CONSTRUCTION

CHAPTER 22

Construction activities, although temporary in nature, can sometimes result in significant adverse impacts. A project's construction activities may affect a number of technical areas analyzed for the operational period, such as air quality, noise, and traffic; therefore, a construction assessment relies to a significant extent on the methodologies and resulting information gathered in the analysis of these technical analyses areas. The following guidance provides the framework for conducting a construction assessment.

100. DEFINITIONS

CONSTRUCTION DURATION is often broken down into short-term (less than two years) and long-term (two or more years). Where the duration of construction is expected to be short-term, any impacts resulting from such short-term construction generally do not require detailed assessment. However, there are instances where a potential impact may be of short duration, but nonetheless significant, because it raises specific issues of concern. In addition, there are technical areas, such as air quality, where the duration of construction alone is not a sufficient indicator of the need for a detailed assessment, and other factors should be considered. In such instances, a targeted assessment of the relevant technical area may be appropriate. The factors to consider in determining whether a construction impact assessment is warranted for a particular technical area, such as transportation or air quality, are discussed in more detail below.

CONSTRUCTION EQUIPMENT is 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.

200. DETERMINING WHETHER A CONSTRUCTION IMPACT ASSESSMENT IS APPROPRIATE

Construction impacts may be analyzed for any project that involves construction or could induce construction. For construction activities not related to in-ground disturbance, short-term construction generally does not warrant a detailed construction analysis. For example, the use of a property for construction staging activities is likely to only warrant analysis if this activity continues for a period of several years. However, consideration of several factors, including the location and setting of the project in relation to other uses and the intensity of construction activities, may indicate that a project's construction activities, even if short-term, warrant analysis in one or more technical areas described below. For instance, further analysis may be warranted in certain areas if a project's construction period would be short, but construction activities that otherwise would take place over a longer period have been compressed into this shorter timeframe.

The following should be used by the lead agency to determine whether further analysis of a project's construction activities is needed for any technical area.

TRANSPORTATION

Construction activities may affect several elements of the City's transportation system, including traffic, transit, pedestrians, and parking. A transportation analysis of construction activities is predicated upon the duration, intensity, complexity and/or location of construction activity.

Analysis of construction activities on transportation is often not required, as many projects do not generate enough construction traffic to warrant such analysis. However, due to the location, extent, and intensity of construction, this is not always the case. Therefore, the lead agency should consider a number of factors before determining whether a preliminary assessment of the effect of construction on transportation is needed. These factors include:

- Whether the project's construction would be located in a Central Business District (CBD) or along an arterial or major thoroughfare.
    - If 'yes', the duration and the nature of the construction activity (which could include, if known, the number of construction-related auto and truck trips (in PCEs), on-site vs. on-street staging area, hours of construction, etc.) should be considered to determine whether a preliminary assessment would be needed.
- Whether the project's construction activities, regardless of where it will be located either in a CBD or along an arterial or major thoroughfare, would require closing, narrowing, or otherwise impeding moving lanes, roadways, key pedestrian facilities (*e.g.,* sidewalks, crosswalks, corners/corner reservoirs), parking lanes and/or parking spaces in on-site or nearby parking lots and garages, bicycle routes and facilities, bus lanes or routes, or access points to transit.
    - If so, would the closure be located in an area with high pedestrian activity or near sensitive land uses such as a school, hospital, or park?
        - If 'yes', the proximity of the closure to the sensitive area(s), the extent of the rerouting of pedestrians, bicycles or vehicular traffic, and the duration of the closure activity should be considered to determine whether a preliminary assessment would be needed.
- Whether the project would involve construction on multiple development sites in the same geographic area, such that there is the potential for several construction timelines to overlap, and last for more than two years overall. If yes, then a preliminary assessment of the effect of construction on transportation may be needed.

AIR QUALITY OR NOISE

Generally, if a transportation analysis is not needed with regard to construction activities, an air quality or noise assessment of construction vehicles is likely not warranted. With regard to the air quality and noise effects of other construction activities, the following should be considered by the lead agency in determining whether a preliminary analysis is needed. Often, this involves considerations of construction equipment and activities.

An assessment of air quality and noise for construction activities is likely not warranted if the project's construction activities:

- Are considered short-term;
- Are not located near sensitive receptors;
- Do not involve construction of multiple buildings where there is a potential for on-site receptors on buildings to be completed before the final build-out; and
- The pieces of diesel equipment that would operate in a single location at peak construction are limited in number.

If a project either does meet one or more of the criteria above or one of the above criteria is unknown at the time of review, a preliminary air quality or noise assessment is not automatically required. Instead, various factors should be considered, such as the types of construction equipment (gas, diesel, electric), the nature and extent of any commitment to use the Best Available Technology (BAT) for construction equipment, the physical relationship of the project site to nearby sensitive receptors, the type of construction activity, and the duration of any heavy construction activity.

