NEW YORK CITY

Open Industrial Uses Study

DRAFT

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DEPARTMENT OF CITY PLANNING CITY OF NEW YORK

http://www.nyc.gov/html/dcp/html/oius/index.shtml

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NEW YORK CITY

Open Industrial Uses Study

2014

ABOUT THE STUDY

The City of New York aims to improve the condition of manufacturing zones citywide by making industrial areas greener, safer, stronger and more resilient to climate change. These widely distributed districts are home to hundreds of businesses across all sectors and are also the only locations where essential and sometimes unenclosed heavy industrial uses are permitted to operate. These unenclosed businesses, open industrial uses (OIUs), perform a critical, but often overlooked role in the City's economy. The City seeks to continue to support these businesses as they provide valuable and necessary functions, employment opportunities in each borough, and opportunity for high wages employment for a broad profile of New Yorkers.

Open industrial uses facilities (OIUs) often include activities that, unless managed properly, can have negative effects on air, soil and water quality and can create quality of life impacts for adjacent uses such as noise, odor, dust and debris. While many open industrial use facilities operate in accordance with existing regulations and actively undertake efforts to enhance their neighborhoods, the Open Industrial Uses Study focuses on developing strategies to ensure that all open industrial uses facilities are operating in such a way. It has developed these strategies by evaluating the land use regulation challenges posed by OIUs as they exist today, and identifying specific solutions to address them in order to close regulatory gaps and thereby better protect air and water quality, improve the business environment and the quality of life for communities in and near New York City's industrial areas.

Building on past and current city initiatives, thirteen city agencies and two state agencies (see page 8 for the interagency taskforce member list) joined together to study unenclosed industrial facilities citywide. Funding for the study was provided through the New York City Industrial Development Agency (IDA), New York City Department of Environmental Protection (DEP) and New York City Department of City Planning (DCP). Additional funding was provided by the New York State Department of State (DOS), via the Environmental Protection Fund.

As the study's lead agency, DCP, working with an interagency working group, external advisory committee, and engineering consultants Henningson, Durham & Richardson Architecture and Engineering, P.C. (HDR) and Parsons Brinckerhoff (PB), identified and analyzed cost-effective best management practices and pollution prevention controls for open industrial uses to improve standards in manufacturing zones, enhance economic development, create safer and cleaner environments and safeguard facilities in the flood zone.

 Image courtesy of Mitch Waxman

PROJECT LEAD
New York City Department of City Planning

FUNDING AGENCIES
New York City Economic Development Corporation
New York City Department of Environmental Protection
New York City Department of City Planning
New York State Department of State

CONSULTANT TEAM
Henningson, Durham & Richardson Architecture and Engineering, P.C.
Parsons Brinkerhoff

INTERAGENCY TASKFORCE
New York City Agencies
Business Integrity Commission
Department of City Planning
Department of Consumer Affairs
Department of Buildings
Department of Environmental Protection
Department of Health and Mental Hygiene
Department of Sanitation
Economic Development Corporation
Fire Department
Law Department
Mayor's Office of Environmental Remediation
Mayor's Office of Emergency Management
Small Business Services

New York State Agencies
Department of State
Department of Environmental Conservation

Image page 5: A scrap metal recycling pile spilling into wetlants and potentially contributing polluton to the Bronx River.

Image pages 6 and 7: Scrap metal processing and recycling facility in Newtown Creek. Photo courtesy of Mitch Waxman.

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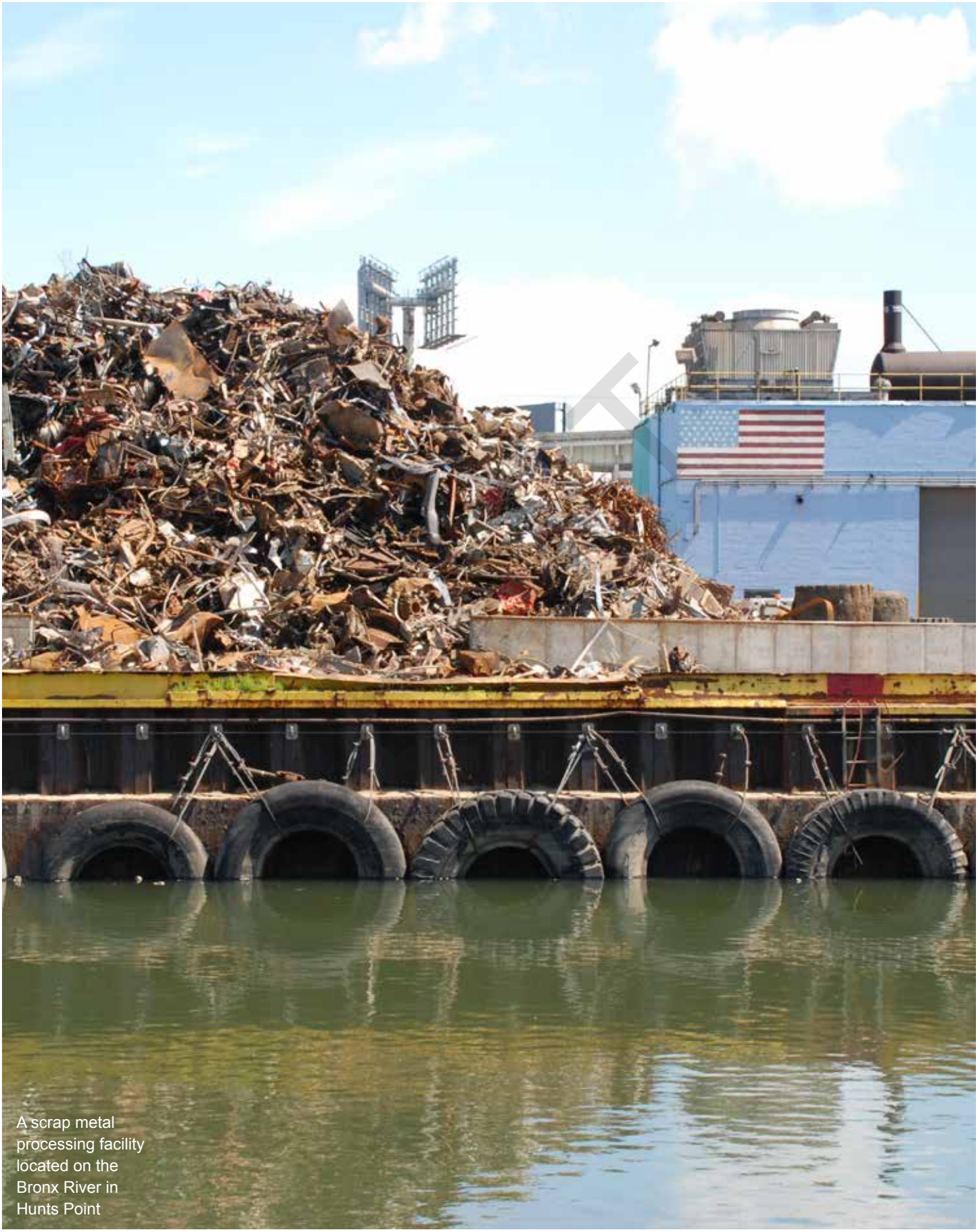


