than 1,000 mg/kg, the cleanup standard for total volatile organic contaminants shall be based on an evaluation of actual and potential impacts to any subsurface structures and shall include:

i. If total volatile organic contaminants are detected in the gas phase in this soil, the concentration in mg/m^3 of the contaminant in a residential living space shall not exceed the lower of either:

(1) The chronic inhalation reference concentration impacted by the soil for habitable structures; or

(2) Ten percent of the lower explosive limit for an enclosure; and

ii. In all other circumstances, reduction to the maximum extent possible of any such actual or potential impact;

4. No soil shall exhibit the hazardous waste characteristics of ignitability, corrosivity and reactivity as defined in the hazardous waste regulations at N.J.A.C. 7:26-8 due to the presence of contaminants; and

5. The Department may require the use of institutional controls pursuant to N.J.A.C. 7:26D-8 when necessary to protect human health and the environment.

(d) Any person may initiate the process, pursuant to N.J.A.C. 7:26D-7, for an alternate soil cleanup standard, or a deferral of a soil cleanup standard.

TABLE 3-1
SOIL CLEANUP STANDARDS (mg/kg)

Contaminant	CASRN	Residential Surface Soil Standards	Subsurface Soil Standards
Acenaphthene	83-32-9	3,400	100
Acetone	67-64-1	1,000	50
Acrylonitrile	107-13-1	1	100
Aldrin	309-00-2	0.040	50
Anthracene	120-12-7	10,000	500
Antimony	7440-36-0	14	
Arsenic (Total)	7440-38-2	20	
Barium	7440-39-3	600	
Benzene	71-43-2	3	1
3,4-Benzofluoranthene (Benzo(b)fluoranthene)	205-99-2	0.66	500
Benzo(a)anthracene	56-55-3	0.66	500
Benzo(a)pyrene (BaP)	50-32-8	0.66	100
Benzo(k)fluoranthene	207-08-9	0.66	500
Benzo(ghi)perylene	191-24-2	0.66	500
Benzyl Alcohol	100-51-6	10,000	50
Beryllium	7440-41-7	2	
Bis(2-chloroethyl) ether	111-44-4	1	1
Bis(2-chloroisopropyl) ether	39638-32-9	2,300	10
Bis(2-ethylhexyl) phthalate	117-81-7	49	100
Bromodichloromethane (Dichlorobromomethane)	75-27-4	5	1
Bromoform	75-25-2	86	1
Bromomethane	74-83-9	790	1
2-Butanone (MEK)	78-93-3	1,000	50
Butylbenzyl phthalates	85-68-7	10,000	100
Cadmium	7440-43-9	1	
Carbon tetrachloride	56-23-5	2	1
Chlorobenzene	108-90-7	37	1
Chloroform	67-66-3	19	1
4-Chloro-3-methyl phenol (p-Chloro-m-cresol)	59-50-7	10,000	100
Chloromethane	74-87-3	520	10
2-Chlorophenol	95-57-8	280	50
Chrysene	218-01-9	0.66	500
Copper	7440-50-8	600	
Cyanide	57-12-5	280	
4,4'-DDD (p,p'-TDE)	72-54-8	3	100
4,4'-DDE	72-55-9	2	100
4,4'-DDT	50-29-3	2	100
Dibenz(a,h)anthracene	53-70-3	0.66	500
Dibromochloromethane (Chlorodibromomethane)	124-48-1	110	1
Di-n-butyl phthalate	84-74-2	5,700	100
Di-n-octyl phthalate	117-84-0	1,100	100
1,2-Dichlorobenzene	95-50-1	5,100	50
1,3-Dichlorobenzene	541-73-1	5,100	100
1,4-Dichlorobenzene	106-46-7	280	100
3,3'-Dichlorobenzidine	91-94-1	2	100
1,1-Dichloroethane	75-34-3	1,000	1
1,2-Dichloroethane	107-06-2	6	1
1,1-Dichloroethene	75-35-4	51	10
1,2-Dichloroethene (trans)	156-60-5	960	50
1,2-Dichloroethene (cis)	156-59-2	79	50
2,4-Dichlorophenol	120-83-2	170	10
1,3-Dichloropropene (cis and trans)	542-75-6	4	1
Dieldrin	60-57-1	0.042	50
Diethyl phthalate	84-66-2	10,000	50
2,4-Dimethyl phenol	105-67-9	1,100	50

Dimethyl phthalate	131-11-3	10,000	50
2,4-Dinitrophenol	51-28-5	110	10
2,4-Dinitrotoluene	121-14-2	1	10
Endosulfan	115-29-7	3	50
Endrin	72-20-8	17	50
Ethylbenzene	100-41-4	1,000	100
Fluoranthene	206-44-0	2,300	500
Fluorene	86-73-7	2,300	100
Fluoride	16984-48-8	1,100	
Heptachlor	76-44-8	0.15	500
Hexachlorobenzene	118-74-1	0.42	50
Hexachlorobutadiene	87-68-3	11	50
Hexachlorocyclopentadiene	77-47-4	400	100
Hexachloroethane	67-72-1	1,700	100
Indeno(1,2,3-cd)pyrene	193-39-5	0.66	500
Isophorone	78-59-1	1,100	10
Lead (Total)	7439-92-1	100	
Lindane	58-89-9	0.52	1
Methoxychlor	72-43-5	280	500
Mercury (Total)	7439-97-6	14	
4-Methyl-2-pentanone (MIBK)	108-10-1	1,000	50
Methylene chloride	75-09-2	49	10
Napthalene	91-20-3	230	100
Nickel (Soluble salts)	7440-02-0	250	
Nitrobenzene	98-95-3	1	50
N-Nitrosodiphenylamine	86-30-6	140	100
N-Nitrosodi-n-propylamine	621-64-7	0.66	1
PCBs (Polychlorinated biphenyls)	1336-36-3	0.45	100
Pentachlorophenol	87-86-5	1,700	100
Phenol	103-95-2	10,000	50
Pyrene	129-00-0	1,700	500
Selenium (Total)	7782-49-2	1	
Silver	7440-22-4	40	
Styrene	100-42-5	23	100
1,1,1,2-Tetrachloroethane	630-20-6	260	1
1,1,2,2-Tetrachloroethane	79-34-5	34	1
Tetrachloroethylene	127-18-4	9	1
Thallium	7440-28-0	2	
Toluene	108-88-3	1,000	500
Toxaphene	8001-35-2	0.62	100
1,2,4-Trichlorobenzene	120-82-1	1,100	100
1,1,1-Trichloroethane	71-53-6	210	50
1,1,2-Trichloroethane	79-00-5	23	1
Trichloroethene (TCE)	79-01-6	23	1
2,4,5-Trichlorophenol	95-95-4	5,600	50
2,4,6-Trichlorophenol	88-06-2	62	50
Vanadium	7440-62-2	380	
Vinyl chloride	75-01-4	2	1
Xylenes (Total)	1330-29-7	360	10
Zinc	7440-66-6	1,500	

7:26D-3.3 Compliance

(a) Compliance with applicable soil cleanup standards shall be established throughout the appropriate soil zone at the contaminated site.

(b) Compliance with a soil cleanup standard is achieved when:

1. The arithmetic mean of the concentrations of the contaminant in all soil samples in an area of concern is less than or equal to the applicable soil cleanup standard for that contaminant;

2. No single soil sample exceeds the applicable soil cleanup standard by a factor of more than:

i. Ten for a soil standard of less than or equal to 10 ppm, but not more than 50 ppm;

ii. Five for a soil standard greater than 10 but less than or equal to 100 ppm, but not more than 200 ppm; and

iii. Two for a soil standard greater than 100 ppm; and

3. No more than 10 percent of the soil samples, or one sample if two to 10 samples, inclusively, are used, exceed the applicable soil cleanup standard.

(c) Sampling shall be conducted in the areas of concern consistent with the remedial investigation requirements approved by the Department.

(d) To determine compliance with this subchapter for a remedy which does not involve the physical, chemical or biological removal of contaminants, an alternate cleanup standard or a deferral of a cleanup standard is required pursuant to N.J.A.C. 7:26D-7. If an alternate cleanup standard or a deferral is not applicable pursuant to N.J.A.C. 7:26D-7 for such a situation, then compliance will not have been achieved with this subchapter.

(c) In no event shall compliance be achieved with the surface soil cleanup standards in this subchapter by applying two feet of clean fill onto a contaminated site, without the express prior written approval of the Department.

TABLE 7-1
NON-RESIDENTIAL SURFACE SOIL CLEANUP STANDARDS
(mg/kg)

Contaminants	CASRN	Non Residential Surface Soil Standards
Acenaphthene	83-32-9	10,000
Acetone	67-64-1	1,000
Acrylonitrile	107-13-1	5
Aldrin	309-00-2	0.17
Anthracene	120-12-7	10,000
Antimony	7440-36-0	340
Arsenic (Total)	7440-38-2	20
Barium	7440-39-3	26,000
Benzene	71-43-2	13
3,4-Benzofluoranthene (Benzo(b)fluorantnene)	205-99-2	2.5
Benzo(a)anthracene	56-55-3	2.5
Benzo(a)pyrene (BaP)	50-32-8	0.66
Benzo(k)fluoranthene	207-08-9	2.5
Benzo(ghi)perylene	191-24-2	2.5
Benzyl Alcohol	100-51-6	10,000
Beryllium	7440-41-7	2
Bis(2-chloroethyl) ether	111-44-4	3
Bis(2-chloroisopropyl) ether	39638-32-9	10,000
Bis(2-ethylhexyl) phthalate	117-81-7	210
Bromodichloromethane (Dichlorobromomethane)	75-27-4	22
Bromoform	75-25-2	370
Bromomethane	74-83-9	1,000
2-Butanone (MEK)	78-93-3	1,000
Butylbenzyl phthalates	85-68-7	10,000
Cadmium	7440-43-9	100
Carbon tetrachloride	56-23-5	4
Chlorobenzene	108-90-7	690
Chloroform	67-66-3	28
4-Chloro-3-methyl phenol (p-Chloro-m-cresol)	59-50-7	10,000
Chloromethane	74-87-3	1,000
2-Chlorophenol	95-57-8	5,200
Chrysene	218-01-9	2.5
Copper	7440-50-8	600
Cyanide	57-12-5	5,200
4,4'-DDD (p,p'-TDE)	72-54-8	12
4,4'-DDE	72-55-9	9
4,4'-DDT	50-29-3	9
Dibenz(a,h)anthracene	53-70-3	0.66
Dibromochloromethane (Chlorodibromomethane)	124-48-1	1,000
Di-n-butyl phthalate	84-74-2	10,000
Di-n-octyl phthalate	117-84-0	10,000
1,2-Dichlorobenzene	95-50-1	10,000
1,3-Dichlorobenzene	541-73-1	10,000
1,4-Dichlorobenzene	106-46-7	1,200
3,3'-Dichlorobenzidine	91-94-1	-
1,1-Dichloroethane	75-34-3	1,000
1,2-Dichloroethane	107-06-2	24
1,1-Dichloroethane	75-35-4	940
1,2-Dichloroethene (trans)	156-60-5	10,000
1,2-Dichloroethene (cis)	156-59-2	1,500
2,4-Dichlorophenol	120-83-2	5,200
1,3-Dichloropropene (cis and trans)	542-75-6	5
Dieldrin	60-57-1	0.18
Diethyl phthalate	84-66-2	10,000
2,4-Dimethyl phenol	105-67-9	10,000
Dimethyl phthalate	131-11-3	10,000
2,4-Dinitrophenol	51-28-5	2,100
2,4-Dinitrotoluene	121-14-2	4
Endosulfan	115-29-7	52
Endrin	72-20-8	310
Ethylbenzene	100-41-4	1,000
Fluoranthene	206-44-0	10,000
Fluorene	86-73-7	10,000
Fluoride	16984-48-8	10,000
Heptachlor	76-44-8	0.65
Hexachlorobenzene	118-74-1	2
Hexachlorobutadiene	87-68-3	210
Hexachlorocyclopentadiene	77-47-4	7,300
Hexachloroethane	67-72-1	10,000
Indeno (1,2,3-cd) pyrene	193-39-5	2.5
Isophorone	78-59-1	10,000
Lead (Total)	7439-92-1	600
Lindane	58-89-9	2.2
Methoxychlor	72-43-5	5,200
Mercury (Total)	7439-97-6	260
4-Methyl-2-pentanone (MIBK)	108-10-1	1,000
Methylene chloride	75-09-2	170
Napthalene	91-20-3	4,200
Nickel (Soluble salts)	7440-02-0	2,400
Nitrobenzene	98-95-3	520
N-Nitrosodiphenylamine	86-30-6	590
N-Nitrosodi-n-propylamine	621-64-7	0.66
PCBs (Polychlorinated biphenyls)	1336-36-3	2
Pentachlorophenol	87-86-5	10,000
Phenol	108-95-2	10,000
Pyrene	129-00-0	10,000
Selenium (Total)	7782-49-2	1,000
Silver	7440-22-4	2,000
Styrene	100-42-5	97
1,1,1,2-Tetrachloroethane	630-20-6	440
1,1,2,2-Tetrachloroethane	79-34-5	70
Tetrachloroethylene	127-18-4	37
Thallium	7440-28-0	2
Toluene	108-88-3	1,000
Toxaphene	8001-35-2	2.7
1,2,4-Trichlorobenzene	120-82-1	10,000
1,1,1-Trichloroethane	71-55-6	3,800
1,1,2-Trichloroethane	79-00-5	420
Trichloroethene (TCE)	79-01-6	100
2,4,5-Trichlorophenol	95-95-4	10,000
2,4,6-Trichlorophenol	88-06-2	260
Vanadium	7440-62-2	7,000
Vinyl chloride	75-01-4	7
Xylenes (Total)	1330-29-7	6,300
Zinc	7440-660-6	1,500

WATERFRONT REVITALIZATION PROGRAM APPENDIX

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Waterfront Revitalization Program Policies

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Waterfront Revitalization Program Policies

Following is a complete list of the 56 policies of the New York City Waterfront Revitalization Program. The 44 numbered policies are the State policies of the Coastal Management Program; the 12 lettered policies are specific to New York City's program. Following many of the policies is a discussion from the State Coastal Management Program. This discussion ranges from general policy directives to guidelines or practical instruction.

POLICY 1: *Restore, revitalize, and redevelop deteriorated and underutilized waterfront areas for commercial, industrial, cultural, recreational, and other compatible uses.*

The New York City Comprehensive Waterfront Plan provides guidance in encouraging redevelopment in appropriate areas; all proposed actions may consider this plan in conjunction with other waterfront policies and plans.