To illustrate the above, construction noise, generated by pile driving, truck traffic, blasting, demolition, *etc.*, is generally analyzed only when it affects a sensitive receptor over a long period of time. Based upon experience, unless ambient noise levels are very low and/or construction source levels are very

high, and there are no structures that provide shielding, it is unusual for construction sources to have significant impacts at distances beyond 1,500 feet in New York City. Therefore, further analysis should be performed if the proposed project would cause construction equipment to be operating within 1,500 feet of a receptor for a period of time exceeding two years. In some circumstances, however, even a shorter term construction phase may affect highly sensitive locations (such as schools, hospitals, *etc.*), warranting further quantitative analysis.

OTHER TECHNICAL AREAS

HISTORIC AND CULTURAL RESOURCES

Construction impacts may occur on historic and cultural resources if in-ground disturbances or vibrations associated with project construction could undermine the foundation or structural integrity of nearby resources.

A construction assessment is not needed for historic and cultural resources unless the project involves construction activities within 400 feet of a historic resource. Note that both impacts on archaeological resources from construction and demolition of an architectural resource as a result of the project are assessed as part of the historic and cultural resources analysis described in Chapter 9, "Historic and Cultural Resources."

HAZARDOUS MATERIALS

A construction assessment is not needed for hazardous materials unless the construction activities would disturb a site, or be located adjacent to a site containing hazardous materials. The conclusions from Chapter 12, "Hazardous Materials," regarding the presence or absence of hazardous materials on the site(s) may be used in making this determination.

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 Chapter 12, "Hazardous Materials." Any impacts from in-ground disturbance that are identified in Chapter 12 should be identified in this chapter as well. The mitigation or other measures to avoid the impact, such as an (E) Designation or Restrictive Declaration, should be disclosed here as well. If the impact identified in Chapter 12 is fully mitigated, no further analysis of the effect from construction activities on hazardous materials is needed. If an unmitigated significant impact is identified in Chapter 12, the unmitigated impact should be disclosed in this chapter as well.

NATURAL RESOURCES

Natural resources may 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.

A construction assessment is not needed for natural resources unless the construction activities would disturb a site or be located adjacent to a site containing natural resources. The conclusions from Chapter 11, "Natural Resources," regarding the presence or absence of natural resources on the site(s) may be used in making this determination. If there is a potential for the construction activities to disturb a natural resource, a preliminary natural resources assessment, using the guidance below and in Chapter 11, "Natural Resources," should be conducted to determine whether, and the extent to which, the project's construction activities would disturb natural resources.

OPEN SPACE, SOCIOECONOMIC CONDITIONS, COMMUNITY FACILITIES, LAND USE AND PUBLIC POLICY, NEIGHBORHOOD CHARACTER AND INFRASTRUCTURE

A preliminary construction assessment is generally not needed for these technical areas unless the following are true:

- The construction activities are considered "long-term" (more than 2 years);
- Short-term construction activities would not directly affect a technical area, such as impeding the operation of a community facility (*e.g.*, result in the closing of a community health clinic for a period of a month(s)).

If further assessment is warranted for one or more these technical areas, a preliminary analysis may be conducted for those areas only.

300. ASSESSMENT METHODS

310. PRELIMINARY ASSESSMENT

In addition to the information gathered in Section 200, the following information should be considered in the preliminary assessments for the transportation, air quality, or noise effects of construction activities. For those areas with specific direct effects only, such as an effect of construction on historic resources, this information may not be required.

- The construction stages and activities, including numbers and types of equipment, and the anticipated duration of each stage or activity;
- The number of daily construction vehicles (construction worker vehicles and construction trucks) and deliveries and their temporal distribution for each stage and activity, presented in Passenger Car Equivalents (PCEs); and
- The number of daily construction workers and their temporal distribution for each stage and activity.

The range of construction impact issues that may be assessed in a preliminary assessment and the circumstances where a detailed assessment may be warranted for a specific technical area are described below. The assessment should be targeted only to those issues where potential impacts may result from the project's construction activities. Based on the results of the preliminary assessment, the lead agency should consider construction duration, the project's geographic surroundings, related pedestrian and vehicular activities, the distance between the general public and emissions sources, construction intensity, and the thresholds that trigger further analysis in the appropriate technical area to determine whether a detailed analysis is needed.

TRANSPORTATION

The volume of vehicular traffic (including trucks) expected to be generated during peak construction hours should be estimated in order to determine whether a detailed quantitative analysis is warranted. The assessment of construction-related traffic should consider vehicles generated by construction employees driving to and from the site, as well as trucks and other vehicles associated with project construction. Calculating the background information necessary for this assessment can be performed as follows:

- Estimate the construction employee and construction-related vehicle trips (presented as PCEs) that would be generated during construction peak periods. This should include an estimate of the number 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 information is usually developed by, or in close coordination with, the project's engineers. Typically, construction peak hours take place earlier than the AM and PM traffic peak hours. For some projects, however, a portion of the employee- and

construction-related vehicle trips will occur at the same time as peak commuting or traffic conditions in the area. For example, where the peak hour for the study area under current conditions is 8:00 a.m. to 9:00 a.m., the analysis may note that approximately 10 to 15 trucks and 50 autos are expected to bring construction workers to the site during the 7:00 a.m. to 8:00 a.m. peak arrival hour for construction-related activity, while 3 to 5 trucks and 15 autos are expected to do likewise during the 8 to 9 AM peak travel hour for the study area.