A scrap metal processing facility located on the Bronx River in Hunts Point

INTRODUCTION:

EXECUTIVE SUMMARY

This study is part of a broader effort to support the larger industrial sector, which is comprised of almost 40,000 businesses that employ almost a half a million workers who have a collective output of almost 16 percent of the City's total gross city product. Many industrial companies provide relatively high-paying jobs that on average pay higher wages than other occupations available to workers without a college degree. Industrial businesses, like all businesses in New York City, are subject to regulations governing land use and development as detailed in the Zoning Resolution of the City of New York and their facilities are directly affected by its evolution.

New York City's 1961 Zoning Resolution was adopted at the earliest stages of a transition in societal awareness of environmental issues. After decades of indifference toward air and water pollution resulting in widespread environmental degradation, public policy—both nationally and within the City—was moving toward the view that public health and the quality of the environment should be protected by appropriate checks on industrial activities.

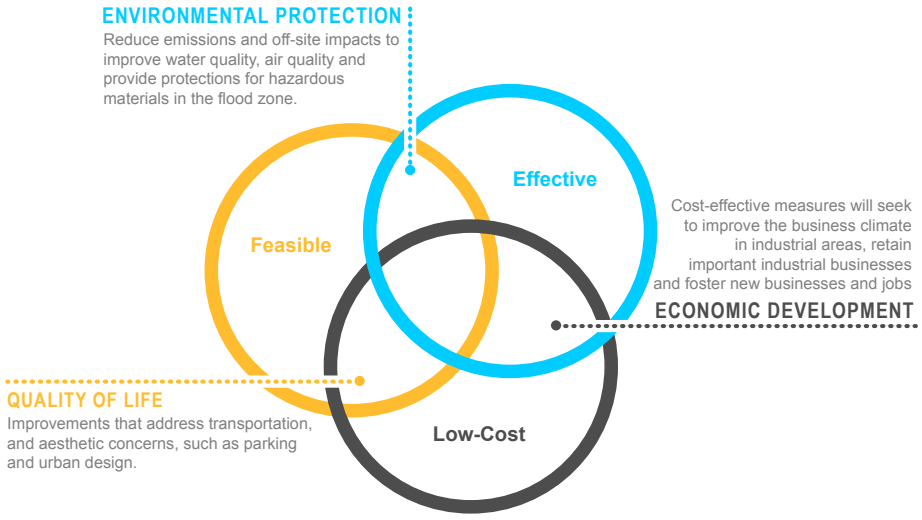
The 1961 Zoning Resolution, using the best environmental knowledge available at that time from studies conducted in the mid-1950s, enacted "performance standards" that sought the gradual upgrading of industry, particularly in proximity to residential areas. A central feature of the approach was to classify land uses by their propensity to produce objectionable influences and hazards such as emissions, smoke, noise, dust and vibration. Industrial uses for which such emissions could not be controlled

THE GOALS OF THE OPEN INDUSTRIAL USES STUDY INCLUDE:

(a) Improving the environment for business and job growth;

(b) Preventing pollution and adverse effects on nearby communities; and

(c) Promoting a level playing field for businesses that comply with environmental standards.



without great expenses, were to locate in M3 (heavy manufacturing) districts where they would not be a nuisance to residential or commercial land uses. Standards for noise, dust, smoke, odor and vibration were accordingly set at a relatively permissive level in M3 districts. It was recognized, for example, that an asphalt plant with dust and odor would not be considered a nuisance to an adjacent municipal incinerator or rock crushing plant, with emissions of their own, provided certain limits were met. Higher performance districts – M2 for medium level of industry, M1 for light manufacturing – each had progressively high standards for emissions of noise, dust, smoke and vibration. The gradualism of the zoning standards, and the tolerance of M3 districts as "low performance" districts, or areas that permitted uses involving objectionable influences and hazards, was rapidly overtaken by changing public attitudes toward pollution. In 1962, soon after the release of the 1961 Zoning Resolution, Rachel Carson published Silent Spring , a book that enhanced public awareness of environmental contamination, and which is often credited with spurring the rise of the modern environmental movement (1). Likewise, building on these initial efforts, an array of local, state and federal environmental laws and regulations adopted in the 1970s, such as the Clean Air Act, the Clean Water Act, the National Environmental Policy Act, the New York State Environmental Conservation Law and Title 24 of the New York City Administrative Code (Environmental Protection and Utilities), have greatly improved environmental conditions in the nation, state and city since 1961. However, New York City zoning has not kept pace.

Unenclosed industrial uses are prevalent throughout industrial areas in all boroughs except Manhattan, and tend to concentrate along the city's waterways. In 2011, the Department of City Planning (DCP) conducted field surveys in six industrial areas as case studies: Eastchester and Hunts Point in the Bronx, Jamaica in Queens, both the Brooklyn and Queens areas along Newtown Creek, East New York and Flatlands/ Fairfield in Brooklyn, and the North Shore of Staten Island. The information gathered includes the number of such uses in each study area, their size, and a description of issues associated with each type of use. In 2013, in cooperation with partner City agencies and in coordination with State agencies and industry, community and environmental stakeholders, DCP has advanced the Open Industrial Uses Study to meet key objectives and to identify actionable recommendations: (a) Improving the environment for business and job growth; (b) Preventing pollution and adverse effects on nearby communities; and (c) Promoting a level playing field for businesses that comply with environmental standards. The study included outreach to industrial businesses, community organizations and environmental advocates, as well as analysis of industry best practices for facility design, a review of regulations affecting similar uses in other cities and an evaluation of the current local, state and federal regulatory environment.