In accordance with the WRP and New York State Coastal Management Program, when an action is proposed to take place in an urban waterfront area, the following guidelines may be helpful in identifying whether or not there will be a consistency issue:

1. Priority should be given to uses that are dependent on a location adjacent to the water.

2. The action should enhance existing and anticipated uses. For example, a new highway should be designed and constructed so as to serve the potential access needs for desirable industrial development.

3. The action should serve as a catalyst to private investment in the area.

4. The action should improve the deteriorated condition of a site and, at a minimum, must not cause further deterioration. For example, a building could not be abandoned without protecting it against vandalism and/or structural decline.

5. The action must lead to development that is compatible with the character of the area, with consideration given to scale, architectural style, density, and intensity of use.

6. The action should have the potential to improve the existing economic base of the community, and, at a minimum, must not jeopardize this base. For example, waterfront development meant to serve consumer needs would be inappropriate in an area where no increased consumer demands were expected and existing development was already meeting demand.

7. The action should improve adjacent and upland views of the water, and, at a minimum, must not affect these views in an insensitive manner.

8. The action should have the potential to improve the potential for multiple uses of the site.

NEW YORK CITY POLICY A: *Improve urban shorelines by maintaining, removing, or recycling waterfront structures (piers, docks, wharves etc.) in accordance with waterfront development policies and plans. Identify alterative uses for underutilized waterfront structures.*

POLICY 2: *Facilitate the siting of water-dependent uses and facilities on or adjacent to coastal waters.*

Municipally owned waterfront sites should be used for water-dependent uses, and/or should be developed to promote public access, where safety and security concerns can be addressed. Non-water-dependent uses should only be considered where it can be demonstrated that no feasible non-waterfront site exists or where the temporary nature of the facility does not commit the site in the long term.

The following uses and facilities are considered as water-dependent:

1. Uses that depend on the utilization of resources found in coastal waters (for example: fishing, mining of sand and gravel, mariculture activities);

2. Recreational activities that depend on access to coastal waters (for example: swimming, fishing, boating, wildlife viewing);

3. Uses involved in the sea/land transfer of good (for example: docks, loading areas, pipelines, short-term storage facilities);

4. Structures needed for navigational purposes (for example: locks, dams, lighthouses);

5. Flood and erosion protection structures (for example: breakwaters, bulkheads);

6. Facilities needed to store and service boats and ships (for example: marinas, boat repair, boat construction yards);

7. Uses requiring large quantities of water for processing and cooling purposes (for example: hydroelectric power plants, fish processing plants, pumped storage power plants);

8. Uses that rely heavily on the waterborne transportation of raw materials or products that are difficult to transport on land, thereby making it critical that a site near to shipping facilities be obtained (for example: coal export facilities, cement plants, quarries);

9. Uses that operate under such severe time constraints that proximity to shipping facilities becomes critical (for example: firms processing perishable foods);

10. Scientific/education activities that, by their nature, require access to coastal waters (for example: certain meteorological and oceanographic activities); and

11. Support facilities that are necessary for the successful functioning of permitted water-dependent uses (For example: parking lots, snack bars, first aid stations, short-term storage facilities). Though these uses must be near the given water-dependent use they should, as much as possible, be sited inland from the water-dependent use rather than on the shore.

According to the WRP, uses that are enhanced by a waterfront location should be encouraged to located along the shore, through not at the expense of water-dependent uses. A water-enhanced use is defined as a use that has no critical dependence on obtaining a waterfront location, but profitability of the use and/or the enjoyment level of the users would be increased significantly if the use were adjacent to, or had visual access to the

waterfront. A restaurant that uses good site design to take advantage of a waterfront view, and a golf course that incorporates the coastline into the course design, are two examples of water-enhanced uses.

If there is no immediate demand for a water-dependent use in a given area but a future demand is reasonably foreseeable, temporary non-water-dependent uses should be considered preferable to a non-water-dependent use that involves an irreversible, or nearly irreversible commitment of land. Parking lots, passive recreational facilities, outdoor storage areas, and non-permanent structures are uses that would likely be considered as "temporary" non-water-dependent uses.

In the actual choice of sites where water-dependent uses will be encouraged and facilitated, the following guidelines should be used:

1. Competition for space—competition for space or the potential for it, should be indicated before any given site is promoted for water-dependent uses. The intent is to match water-dependent uses with suitable locations and thereby reduce any conflicts between competing uses that might arise. Not just any site suitable for development should be chosen as a water-dependent use area. The choice of a site should be made with some meaningful impact on the real estate market anticipated. The anticipated impact could either be one of increased protection to existing water-dependent activities or else the encouragement of water-dependent development.

2. In-place facilities and services—most water-dependent uses, if they are to function effectively, will require basic public facilities and services. In selecting appropriate areas for water-dependent use, consideration should be given of the following factors:

   a. The availability of public sewers, public water lines and adequate power supply;

   b. Access to the area for trucks and rail, if heavy industry is to be accommodated; and

   c. Access to public transportation, if a high number of person trips is to be generated.

3. Access to navigational channels—if commercial shipping, commercial fishing, or recreational boating are planned, the locality should consider setting aside a site, within a sheltered harbor, from which access to adequately sized navigation channels would be assured.

4. Compatibility with adjacent uses and the protection of other coastal resources—water-dependent uses should be located so that they enhance, or at least do not detract from, the surrounding community. Consideration should also be given to such factors as the protection of nearby residential areas from odors, noise, and traffic. Affirmative approaches should also be employed so that water-dependent uses and adjacent uses can serve to complement one another. For example, a recreation-oriented water-dependent use area could be sited in an area already oriented towards tourism. Clearly, a marina, fishing pier or swimming area would enhance, and in turn be enhanced by, nearby restaurants, motels and other non-water-oriented tourist activities. Water-dependent uses must also be sited so as to avoid adverse impacts on the significant coastal resources.

5. Preference to underutilized sites—the promotion of water-dependent uses should serve to foster development as a result of the capital programming, permit expediting, and other State and local actions that will be used to promote the site. Nowhere is such a stimulus needed more than in those portions of the State's waterfront areas that are currently underutilized.

6. Providing for expansion—a primary objective of the policy is to create a process by which water-dependent uses can be accommodated well into the future. State agencies and localities should therefore give consideration to long-term space needs and, where practicable, accommodate future demand by identifying more land that is needed in the near future.

NEW YORK CITY POLICY B: *Improve channels as necessary to maintain and stimulate economic development.*

POLICY 3: *Promote the development and use of the State's major ports as centers of commerce and industry, emphasizing the siting, within port areas, of land use and development which is necessary to, or in support of, the waterborne transportation of cargo and people. The State's major ports are the ports of Albany, Buffalo, New York, Ogdensburg, and Oswego.*

The following guidelines shall be used in determining consistency:

1. In assessing proposed projects within or abutting a major port, given that all other applicable policies are adhered to, the overriding consideration is the maintenance and enhancement of port activity, i.e., development related to waterborne transportation, which will have precedence over other, non-port-related activities.

2. Dredging to maintain the economic viability of major ports will be regarded as an action of regional or Statewide public benefit if: a clear need is shown for maintaining or improving the established alignment, width, and depth of existing channels or for new channels essential to port activity; and it can be demonstrated that environmental impacts would be at acceptable levels according to State regulations governing the activity.

3. Landfill projects in the near-shore areas will be regarded as an acceptable activity within major port areas, provided adverse environmental impacts are acceptable under all applicable environmental regulation and a strong economic justification is demonstrated

4. If non-port related activities are proposed to be located in or near to a major port, these uses shall be sited so as not to interfere with normal port operations.

5. When not already restricted by existing laws or covenants, and when there is no other overriding regional or Statewide public benefit for doing otherwise, surplus public land or facilities within or adjacent to a major port shall be offered for sale, in the first instance, to the appropriate port authority.

6. In the programming of capital projects for port areas, highest priority will be given to projects that promote the development and use of the port.

   However, in determining such priorities, consideration must also be given to non-port related interests within or near the ports that have demonstrated critical capital programming needs.

7. No buildings, piers, wharves, or vessels shall be abandoned or otherwise left unused by a public agency or sold without making provisions for their maintenance in sound condition or for their demolition or removal.

8. Proposals for the development of new major ports will be assessed in terms of the anticipated impact on: a) existing New York State major ports; b) existing modes of transportation; and c) the surrounding land uses and overall neighborhood character of the area in which the proposed port is to be located; and other valued coastal resources.

9. Port development shall provide opportunities for public access insofar as these opportunities do not interfere with the day-to-day operations of the port and the port authority and its tenants do not incur unreasonable costs.

POLICY 4: *Strengthen the economic base of smaller harbor areas by encouraging the development and enhancement of those activities which have provided such areas with a unique identity.*

The following guidelines shall apply:

1. The action shall give priority to those traditional and/or desired uses that are dependent on or enhanced by a location adjacent to the water.

2. The action will enhance or not detract from or adversely affect existing traditional and/or desired anticipated uses.

3. The action shall not be out of character with, nor lead to development that would be out of character with, existing development in terms of the area's scale, intensity of use, and architectural style.

4. The action must not cause a site to deteriorate, e.g., a structure shall not be subject to vandalism and/or structural decline.

5. The action will not adversely affect the existing economic base of the community, e.g., waterfront development designed to promote residential development might be inappropriate in a harbor area where the economy is dependent upon tourism and commercial fishing.

6. The action will not detract from views of the water and smaller harbor area, particularly where the visual quality of the area is an important component of the area's appeal and identity.

POLICY 5: *Encourage the location of development in areas where public services and facilities essential to such development are adequate.*

This policy is intended to accomplish the following:

- Strengthen existing residential, industrial, and commercial centers;
- Foster an orderly pattern of growth where outward expansion is occurring;
- Increase the productivity of existing public services and moderate the need to provide new public services in outlying areas;
- Preserve open space in sufficient amounts and where desirable; and
- Foster energy conservation by encouraging proximity between home, work, and leisure activities.

The following guidelines shall be used in making a determination as to whether the action is within, contiguous to, or in close proximity to an area of concentrated development where infrastructure and public services are adequate:

1. Cities, built-up suburban towns and villages, and rural villages in the coastal area are generally areas of concentrated development where infrastructure and public services are adequate.

2. Other locations in the coastal area may also be suitable for development, if three or more of the following conditions prevail:

a. Population density of the area surrounding or adjacent to the proposed site exceeds 1,000 persons per square mile;

b. Fewer than 50 percent of the buildable sites (i.e., sites meeting lot area requirements under existing local zoning regulations) within a one-mile radius of the proposed site are vacant;

c. Proposed site is served by or is near to public or private sewer and water lines;

d. Public transportation service is available within one mile of the proposed site; and

e. A significant concentration of commercial and/or industrial activity is within one-half mile of the proposed site.

3. The following points shall be considered in assessing the adequacy of an area's infrastructure and public services:

   a. Streets and highways serving the proposed site can safely accommodate the peak traffic generated by the proposed land development;

   b. Development's water needs (consumptive and fire fighting) can be met by the existing water supply system;

   c. Sewage disposal system can accommodate the water generated by the development;

   d. Energy needs of the proposed land development can be accommodated by existing utility systems;

   e. Stormwater runoff from the proposed site can be accommodated by on-site and/or off-site facilities; and

   f. Schools, police and fire protection, and health and social services are adequate to meet the needs of the population expected to live, work, shop, or conduct business in the area as a result of the development.

It is recognized that certain forms of development may and/or should occur at locations that are not within or near areas of concentrated development. Thus, this coastal development policy does not apply to the following types of development projects and activities:

1. Economic activities that depend upon sites at or near locations where natural resources are present, e.g., lumber industry, quarries.

2. Development that by its nature is enhanced by a non-urbanized setting, e.g., a resort complex, campgrounds, second home developments.

3. Development that is designed to be a self-contained activity, e.g., a small college, an academic or religious retreat.

4. Water-dependent uses with site requirements not compatible with this policy or when alternative sites are not available.

5. Development that because of its isolated location and small-scale has little or no potential to generate and/or encourage further land development.

6. Uses and/or activities that because of public safety consideration should be located away from populous areas.

7. Rehabilitation or restoration of existing structures and facilities.

8. Development projects that are essential to the construction and/or operation of the above uses and activities.

POLICY 6: *Expedite existing permit procedures in order to facilitate the siting of development activities at suitable locations.*

POLICY 7: *Significant coastal fish and wildlife habitats will be protected and preserved so as to maintain their viability as habitats.*

The range of generic activities most likely to affect significant coastal fish and wildlife habitats include but are not limited to the following:

1. Draining wetlands, ponds: Cause changes in vegetation, or changes in groundwater and surface water hydrology.

2. Filling wetlands, shallow areas of streams, lakes, bays, estuaries: May change physical character of substrate (e.g., sandy to muddy, or smother vegetation, alter surface water hydrology).

3. Grading land: Results in vegetation removal, increased surface runoff, or increased soil erosion and downstream sedimentation.

4. Clear cutting: May cause loss of vegetative cover, increased fluctuations in the amount of surface runoff, or increased streamed scouring, soil erosion, or sediment deposition.

5. Dredging or excavation: May cause change in substrate composition, possible release of contaminants otherwise stored in sediments, removal of aquatic vegetation, or change circulation patterns and sediment transport mechanisms.

6. Dredge spoil disposal: May induce shoaling of littoral areas, or change circulation patterns.

7. Physical alteration of shore areas through channelization or construction of shore structure: May change in volume and rate of flow or increased scouring, sedimentation

8. Introduction, storage or disposal of pollutants such as chemical, petrochemical, solid wastes, nuclear wastes, toxic material, pesticide, sewage effluent, urban and rural runoff, leachate of hazardous and toxic substances stored in landfills: May cause increased mortality or sublethal effects on organisms, alter their reproductive capabilities, or reduce their value as food organisms.

The range of physical, biological and chemical parameters that should be considered include but are not limited to the following:

1. Physical parameters such as: Living space, circulation, flushing rates, tidal amplitude, turbidity, water temperature, depth (loss of littoral zone), morphology, substrate type, vegetation, structure, erosion and sedimentation rates.

2. Biological parameters such as: Community structure, food chain relationships, species diversity, predator/prey relationships, population size, mortality rates, reproductive rates, behavioral patterns, and migratory patterns.

3. Chemical parameters such as: Dissolved oxygen, carbon dioxide, pH, dissolved solids, nutrients, organic salinity, pollutants (heavy metals, toxic and hazardous materials).

Habitat Impairment Test

A habitat impairment test must be applied to any activity that is subject to consistency review under Federal and State laws, or under applicable local laws contained in the approved New York City Waterfront Revitalization Program. If the proposed action is subject to consistency review, then the habitat protection policy applies, whether the proposed action is to occur within or outside the designated area.