- Using the data gathered for the traffic analysis, assess whether the AM or PM peak hours for construction of the project will overlap with peak operational hours for the project.

If applicable, the preliminary assessment should also comment on the extent to which sidewalk, travel lane(s) or street closures would impact traffic and pedestrian flows, and it should assess whether capacity losses and/or full street closures would affect traffic patterns, create traffic diversions, cause backups or otherwise cause a significant deterioration in local or regional traffic flow. For multi-phase projects, potential construction impacts should be addressed for each phase. Note that the term "closure" is used broadly and includes the complete closure of a street or sidewalk for 24 hours a day, as well as the taking of one curb lane 24 hours a day to accommodate construction vehicles or field offices or the closure of a lane or lanes during parts of the day. 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 should also be disclosed, especially for active retail or residential areas where such losses may affect retail activity and residents.

No detailed traffic analysis for construction activities is needed if the construction peak would generate fewer than 50 vehicle trips (presented in PCEs). If the project involves multiple development sites over varying construction timelines, a preliminary assessment must take into account whether the PCEs associated with operational trips from completed portions of the project and construction trips associated with construction activities could overlap and exceed the 50 PCE threshold. If not, further analysis is not required.

If the project would exceed the 50 PCE threshold, the conclusion may be drawn that the project would have no significant impacts with regard to traffic and, therefore, no detailed traffic analysis for construction activities is needed if the following factors are all present:

- The construction peak would generate fewer vehicle trips (presented as PCEs) than the operational project peak and the construction peak lane geometry, signal timing, and parking regulations are consistent with those of the operational peak hours;
- The construction would occur during off-peak hours or during hours comparable to the operational peak hours;
- The project has been determined not to produce the potential for significant adverse traffic impacts during the operational period; and
- The preliminary assessment indicates that changes to the capacity of the roadway network related to construction activities are not likely to cause a significant deterioration in local or regional traffic flow.

Correspondingly, if construction would generate a number of vehicular trips similar to or greater than the proposed project and if the operational analysis indicates significant impacts, a more detailed construction traffic assessment may be necessary. In cases where the project's operational analyses do not identify significant traffic impacts but the project's construction-related activities could affect the capacity of the roadway network in an area and result in the potential for a significant impact, a detailed traffic analysis may be warranted.

AIR QUALITY

Construction impacts on air quality may occur because of particulate matter emitted by construction activities or sandblasting, exhaust and emissions from construction equipment, and increased truck traffic to and from the construction site on local roadways or because of temporary road closings. Specifically for mobile sources, these noticeable effects on air quality are typically results of lane closures, traffic diversions, disruptions of area traffic flow or goods delivery, as mentioned above under traffic. For stationary sources, they are typically correlated with large diesel equipment, on-site batching plants, and fugitive dust emissions, and often focus on emissions of $PM_{2.5}$. The determination whether it is sufficient to conduct a qualitative analysis of these emissions or whether a quantitative analysis is required cannot be made based solely on the duration of the construction period, and should take into account such factors as the location of the project site in relation to existing residential uses or other sensitive receptors, the intensity of the construction activity, and the extent to which the project incorporates commitments to appropriate emission control measures. The mobile and stationary source analyses follows the same guidance detailed in Chapter 17, "Air Quality."

If the operational analysis indicates that the project would not result in significant mobile source impacts, and the vehicular trip generation from construction would be less than that of the proposed project, then a more detailed assessment is usually not necessary. In this case, the analysis may be qualitative, describing how the determination of no significant impact was reached. However, if the construction peak would generate significantly more vehicles than the project peak or if significant air quality impacts are expected under the With-Action condition, more detailed analyses may be necessary.

NOISE

For mobile sources, effects on noise are typically results of lane closures, traffic diversions, disruptions of area traffic flow or goods delivery, as mentioned above under transportation. For stationary sources, construction noise, generated by pile driving, truck traffic, blasting, demolition, *etc.*, is generally analyzed in detail only when it affects a sensitive receptor over a long period of time. The determination whether it is sufficient to conduct a qualitative analysis or whether a quantitative analysis is required cannot be made based solely on the duration of the construction period, and should take into account such factors as the location of the project site in relation to existing residential uses or other sensitive receptors, the intensity of the construction activity, and the extent to which the project incorporates commitments to appropriate noise control measures. The mobile and stationary noise source analyses follows the same guidance detailed in Chapter 19, "Noise."