A broad range of unenclosed industrial uses, classified as "low performing" in the 1961 zoning, are permitted within the city's manufacturing districts by zoning and other applicable administrative regulations, including auto dismantling, transfer and sorting of source separated mixed recyclables (containing metal, glass, paper, cardboard and plastic), processing and transfer of construction and demolition debris, asphalt and cement manufacturing, scrap metal processing, and general storage of granular or particulate materials, petroleum or petroleum products, and heavy metals or toxic materials (2). Nationally, these industrial business types gravitate to populated urban areas such as New York City, where they are integral to construction and waste management industries, while also facilitating recycling and resource conservation practices. However, open industrial uses that do not provide adequate environmental

controls can create negative influences on neighboring businesses and residents, and pollute the city's soil, air and waterways. Despite greater awareness of the health and safety risks posed by poorly designed and operated OIUs, as well as changes in technology, the establishment of best management practices for industrial operations and stricter federal air and water quality standards, zoning standards regarding the performance of open industrial uses have not changed since 1961. Furthermore, while a variety of other laws and regulations provide important protections, regulatory gaps and enforcement challenges exist, and some facilities do not comply with contemporary environmental standards.

Hurricane Sandy, which struck New York City on October 29, 2012, highlighted an additional range of issues. Many OIUs are located in the city's flood zones. Unless properly secured, openly stored materials can become waterborne in a storm surge or flood, resulting in the potential for public health hazards, navigational hazards and pollution of the city's waterways.

Rather than requiring full enclosure or prohibition of these uses, as is common in many other cities, the study recognizes that these operations are most practically sited outdoors, and proposes targeted improvements to the industrial landscape that include a menu of structural landscape typologies that represent best practices for the design of outdoor industrial facilities. Based on analysis by engineering consultants HDR and Parsons Brinkerhoff, the study provides several recommendations to improve environmental performance of open industrial uses and enhance conditions in industrial areas. Implementation of the recommendations outlined in this report will require public review and legislative actions, including environmental review, as well as a zoning text amendment subject to approval by the City Planning Commission and the City Council and local law changes subject to City Council approval. Prior to referral of a text amendment and as part of a mandated public review process, the Department of City Planning will conduct extensive outreach to multiple stakeholders for comment on the proposed changes. The affected stakeholders represent a diverse group of individuals and organizations, including industrial businesses; elected officials; property owners; local residents; civic associations; advocates for the environment and environmental justice; local development corporations and nonprofit organizations; workers; labor unions; and officials from state and local government agencies. All comments received during outreach to stakeholders will be carefully considered prior to initiation of the public review process. The specific recommendations are summarized below.

Recommendation 1: ***Adopt new zoning definitions for OIUs that are consistent with other City and State regulations and also acknowledge the characteristics of activities occurring on these sites.***

Many New York City and State regulations contain contemporary terminology for open industrial uses. However, New York City zoning currently classifies most open industrial uses (OIUs) - unenclosed scrap metal processing, vehicle dismantling, construction and demolition debris transfer and waste recycling – as "junkyards". Other U.S. cities have adopted or proposed new zoning regulations that, while seeking to limit or control the operations of open uses, also acknowledge that these uses are more than junkyards, and in fact represent a number of industries of growing importance as urban populations grow and public policies seek to promote, and even require, recycling. Defining these terms will enable the zoning resolution to clarify the businesses subject to the zoning provisions, be consistent with other regulations and

more accurately reflect contemporary business practices.

Recommendation 2: ***Require existing and new OIUs to comply with new physical design standards for effective onsite pollution prevention controls.***

The proposed regulatory changes include a zoning text amendment that will require existing and new OIUs to comply with new physical design standards for effective onsite pollution prevention controls. These explicit, prescriptive controls will establish transparent and uniform site design standards in lieu of the existing zoning performance standards, which have been superseded by other, more stringent codes and have proven to be an ineffective means of regulating environmental conditions in industrial areas. An estimated 6,700 employees in a variety of occupations work for industries located on 632 OIU sites identified in New York City. It should be noted, however, that not all of these businesses would be subject to the new requirements. An unknown number of businesses may already comply with the proposed standards. If compliance can be demonstrated on plans certified by an engineer, these firms would not be required to make additional improvements. While some existing firms may already comply with some or all of the site design standards, others, including approximately 30 construction and demolition debris facilities (estimated 250 employees) that comply with sanitation department requirements and an estimated 300 sites (approximately 2,300 employees) with outdoor storage of nonhazardous or non-granular materials, are exempt for the site design requirements. The specific recommended design standards include:

- Paving and grading of activity and storage areas with an impervious surface, sloped to direct runoff into a drainage system to capture stormwater. Activity areas are any portion of the site used for manufacturing, processing, loading, unloading, queuing and washing. Storage areas are any portion of a site used for temporary or long-term storage of materials, but do not include parking;
- Installation of a drainage system for the paved area, including appropriate treatment, filtration and detention systems configured and designed to treat captured contaminated water before it is released into sewer systems or waterways;
- Installation of a containment wall or perimeter fence around any storage or activity area that holds materials that can be dispersed by air or water;
- A limitation on the height of material piles such that no pile shall be higher than the height of the fence or wall, unless the pile is covered except when active operations are underway;
- Covering of all open materials piles except when active operations are underway, where feasible, to control dust, erosion, and stormwater, as required by proposed amendments to the New York City Air Pollution Control Code.

Recommendation 3: ***Require new OIUs to provide off-street loading berths and, where adjacent to residence districts, perimeter landscaping.***

The truck traffic, on-street vehicle queuing and the appearance associated with many OIUs can negatively affect conditions for residents and workers in and near industrial areas. Requirements for onsite queuing space or loading berths and perimeter landscaping for new OIUs can address these quality of life concerns by improving the compatibility between potentially conflicting uses and enhancing neighborhood character.