The specific habitat impairment test is as follows.

In order to protect and preserve a designated significant coastal fish and wildlife habitat, land and water uses or development shall not be undertaken if such actions would:

- destroy the designated habitat; or
- significantly impair the viability of a designated habitat.

Habitat destruction is defined as the loss of fish or wildlife use through direct physical alteration, disturbance, or pollution of a designated area or through the indirect effects of these actions on a designated area. Habitat destruction may be indicated by changes in vegetation, substrate, or hydrology, or increases in runoff, erosion, sedimentation or pollutants.

Significant impairment is defined as reduction in vital resources (e.g., food, shelter, living space) or change in environmental conditions (e.g., temperature, substrate, salinity) beyond the tolerance range of important species of fish or wildlife that rely on the habitat values found within the designated area. Indicators of a significantly impaired habitat focus on ecological alterations and may include but are not limited to reduced carrying capacity, changes in community structure (food chain relationships, species diversity), reduced productivity and/or increased incidence of disease and mortality.

The tolerance range of a species of fish or wildlife is not defined as the physiological range of conditions beyond which a species will not survive at all, but as the ecological range of conditions that supports the species population or has the potential to support a restored population, where practical. Either the loss of individuals through an increase in emigration or an increase in death rate indicates that the tolerance range of the species has been exceeded. An abrupt increase in death rate may occur as an environmental factor falls beyond a tolerance limit (a range has both upper and lower limits). Many environmental factors, however, do not have a sharply defined tolerance limit, but produce increasing emigration or death rates with increasing departure from conditions that are optimal for the species.

The range of parameters that should be considered in applying the habitat impairment test include but are not limited to the following:

1. Physical parameters such as living space, circulation, flushing rates, tidal amplitude, turbidity, water temperature, depth (including loss of littoral zone), morphology, substrate type, vegetation, structure, erosion and sedimentation rates;

2. Biological parameters such as community structure, food chain relationships, species diversity, predator/prey relationships, population size, mortality rates, reproductive rates, meristic features, behavioral patterns and migratory patterns; and

3. Chemical parameters such as dissolved oxygen, carbon dioxide, acidity, dissolved solids, nutrients, organic, salinity, and pollutants (heavy metals, toxics and hazardous materials).

Although not comprehensive, examples of generic activities and impacts that could destroy or significantly impair habitat values are provided within the New York State Department of State's 1992 Significant Coastal Fish and Wildlife Habitat Program document. The Impact Assessment section of that document provides a narrative for each designated habitat in New York City. The habitats are listed as Lemon Creek, Fresh Kills, Pralls Island, Sawmill Creek Marshes, Goethals Bridge Pond, Shooters Island, Lower Hudson Reach, North & South Brother

Island, Pelham Bay Park Wetlands, Little Neck Bay, Alley Pond Park, Udall's Cove, Meadow and Willow Lakes, Jamaica Bay, and Breezy Point. This information is provided to assist in applying the habitat impairment test to a proposed activity.

POLICY 8: *Protect fish and wildlife resources in the coastal area from the introduction of hazardous waste and other pollutants which bioaccumulate in the foodchain or which cause significant sublethal or lethal effect on those resources.*

POLICY 9: *Expand recreational use of fish and wildlife resources in coastal areas by increasing access to existing resources, supplementing existing stocks and developing new resources.*

The following additional guidelines should be considered by State and Federal agencies as they determine the consistency of their proposed action with the above policy:

1. Consideration should be made by Federal and State agencies as to whether an action will impede existing or future utilization of the State's recreational fish and wildlife resources.

2. Efforts to increase access to recreational fish and wildlife resources should not lead to stocks, and expanding aquaculture facilities.

   The following additional guidelines should be considered by State and Federal agencies as they determine the consistency of their proposed action with the above policy:

   a. A public agency's commercial fishing development initiative should not preempt or displace private sector initiative.

   b. A public agency's efforts to expand existing or create new on-shore commercial fishing support facilities should be directed towards unmet development needs rather than merely displacing existing commercial fishing activities from a nearby port. This may be accomplished by taking into consideration existing State or regional commercial fishing development plans.

   c. Consideration should be made by State and Federal agencies whether an action will impede existing utilization or future development of the State's commercial fishing resources.

   d. Commercial fishing development efforts should be made in a manner that ensures the maintenance and protection of the renewable fishery resources.

POLICY 10: *Further develop commercial finfish, shellfish and crustacean resources in the coastal areas by encouraging the construction or improvement of existing on-shore commercial fishing facilities, increasing marketing of the State's seafood products, maintaining adequate stocks and expanding agricultural facilities.*

POLICIES 11-17: FLOODING AND EROSION

Natural features such as beaches, bluffs, wetlands, dunes, and near-shore shallow waters absorb wave energy and protect coastlines from wind and waves, storm-induced high water, and other causes of flooding and erosion. The following group of policies address the flooding and erosion concerns for proposed actions in the coastal zone.

POLICY 11: *Buildings and other structures will be sited on the coastal area so as to minimize damage to property and the endangering of human lives by flooding and erosion.*

Flooding

This policy requires compliance with Local Law 33 and Article 10 of the Administrative Code if the action is located in the flood hazard area.

To determine if the proposed action is within the flood hazard area, check the Flood Insurance Rate Maps available at the New York City Department of City Planning or the Federal Emergency Management Agency. If the proposed action is located in an area of the map designated as an "A" zone or a "V" zone, further analysis is needed. The next step is to determine the proposed action's site elevation by converting the elevation identified on the Flood Insurance Rate Maps, based on the National Geodetic Vertical Datum (NGVD) to (NGVD), to the local datum as described in the table below.

National Geodetic Vertical Datum (NGVD) is a vertical control used as a reference for establishing elevations within the flood plain. It is the United States coast and geodetic survey mean sea level datum of 1929. The following table shall be used to convert NGVD to borough datum elevations.

Conversion of NGVD to Borough Datum

Borough	Conversion Figure*
Bronx	+ 2.608
Brooklyn	+ 2.547
Manhattan	+ 2.752
Queens	+ 2.725
Staten Island	+ 3.192

* Add conversion figure to NGVD to obtain borough datum elevation in feet.

If the action is in the flood hazard area, local law requires that buildings must have the lowest floor (including the basement) elevated or floodproofed to or above the Base Flood Elevation.

The analyst should consider how any project buildings would comply with Local Law 33, and in certain cases, the rationale for the selected flood protection techniques.

Erosion Hazard Areas

Beaches, boardwalks and shorefront communities are valuable assets that must be protected and maintained. If placed inappropriately and without effective shore protection, these assets can be destroyed or become prohibitively expensive to maintain. In general, non-structural erosion control, including dune building, beach nourishment, and adequate set back from eroding areas is preferred over structural solutions.

Locations of the proposed action should be checked on the Coastal Erosion Hazard Maps to determine if the proposed action is with a Coastal Erosion Hazard Area.

If the proposed action is within a designated Coastal Erosion Hazard Area, the proposed action will be subject to the restrictions pursuant to Coastal Erosion Management Regulations, 6 NYCRR Part 505.

NEW YORK CITY POLICY C: *Provide shorefront protection against coastal erosion hazards where there is public benefit and public use along non-public shores.*

NEW YORK CITY POLICY D: *Provide technical assistance for the identification and evaluation of erosion problems, as well as the development of erosion control plans along privately owned erosion shores.*

NEW YORK CITY POLICY E: *Implement public and private structural flood and erosion control projects only when:*

- *Public economic and environmental benefits exceed public economic and environmental costs;*
- *Nonstructural solutions are proven to be ineffective or cost prohibitive;*
- *Projects are compatible with other coastal management goals and objectives, including aesthetics, access and recreation;*
- *Adverse environmental impacts are minimized;*
- *Natural protective features are not impaired; and*
- *Adjacent (downdrift) shorelines are not adversely affected.*

POLICY 12: *Activities or development in the coastal area will be undertaken so as to minimize their adverse effects upon natural features which protect against flooding and erosion.*

POLICY 13: *The construction or reconstruction of erosion protection structures shall be undertaken only if they have a reasonable probability of controlling erosion for at least thirty years as demonstrated in design and construction standards and/or assured maintenance or replacement programs.*

POLICY 14: *The activities and development including the construction or reconstruction of erosion protection structures, shall be undertaken so that there will be no measurable increase in erosion nor flooding at the site of such activities nor development at other locations.*

POLICY 15: *Mining, excavation, or dredging in coastal waters shall not significantly interfere with the natural coastal processes which supply beach materials to land adjacent to such waters and shall be undertaken in a manner which will not cause an increase in erosion of such lands.*

Information about erosion is provided in Section 3I, "Natural Resources."

POLICY 16: *Public funds shall be expended for activities and development, including the construction or reconstruction of erosion control structures, only where the public benefits clearly outweigh their long-term monetary and other costs including their potential for increasing erosion and their adverse effects on natural protective features.*

POLICY 17: *Non-structural measures to minimize damage to natural resources and property from flooding and erosion shall be used whenever possible.*

POLICIES 18-25: THE PUBLIC WATERFRONT

Historically, the public right of access to and use of the foreshore and waters—the public trust doctrine as it has been termed—is based on the conviction that the "wet sand" between high and low water, underwater land and the water itself has unique characteristics associated with a public purpose.

Concurrent with the public trust, the riparian owner (the owner of land adjoining the water) had the right of access to the lands under water to build a dock or pier from the upland, and the right to make other improvements that would allow navigation, fishing or recreation.

The common law recognized that the public trust and the riparian rights of private owners often were in conflict. As cases came to the courts, the balance shifted with the circumstances. In recent years, the public trust doctrine has evolved to include recreation, aesthetic enjoyment, and environmental protection in addition to the historic considerations of fishing and navigation, Although the New York courts have not articulated this definition of the public trust in a detailed manner, the expanded definition of public access should be recognized as part of New York law.

POLICY 18: *To safeguard the vital interest of the State of New York and of its citizens in the waters and other valuable resources of the State's coastal area, all practicable steps shall be taken to ensure that such interests are accorded full consideration in the deliberations, decisions and actions of State and Federal bodies with authority over those waters and resources.*

POLICY 19: *Protect, maintain and increase the level and types of access to public water-related recreation resources.*

As set forth in the Comprehensive Waterfront Plan, an overriding principle of planning today is to re-establish the public's connection to the waterfront by creating new opportunities for visual, physical, and recreational access. This goal can be realized in various ways: by extending and improving a network of public spaces through parks, street ends and numerous publicly owned properties along the shoreline; and by enhancing and connecting these spaces with public access along the waterfront on private properties where compatible redevelopment is taking place.

The following State guidelines will be used in determining the consistency of a proposed action with this policy:

1. The existing access from adjacent or proximate public lands or facilities to public water-related recreation resources and facilities shall not be reduced, nor shall the possibility of increasing access in the future from adjacent or proximate public lands or facilities to public water-related recreation resources and facilities be eliminated, unless in the latter case, estimates of future use of these resources and facilities are too low to justify maintaining or providing increased public access.

   The following is an explanation of the terms used in the above guidelines:

   a. Access—the ability and right of the public to reach and use public coastal lands and waters.

   b. Public water-related recreation resources of facilities—all public lands or facilities that are suitable for passive or active recreation that requires either water or a waterfront location or is enhanced by a waterfront location.

   c. Public lands or facilities—lands or facilities held by State or local government in fee simple or less-than-fee simple ownership and to which the public has access or could have access, including underwater lands and the foreshore.

d. A reduction in the existing level of public access—includes but is not limited to the following:

(1) The number of parking spaces at a public water-related recreation resource or facility is significantly reduced.

(2) The service level of public transportation to a public water-related recreation resource or facility is significantly reduced during peak season use and such reduction cannot be reasonably justified in terms of meeting systemwide objectives.

(3) Pedestrian access is diminished or eliminated because of hazardous crossings required at new or altered transportation facilities, electric power transmission lines, or similar linear facilities.

(4) There are increases in the following: already existing special fares of public transportation to a public water-related recreation resource or facility; and/or admission fees to such a resource or facility, and an analysis shows that such increases will significantly reduce usage by individuals or families with incomes below the State government established poverty level.

e. An elimination of the possibility of increasing public access in the future includes, but is not limited to the following:

(1) Construction of public facilities that physically prevent the provision, except at great expense, of convenient public access to public water-related recreation resources and facilities.

(2) Sale, lease, or other transfer of public lands that could provide public access to public water-related recreation resources and facilities.

(3) Construction of private facilities that physically prevent the provision of convenient public access to public water-related recreation resources or facilities from public lands and facilities.

2. Any proposed project to increase public access to public water-related recreation resources and facilities shall be analyzed according to the following factors:

a. The level of access to the provided should be in accord with estimated public use. If not, the proposed level of access to be provided shall be deemed inconsistent with the policy.

b. The level of access to be provided shall not cause a degree of use that would exceed the physical capability of the resource or facility. If this were determined to be the case, the proposed level of access to be provided shall be deemed inconsistent with the policy.

3. The State will not undertake or fund any project that increases access to a water-related resource or facility that is not open to all members of the public.

4. In their plans and programs for increasing public access to public water-related resources and facilities, State agencies shall give priority in the following order to projects located: within the boundaries of the Federal-Aid Metropolitan Urban Area and served by public transportation; within the boundaries of the Federal-Aid Metropolitan Urban Area but not served by public transportation; outside the defined Urban Area boundary and served by public transportation; and outside the defined Urban Area boundary but not served by public transportation.

Consideration may be given to the following guidance on the provision of public access:

- Public Access should feel public.
- Public Access should be useable.
- Site design should provide, maintain, and enhance visual access and visual quality of the waterfront.
- Public access shall be continuous where appropriate and possible.

- Public access should be designed for durability and low maintenance.
- Public access should maintain safety and security.
- Design of public access should have minimum impact on fragile environments.
- Design of public access should provide distinction between public and private spaces.
- The New York City waterfront symbol should be used to indicated public access (see New York City Waterfront Symbols Guidelines).

POLICY 20: *Access to the publicly owned foreshore or water's edge, and to the publicly owned lands immediately adjacent to these areas shall be provided, and it shall be provided in a manner compatible with the adjoining uses. To ensure that such lands remain available for public use, they will be retained in public ownership.*

The following State coastal policy guidelines will be used in determining the consistency of a proposed action with this policy:

1. Existing access from adjacent or proximate public lands or facilities to existing public coastal lands and/or waters shall not be reduced, nor shall the possibility of increasing access in the future from adjacent or nearby public lands or facilities to public coastal lands and/or waters be eliminated, unless such actions are demonstrated to be of overriding regional or Statewide public benefit, or in the latter case, estimates of future use of these lands and waters are too low to justify maintaining or providing increased access.