OTHER TECHNICAL AREAS:

LAND USE AND NEIGHBORHOOD CHARACTER

A construction impact analysis of land use and neighborhood character is typically needed if construction would require continuous use of property for an extended duration, thereby having the potential to affect the nature of the land use and character of the neighborhood. A land use and neighborhood character assessment for construction impacts looks at the construction activities that would occur on the site (or portions of the site) and their duration. The analysis determines whether the type and duration of the activities would affect neighborhood land use patterns or neighborhood character. For example, a single property might be used for staging for several years, resulting in a "land use" that would be industrial in nature. Depending on the nature of existing land uses in the surrounding area, this use of a single piece of property for an extended duration and its compatibility with neighboring properties may be assessed to determine whether it would have a significant adverse impact on the surrounding area. Guidance for a preliminary assessment of the effects to land use, zoning, and public policy and neighborhood character, and consequently, whether a detailed analysis is warranted, may be found in Chapter 4, "Land Use, Zoning, and Public Policy," and Chapter 21, "Neighborhood Character."

SOCIOECONOMIC CONDITIONS

If the proposed project would entail construction of a long duration that could affect the access to and therefore viability of a number of businesses, and the failure of those businesses has the potential to affect neighborhood character, a preliminary assessment for construction impacts on socioeconomic conditions should be conducted. This assessment 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. Guidance for a preliminary assessment of the effects socioeconomic conditions, and consequently, whether a detailed analysis is warranted, may be found in Chapter 5, "Socioeconomic Conditions."

COMMUNITY FACILITIES AND SERVICES

A construction impact assessment should be conducted for any community facility that would be directly affected by construction (*e.g.*, if construction would disrupt services provided at the facility 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. The assessment of construction impacts on community facilities examines the service disruption to those facilities that may occur during construction. Guidance for an analysis of direct effects to community facilities may be found in Chapter 6, "Community Facilities."

OPEN SPACE

A construction impacts analysis for open space should 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 for an extended period during construction activities. 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. In addition, the Department of Parks and Recreation should be consulted to coordinate replacement of any street trees lost as a result of the project. Guidance for an analysis of effects to open space, and consequently, whether detailed analysis is warranted, may be found in Chapter 7, "Open Space."

HISTORIC AND CULTURAL RESOURCES

The assessment of construction impacts on historic and cultural resources considers the possibility of physical damage to any architectural or archaeological resources identified in the project's historic and cultural resources assessment, identified in Chapter 9, "Historic and Cultural Resources." Impacts on archaeological resources from construction are assessed as part of the overall evaluation of the project's effect on archaeological resources (see Chapter 9, "Historic and Cultural Resources").

If a project's construction activities are located within 400 feet of a historic or cultural resource, potential hazards should be assessed, such as whether certain character-defining elements of a structure, including but not limited to rooftops or stained glass windows, could be impacted by falling objects from an adjacent construction site.

There are also regulatory mechanisms that address many of the concerns regarding vibrations associated with construction. If the project is located within 90 feet of a New York City Landmark, a National Register-listed property, or within a New York City Historic District, the potential for physical disturbance should be disclosed and the project is required to comply with DOB Technical Policy and Procedure Notice (TPPN) #10/88. TPPN #10/88 supplements the standard building protections afforded by Building Code C26-112.4 by requiring a monitoring program to reduce the likelihood of construction damage to adjacent New York City Landmarks and Na-

tional Register-listed properties (within 90 feet) and to detect at an early stage the beginnings of damage so that construction procedures may be changed.

If the project is not located within 90 feet of a historic or cultural resource that is NYC-landmark eligible, eligible for the State and National Register of Historic Places, or is within an eligible New York City Historic District, no special protections apply. Therefore, the potential for physical disturbance and adverse impacts to those historic and cultural resources should be disclosed.

NATURAL RESOURCES

If a project or construction staging area is located near a sensitive natural resource (such as wetlands, *etc.*, as defined in Chapter 11, "Natural Resources"), construction activities may result in the disruption of these areas. Projects located on the waterfront or on sites which discharge to a separate sewer system may also have construction impacts on water quality from construction work in or near the water. If large land areas are expected to have surface soils exposed to precipitation, an analysis of runoff may be warranted. 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.*).

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. An assessment could also include an inventory of existing street trees within the construction impact zone if the project would potentially result in the loss of those trees. The potential for construction activities near the root zone of a tree to compact the soil and destroy the roots and/ or kill the tree over a period of time that may extend beyond the duration of the construction project should be examined as well. The assessment of such issues is described in Chapter 11, "Natural Resources." Usually the assessment is more qualitative in nature, since these potential impacts may be mitigated to a great extent.

HAZARDOUS MATERIALS

Because soils are disturbed during construction and utility placement, any project proposed for a site that has been found to have the potential to contain hazardous materials should also consider the possible construction impacts that may result from that contamination and identify measures to avoid impacts. This is typically part of the hazardous materials analysis, and is described in Chapter 12, "Hazardous Materials."

INFRASTRUCTURE

If construction would cause a disruption to 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 appropriate agency is recommended to ensure that any disruption is temporary. Another example for a large project would be the extensive number of construction-related heavy trucks and their effect on pavement conditions. If such disruptions were expected, a more detailed analysis may be warranted.