Recommendation 4: ***Amend other City codes to clarify existing environmental requirements, complement proposed zoning amendments and provide for enhanced enforcement.***

Multiple city, state and federal agencies regulate the operation of industries engaging in OIUs. The study team identified specific changes to other City codes as the appropriate vehicle to address specific environmental issues associated with OIUs. These changes would:

- Amend the NYC Building Code to (1) allow higher fences to provide for better containment and screening of larger material piles; (2) require OIUs to post signs to support better identification of sites for improved enforcement of applicable regulations; and (3) specify flood hazard mitigation standards for open industrial sites and for hazardous materials stored in the flood zone;
- Amend Department of Sanitation transfer station rules for non-putrescible waste transfer stations to be consistent with proposed amendments to zoning performance standards;
- Amend the New York City Air Pollution Control Code to revise requirements that apply to unenclosed storage piles and to require, and better enforce, dust-suppression at open industrial facilities (amendment is to be completed in the near future).

Only an estimated 30 percent of the city's estimated 630 OIUs located within FEMA's 100-year floodplain would be subject to the building code amendments requiring flood hazard mitigation standards.

Recommendation 5: ***Establish financial and technical assistance programs to assist businesses in complying with the proposed regulations.***

In order to encourage environmental upgrades of OIUs and offset the costs associated with the new regulations, the Industrial Development Agency (IDA) recently approved the Open Industrial Uses Sales Tax Exemption Program to provide sales tax exemptions for each company on purchases of building, construction and renovation materials, and installation and associated services for the purpose of assisting such businesses with the renovation and improvement to their properties. The estimated costs to businesses of implementing the proposed regulations will be analyzed prior to referral of a text amendment by an engineer as part of the environmental review

Image courtesy of Mitch Waxman

A scrap metal processing facility located on the Bronx River in Hunts Point

process. The study team also recommends that a targeted outreach program be developed to educate the affected businesses about the changes to the regulations, and to assist with permit coordination and compliance. The outreach program will also collect important information from businesses about their understanding of existing regulations and existing challenges with compliance.

Recommendation 6: ***Analyze additional options for monitoring compliance, voluntary environmental controls and increased resiliency of industrial areas within flood zones.***

This study identified several additional potential recommendations or issues that, while outside the scope of this work, are worth additional consideration for their potential for additional environmental protection and improved flood resiliency in industrial areas. These recommendations include the following:

- Create a registry of OIUs in New York City to aid in monitoring and enforcement of the proposed regulations;
- Monitor air and water quality (e.g. fine particulate material and total suspended solids, respectively) in the neighborhoods where OIUs concentrate to evaluate the effectiveness of the proposed requirements;
- Create incentive programs that can encourage voluntary adoption of additional pollution prevention controls for OIUs and similar businesses;
- Evaluate implications of climate change and sea level rise for industrial uses in flood zones, the storage of hazardous materials, and the resilient construction and adaptation of buildings within industrial areas.

The Open Industrial Uses Study offers an innovative approach to environmental protection in New York City's manufacturing zones by laying out a pathway to increase the economic and environmental resiliency of this industrial sector. This report synthesizes research, analysis, public objectives and public feedback developed through the Open Industrial Uses Study during 2012 and 2013.The study recommends regulatory amendments that can strengthen New York City's manufacturing districts with stronger agency coordination and a more efficient and effective permitting regime, that takes into account current environmental best practices. The approach proposed by this study combines best practices for onsite pollution controls with incentives for funding, code coordination and implementation to establish a higher environmental and quality of life standard for all manufacturing districts while allowing businesses to continue to operate successfully.

STUDY OBJECTIVES

The Open Industrial Uses Study aims to better regulate environmental impacts that threaten water and air quality, add to flood hazard risks and restrain economic activity in New York City's manufacturing districts. The potential risks posed from open industrial uses may take place on a daily basis due in large part to the improper storage of raw materials, waste products, chemicals and hazardous materials. The pollution risks are heightened in waterfront areas where storm events expose unsecured materials to wind, rainfall, inundation by flooding and, in some areas, wave action. This study has explored existing zoning and other regulatory policies that affect open industrial uses in order to establish new design standards, as well as the fiscal and administrative tools needed to implement them.

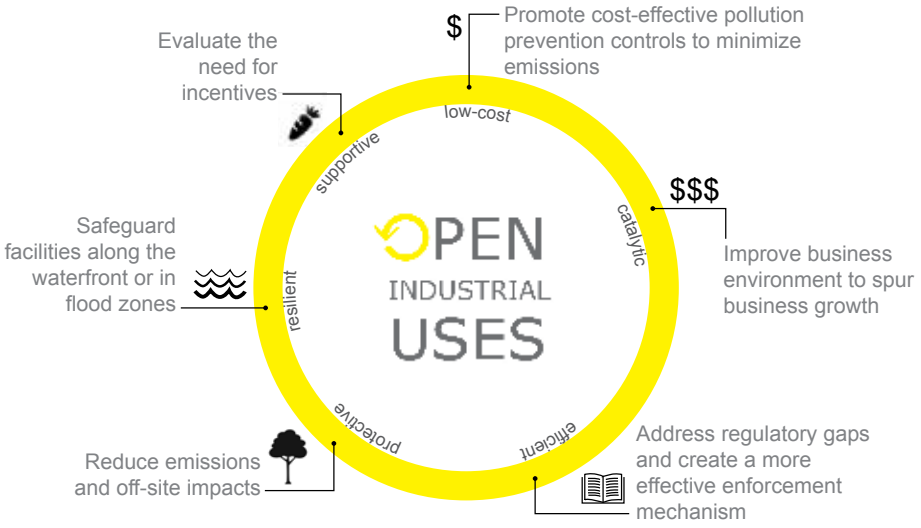
Specifically, the study assesses cost-effective pollution prevention controls and stronger safeguards for open uses and storage of hazardous and non-hazardous materials at industrial facilities. Implementing cost-effective pollution prevention controls at these facilities will improve the business climate in industrial areas, retaining important industrial businesses and fostering the creation of new businesses and jobs in areas near open industrial uses. The study offers recommendations for zoning text amendments and other legislation, as well as incentives that may assist in the implementation of such controls. This would reinforce other City efforts to improve the business climate, environment and protect communities and natural resources.