   The following is an explanation of the terms in the above guidelines:

   a. (See definitions under Policy 19 for "access" and "public lands or facilities").

   b. A reduction in the existing level of public access—includes but is not limited to the following:

      (1) Pedestrian access is diminished or eliminated because of hazardous crossings required at new or altered transportation facilities, electric power transmission lines, or similar linear facilities.

      (2) Pedestrian access is diminished or blocked completely by public or private development.

   c. An elimination of the possibility of increasing public access in the future—includes but is not limited to, the following:

      (1) Construction of public facilities that physically prevent the provision, except at great expense, of convenient public access to public coastal lands and/or waters.

      (2) Sale, lease, or other conveyance of public lands that could provide public access to public coastal lands and/or waters from public lands and facilities.

      (3) Construction of private facilities that physically prevent the provision of convenient public access to public coastal lands and/or waters from public lands and facilities.

2. The existing level of public access within public coastal lands or waters shall not be reduced or eliminated. A reduction or elimination in the existing level of public access—includes but is not limited to the following:

   a. Access is reduced or eliminated because of hazardous crossings required at new or altered transportation lines, or similar linear facilities.

   b. Access is reduced or blocked completely by any public development.

3. Public access from the nearest public roadway to the shoreline and along the coast shall be provided by new land use or development except where (a) it is inconsistent with public safety, military security, or the protection of identified fragile coastal resources; (b) adequate access exists within one-half mile; or (c) agriculture would be adversely affected. Such access shall not be required to be open to public use until a public agency or private association agrees to accept responsibility for maintenance and liability of the accessway.

4. The State will not undertake or fund any project that increases access to a water-related resource or facility that is not open to all members of the public.

5. In their plans and programs for increasing public access, State agencies shall give priority in the following order to projects located; within the boundaries of the Federal-Aid Metropolitan Urban Area but not served by public transportation; within the Federal-Aid Metropolitan Urban Area but not served by public transportation; outside the defined Urban Area boundary and served by public transportation; outside the defined Urban Area boundary and served by public transportation; and outside the defined Urban Area boundary but not served by public transportation.

6. Proposals for increased public access to coastal lands and waters shall be analyzed according to the following factors:

   a. The level of access to be provided should be in accord with estimated public use. If not, the proposed level of access to be provided shall be deemed inconsistent with the policy.

   b. The level of access to be provided shall not cause a degree of use that would exceed the physical capability of the coastal lands or waters. If this were determined to be the case, the proposed level of access to be provided shall be deemed inconsistent with the policy.

POLICY 21: *Water-dependent and water-enhanced recreation will be encouraged and facilitated, and will be given priority over non-water-related uses along the coast.*

Water-related recreation includes such obviously water-dependent activities as boating, swimming, and fishing as well as certain activities that are enhanced by a coastal location and increase the general public's access to the coast such as pedestrian and bicycle trails, picnic areas, scenic overlooks and passive recreation areas that take advantage of coastal scenery.

Provided the development of water-related recreation is consistent with the preservation and enhancement of such important coastal resources as fish and wildlife habitats, aesthetically significant areas, historic and cultural resources, agriculture and significant mineral and fossil deposits, and provided demand exists, water-related recreation development is to be increased and such uses shall have a higher priority than any non-coastal dependent uses, including non-water-related recreation uses. In addition, water-dependent recreation uses shall have a higher priority over water-enhanced recreation uses. Determining a priority among coastal-dependent uses will require a case-by-case analysis.

Among priority areas for increasing water-related recreation opportunities are those areas where access to the recreation opportunities of the coast can be provided by new or existing public transportation services and those areas where the use of the shore is severely restricted by highways, railroads, industry, or other forms of existing intensive land use or development. The New York State Department of State, working with the Office of Parks, Recreation and Historic Preservation and with local governments, will identify communities whose use of the shore has been so restricted and those sites shoreward of such developments that are suitable for recreation and can be made accessible. Priority shall be given to recreational development of such lands.

The siting or design of new public development in a manner that would result in a barrier to the recreational use of a major portion of a community's shore should be avoided as much as practicable.

Among the types of water-dependent recreation, provision of adequate boating services to meet future demand is to be encouraged by this Program. The siting of boating facilities must be consistent with preservation and enhancement of other coastal resources and with their capacity to accommodate demand. The provision of new public boating facilities is essential in meeting this demand, but such public actions should avoid competition with private boating development. Boating facilities will, as appropriate, include parking, park-like surroundings, toilet facilities, and pumpout facilities. Harbors of Refuge are particularly needed for a better locational pattern of boating facilities to correct problems of overused, insufficient, or improperly sited facilities.

Also to be encouraged is non-motorized recreation in the State's coastal area. Water-related off-road recreational vehicle use is an acceptable activity, provide no adverse environmental impacts occur. Where adverse environmental impacts will occur, mitigating measures will be implemented, where practicable to minimize such adverse impacts. If acceptable mitigation is not practicable, prohibition or the use by off-road recreational vehicles will be posted and enforced.

In addition to the policy explanation above, consideration may be given to the Comprehensive Waterfront Plan and other waterfront policies and plans. A goal of the plan is to promote the use of the waterfront for activities that need to be at the water's edge or that enliven it. Three categories of uses should be applied in the review of proposed actions:

- Water-dependent uses are those that require direct access or proximity to marine or tidal waters in order to function.

- Waterfront-enhancing uses are primarily recreational, cultural, retail, or entertainment uses whose location on the waterfront would add to public use and enjoyment of the water's edge.

- Non-water-related uses include all uses that do not require a waterfront location and whose location at the waters's edge would not automatically add to public use or enjoyment of the waterfront.

The Comprehensive Waterfront Plan distinguishes between uses that enliven the public aspect of the waterfront and uses that derive some benefit from the waterfront location, including economic benefit. Water-enhancing areas will be given priority after water-dependent uses.

NEW YORK CITY POLICY F: *Priority shall be given to the development of mapped parklands and appropriate open space where the opportunity exists to meet the recreational needs of:*

- *Immobile user groups; and*
- *Communities without adequate waterfront park space and/or facilities.*

According to the Comprehensive Waterfront Plan, as parks are developed or redesigned, waterfront access and water-related activity can be incorporated into the plans. In some large or hilly parks, the shoreline is far away or inaccessible from centers of activity inside or outside the park. Because safety is an important concern, waterfront areas must be visually and physically connected to centers of activity, with frequent, direct and safe paths to supervised areas or public streets.

NEW YORK CITY POLICY G: *Maintain and protect New York City beaches to the fullest extent possible.*

Beach nourishment programs include Coney Island and the Rockaway Peninsula. Consideration is being given to Staten Island's south and east shores. Case-by-case projects have been undertaken as needed, such as nourishment projects at Orchard Beach.

POLICY 22: *Development when located adjacent to the shore will provide for water-related recreational activities whenever such recreational use is appropriate in light of reasonably anticipated demand for such activities, and the primary purpose of the development.*

Under Policy 22, the types of development that can generally provide water-related recreation as a multiple use include but are not limited to:

- Parks
- Highways
- Power plants
- Utility transmission rights-of-way
- Sewage treatment facilities
- Mental health facilities*
- Hospitals*
- Prisons*
- Schools, universities*
- Military facilities*
- Nature preserves*
- Large residential subdivisions (50 units)
- Shopping centers
- Office buildings

Appropriate recreation uses that do not require any substantial additional construction shall be provided at the expense of the project sponsor provided the cost does not exceed 2 percent of total project cost.

POLICY 23: *Protect, enhance, and restore structures, districts, areas, or sites that are of significance in the history, architecture, archaeology, or culture of the State, its communities, or the nation.*

The structures, districts, areas, or sites that are of significance in the history, architecture, archaeology or culture of the State, its communities, or the Nation comprise the following resources:

(a) A resource that is in a Federal or State park established, among other reasons, to protect and preserve the resource.

(b) A resource on, nominated to be on, or determined eligible to be on the National or State Register of Historic Places.

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* The types of recreation uses likely to be compatible with these facilities are limited to the more passive forms, such as trails or fishing access. In some cases, land areas not directly or immediately needed by the facility could be used for recreation.

(c) A resource on or nominated to be on the State Nature and Historic Preserve Trust.

(d) An archeological resource that is on the State Department of Education's inventory of archeological sites.

(e) A local landmark, park, or locally designated historic district that is located within the boundary of an approved local waterfront revitalization program.

(f) A resource that is a significant component of an Urban Cultural Park.

All practicable means shall be considered and adopted to prevent a significant adverse change to these resources. A significant adverse change includes but is not limited to:

(a) Alteration of or addition to one or more of the architectural, structural, ornamental or functional features of a building, structure, or site that is a recognized historic, cultural, or archeological resource, or component thereof. Such features are defined as encompassing the style and general arrangement of the exterior of a structure and any original or historically significant interior features including type, color, and texture of building materials, entryways, and doors; fenestration; lighting fixtures; roofing; sculpture and carving; steps rails; fencing; windows; vents and other openings; grillwork; signs; canopies; and other appurtenant fixtures and, in addition, all buildings, structures, outbuildings, walks, fences, steps, topographical feature, earthworks, paving, and signs located on the designated resource property. (To the extent they are relevant, the Secretary of the Interior's "Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings" shall be followed).

(b) Demolition or removal in full or part of a building, structure, or earthworks that is a recognized historic, cultural, or archeological resource or component thereof, to include all those features described in (a) above plus any other appurtenant fixture associated with a building structure or earthwork.

(c) All proposed actions within 500 feet of the perimeter of the property boundary of the historic, architectural, cultural, or archeological resource and all actions within an historic district that would be incompatible with the objective of preserving the quality and integrity of the resource. Primary considerations to be used in making judgment about compatibility should focus on the visual and locational relationship between the proposed actions and the special character of the historic, cultural, or archeological resource. Compatibility between the proposed action and the resource means that the general appearance of the resource should be reflected in the architectural style, design material, scale, proportion, composition, mass, line, color, texture, detail, setback, landscaping, and related items of the proposed actions. With historic districts this would include infrastructure improvements or changes, such as street and sidewalk paving, street furniture, and lighting.

NEW YORK CITY POLICY H: *Insure ongoing maintenance of all waterfront parks and beaches to promote full use of secure, clean areas with fully operable facilities.*

POLICY 24: *Prevent impairment of scenic resources of Statewide significance.*

Consideration may be given to the Comprehensive Waterfront Plan that states that views to and along the water add to the economic value of development and to the quality of life in both public and private spaces. Skylines, bridges, and landmarks are perhaps most memorable when reflected in the water against a changing sky. Waterfronts are among the few places in the City that offer wide vistas.

The Coastal Management Program will identify on the coastal area map scenic resources of Statewide significance. The following general criteria will be combined to determine significance:

- Quality. The basic elements of design (i.e, two-dimensional line, three-dimensional form, texture, and color) combine to create all high quality landscapes. The water, landforms, and built components of scenic coastal landscapes exhibit variety of line, form, texture, and color. This variety is not, however, so great as to be chaotic. Scenic coastal landscapes also exhibit unity of components. This unity is not, however, so complete as to be monotonous. Example: the Thousand Islands where the mix of water, land, vegetative and man-made components creates interesting variety, while the organization of these same components creates satisfying unity.

  Often, high-quality landscapes contain striking contrasts between lines, forms, textures and colors. Example: A waterfall where horizontal and vertical lines and smooth turbulent textures meet in dramatic juxtaposition.

  Finally, high-quality landscapes are generally free of discordant features, such as structures or other elements that are inappropriate in terms of siting, form, scale, and/or materials.

- Uniqueness. The uniqueness of high-quality landscapes is determined by the frequency of occurrence of similar resources in a region of the State or beyond.

- Public Accessibility. A scenic resource of significance must be visually and, where appropriate, physically accessible to the public.

- Public Recognition. Widespread recognition of a scenic resource is not a characteristic intrinsic to the resource. It does, however, demonstrate people's appreciation of the resource for its visual, as well as evocative, qualities. Public recognition serves to reinforce analytic conclusions about the significance of a resource.

When considering a proposed action, agencies shall first determine whether the action could affect a scenic resource of Statewide significance. This determination would involve 1) a review of the coastal area map to ascertain if it shows an identified scenic resource that could be affected by the proposed action, and 2) a review of the types of activities proposed to determine if they would be likely to impair the scenic beauty of an identified resource.

Impairment will include: (i) the irreversible modification of geologic forms; the destruction or removal of vegetation; the modification, destruction, or removal of structures, whenever the geological forms, vegetation, or structures are significant to the scenic quality of an identified resource; and (ii) the addition of structures that because of siting or scale will reduce identified views or that because of scale, form, or materials will diminish the scenic quality of an identified resource.

The following siting and facility-related guidelines are to be used to achieve this policy, recognizing that each development situation is unique and that the guidelines will have to be applied accordingly. Guidelines include:

- Siting structures and other development such as highways, power lines, and signs, back from shorelines or in other inconspicuous locations to maintain the attractive quality of the shoreline and to retain views to and from the shore;

- Clustering orienting structures to retain views, save open space and provide visual organization to a development;

- Incorporating sound, existing structures (especially historic buildings) into the overall development scheme;

- Removing deteriorated and/or degrading elements;

- Maintaining or restoring the original land form, except when changes screen unattractive elements and/or add appropriate interest;

- Maintaining or adding vegetation to provide interest, encourage the presence of wildlife, blend structures into the site, and obscure unattractive elements, except when selective clearing removes unsightly, diseased, or hazardous vegetation and when selective clearing creates views of coastal waters;

- Using appropriate materials, in addition to vegetation, to screen unattractive elements; and
- Using appropriate scales, forms, and materials to ensure that buildings and other structures are compatible with and interest to the landscape.

POLICY 25: *Protect, restore and enhance the natural and man-made resources which are not identified as being of Statewide significance but which contribute to the overall scenic quality of coastal area.*

The siting and design guidelines listed under Policy 24 should be considered for proposed actions in the general coastal area. More emphasis may need to be placed on removal of existing elements, especially those that degrade the coastal area scenic quality, and on addition of new elements or other changes, that enhance the coastal area scenic quality. Removal of vegetation at key points to improve visual access to coastal waters is one such change that might be expected to enhance scenic quality.