320. STUDY AREA

If detailed quantitative analysis is needed, study areas for construction impacts analyses are established. Baseline data for the construction impact analyses are typically the same as those used in conducting impact analyses for the With-Action condition; however, the study areas for construction impact analyses may vary, since a great deal depends on the route that construction vehicles will take. Generally, the areas that could be affected by construction are the uses immediately bordering the site, truck routes to and from the site, routes which construction vehicles and employees would take to access the site, vehicular detour routes with major traffic diversion, bicycle detour routes, historic and cultural properties adjacent to the site or historic districts containing the site, and facilities with substantially relocated pedestrian volumes.

To illustrate, the analysis of mobile air quality impacts includes intersections where the greatest increase in construction-related truck traffic is expected, and the analysis is performed using the techniques described in Subsection 321 of Chapter 17, "Air Quality."

For noise, 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. Generally, receptors within a 1,500-foot radius of the proposed project (for stationary construction sources) and along feeder streets to the proposed project (for mobile construction sources) should be considered if a detailed construction assessment is necessary. The method for selecting the study areas for stationary and mobile sources in Chapter 19, "Noise," should be used.

330. DETAILED ANALYSIS TECHNIQUES

Detailed construction impact analyses are typically based on the guidance used for the operational analyses for the various technical areas. The primary difference in assessing construction impacts is that the nature of the impacts associated with construction are often unique to construction disruption, such as fugitive dust, traffic diversion, and pedestrian crosswalk and bicycle lane relocation. When more detailed analyses are called for, the methodology for analysis is the same as that used in conducting impact analyses for the With-Action condition.

The construction analysis (especially as it relates to the air quality, noise, and transportation technical areas) 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 major phase on each portion of the site and the duration of each phase are documented and used for the analyses. This information serves as the basis for describing and analyzing construction impacts. For analysis of multi-phased construction, the assessment is often broken into two or three major phases, during which different portions of the site would be used in varying ways and with varying intensities. For example, during the first phase, construction might 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 might be completed on the northern end and initiated on the center of the site, while the southern portion of the site is used for staging.

For projects requiring detailed construction analyses, there may be instances where the lead agency, in its discretion, determines it is appropriate to cumulatively assess the construction impacts of the project, in conjunction with those of known No-Action developments that are in close proximity to construction activities under the project. In order to accurately assess cumulative construction impacts, the adjacent projects to be considered should be limited to those with known information regarding construction activities and impacts—often, these projects have been subject to a separate environmental assessment. For information regarding projects in the study area undergoing environmental review, please contact the Mayor's Office of Environmental Coordination.

The following technical approaches and analysis methodologies may be useful in preparing a detailed construction impact analysis where the potential exists for significant impacts.

TRANSPORTATION

If, based upon the results of the preliminary assessment for transportation, a detailed traffic, transit or pedestrian analysis is warranted, the analysis is usually conducted for the hours most likely to have significant adverse impacts. The determination of construction phase impacts entails an abbreviated version of the impact assessment framework described in Chapter 16, "Transportation," and addresses the likely significance of any such impacts on the study area street network. It focuses on depicting the potential magnitude and duration of impacts for the key locations likely to be impacted, rather than for all potential impact locations analyzed within the operational period analyses. This could include a quantitative evaluation of expected levels of service at intersections in the study area that would be affected by construction traffic, or a quantitative determination 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.

For projects involving temporary roadway or lane closures requiring detailed analysis, the traffic diversions that would occur during the construction phasing, until the new roadway system is functioning, should be assessed. This analysis follows the methodology described in Chapter 16, "Transportation."

AIR QUALITY

The air quality analyses for construction may examine mobile sources from construction traffic and stationary sources from activities on-site.

If, based upon the screening analyses conducted in the preliminary assessment, detailed quantitative analysis is warranted, the mobile or stationary source analysis follows the same guidance detailed in Chapter 17, "Air Quality."

The analysis usually quantifies the length of time the dust-causing activities are expected to last, and describes the measures that are undertaken to minimize the emissions (*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 the potential for project impacts.

The effects of particulate matter emissions from the construction site and earthmoving equipment should be considered. If the project 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 AERMOD, and emission factors such as from AP-42. Fugitive dust emissions from construction material handling are estimated to analyze construction impacts on air quality. In addition to the estimates of emissions from the physical movement or from the tires of such equipment that entrain particulates into the air, exhaust emission factors (from combustion) for such equipment should be included in this analysis. The most recent AP-42 factors, NEVES Report or EPA NONROAD model should be used for nonroad mobile source emissions (please refer to EPA website http://www.epa.gov/nonroad/ for the latest model version). Estimated activities, cycles of equipment operations, duration of operations, equipment types, emission factors, and load factors should be used to estimate emissions. Emission control measures, such as watering of material storage piles or truck tires that are taken into consideration in the analysis should be documented.

NOISE

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.

If the preliminary assessment indicates the need to conduct a mobile source noise analysis (associated with heavy truck trips passing sensitive receptors over a long period of time) or a stationary source

noise analysis (associated with construction equipment and activities), then detailed analysis is required. 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.