There are six primary objectives of this study:

1. Investigate cost-effective pollution prevention controls that can to reduce air, land, water and noise pollution.
2. Improve the business environment and generate new investment in nearby industrial areas.
3. Increase transparency and predictability of land use controls and environmental standards for business owners, while improving the ease of enforcement for regulators.
4. Reduce emissions and off-site impacts caused by unenclosed industrial uses.
5. Safeguard facilities along the waterfront and increase flood resilience by better regulating storage of chemicals and other industrial materials in coastal areas.
6. Evaluate the need for incentives and technical assistance to businesses which would be required to make facility upgrades.

SIX PRIMARY OBJECTIVES OF THE OPEN INDUSTRIAL USES STUDY

The Open Industrial Uses Study (OIUS) is designed to support and grow the City's working waterfront and industrial businesses, while making industrial areas greener, stronger, safer and more resilient to climate change.



PLANNING CONTEXT AND RECENT INITIATIVES

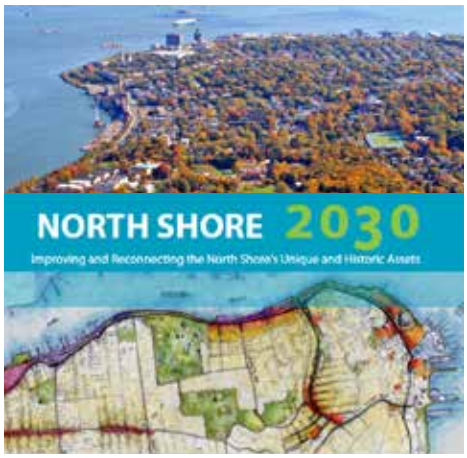
New York City is the most populous city in the United States. According to the July 2012 U.S. Census Bureau latest-available population estimate, over 8.3 million people live within its boroughs. By 2040, the population is projected to reach 9 million (3). Growing population, aging infrastructure, a changing climate and shifting economies have led to the development of plans to address the physical, social and economic future of New York City. Recognizing that the City is built largely on islands with an estimated 520 miles of shoreline, the City has specifically conducted a series of planning initiatives aimed to strengthen environmental protection and climate resilience in waterfront and coastal neighborhoods.

These initiatives have also addressed the need to accommodate jobs and housing for a growing population and diversifying economy, and have included in-depth studies and targeted rezoning of the City's manufacturing districts, many of which have seen steep declines in industrial jobs since they were established in 1961. For over two decades the City has been also been engaged in the restoration and revitalization of its coastal areas, which include some of the City's most active industrial areas.

The impetus for the Open Industrial Uses Study came from specific input received during outreach for Vision 2020: New York City's Comprehensive Waterfront Plan, North Shore 2030, and outreach to industrial businesses and surveys of industrial areas where OIUs are known to cluster. Representatives of companies located in manufacturing districts cited impacts that certain open uses have on their operations and the business environment. Advocates involved in outreach for Vision 2020: Comprehensive Waterfront Plan also expressed concern that these types of operations create health and safety hazards for communities in or adjacent to industrial areas, and present particular risks in the event of flooding from storm surges. Flooding from Hurricane Sandy and Tropical Storm Irene has underscored the importance of these issues and the vulnerability of open industrial facilities in floodplains along the waterfront.

A final important issue in the planning context for this study is the obsolescence of zoning performance standards that affect where unenclosed industrial uses can locate, determine whether enclosure requirements apply and establish the environmental standards to which they are expected to adhere. The zoning resolution establishes minimum requirements or maximum allowable limits for industrial uses on noise, vibration, smoke, odor or other effects of industrial uses. However, these standards have not been updated since they were first established in 1961 and thus warrant review in light of current science and state and federal environmental standards and regulations.

PlaNYC, Vision 2020: New York City Comprehensive Waterfront Plan, and *North Shore 2030* are preceding plans and initiatives that identified a need to analyze pollution concerns with open industrial facilities.



The Open Industrial Uses Study seeks to find alternatives to current performance-based zoning to regulate where unenclosed industrial uses can locate and the standards to which they must be designed.

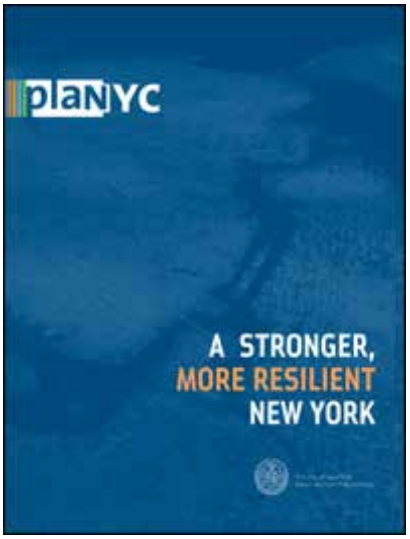
Zoning performance standards, although innovative when enacted in 1961, rapidly proved to be inadequate alone to meet the public's rapidly evolving expectations of clean air, clean water and minimized public health risks. The standards were prospective, "grandfathering" existing polluting uses and viewed M3 districts as sanctuaries for "low-performing" industrial uses. Moreover, performance standards did not address water pollution.

In most cases, the performance standards in zoning have been superseded by more stringent and effective regulations that resulted from the environmental movement of the 1960s and 1970s and lawmakers responding with statutes and regulations. In addition to the outdated and overly lax nature of the current zoning performance standards, the method by which they are enforced –monitoring during operation only in response to complaints – does not fit the usual zoning enforcement scenario, for which compliance is determined at the time that plans are filed for new or altered buildings and open uses. Regulations that relate to the ongoing operation of a business, rather than to construction, are better suited to laws and codes that apply to all businesses on a continuing basis, whether or not they are engaged in construction activities.

The Open Industrial Uses Study seeks to find alternatives to current performance-based zoning to regulate where unenclosed industrial uses can locate and the standards to which they must be designed. Utilizing site design standards informed by environmental best practices is a better way to utilize zoning to ensure better environmental performance of open industrial uses and compatibility with neighboring land uses in New York City's dense urban environment.