POLICY 26: *Conserve and protect agricultural lands in the State's coastal area.*

NOT APPLICABLE IN NEW YORK CITY

POLICY 27: *Decision on the siting and construction of major energy facilities in the coastal area will be based on public energy needs, compatibility of such facilities with the environment and the facility's need for a shorefront location.*

NEW YORK CITY POLICY I: *Siting of liquified and substitute natural gas facilities, including those associated with the tankering of such gas, shall take into consideration State and national energy needs, public safety concerns and the necessity for a shorefront location.*

POLICY 28: *Ice management practices shall not damage significant fish and wildlife and their habitats, increase shoreline erosion or flooding or interfere with the production of hydroelectric power.*

POLICY 29: *Encourage the development of energy resource on the outer continental shelf (OCS) and in other water bodies and ensure the environmental safety of such activities.*

POLICY 30: *Municipal, industrial, and commercial discharge of pollutants, including but not limited to, toxic and hazardous substances, into coastal waters will conform to State water quality standards.*

POLICY 31: *State coastal area policies and management objectives of approved local waterfront revitalization programs will be considered while reviewing coastal water classifications and while modifying water quality standards; however, those waters already overburdened with contaminants will be recognized as being a development constraint.*

POLICY 32: *Encourage the use of alternative or innovative sanitary waste systems in smaller communities where the cost of conventional facilities are unreasonably high, given the size of the existing tax base of these communities.*

POLICY 33: *Best management practices will be used to ensure the control of stormwater runoff and combined sewer overflows draining into coastal waters.*

POLICY 34: *Discharge of waste material into coastal waters from vessels under the State's jurisdiction will be limited so as to protect significant fish and wildlife habitats, recreational areas and water supply areas.*

POLICY 35: *Dredging and dredge spoil disposal in coastal waters will be undertaken in a manner that meets existing State dredging permit requirements and protects significant fish and wildlife habitats, aesthetic resources, natural protective features, important agricultural lands and wetlands.*

POLICY 36: *Activities related to the shipment and storage of petroleum and other hazardous materials will be conducted in a manner that will prevent or at least minimize spills into coastal waters: all practicable efforts will be undertaken to expedite the cleanup of such discharges; and restitution for damages will be required when these spills occur.*

POLICY 37: *Best management practices will be utilized to minimize the non-point discharge of excess nutrients, organics, and eroded soils into coastal waters.*

Consideration may be given to the Comprehensive Waterfront Plan, which states that non-point pollution is caused by runoff from land surfaces. Runoff comes from residential lawns, highways and urban streets, seeping septic tanks, leaking landfills, construction sites, and chemical spills. New York City's Local Law 7 (Section P110.0) sets standards for the design of stormwater systems. The Department of Environmental Protection is embarking on a program to identify and classify stormwater discharges resulting in water quality impairment and develop management standards to control them.

POLICY 38: *The quality and quantity of surface water and groundwater supplies will be conserved and protected particularly where such waters constitute the primary sole source of water supply.*

POLICY 39: *The transport, storage, treatment, and disposal of solid wastes, particularly hazardous wastes, within coastal areas will be conducted in such a manner so as to protect groundwater and surface waters supplies, significant fish and wildlife habitats, recreational areas, important agricultural lands, and scenic resources.*

The Federal Water Pollution Control Act requires all waters of the United States to be fishable and swimmable to the maximum extent practicable. See Section 3I, "Natural Resources," in this Manual.

NEW YORK CITY POLICY J: *Adopt end-use plans for landfill areas which specify the following:*

- *Final capacity.*
- *Final contours.*
- *Leachate, erosion, and gas control systems.*
- *Re-vegetation strategies.*
- *Interim review schedules.*

NEW YORK CITY POLICY K: *Curtail illegal dumping throughout the coastal zone and restore areas scarred by this practice.*

Consideration may be given to the Comprehensive Waterfront Plan, which states that wetlands outside of City, State, and Federal parklands lacking a clear jurisdictional responsibility are often treated as a no-man's land subject to illegal fill, unsightly dumping, and vandalism. Some of these wetlands will eventually be annexed to adjacent parks.

In addition, the plan calls for City agencies, including the Departments of Sanitation, Transportation, Parks and Recreation, and Environmental Protection, to pursue a clean-up and guardrail program designed to stop illegal access and dumping in the most vulnerable wetlands. The City should explore using the Department of General Services' Land Reclamation Program, which cleans and "greens" large tracts of vacant, innercity land to maintain wetland areas unsuitable for parkland.

NEW YORK CITY POLICY L: *Encourage energy development from waste and waste landfills.*

POLICY 40: *Effluent discharged from major steam electric generating and industrial facilities into coastal waters will not be unduly injurious to fish and wildlife and will conform to State water quality standards.*

POLICY 41: *Land use or development in the coastal area will not cause national or State air quality standards to be violated.*

Where feasible, the Comprehensive Waterfront Plan encourages an increased role for the use of waterborne and rail freight to help improve air quality.

POLICY 42: *Coastal management policies will be considered if the State reclassifies land areas pursuant to the prevention of significant deterioration regulations of the Federal Clean Air Act.*

POLICY 43: *Land use or development in the coastal area must not cause the generation of significant amounts of the acid rain precursors: nitrates and sulfates.*

POLICY 44: *Preserve and protect tidal and freshwater wetlands and preserve the benefits derived from these areas.*

The Comprehensive Waterfront Plan points out that although wetlands are regulated by several agencies, overlapping and often confusing regulatory regimes may not adequately protect them. For example, the U.S. Army Corps of Engineers does not regulate adjacent areas, and DEC does not regulate upland areas adjacent to wetlands if they are the result of fill and are more that 10 feet above sea level. Construction in these unregulated areas can generate runoff and other disturbances that may harm adjacent wetlands. Even when regulated, some buffer areas may not be deep enough to protect the wetland ecosystem, which may contain important grassland and woodland habitats. See Section 3I, "Natural Resources," in this Manual.

WATERFRONT REVITALIZATION PROGRAM APPENDIX 2

Procedures For Waterfront Revitalization Program Consistency Local, State, and Federal Actions

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Procedures For Waterfront Revitalization Program Consistency Local, State, and Federal Actions

In 1982, the New York City Board of Estimate adopted the Waterfront Revitalization Program (WRP) to guide and promote revitalization and redevelopment of the City's waterfront areas. The WRP designated the City Planning Commission (CPC) as the City Coastal Commission (CCC) to coordinate the review of local, State, and Federal development proposals along New York City's nearly 600 miles of waterfront. The mandate of the CCC is to ensure that each action it reviews is consistent with the policies established in the WRP. Described below are the procedures utilized by the CPC, in its role as the CCC, and by DCP.

The current review of waterfront-related actions can be divided into two separate categories: 1) local projects brought to the CPC via ULURP or 197-a or to the Department of City Planning via CEQR and BSA, and 2) Federal and State actions that are subject to WRP consistency review but not to any other local review processes.

Local Actions

Local actions subject to CEQR , ULURP, or other CPC processes are reviewed for consistency by DCP staff (Waterfront and Open Space Division). In order to implement the CCC's mandate to review projects for consistency with WRP policies, WRP consistency is incorporated into the CPC's review of actions. Within this framework, the CPC must hold a public hearing and take one of the following actions: (1) approve, (2) approve with modifications, or (3) disapprove the action. When applicable, a recommendation is then forwarded to the City Council in the CPC's report. The reports will state that the CPC has determined, acting as CCC, the consistency with the WRP. For BSA actions subject to CEQR, WRP consistency is incorporated within the CEQR review.

Procedures

All local WRP actions brought before the CPC through the ULURP or 197-a review process will continue to follow the existing procedures established for these projects. A WRP check-off box on the regular briefing sheet alerts the City Planning Commission that the project under review is also subject to City Coastal Commission review. In evaluating the project's effect on the City's waterfront, the City Coastal Commission will consider the policies set forth in the Waterfront Revitalization Program.

Once a ULURP or 197-a project is approved by the Commission, a WRP discussion will be included in the CPC report. If the project has been found consistent with the policies and intent of the WRP, language will be added to the report to the effect that: "The City Coastal Commission, having reviewed the waterfront aspects of this action, finds that the action will not substantially hinder the achievement of any WRP policy and hereby determines that this action is consistent with WRP policies." However, if the Commission approves a project that will hinder the achievement of waterfront policy, the report must reflect a CCC decision that the action has satisfied all four of the requirements set forth below:

(a) no reasonable alternatives exist that would permit the action to be taken in a manner that would not substantially hinder the achievement of such policy;

(b) the action taken will minimize adverse effects on such policies to the maximum extent practicable;

(c) the action will advance one or more of the other coastal policies; and

(d) the action will result in an overriding local or regional public benefit.

These requirements closely follow State Coastal Management Program decision-making findings (Section 600.4).

No special public notice requirements are necessary under WRP; these projects will follow existing ULURP and 197-a procedures for public notice.

Federal and State Actions

State and Federal actions are processed through WRP differently than local actions, but continue to receive the same technical review. Currently, the Waterfront and Open Space Division of DCP receives notice of Federal actions from the New York State Department of State (DOS), which coordinates consistency review for the various Federal agencies involved in New York State waterfront projects. Notice of State actions is received directly from the individual State agency before which an application affecting the waterfront is pending, such as the New York State Department of Environmental Conservation (DEC). Once received, the Waterfront and Open Space Division reviews the project's consistency with WRP policies and confers and coordinates with other divisions and borough offices, as needed.

Only certain Federal and State actions—those that exceed one or more of the designated thresholds—will be brought to the CPC, acting as the CCC. The Waterfront and Open Space Division will continue to manage the review of the others.

These thresholds are as follows:

(a) Actions that require the balancing of several different policies;
(b) Actions that are significantly inconsistent with waterfront policies;
(c) Actions that require a Federal or State EIS: or
(d) Actions that require policy interpretation.

Using the threshold analysis, the Waterfront and Open Space Division, as the coordinator of consistency review for Federal and State actions, will ascertain which actions require consideration by the CCC.

Procedures

Actions that do not exceed the thresholds will continue to be reviewed by the Waterfront and Open Space Division. These actions are generally standard permit applications that do not raise significant policy questions.

In all cases, a determination of consistency or inconsistency by the CCC or the Division must be forwarded to the affected agency within 30 days of receipt of information regarding the proposed project. When insufficient information is received, the Waterfront and Open Space Division will make a request of the applicant for additional information to ensure compliance with WRP regulations. The Division will notify the affected agency that until such information has been received and reviewed, the project is presumed inconsistent with WRP.

The Division will coordinate the intra- and interagency review of those actions that exceed the designated thresholds, acting as lead for WRP purposes throughout the review process. The actions will be reviewed at headquarters prior to CCC consideration to finalize agencywide coordination.

A briefing sheet for actions that exceed the designated thresholds, incorporating the information necessary for CCC consideration of the project, such as project location, requested actions, other permit requirements, project description/history, issues, applicable WRP policies and staff recommendations. These actions will appear at the end of the regular CPC agenda.

CCC consistency review of Federal and State actions, whether by the Department or the CCC, does not require a public hearing or any public review. A public hearing in fact would be impossible under the tight time constraints

for consistency review; each action is tied to the review schedules of each agency. Public participation in these Federal and State actions is coordinated by the permitting State or Federal agency.

Findings of the CCC will be transmitted to the permitting agency by the Waterfront and Open Space Division. If the CCC determines that the action is consistent with the policies and intent of the WRP, then a letter to the appropriate State or Federal agency would state that: "The City Coastal Commission, having reviewed the waterfront aspects of this action, finds that the action will not substantially hinder the achievement of any WRP policy and hereby determines that this action is consistent with WRP policies."

However, if the CCC determines that the project will hinder the achievement of the WRP, a letter from the CCC will be sent to the project applicant and the permitting agency, stating whether the action has satisfied the following requirements:

(a) no reasonable alternatives exist that would permit the action to be taken in a manner which would not substantially hinder the achievement of such policy;

(b) the action taken will minimize all adverse effects on such policies to the maximum extent practicable;

(c) the action will advance one or more of the other coastal policies; and

(d) the action will result in an overriding local public benefit.

The Waterfront and Open Space Division will continue to be the central record keeper for all State and Federal CCC actions. An official WRP file number, project name, and applicant name, and project status will be recorded for all actions.

WATERFRONT REVITALIZATION PROGRAM APPENDIX 3

Consistency Assessment Form

NEW YORK CITY WATERFRONT REVITALIZATION PROGRAM

Consistency Assessment Form

Proposed actions subject to CEQR, ULURP, State or Federal Agency Actions that are situated within the designated boundaries of New York City's Coastal Zone must be assessed for their consistency with the City's Local Waterfront Revitalization Program (LWRP). New York City's LWRP was adopted as a 197-a Plan in coordination with local, State, and Federal laws and regulations, including the State's Coastal Management Program (Executive Law, Article 42) and the Federal Coastal Zone Management Act of 1972 (P.L. 92-583). This form is intended to assist an applicant in certifying that the proposed activity is consistent with the local Waterfront Revitalization Program. It should be completed at the time when the local or state application is prepared. The Department of City Planning will use the completed form and accompanying information in its review of the applicant's certification of consistency. Answering "yes" to a question in section C does not necessarily mean an inconsistency exists but rather is intended to alert the applicant and reviewer that additional information is required.

A. APPLICANT

1. Name:_____
   (please print)
2. Address:_____
3. Telephone: Area Code ( )_____

Owner:_____

B. PROPOSED ACTIVITY

1. Brief description of activity:_____

   _____
2. Purpose of activity:_____
3. Location of activity:

   _____ _____
   County Street or Site Description
4. Type of local or state action required:_____
5. If a federal or state permit/license was issued or is required for the proposed activity, identify the agency and provide the application or permit number, if known:_____
6. IS federal or state funding being used to finance the project? If so, please identify the funding source.

   _____

C.COASTAL ASSESSMENT The following checklist represents in a broad sense, the 44 State Coastal Zone Management Program policies and 12 City LWRP policies. (The numbers and letters in parentheses after each question indicated the policy or policies that are the focus of the question.) A listing and detailed explanation of the Waterfront Revitalization Program policies titled New York City Waterfront Revitalization Program Manual can be obtained from the Department of City Planning Book Store located at 22 Reade Street, Manhattan, (212) 720-3667. Figures listed after various questions can be found in Section 3K of the Manual and are simplified, for information concerning detailed maps please contact the Department of City Planning, Waterfront and Open Space Division, (212) 720-3620.

Check either "Yes" or "No" for each of the following questions.