Table 22-1 shows the maximum allowable noise emission levels for specific pieces of construction equipment based upon the New York City Noise Control Code (Local Law 113) and per Chapter 28, "Citywide Construction Noise Mitigation" of the Department of Environmental Protection (DEP) Notice of Adoption of Rules for Citywide Construction Noise Mitigation. The values from Local Law 113 of 2005 represent the maximum allowable noise emission levels for specific pieces of construction equipment at construction sites in New York City, and the values from Chapter 28 are what DEP uses to identify equipment that may be the cause for a noise complaint. Construction equipment with maximum noise emission levels less than those shown in Table 22-1 is available. Guidance on quieter available construction equipment and quieter construction procedures is provided in DEP Notice of Adoption of Rules for Citywide Construction Noise Mitigation, as well as from the equipment manufacturers. Noise levels from construction may also be reduced through the use of perimeter noise barriers, temporary portable barriers, shrouds, shields, enclosures, *etc.* These path controls should be investigated where feasible. Absent information about specific equipment noise characteristics, the maximum values shown in Table 22-1 should be assumed, and these values may be adjusted for distance assuming a 6 dB(A) attenuation per doubling of distance. At distances of less than 25 feet, specific equipment noise data should be used for distance attenuation.

Where detailed construction noise analysis is necessary, construction noise analysis modeling methodologies have been developed by a variety of federal agencies including the Federal Highway Administration (FHWA), Federal Transit Administration (FTA), and Environmental Protection Agency (EPA). The Roadway Construction Noise Model (RCNM) is the FHWA model for detailed construction noise analysis, and the maximum noise emission levels and the equipment usage factors in Table 22-1 are based on the RCNM construction equipment library. The CadnaA or SoundPLAN model can also be used for detailed construction noise analysis. If these models are used, absent project specific information, construction equipment noise emissions levels and usage factors from the RCNM could be utilized for analysis. In general these models, which should be applied to each phase of construction (*i.e.*, clearing, foundation, erection, finishing, landscaping, *etc.*) separately, account for the noise emission of each particular piece of equipment, the number of pieces of equipment on the site, a usage factor which accounts for the fraction of time the equipment is being used, topography and ground level effects, source-receptor distance, and shielding in calculating a maximum $L_{eq(1)}$ at the closest noise-sensitive receptor to the proposed project. To determine potential significant impacts caused by the construction activity, these levels are compared to the No-Action noise levels and to applicable standards.

Table 22-1
Noise Emission Reference Levels (A-weighted decibels with RMS "slow" time constant)

Equipment Description	Usage Factor (%)	L_{max} @ 50 Feet
All Other Equipment > 5 HP	50	85
Auger Drill Rig	20	85
Backhoe	40	80
Bar Bender	20	80
Blasting	N/A	94
Boring Jack Power Unit	50	80
Chain Saw	20	85

Clam Shovel (dropping)	20	93
Compactor (ground)	20	80
Compressor (air, less than or equal to 350 cfm)	40	53
Compressor (air, greater than 350 cfm)	40	58
Concrete Batch Plant	15	83
Concrete Mixer Truck	40	85
Concrete Pump Truck	20	82
Concrete Saw	20	90
Crane	16	85
Dozer	40	85
Drill Rig Truck	20	84
Drum Mixer	50	80
Dump Truck	40	84
Dumpster/Rubbish Removal	20	78
Excavator	40	85
Flat Bed Truck	40	84
Front End Loader	40	80
Generator	50	82
Generator (< 25 KVA, VMS signs)	50	70
Gradall	40	85
Grader	40	85
Grapple (on Backhoe)	40	85
Horizontal Boring Hydr. Jack	25	80
Hydra Break Ram	10	90
Impact Pile Driver	20	95
Jackhammer	20	73
Man Lift	20	85
Mounted Impact Hammer (Hoe Ram)	20	90
Pavement Scarafier	20	85
Paver	50	85
Pickup Truck	40	55
Pneumatic Tools	50	85
Pumps	50	77
Refrigerator Unit	100	82
Rivet Buster / Chipping Gun	20	85
Rock Drill	20	85
Roller	20	85
Sand Blasting	20	85
Scraper	40	85
Shears (on Backhoe)	40	85
Slurry Plant	100	78
Slurry Trenching Machine	50	82
Soil Mix Drill Rig	50	80
Tractor	40	84
Vacuum Excavator (Vac-truck)	40	85
Vacuum Street Sweeper	10	80
Ventilation Fan	100	85
Vibrating Hopper	50	85
Vibratory Concrete Mixer	20	80
Vibratory Pile Driver	20	95
Warning Horn	5	85
Water Jet Deleading	20	85
Welder / Torch	40	73

Notes: As per Local Law 113 §24-228(a)(1) *Construction, Exhausts, and other Devices*, "Sound, other than impulsive sound, attributable to the source or sources, that exceeds 85 dBA as measured 50 or more feet from the source or sources at a point outside the property line where the source or sources are located or as measured 50 or more feet from the source or sources on a public right-of-way" is prohibited.
[A] Indicates the value is from Local Law 113; other values are from Chapter §28-109, Appendix.
[B] Impact Device
Sources: Local Law 113 and the New York City Department of Environmental Protection Notice of Adoption of Rules for Citywide Construction Noise Mitigation: Chapter §28-109, Appendix.