Performance standards apply to all enclosed and unenclosed industrial uses and some heavy commercial uses. This highlights the need for a comprehensive overhaul of performance standards in zoning. However, such a study is beyond the scope of this analysis; performance standards are addressed here to the extent that they apply to the specific uses that are the subject the Open Industrial Uses Study. It should be noted that the unenclosed industrial uses that are the subject of this study are among the lowest performing uses by virtue of lack of full enclosure and the nature of their operations. Therefore, addressing the shortcomings of the performance standards as they pertain to these uses will go a long way to resolving some of the overall shortcomings of these standards.

The Mayor's Special Initiative for Rebuilding and Resiliency report published in 2013 provides a plan for *A Stronger, More Resilient New York*



PlaNYC

Released in 2007 and then updated in 2011, PlaNYC was an effort to prepare the City for one million more residents, strengthen the economy, combat climate change, and enhance the quality of life for all New Yorkers. The plan covers a broad range of issues, including issues related to environmental protection, natural systems and waterfront planning, and the remediation of brownfields. Many open industrial facilities are located in areas that are the subject of brownfield planning efforts by the City or community-based organizations. (4)

North Shore 2030 Vision Plan

The result of a two-year public and interagency planning process, this report details long-term recommendations necessary to meet the North Shore 2030 Vision Plan that will guide public and private investment and land use decisions over the next 20 years for the North Shore of Staten Island. Throughout the outreach process, community residents reinforced the need to raise environmental standards for existing and expanding industrial land uses along the North Shore.

U.S. EPA Definitions

Brownfields

"Real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. Cleaning up and reinvesting in these properties protects the environment, reduces blight, and takes development pressures off greenspaces and working lands." (4)

Green/Gray Infrastructure

"Gray infrastructure refers to traditional practices for stormwater management and wastewater treatment, such as pipes and sewers. Green infrastructure refers to sustainable pollution reducing practices that also provide other ecosystem services." (5)

Vision 2020: New York City Comprehensive Waterfront Plan

Released in 2011, Vision 2020, led by the Department of City Planning, is a 10-year vision plan for the future of the waterfront developed over a year-long, participatory planning process involving multiple agencies and organizations and input from New Yorkers in every borough. The plan's Goal 3, Support Economic Development Activity on the Working Waterfront, notes the importance of protecting harbor water from contamination and controlling air emissions in industrial waterfront areas, while strengthening the city's maritime operations. Goal 4 is to improve water quality through the use of both grey and green infrastructure (5). Goal 8, identify and pursue strategies to increase the city's resilience to climate change and sea level rise, outlines the risks associated with flooding and storm surge along the working waterfront, where hazardous materials are sometimes stored.

Department of City Planning Industrial Survey 2011

In 2011 and 2012 DCP conducted surveys of manufacturing zones throughout the city. This industrial survey identified the types of unenclosed industrial uses that are prevalent in New York City and established the six primary focus uses that are the subject of the Open Industrial Uses Study. The survey documents physical characteristics of such sites throughout the city, accounting for the primary clusters and predominant neighborhoods where they are located.

Special Initiative for Rebuilding and Resiliency (SIRR)

In June 2013, the City released A Stronger, More Resilient New York, a proposed comprehensive planning document that includes recommendations both for rebuilding the communities impacted by Hurricane Sandy and increasing the resilience of infrastructure and buildings citywide against future storm events. The Open Industrial Uses Study is included as "Initiative 1" in the Environmental Protection and Remediation chapter. The initiative addresses the safe storage of materials in the flood zone and supports OIUS's objectives to provide for cost-effective measures that can help to make the City's industrial areas stronger, safer and more resilient to climate change and associated flooding and other storm risks.

HURRICANES AND STORMS

After Hurricaine Sandy, storm surge damage was visable along the industrial waterfront in Red Hook, Brooklyn.

Hurricanes Irene and Sandy have underscored the vulnerability of New York City's waterfront neighborhoods to extreme weather. A significant number of open industrial facilities are located in the 100-year floodplain.

PUBLIC OUTREACH AND INTERAGENCY COLLABORATION

Led by the Department of City Planning, OIUS is a two-year study and planning process involving multiple agencies, organizations and businesses. Twelve city agencies collaborated on the study, including the New York City Departments of City Planning (DCP), Buildings (DOB), Environmental Protection (DEP), Sanitation (DSNY), Consumer Affairs (DCA), Fire (FDNY), and Small Business Services (SBS); the Office of Emergency Management (OEM); the Business Integrity Commission (BIC) and the Mayor's Offices of Long Term Planning and Sustainability (OLTPS) and Environmental Remediation (OER); as well as the New York City Economic Development Corporation (EDC). The interagency working team also consulted with State agencies, including the New York Department of State (NYS DOS), New York State Department of Environmental Conservation (NYS DEC) and New York State Department of Motor Vehicles (NYS DMV).

In January 2013, the City convened an external advisory committee consisting of representatives from key stakeholder groups such as industrial companies, environmental advocates and community organizations with local perspectives and expertise in industrial, environmental, waterfront, community and business issues (http://www.nyc.gov/html/dcp/html/oius/oius4.shtml). The committee played a key role in informing the study through periodic committee meetings and individual sessions with the project team.

ORGANIZATION OF THE STUDY

The primary research question for this study is how to improve the regulatory framework pertaining to open industrial uses to enhance the environmental performance of facilities located in New York City. The study concentrates on design strategies that help prevent or mitigate pollution at open industrial facilities and boost the protection of hazardous materials stored outdoors in the flood zone.

OPEN INDUSTRIAL USES STUDY PROCESS

2012

	LATE 2012	JAN 2013	FEB 2013	MAR 2013
Milestones	Convened interagency committee.	Kick off engineering study.	Draft matrix of pollution prevention controls completed.	Final matrix of controls and assessment completed. Begin prototypical site visits.
Outreach Activities	Generated draft stakeholder lists, initial outreach to industry and stakeholder contacts	Preliminary stakeholder meetings, for environmental, community and industrial groups	Selection of external advisory committee members	First external advisory committee meeting

EXTERNAL ADVISORY COMMITTEE

The following organizations are represented on the committee:

Eddie Bautista, Executive Director **New York City Environmental Justice Alliance**
David Biederman, Esq., General Counsel **National Solid Waste Management Association (NSWMA)**
Jamila Diaz, Director of Industrial Business Services **South Bronx Overall Economic Development Corporation (SOBRO)**
Laura Hennen, East Region SHEC Director **Sims Metal Management**
Laura Imperiale, Director of Government Affairs **Tully Construction Co. Inc.**
Robert LoPinto, Principal **Shapiro Engineering, P.C.**
Phillip Musegaas, Hudson River Program Director **Riverkeeper**
Andrea Schaffer, Principal **City Matters, Inc.**
Kellie Terry-Sepulveda, Executive Director **The Point Community Development Corporation**
Beryl Thurman, Executive Director **North Shore Waterfront Conservancy**
Anusha Venkataraman, Green Light District Director **El Puente, Leaders for Peace & Justice**
Richard Werber, Director **Greater Jamaica Development Corporation**
Elizabeth Yeampierre, Esq., Executive Director **United Puerto Rican Organization of Sunset Park (UPROSE)**

Chapter 1 focuses on the types of uses under investigation in the study, their legacy in New York City's waterfront neighborhoods and the historic undercurrents that have shaped today's industrial landscapes. Chapter 2 summarizes survey work done by the Department of City Planning to comprehensively identify and locate the many open industrial uses in the city. OIUs tend to cluster in existing manufacturing districts, such as along Newtown Creek, Hunts Point, Eastchester, East New York, Jamaica and the North Shore of Staten Island.

Chapters 3 through 6 describe the study's analysis of the four most critical subjects of environmental concern: stormwater management, air quality, site planning and flood hazard mitigation. Within each chapter, the environmental concerns are presented along with a summary of the existing regulations that are relevant. These chapters also present the analysis of the consultant and study team and recommended regulatory amendments that would improve compliance with and enforcement of national, state and local standards.

The final chapter, Chapter 7, summarizes the proposed suite of regulatory amendments and outlines suggested incentive and technical assistance programs to help implement the recommendations of this study.

Multiple New York City and state agencies, local organizations and members of the public consulted on the study in 2013.

METHODOLOGY FOR ANALYSIS OF CONTROLS

Engineering Study
Four primary tasks, described below, were completed during the engineering study by consultant team HDR and Parsons Brinkerhoff.

1 Matrix of Controls
Identification of potential pollution prevention typologies and controls including preliminary assessment of costs and effectiveness.

2 Prototypical Sites
Evaluation of real world examples where the controls are applied and assessed for cost and other constraints. Represents citywide and upland and waterfront sites.

3 Financial Feasibility
Assessment of a businesses capacity to absorb the cost of potential new controls on site.

4 Evaluation of Incentives
Identification of existing incentive programs and the potential for new incentive programs to provide assistance to businesses.

To identify practical and cost-effective measures for the control of air and water pollution, noise and risks from hazardous materials from unenclosed industrial uses in the city, Henningson, Durham & Richardson Architecture and Engineering, P.C. and Parsons Brinckerhoff (the consultant team) conducted an engineering analysis of recommended controls. Priority controls were identified through a comprehensive assessment of "Best Management Practices" recognized by federal and state agencies and industrial associations across the nation. This list of controls was then evaluated based on the cost of incorporating these controls on prototypical open industrial sites throughout the city. An assessment was also conducted of the need for and type of financial incentives to foster implementation of the recommended controls at existing or new unenclosed industrial use sites.

The consultant team first developed a list of physical and operational Best Management Practices that could be potentially applied to avoid, minimize and mitigate air emissions, noise, hazardous materials releases and water quality pollution from open industrial sites. Control options were identified through a range of regulations and best management practices for industrial operations, including information provided in documents developed in support of draft citywide Municipal Separate Storm Sewer System permits, Local Law 113 (New York City Noise Code), New York City Air Code and New York State Air Quality regulations, New York State Environmental Conservation Law, the Clean Water Act, Federal and City Community Right-to-Know hazardous materials requirements, review of additional pollution control documents available from USEPA, NYSDEC, other state agencies and industry associations. (6)

The consultant team provided for each identified control option:

1. An estimate of its effectiveness to control air emissions, noise, hazardous material releases, and stormwater pollutant discharges from each prototypical land use;
2. An assessment, based on review of regulatory guidance, of whether it represents best management practice or best available control option for the pollutants of concern;
3. An assessment of whether it has been successfully applied to similar land uses and facilities located on the identified prototypical sites; and
4. An order-of-magnitude estimate of the capital and long-term maintenance and operation costs on a unit cost basis.

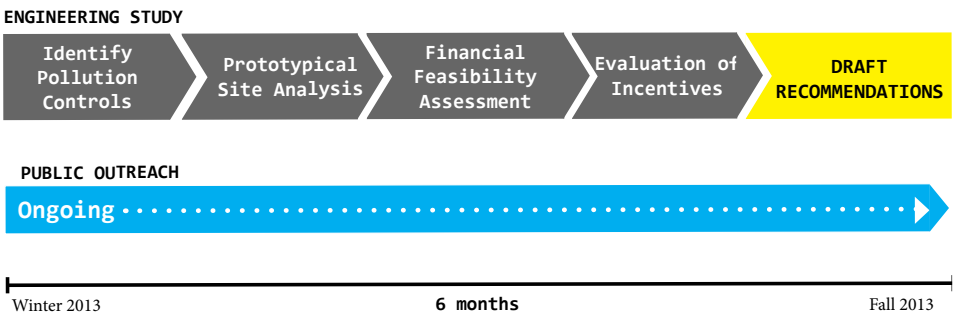
The controls were then applied to six prototypical sites representing each different open industrial use type being studied, varying conditions in different boroughs and location in the 100-year floodplain. The consultant team prepared baseline descriptions for each site based on site observations, review of available air quality, water quality and hazardous materials permits for the facility, and land use and zoning information available from DCP and other city and state agencies. The consultant team then identified and described the physical improvements required to implement the pollution prevention controls recommended to achieve consistency with best management practices. In completing this assessment, they prepared an assessment of the relative cost burden of implementing pollution controls at the prototypical sites. They then applied a business case model analysis to each of the prototype uses. The model provided a framework for decision-making for the affected businesses on adopting recommended pollution control measures at existing locations. The analysis identified potential costs, benefits and risks for the prototypical sites in implementing pollution controls at their current location.