		YES	NO
1.	Is the site(s) that would be affected by the action located in or near any significant coastal fish and wildlife habitats? (7) (see Figure 3K-2)	—	—
2.	Would the action involve any activity in or near a tidal or freshwater wetland? (44) (see Figure 3K-3)	—	—
3.	Would the action result in any activities within a Federally designated flood hazard area and/or State-designated erosion hazard area? (11, 12, 17, C, D, E) (see Figure 3K-4)	—	—
4.	Would the action involve construction or reconstruction of a flood or erosion control structure? (13, 14, 16, 17, C, D, E)	—	—
5.	Would the action involve any new or increased activity on or near any beach, dune, barrier island, or bluff? (12, G)	—	—
6.	Would the action involve mining, dredging, or dredge disposal, or placement of dredged or fill materials in coastal waters? (15, 35, B)	—	—
7.	Would the action result in any of the following: -Shipping, handling, or storing of solid wastes, hazardous materials, or other pollutants; -Development of a site that may contain contamination or has a history of underground fuel tanks, oil spills, etc.; -Construction activities that could lead to erosion. (8, 36, 37, 38, 39)	— — —	— — —
8.	Would the action result in the discharge of toxins, hazardous substances, or other pollutants, effluent, or waste into any waters? (8, 30, 31, 34, 37, 38, 40)	—	—
9.	Would the action result in the draining of storm water runoff or sewer overflows into coastal waters? (8, 32, 33)	—	—
10.	Would the project in any way affect the water quality classification of nearby waters or be unable to be consistent with that classification? (31) (see Figure 3K-5)	—	—
11.	Would the action cause violations of the National or State air quality standards? (41, 42)	—	—
12.	Would the action result in significant amounts of acid rain precursors (nitrates and sulfates)? (43)	—	—
13.	Would the action have any effect on commercial or recreational use of fish resources? (9, 10)	—	—
14.	Would the action have any effects on surface water or groundwater supplies? (38)	—	—
15.	Would the action result in a reduction of existing or required access to or along coastal waters, public access areas, public parks or open spaces? (19, 20, 21, F)	—	—

		Yes	No
16.	Would the action result in any development along the shoreline but NOT include new water-enhanced or water-dependent recreation space? (21, 22)	—	—
17.	Would the action result in new open space that is not accessible to immobile (handicapped) user groups? (F)	—	—
18.	Would the action result in the provision of open space without the provision for its maintenance? (H)	—	—
19.	Would the action affect natural or built resources that contribute to the scenic quality of a coastal area? (25)	—	—
20.	Does the site currently include elements that degrade the area's scenic quality or block views to the water? (25)	—	—
21.	Would the proposed action have a significant adverse impact on historic or archaeological resources? (23)	—	—
22.	Would the action be located in an important maritime and industrial area as shown in the New York City Comprehensive Waterfront Plan? (see Figure 3K-6) Some of these areas may include portions of the following locations: -Kill Van Kull in Staten Island from Howland Hook to Snug Harbor; -Brooklyn waterfront at Red Hook and Sunset Park (from Pier 6 to Owls Head); -Brooklyn Navy Yard; -Newtown Creek; and -South Bronx (Port Morris and Hunts Point). (2, 3)	—	—
23.	Would the action be located in a small harbor area (any area with a unique maritime identity; for example, Sheepshead Bay or City Island)? (4)	—	—
24.	Would the action involve the siting or construction of a facility essential to the generation or transmission of energy, or a natural gas facility, or would it develop new energy resources? (27, 29, I)	—	—
25.	Would the action involve ice management practices? (28)	—	—
26.	Would the action affect any sites that have been used as landfills? (J, L)	—	—
27.	Is illegal dumping occurring on a site that would be affected by the action? (K)	—	—
28.	Would the action affect solid waste management goals and objectives? (L)	—	—
29.	Is the site of the action a deteriorated or underutilized waterfront site? (1, A)	—	—
30.	Does the site of the action include any waterfront structures (e.g., piers, docks, bulkheads, wharves, or erosion protection devices)? (A)	—	—
31.	Would the action result in a change in scale or character of a neighborhood? (1)	—	—
32.	If the action would affect a site located on the waterfront, would it facilitate the siting of a use that is NOT water-dependent? (2)	—	—

33. Would the proposed action require provision of new public services or infrastructure in an undeveloped or sparsely populated section of the coastal area? (5, 6) Yes — No —

34. Would the action result in a physical alteration to a site along the waterfront, including land along the shoreline, land underwater, or coastal waters? (2, 11, 12, 18, 20-22, 25, 28, 32, 35, 37, 38, 41, 43, 44, A-E) — —

D. ADDITIONAL STEPS

If any of the questions in Section C are answered "Yes", then the applicant or agent is advised to consult the local Waterfront Revitalization Program document, available at the Department of City Planning Book Store. The proposed activity must be analyzed in more detail with respect to the applicable state or local coastal policies. On a separate page(s), the applicant or agent shall: (a) identify, by policy numbers, which coastal policies are affected by the activity, (b) briefly assess the effects of the activity upon the policy; and, (c) state how the activity is consistent with each policy. Following the completion of this written assessment, the applicant or agency shall complete Section E and submit the documentation required by Section F.

E. CERTIFICATION

The applicant or agent must certify that the information provided is truthful and that the proposed activity is consistent with the New York City Waterfront Revitalization Program or the State Coastal Management Program, as appropriate. If this certification cannot be made, the proposed activity shall not be undertaken as proposed and the applicant should contact the Waterfront and Open Space Division for further instructions. If the certification can be made, complete this Section.

"The proposed activity complies with New York State's approved Coastal Management Program, or with the applicable New York City Waterfront Revitalization Program, and will be conducted in a manner consistent with such program."

Applicant/Agent's Signature:_____ Date:_____

F. SUBMISSION REQUIREMENTS

1. The applicant or agent shall submit the following documents to the New York City Department of City Planning, Waterfront and Open Space Division, 22 Reade Street, 6W, New York, NY, 10007.

   a. Original signed Waterfront Revitalization Program Assessment Form.
   b. Copy of the completed ULURP, CEQR, or State Permit Application. (If applicable)
   c. Other available information which would support the certification of consistency.

2. If there are any questions regarding the completion or submission of this form, contact the Department of City Planning, Waterfront and Open Space Division at (212) 720-3620.

AIR QUALITY APPENDIX

AIR QUALITY APPENDIX 1

Guidelines for Evaluating Air Quality Impacts from Parking Garages

AIR QUALITY APPENDIX 1

Guidelines for Evaluating Air Quality Impacts from Parking Garages

For air quality purposes, a parking garage is defined as a parking facility that would be totally (or almost totally) enclosed. This type of facility would require mechanical ventilation to limit the carbon monoxide (CO) concentrations within the garage to levels less than those mandated by the New York City Building Code. Table 1 displays the estimated hourly average ins and outs over a 24-hour period for a proposed auto parking garage. A sample air quality analysis is also provided in the attachment for potential air quality impacts from ventilated exhaust CO emissions for an auto parking garage that would start operations in 1997. This analysis does not use the most up-to-date MOBILE program or related emission factors, but the methodology used is still applicable.

Page 1 of the attachment displays all input parameters that are required to estimate the maximum CO emission rates and concentrations within the parking garage in 1997. CO emission factors and background values are reported at the top of the page. In almost all cases, maximum hourly CO emission rates within the facility will be calculated for the time period with the maximum number of departing autos in an hour, since departing autos should be assumed to be "cold" and arriving cars should usually be assumed to be "hot" as part of the recommended procedures for estimating CO emissions for parking facilities. ("Cold" autos emit CO at considerably higher rates than "hot" autos, as shown by the CO emission factors listed.) Likewise, maximum hourly CO emission rates over a consecutive 8-hour period will normally be computed for the 8-hour time period that averages the largest number of departing autos per hour. Maximum hourly and 8-hour average CO emission rates should be determined based on the ins/outs (for the respective time averaging periods) and the mean traveling distance within the garage. The analysis should also assume that all departing autos would idle for one minute before travelling to the exits of the garage, and all arriving and departing autos would travel at 5 mph within the garage. The equations and definitions of the parameters used to determine the emission rates exhausted through the vents and the maximum CO concentrations within the garage are also presented on page 1.

Page 2 of the attachment displays the calculations involved in determining the off-site impacts from the CO exhausted through the garage vent(s). These estimates of off-site CO impacts are based on equations pertaining to the dispersion of pollutants from a stack (EPA's *Workbook of Atmospheric Dispersion Estimates, AP-26*, pg. 6, equations 3.3 and 3.4). The initial horizontal and vertical distributions, $\sigma_y(0)$ and $\sigma_z(0)$, respectively, should be assumed to be equal and calculated by setting the CO concentration at the exit of the vent equal to the CO level within the facility. The sample analysis displays the recommended procedures for estimating 8-hour CO impacts at a receptor near the vent (5 feet from the vent, 6 feet below the midpoint height of the vent) and at a receptor across a street on the far sidewalk from the vent (50 feet away, also 6 feet below the vent midpoint). Page 3 displays contributions from on-street CO emissions to the far sidewalk receptor in this example that were calculated conservatively with a factor (307.7) that yields the maximum predicted impacts (which could be calculated by refined mathematical modeling), when multiplied by the on-street CO emission rate in grams/meter-second. Cumulative CO concentrations at the far sidewalk should be calculated by adding together the contributions from the garage exhaust vent, on-street sources, and background levels. An acceptable alternative method to the procedures detailed above would be to use only the peak hourly CO emissions to calculate the CO emission rates and concentrations at the vent outlet. This alternative procedure would yield very conservative estimates of off-site CO impacts.

Table 1

1997 GARAGE INS/OUTS

HOUR	IN	OUT
12-1	1	1
1-2	1	0
2-3	0	0
3-4	0	0
4-5	0	1
5-6	1	5
6-7	5	8
7-8	7	9
8-9	14	31
9-10	17	8
10-11	18	11
11-12	15	12
12-1	31	32
1-2	14	11
2-3	10	10
3-4	10	11
4-5	13	16
5-6	35	30
6-7	17	20
7-8	13	10
8-9	9	6
9-10	1	2
10-11	1	0
11-12	1	0
TOTAL	234	234

Sample Mechanically Ventilated Parking Garage Analyses:

1997 Mobile 4.1 CO Emission Factors:			1997 CO background
Cold Idle @ 45F	[CI]:	779.91 G/HR	1-HR 5.7 PPM
5mph Cold Auto @ 45F	[CA]:	143.06 G/MI	8-HR 2.9 PPM
5mph Hot Auto @ 45F	[HA]:	25.73 G/MI	

	1997 INS/OUTS											
	MAXIMUM HOUR			MAXIMUM 8-HOUR			GARAGE	MEAN TRAV.DIS.	PEAK HOURLY	8-HR AVG. ER	MAX 1-HR CONC.W/O BKGD	PEAK 8-HR CONC.W/O BKGD	MAX 1HR CONC.W/ BKGD	MAX 8HR CONC.W/ BKGD
	PERIOD	INS	OUTS	PERIOD	INS	OUTS	GSF	(FEET)	(G/SEC)	(G/SEC)	(PPM)	(PPM)	(PPM)	(PPM)
	12AM-1PM	31	32	11AM-7PM	18.1	17.8	48220	300	0.200	0.112	7.60	4.29	13.30	7.19

where: maximum hour is 1-hour period with largest number of autos departing

maximum 8-hour period is usually the 8-hour period with largest average number of departing autos over 8 hours

garage GSF - total gross square feet of garage area, where garage area does not include mechanical areas

mean travel distance - conservative estimate (about two-thirds of the longest travel distance within the facility) of average travel distance for a typical vehicle entering/exiting the facility

Max 1-hour & 8-hour average ER - maximum hourly average CO emission rates within the facility for these respective time averaging periods

Max hour ER:

(max hr autos out)*((CI/60)+(CA)*(mean travel distance/5280))/3600+(max hr autos ins)*HA*(mean travel distance)/(5280*3600)

8-hour average ER

(max 8-hr autos out)*((CI/60)+(CA)*(mean travel distance/5280))/3600+(max 8-hr autos ins)*HA*(mean travel distance)/(5280*3600)

Max 1-hour & 8-hour concentration without background - CO concentrations calculated within the facility based on respective emission rates and New York City building code minimum ventilation rate of 1 cubic foot per minute per gross square feet of garage area for the respective time averaging periods

peak hour conc w/o bkgrd:

0.873*(peak hour ER)*1000/(GSF*0.000472)

8-hour average conc w/o bkgrd:

0.873*(8-hour ave ER)*1000/(GSF*0.000472)

Max 1-hour & 8-hour concentration - maximum 1 and 8-hour concentrations within garage when backgrounds are added to concentrations without backgrounds

Calculation of Cumulative Carbon Monoxide Impacts from Garage and Adjacent Street Emissions

ASSUMPTIONS: 2 Vents (since it is a relatively large garage, smaller garages may only warrant 1 vent)

Middle of Vent is 12' above local grade

Receptor height is 6', at a distance of 5' from vent

$\chi(0) = Q / \pi * \sigma_y(0) * \sigma_z(0)$

1997

8-HOUR CO ER PER VENT = 0.112/2 = 0.056 g/sec = Q
8-HOUR CO CONCENTRATION = 4.29 PPM = 0.0049 g/m^3
8-HOUR CO BKGD = 2.9 PPM
8-HOUR PERSISTENCE FACTOR - 8-HR PF = 0.70

Solve for initial horizontal + vertical distributions:

Let $\sigma_z(0) = \sigma_y(0)$

$0.0049 = 0.056 / \pi * (\sigma_y(0))^2$

Therefore $\sigma_y(0) = 1.9m$

at 5' (1.52m) from vent, 6'(H = 1.83m) below vent height:

$\sigma_y(1.52) = 0.16 * 1.52 + 1.9 = 2.14m$
$\sigma_z(1.52) = 0.14 * 1.52 + 1.9 = 2.11m$

8-hr $\chi(1.52) = (8\text{-hr PF})*Q*(\exp(-0.5*(H/\sigma_z(1.52))^2)) / \pi * \sigma_y(1.52) * \sigma_z(1.52)$

Therefore, $\chi(1.52) = 0.00190\ g/m^3 = 1.7$ PPM

at 50' (15.24m) from vent, 6'(H = 1.83m) below vent height:

$\sigma_y(15.24) = 0.16 * 15.24 + 1.9 = 4.3m$
$\sigma_z(15.24) = 0.14 * 15.24 + 1.9 = 4.0m$

8-hr $\chi(15.24) = (8\text{-hr PF})*Q*(\exp(-0.5*(H/\sigma_z(15.24))^2))/\pi * \sigma_y(15.24) * \sigma_z(15.24)$

Therefore, $\chi(15.24) = 0.000653\ g/m^3 = 0.6$ PPM

Highest On-Street Emissions

		g/mi-hr	g/m-sec
WB adjacent street		6423	0.00111
EB adjacent street		3272	0.00056
	Total	9695	0.00167

Maximum Impacts from line source:

307.7 * (8-hr Persistence Factor) * 0.00167 = 0.36 PPM

Total 8-hr CO Concentration
@ receptor on opposite sidewalk = 0.6 + 0.36 + 2.9 = 3.8 PPM

AIR QUALITY APPENDIX 2

Guidelines for Evaluating Air Quality Impacts from Parking Lots

AIR QUALITY APPENDIX 2

Guidelines for Evaluating Air Quality Impacts from Parking Lots

For air quality purposes, a parking lot is defined as a parking facility that would be an at-grade lot, exposed to the ambient air. Table 1 displays the estimated hourly average ins and outs over a 24-hour period for a proposed auto parking lot. A sample analysis of the potential air quality impacts from CO emissions emitted by an auto parking lot that would start operations in 1997 is provided in the attachment. This analysis does not use the most up-to-date MOBILE program or related emission factors, but the methodology used is still applicable.