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 is often included.

OTHER TECHNICAL AREAS

For the following technical areas--"Land use, Zoning, and Public Policy, "Neighborhood Character," "Socioeconomic Conditions," "Community Facilities," "Open Space," "Historic and Cultural Resources," "Natural Resources," "Hazardous Materials," and "Sewer and Water Infrastructure"—the guidance in the respective chapters for each technical should be followed in conducting the preliminary assessment, determining whether a detailed analysis is warranted, and if so, conducting the detailed analysis.

400. DETERMINING IMPACT SIGNIFICANCE

In general, the determination of the significance of construction impacts is based on the same criteria as described for each relevant technical area of this Manual. For example, if a detailed air quality analysis is conducted for a project's construction activities, the criteria for a significant impact in Chapter 17, "Air Quality," should be used.

500. DEVELOPING MITIGATION

Significant construction impacts may 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 chapters of this Manual and, depending on the impact, may also include such measures as alternative scheduling of construction phases.

Measures that are appropriate specifically for construction impacts are described below:

LAND USE, ZONING, AND PUBLIC POLICY AND NEIGHBORHOOD CHARACTER

Impacts associated with the use of land for construction staging or for activities associated with construction may be mitigated by fencing, plantings, or similar buffers, 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, adjusting closures of travel lanes and sidewalks areas to improve access to businesses, and similar measures.

OPEN SPACE

If construction staging that requires the use of an open space or a loss of access to an open space is determined to be a significant adverse impact, 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. Mitigation may also include the restoration of any open space impacted by a construction project.

HISTORIC AND CULTURAL RESOURCES

Mitigation for the avoidance of blasting impacts may include establishment of criteria for maximum peak particle velocity; movement criteria, and criteria for ground water. Generally, mitigation should be developed in consultation with the Landmarks Preservation Commission.

NATURAL RESOURCES

Mitigation for impacts from runoff and sedimentation may include planting, fencing or the protection of exposed soil areas, and the implementation of best management practices (BMPs) (*e.g.*, filter fences and sediment ponds) or similar measures, to minimize erosion because of precipitation. Where the loss of natural resources is inevitable, replacement plans should be developed as mitigation. Mitigation may also include the implementation of protection measures such as tree guards to reduce the likelihood of accidental tree losses and the replacement of removed street trees.

INFRASTRUCTURE

If impacts from the disruption of infrastructure service during construction are anticipated, mitigation should be developed in close coordination with the appropriate agency.

TRANSPORTATION

Mitigation of traffic impacts related to construction activities may involve temporary changes in signal phasing/timing, closure of travel and/or parking lane(s), modification of lane configuration, changes in traffic and curbside parking regulations, deployment of traffic enforcement agents (TEAs), *etc.* Examples would be prohibition of turns onto a street with reduced capacity due to street narrowing or a temporary bus lane to expedite surface transit. For projects that would create significant impacts on traffic, pedestrians or bicyclists during construction, OCMC may request installation of closed-circuit cameras (CCTV) for incident mitigation along the roadways affected by the construction activities.

Mitigation for construction impacts affecting access to a bus stop or subway access point should be coordinated with New York City Transit (NYCT) and DOT. Access may need to be maintained to certain locations through temporary walkways, or temporary signage may be required directing transit users to other access points. If construction requires the closure of a sidewalk, a temporary walkway may be constructed alongside the site which would require providing pedestrian fencing as well appropriate signage to maintain pedestrian safety. In addition flaggers should be provided to minimize the conflicts between pedestrians and construction-related vehicles. At mid-block construction sites where pedestrians are diverted to the opposite side of the street (provided there is enough capacity), a temporary traffic signal may be required to facilitate the crossing.

AIR QUALITY

Mitigation for impacts from particulate matters includes control measures and construction practices that exceed the requirements of the New York City Air Pollution Control Code and, in the case with City projects, Local Law 77. For City projects, this may include paving areas and pathways where exposed soil would result in fugitive emissions from traveling vehicles and wind erosion. Limiting the use of diesel equipment to cleaner tiers (EPA's Tier II, III, or IV) and/or substituting diesel equipment with electric-power equipment should also be considered. For private developments, the mitigation may include some or all the measures in Local Law 77, in addition to the measures detailed for City projects.

NOISE

Mitigation for construction noise impacts may include noise barriers, use of low noise emission equipment, locating stationary equipment as far as feasible away from receptors, enclosing areas, limiting the duration of activities, specifying quiet equipment, scheduling of activities to minimize impacts (either time of day or seasonal considerations), and locating noisy equipment near natural or existing barriers that would shield sensitive receptors.

600. DEVELOPING ALTERNATIVES

In general, alternatives to address impacts during construction are focused on alternative scheduling of construction phases that can serve to alleviate impacts, particularly those related to traffic. In addition, alternatives may sometimes focus on the design of the proposed project. 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 project at a different location.