Figure 1 displays the overall dimensions of a proposed parking lot. Page 1 of the attachment displays all input parameters that are required to estimate the maximum CO emission rates within the parking lot in 1997. CO emission factors and background values are reported at the top of the page. In almost all cases, maximum hourly CO emission rates within the facility will be calculated for the time period with the maximum number of departing autos in an hour, since departing autos should be assumed to be "cold" and arriving cars should usually be assumed to be "hot" as part of the recommended procedures for estimating CO emissions for parking lots. ("Cold" autos emit CO at considerably higher rates than "hot" autos, as shown by the CO emission factors listed.) Likewise, maximum hourly CO emission rates over a consecutive 8-hour period will normally be computed for the 8-hour time period that averages the largest number of departing autos per hour. Maximum hourly and 8-hour average CO emission rates should be determined based on the ins/outs (for the respective time averaging periods) and the mean traveling distance within the facility. The analysis should also assume that all departing autos would idle for one minute before travelling to the exits of the lot, and all arriving and departing autos would travel at 5 mph within the parking lot. The equations and definitions of the parameters used to determine the CO emission rates within the parking area are identical to those found in "Guidelines for Evaluating Air Quality Impacts from Parking Garages" (Appendix 1).

Equations 1, 2, and 3 display the calculations involved in determining the off-site impacts from CO emitted within the parking lot. These estimates of off-site CO impacts are based on EPA's guidelines pertaining to the dispersion of pollutants from a parking lot (*Guidelines for Air Quality Maintenance Planning and Analysis Volume 9 (Revised): Evaluating Indirect Sources*, p. 92, equations 35 and 36). Definitions of the various parameters in these equations are also provided on page 1 of the attachment. The sample analysis displays the recommended procedures for estimating 8-hour CO impacts at a pedestrian-height sidewalk receptor 6 feet from the lot and at a receptor across a street on the far sidewalk from the vent (62 feet away). On-street CO emissions contributions to the far sidewalk receptor in this example were calculated conservatively with a factor (307.7) that yields the maximum predicted impacts (which could be calculated by refined mathematical modeling), when multiplied by the on-street CO emission rate in grams/meter-second. Cumulative CO concentrations at the far sidewalk should be calculated by adding together the contributions from the parking lot, on-street sources, and background levels. An acceptable alternative method to the procedures detailed above would be to use only the peak hourly CO emissions to calculate the CO emission rates within the facility and off-site 8-hour CO impacts. This alternative procedure would yield very conservative estimates of off-site CO impacts.

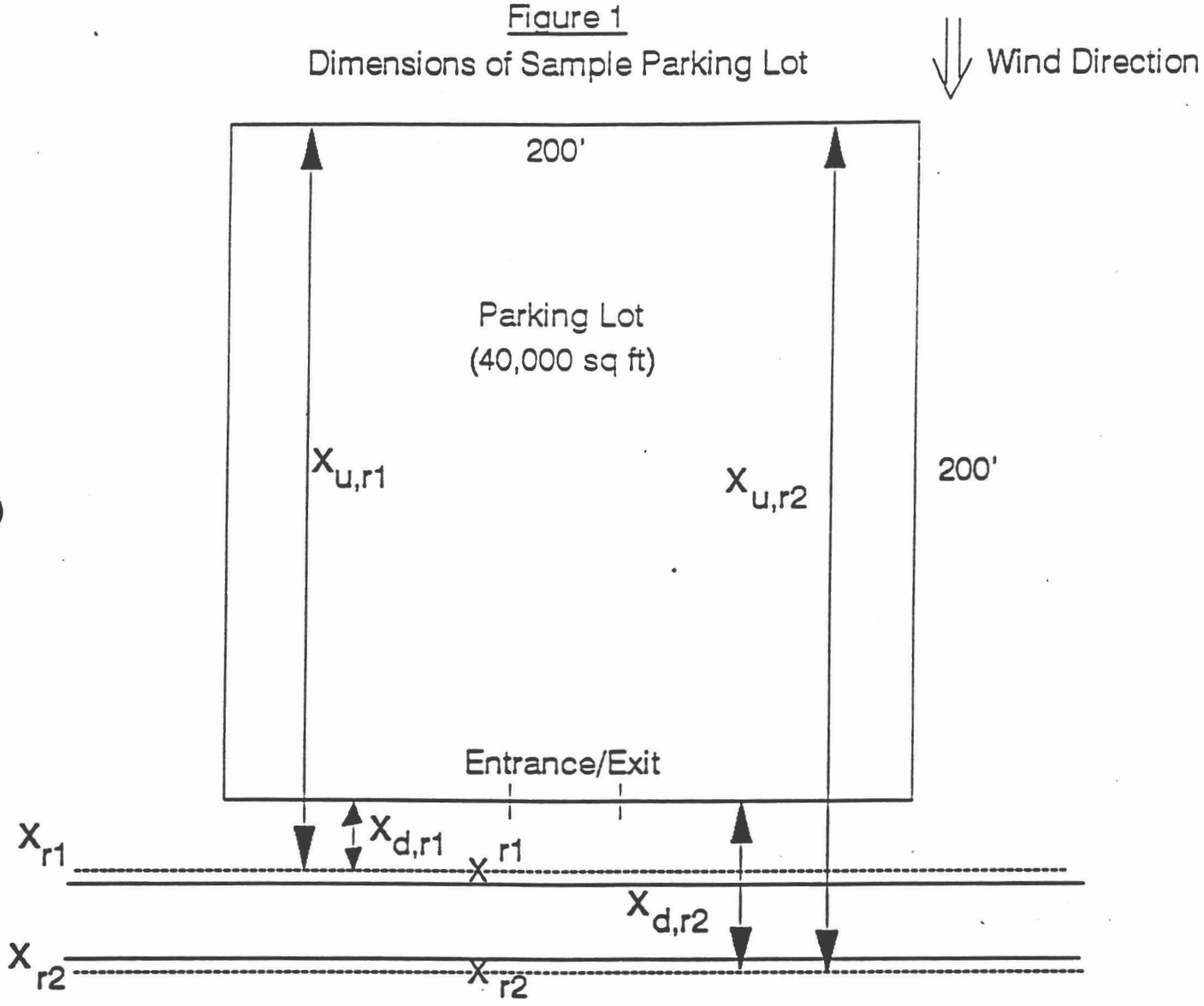
Table 1

1997 PARKING LOT INS/OUT

HOUR	IN	OUT
12-1	1	1
1-2	1	0
2-3	0	0
3-4	0	0
4-5	0	1
5-6	1	5
6-7	3	8
7-8	26	10
8-9	69	20
9-10	16	3
10-11	10	5
11-12	10	5
12-1	13	20
1-2	7	8
2-3	16	19
3-4	28	34
4-5	30	81
5-6	36	40
6-7	24	29
7-8	16	19
8-9	9	7
9-10	1	3
10-11	1	1
11-12	1	0
TOTAL	319	319

Figure 1

Dimensions of Sample Parking Lot



File: PARKLOT.WQ1

Sample Parking Lot Analyses:

1997 Mobile 4.1 CO Emission Factors:

		1997 CO background
Cold Idle @ 30F [CI]:	1028.61 G/HR	1-HR 5.7 PPM
5mph Cold Auto @ 30F [CA]:	188.17 G/MI	8-HR 2.9 PPM
5mph Hot Auto @ 30F [HA]:	32.13 G/MI	

1997 INS/OUTS						PARKING	MEAN	PEAK	8-HR	
MAXIMUM HOUR			MAXIMUM 8-HOUR			LOT	TRAV.DIS.	HOURLY ER	AVG. ER	
PERIOD	INS	OUTS	PERIOD	INS	OUTS	GSF	(FEET)	(G/SEC)	(G/SEC)	Qa, 8-hr
4-5PM	30	81	12-8PM	21.3	31.3	40,000	201	0.557	0.219	0.000059

$$\chi u/Q_a = \frac{0.8}{a(1-b)}(r_u^{1-b} - r_d^{1-b}) * PF \qquad (1)$$

$$r_u = x_u + x_o \qquad (2)$$

$$r_d = x_d + x_o \qquad (3)$$

where:

- χ - 8-hour CO concentration from parking lot emissions (g/m^3)
- u - wind speed (= 1 meter/sec)
- Q_a - CO emissions in parking lot per unit area of lot (g/m^2-sec)
- a,b - empirical constants (for almost all applications, a = 0.50, b = 0.77)
- r_u - effective distance from the receptor to the upwind edge of the parking lot (meters)
- r_d - effective distance from the receptor to the downwind edge of the parking lot (meters)
- x_u - measured distance from the receptor to upwind edge of the parking lot (meters)
- x_d - measured distance from the receptor to downwind edge of the parking lot (meters)
- x_o - virtual distance used to affect an initial vertical mixing of CO emissions (x_o = 19.9m)
- PF - 8-hour meteorological persistence factor (= 0.7)

Since $x_{u,r1}$ = 62.8m (206 ft) & $x_{d,r1}$ = 1.8m (6 ft)
$x_{u,r2}$ = 79.9m (262 ft) & $x_{d,r2}$ = 18.9m (62 ft)

Therefore χ_{r1} = 0.00021 g/m^3 = 0.18 PPM
χ_{r2} = 0.00016 g/m^3 = 0.14 PPM

8-hr Total CO Conc @ r1 = χ_{r1} + bkgrd = 0.18 + 2.9 = 3.08 PPM

	ER	
	g/mi-hr	g/m-sec
WB adjacent street	6423	0.00111
EB adjacent street	3272	0.00056
Total	9695	0.00167

On-street = 307.7 * PF * ER = 0.36 PPM

8-hr Total CO Conc @ r2 = χ_{r2} + On-street + bkgrd = 0.14 + 0.36 + 2.9 = 3.4 PPM

AIR QUALITY APPENDIX 3

Guidelines for Evaluating Air Quality Impacts from Multilevel Naturally Ventilated Parking Facilities

AIR QUALITY APPENDIX 3
Guidelines for Evaluating Air Quality Impacts from Multilevel Naturally Ventilated Parking Facilities

A multilevel parking facility with at least 3 partially open sides is naturally ventilated by the ambient air. A sample analysis of the potential air quality impacts from carbon monoxide (CO) emissions from this type of facility that would start operations in 1997 is provided in the attachment. In this example, maximum hourly CO emissions will be used to conservatively estimate 8-hour CO impacts adjacent to the facility. The 5-6 PM period would have the largest number of departing autos and the largest hourly estimate of CO emissions in this sample analysis for a proposed 7-level naturally ventilated auto parking facility. This analysis does not use the most up-to-date MOBILE program or related emission factors, but the methodology used is still applicable.

Figure 1 provides a side view of a sample 7-level open-sided facility, which would be built above a retail use. Figure 2 displays a top view applicable to each parking level. The proposed facility would have several entrances and exits. Page 1 of the attachment displays all input parameters required to estimate the maximum CO emission rates within the parking lot in 1997. CO emission factors and background values are reported at the top of the page. The analysis should assume that all departing autos would idle for one minute before traveling to the exits for each level, and all arriving and departing autos would travel at 5 mph within the parking facility. The equations and definitions of the parameters used to determine the CO emission rates within the parking area and off-site CO impacts are very similar to those found in "Guidelines for Evaluating Air Quality Impacts from Parking Lots" (Appendix 2), with some modifications.

Estimates of CO emission rates for each level should consist of two components: vehicles arriving/departing the level, and "excess" vehicles that are passing through a level, destined toward a higher or lower parking level within the facility. In this example, the total number of autos traveling in and out of the structure in the 5-6 PM hour have been divided by the number of parking levels (i.e., 7) to determine the average number of vehicles parking or leaving each level in this hour (e.g., a total of 679 departures averages out to 97 departures per level). $Q_{a,lvl}$ represents the CO emission estimates per unit area for vehicles originating from or destined for each level. Excess CO emissions for each level should be calculated based on the number of excess autos traversing through the parking level and the distance traveled by such vehicles. As shown in the example, the number of excess vehicles increases to a maximum at level 1. Q_{exc} represents the excess emissions per level, and $Q_{a,exc}$ is Q_{exc} divided by the floor area of the respective parking level. $Q_{a,tot}$ is defined as the total emissions per unit area per level, and is the sum of $Q_{a,exc}$ and $Q_{a,lvl}$ for each parking level.

The sample analysis displays the recommended procedures for estimating 8-hour CO impacts at a pedestrian-height sidewalk receptor 70 feet from the facility. Equations 1, 2, and 3 are the calculations involved in determining the off-site impacts from CO emitted from an at-grade parking lot. Equation 4 is the recommended correction factor to adjust CO impacts calculated with $Q_{a,tot}$ and equation 1 (i.e., χ center line) for each parking level to a pedestrian height receptor. The equation for this height correction factor ($\bar{x}$) is based on the correction term for elevated point sources in EPA's *Workbook of Atmospheric Dispersion Estimates, AP-26* (pg. 6, equation 3.3). Height correction factors for each level should be based on the difference between pedestrian height (6 feet) and the respective parking level elevation, and should be multiplied to the χ centerline calculated for each level. The table at the bottom of page 2 of the attachment shows the result of these products for each level of the parking facility in this example. Page 3 displays on-street CO emissions contributions to the receptor in this example, which were calculated with a factor (307.7) that yields the maximum predicted impacts (which could be calculated by refined mathematical modeling), when multiplied by the on-street CO emission rate in grams/meter-second. Cumulative CO concentrations at this receptor should be calculated by adding together the contributions from the parking facility, on-street sources and background levels.

An acceptable alternative method to the procedures detailed above would be to use the hourly average CO emissions over the continuous 8-hour period with the largest CO emissions to calculate the CO emission rates within the facility and off-site 8-hour CO impacts. This alternative procedure should consider whether or not a larger proportion of vehicles would use the lower levels over an 8-hour average, as opposed to the equal averaging procedure used with the peak hourly emissions. The procedure employed in this sample analysis did not have to take this into account, since maximum hourly emissions were conservatively applied to estimate CO emission rates over an 8-hour period.

Figure 1

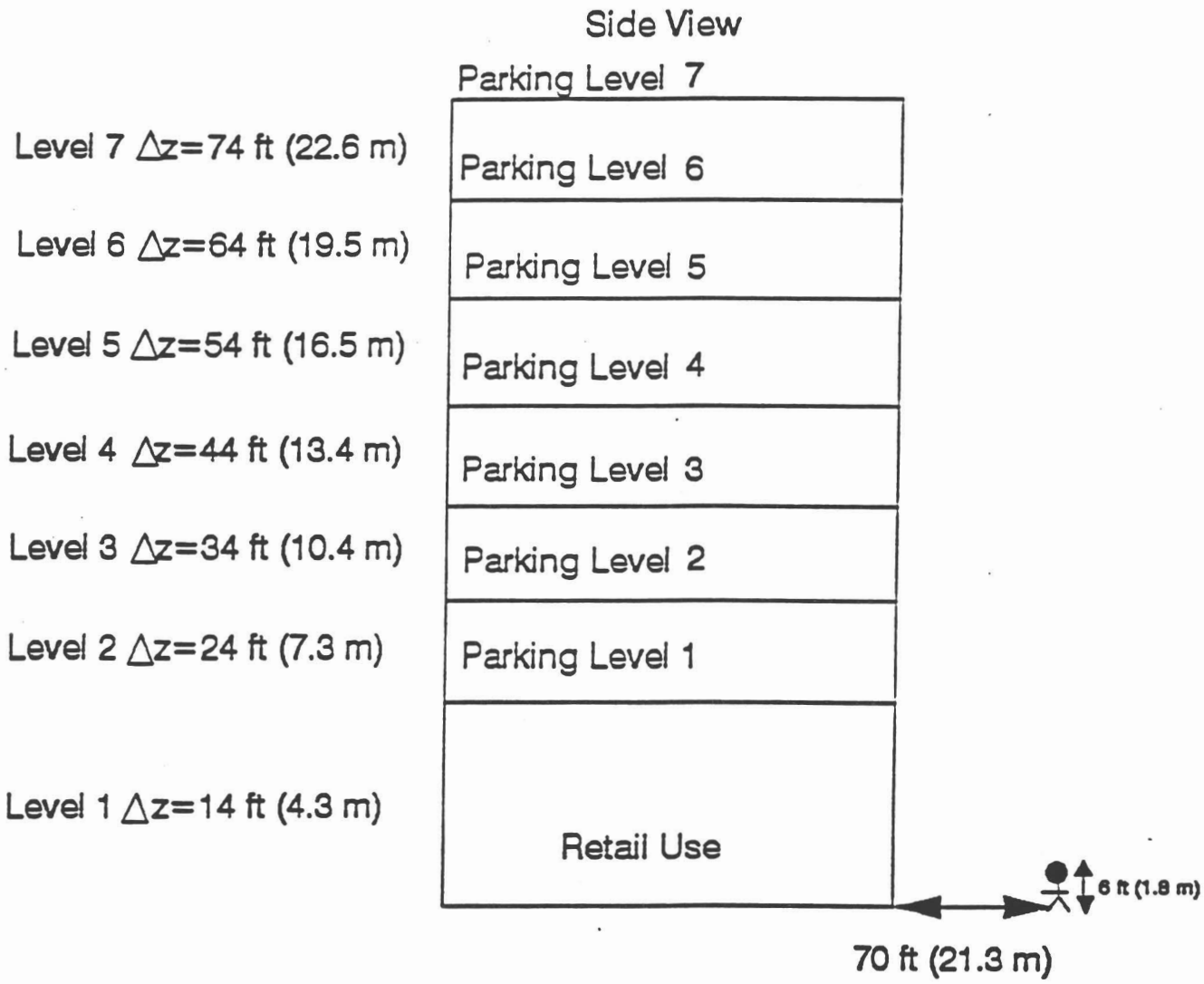
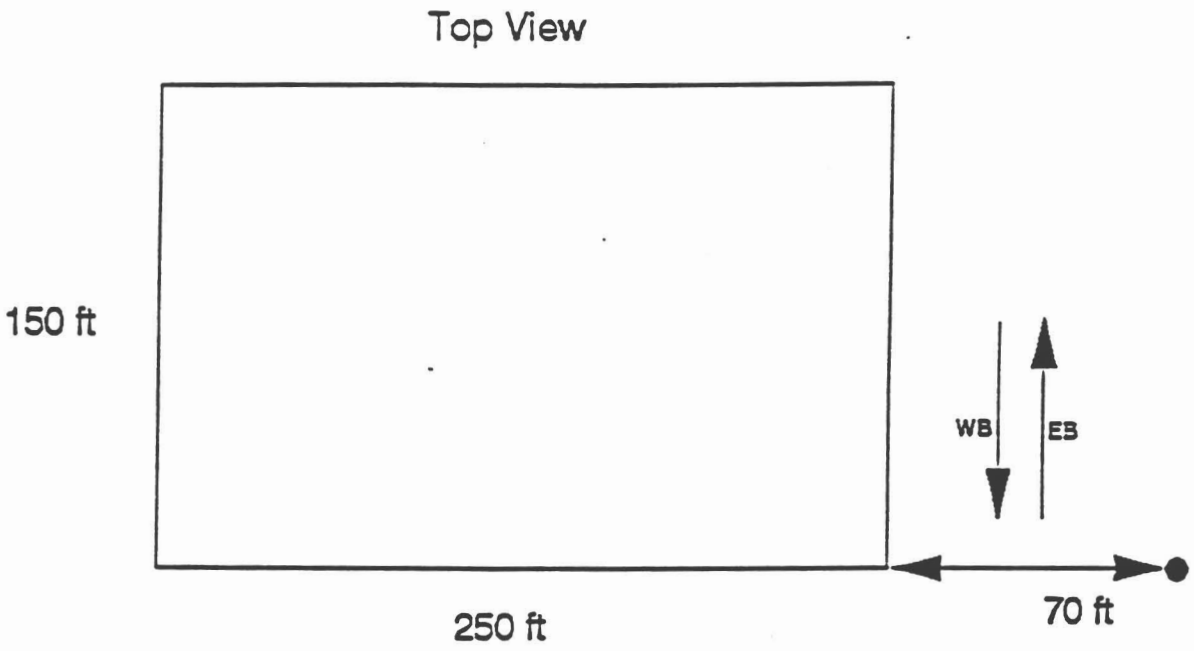

Side View
Parking Level 7
Level 7 Δz=74 ft (22.6 m)
Parking Level 6
Level 6 Δz=64 ft (19.5 m)
Parking Level 5
Level 5 Δz=54 ft (16.5 m)
Parking Level 4
Level 4 Δz=44 ft (13.4 m)
Parking Level 3
Level 3 Δz=34 ft (10.4 m)
Parking Level 2
Level 2 Δz=24 ft (7.3 m)
Parking Level 1
Level 1 Δz=14 ft (4.3 m)
Retail Use
6 ft (1.8 m)
70 ft (21.3 m)

Figure 2



Sample Multi-Level Naturally Ventilated Parking Facility Analysis:

1997 Mobile 4.1 CO Emission Factors:

Cold Idle @ 30F [CI]:	1028.61 g/hr
5mph Cold Auto @ 30F [CA]:	188.17 g/mi
5mph Hot Auto @ 30F [HA]:	32.13 g/mi

1997 CO background
1-HR 5.7 PPM
8-HR 2.9 PPM

1997 INS/OUTS

MAXIMUM HOUR PERIOD	INS	OUTS	MAXIMUM HOUR PER LEVEL PERIOD	INS	OUTS	PARKING LOT GSF	MEAN TRAV.DIS. (FEET)	PEAK HOURLY ER PER LEVEL (G/SEC)	$Q_{a,lvl}$ (g/m^2-sec)
5-6PM	301	679	5-6PM	43	97	37,500	270	0.741	0.000213

Emissions from excess vehicles:

$$Q_{exc} = (N_{veh,dep} * [CA] * \Delta L + N_{veh,arr} * [HA] * \Delta L) / 3600$$

$$Q_{a,exc} = Q_{exc} / GSF$$

where: $N_{veh,dep}$ = number of excess departing autos from upper levels at each floor

$N_{veh,arr}$ = number of excess arriving autos from lower levels at each floor

ΔL = travel distance between floors (= 120 ft)

Level	Excess Vehicles Ins	Outs	Q_{exc}	$Q_{a,exc}$	$Q_{a,lvl}$	$Q_{a,tot}$
7	-	-	-	-	2.13×10^{-4}	2.13×10^{-4}
6	43	97	0.12	3.56×10^{-5}	2.13×10^{-4}	2.48×10^{-4}
5	86	194	0.25	7.12×10^{-5}	2.13×10^{-4}	2.84×10^{-4}
4	129	291	0.37	1.07×10^{-4}	2.13×10^{-4}	3.19×10^{-4}
3	172	388	0.50	1.42×10^{-4}	2.13×10^{-4}	3.55×10^{-4}
2	215	485	0.62	1.78×10^{-4}	2.13×10^{-4}	3.91×10^{-4}
1	258	582	0.74	2.13×10^{-4}	2.13×10^{-4}	4.26×10^{-4}

$$\chi u/Q_a = \frac{0.8}{a(1-b)} (r_u^{1-b} - r_d^{1-b}) * PF \quad (1)$$

$$r_u = x_u + x_o \quad (2)$$

$$r_d = x_d + x_o \quad (3)$$

with variables and constants as defined previously

Since x_u = 97.5m (320 ft) & x_d = 21.3m (70 ft),

Therefore $\chi u/Q_{a,tot} = 3.099$

Vertical Diffusion Correction:

$$\bar{x} = \exp(-0.5 * (\Delta z / \sigma_z)^2) \qquad (4)$$

where: $\bar{x}$ - correction factor for difference between height of each parking level and pedestrian height

σ_z - urban vertical dispersion coefficient for Pooler-McElroy stability class D

σ_z - 0.14 * x, where x is the distance between the edge of the parking area and the receptor site (in meters)

Δz - difference in height between parking lot level and pedestrian height (≈ 6 ft)

since x - 70 ft = 21.3 m,

therefore $\sigma_z = 2.98$ and

$$\bar{x} = \exp(-0.5 * (\Delta z / 2.98)^2)$$

Level	Δz (ft)	Δz (m)	$\bar{x}$
1	14	4.3	0.35
2	24	7.3	0.050
3	34	10.4	0.0023
4	44	13.4	0.000041
5	54	16.5	≈ 0
6	64	19.5	≈ 0
7	74	22.6	≈ 0

Level	$Q_{a,tot}$	χ Center Line	$\bar{x}$	g/m3 @ receptor	PPM	PF*PPM
7	2.13×10^{-4}	0.00066	≈ 0	≈ 0	0.000	0.000
6	2.48×10^{-4}	0.00077	≈ 0	≈ 0	0.000	0.000
5	2.84×10^{-4}	0.00089	≈ 0	≈ 0	0.000	0.000
4	3.19×10^{-4}	0.00100	0.000041	$4.08E \times 10^{-8}$	0.000	0.000
3	3.55×10^{-4}	0.00111	0.0023	$2.55E \times 10^{-6}$	0.002	0.001
2	3.91×10^{-4}	0.00122	0.05	$6.09E \times 10^{-5}$	0.053	0.037
1	4.26×10^{-4}	0.00133	0.35	$4.65E \times 10^{-4}$	0.407	0.285
					total	0.32 = χ_{tot}

		ER	
		g/mi-hr	g/m-sec
WB adjacent street		6423	0.00111
EB adjacent street		3272	0.00056
	Total	9695	0.00167

On-street = 307.7 * PF * ER = 0.36 PPM

8-hr Total CO Conc = χ_{tot} + On-street + bkgrd = 0.32 + 0.36 + 2.9 = 3.6 PPM

AIR QUALITY APPENDIX 4

Guidelines for Performing Vehicle Classification Surveys for Air Quality Analyses

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Collection of vehicle classification data for use in an air quality analysis should be performed according to the following general guidelines, to provide accurate and adequate descriptions of the vehicle mix required by the MOBILE models used to estimate emissions from motor vehicles. To get the most accurate estimate of traffic conditions, vehicle classification data should be taken concurrently with other traffic data collection efforts. Vehicle classification surveys should be performed at or near any sites where mobile source air quality analyses are performed.

1. Three good days of surveys for the midweek AM, midday (if necessary), and PM peak periods. Field surveyors should distinguish among autos, taxis, light duty trucks, heavy duty gas trucks, and heavy duty diesel vehicles. Buses should be considered to be heavy duty diesel vehicles.

2. If a weekend air quality analysis is required, surveys should be performed for at least one day for the weekend peak hour.

3. Field observers should use the following criteria to distinguish between light-duty trucks and heavy-duty trucks:

   Light-duty trucks: vans, ambulances, pickup trucks, all trucks with 4 wheels.

   Heavy-duty trucks: Basically all vehicles with 6 or more wheels. (Note: six wheels can be on 2- or 3-axle vehicles.)

   The field observer should be acquainted with the stacks associated with heavy-duty diesel trucks in order to distinguish them from heavy-duty gas trucks. Light-duty gas trucks should be divided into two groups (LDGT 1 and LDGT 2) based on local registration data. The registered split between LDGT 1 and LDGT 2 is 73 percent to 27 percent, respectively, at the time these guidelines were prepared. DEC or DEP can be contacted to determine if this split (73/27) is still appropriate.

4. The percentage of taxis for each link could be divided into fleet medallion (FM) and non-fleet medallion (NFM) taxis based on the ratio between FM and NFM listed in DEP's Report #34 (approximately 3 FM for every 1 NFM). Since field observers usually cannot distinguish between non-medallion (NM) taxis and private autos when taking surveys, the NM taxi fraction as listed in Report #34 could be subtracted from the auto fraction for each link, or instead, the NM taxi fraction could be treated as autos in the emissions calculations. The emissions for light-duty gas autos can then be calculated using the latest approved MOBILE model with these four distinct classifications (autos, FM, NFM, and NM taxis).

5. Raw survey counts should be summed by vehicle type. The average vehicle classification for the street corridor during the respective peak period should be based upon the summed values and the relative percentages among the vehicle types.