700. REGULATIONS AND COORDINATION

710. REGULATIONS AND STANDARDS

The following list is not exhaustive and applicants are responsible for determining any local, State, and Federal regulations that apply.

NEW YORK CITY AIR POLLUTION CONTROL CODE

All projects, whether or not subject to the requirements of CEQR, are required to comply with the New York City Air Pollution Control Code, which 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." Local Law 77 of 2003 requires that any diesel-powered nonroad equipment, fifty horsepower or greater, that is owned by, operated by or on behalf of, or leased by a City Agency be powered by Ultra Low Sulfur Diesel (ULSD) and utilize Best Available Technology (BAT). Documentation of these measures and commitment to adherence to these requirements are often reflected in the environmental assessment.

NEW YORK CITY ASBESTOS CONTROL PROGRAM

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 an existing building could result in emissions of asbestos, the qualitative analysis should document a commitment to the adherence of these measures and requirements during construction.

LOCAL LAW 24 OF 2005

Local Law 24 of 2005 requires the issuance of a community reassessment, impact amelioration (CRIA) statement or Environmental Assessment Statement (EAS)/Environmental Impact Statement (EIS) in lieu of CRIA if a publicly mapped street is closed for more than 180 consecutive calendar days to vehicular traffic. The CRIA Statement or equivalent EAS/EIS must be delivered to both the community board and the city council member in whose district the street is located on or before the 210th day of the street closure. In addition, at least one public forum must be held prior to the issuance of either the CRIA, EAS, or EIS if the project is one for which DOT has issued a permit. Further information is available from:

New York City Department of Transportation
Division of Traffic Planning
55 Water Street
New York, NY 10041

REQUIRED PERMITS FROM DOT'S OFFICE OF CONSTRUCTION MITIGATION AND COORDINATION

Before receiving construction permits from DOT (such as street opening, sidewalk construction, construction activity or canopy permits), the traffic, bicycle detour, and pedestrian access plans must be approved by OCMC, located at 55 Water Street in Manhattan. For areas south of Canal/Rutgers

Street, plans must be approved by the Lower Manhattan Borough Commissioner's Office instead of OCMC. For bicycle detour plans located anywhere in the City, the DOT's Office of Alternative Modes must also review the plan. Should any bus stops or bus routes need to be relocated or subway station access be affected, such impacts must be identified and reviewed with NYCT and DOT.

Pedestrian access plans should identify the extent to which any sidewalks and/or crosswalks would be closed or narrowed to allow for construction-related activity and describe how pedestrian access to adjacent land uses and uses through the area/intersections would be maintained. In addition, any construction activities that necessitate the closure of an existing bicycle lane(s) would require the preparation of a bicycle detour plan showing the detour bicycle lane with pavement marking and signage. The plan should show how the proposed temporary bicycle lane would be reconnected to other existing bicycle lane(s) in the area.

NEW YORK CITY NOISE CONTROL CODE

The New York City Noise Control Code, as amended in 2005, defines "unreasonable and prohibited noise standards and decibel levels" for the City of New York. The New York City Noise Control Code, Section 24-219, contains rules that prescribe "noise mitigation strategies, methods, procedures and technology that shall be used at construction sites" when certain construction devices or activities occur. Specifically, the Code requires:

- The development and implementation of a site-specific construction noise mitigation plan, where appropriate;
- Construction activities to occur between 7 AM to 6 PM Monday through Friday (construction work to occur outside the permitted days/hours requires prior authorization); and
- Certain pieces of construction equipment (see Subchapter 5 of the New York City Noise Control Code, "Prohibited Noise Specific Noise Sources–Sound Level Standard") to satisfy maximum allowable noise emission requirements.
- In addition, Title 15, Chapter 28 of the New York City Administrative Code prescribes citywide construction noise mitigation rules, found here, which prescribe the methods, procedures and technology to be used at construction sites to achieve noise mitigation whenever any one or more of certain construction devices or activities set forth in the rules are employed or performed.

NEW YORK CITY PROCEDURE FOR THE AVOIDANCE OF DAMAGE TO HISTORIC STRUCTURES

Regulations for the protection of historic structures are found in "Technical Policy and Procedure Notice #10/88, Procedures for the Avoidance of Damage to Historic Structures Resulting from Adjacent Construction when subject to Controlled Inspection by Section 27-724 and for Any Existing Structure Designated by the Commissioner," issued by the New York City Department of Buildings. Additional standards and guidance are available from:

New York City Landmarks Preservation Commission
Environmental Review Division
1 Centre St., 9N
New York, NY 10007

720. APPLICABLE COORDINATION

Depending on the potential impact, the agencies responsible for implementing required mitigation measures should be coordinated with as soon as practicable. The agencies that may be contacted are specified within the different technical chapters of this Manual.

In addition, it may be necessary to coordinate with DOT's Office of Construction Mitigation and Coordination in the event rerouting of truck traffic during construction or other traffic-related or pedestrian-related mitigation measures are proposed during construction.