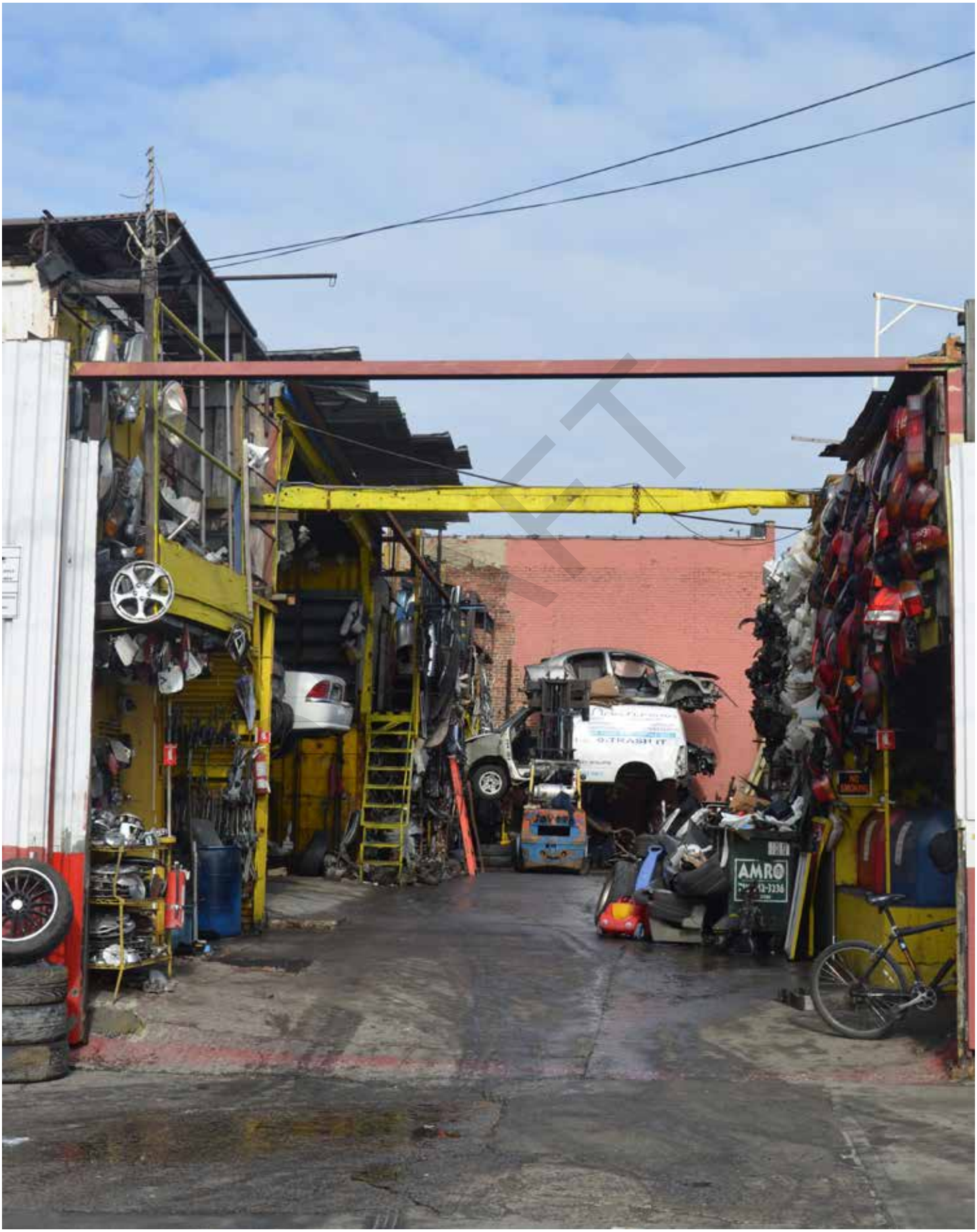
It considers:
a) Capital and operating and maintenance (O&M) costs of pollution control measures and facility relocation costs, including any temporary business disruptions;
b) Changes in operational and transportation costs;
c) Annual revenue for each industry.

Data on annual revenue for each industry was based on the North American Industry Classification System (NAICS) median data values on industry-wide median annual revenue, estimated present value of long-term revenue, median number of employees and approximate annual revenue per employees. Capital costs for pollution prevention controls identified in the prototypical site analysis varied depending on the use type and site size, and included both existing controls (observed at the prototypical site) as well as proposed controls. O&M costs were developed using a 25-year design life assumption. Using the estimated median annual revenue, cost burden budgets based on percentages of long-term annual revenue were estimated for 1 percent, 3 percent and 5 percent of revenue to understand the range of pollution controls that could be supported given a low, medium and high burden on the firm. Considering impacts on the firms, and assuming that the average firm makes between 10 to 15 percent of total revenue in profits, a 1 percent impact on revenues would reduce profits by 10 percent or be passed onto customers as higher prices. While profit margins vary by industry and by business, 10 to 15 percent is a common baseline used in the industrial sector for estimating profit. This method of evaluation is based on the EPA's method for estimating the cost of environmental regulations, and is common practice in the industry. Imposing any cost burden higher than 5 percent of annual revenue is potentially detrimental and considered the tipping point for a company to stay in business at this location or move elsewhere. Based on the analysis prepared by the consultant, this study recommends proposed controls that fall only into the 1 percent and 3 percent budgets.

To avoid an adverse financial burden to open industrial use businesses, and using the pollution control budgets as a guideline for costs, a targeted pollution control package was identified to allow the most cost-effective controls to be implemented without imposing an excessive burden on businesses.

Schedule outline of the engineering analysis of possible pollution prevention controls.





Chapter 1: CONTEXT

WHAT ARE OPEN INDUSTRIAL USES?

Concrete and asphalt manufacturing and recycling

Scrap metal processing

Auto dismantling and wrecking

Construction and demolition debris transfer station

Waste recycling

Unenclosed storage of materials, including granular or particulate materials, petroleum, heavy metals or toxic products

Left: View from the street of an auto dismantler on a small, compact site in Hunts Point, Bronx.

Open industrial uses are, in this study, manufacturing, distribution and waste-processing businesses that, due to the land-intensive nature of their operations, locate on largely unenclosed sites and pose certain environmental hazards and quality of life impacts such as noise, odor, dust and debris on surrounding businesses and residents. These uses tend to be either dependent on, or a consequence of population concentrations in urban areas, and are also typically characterized by operations that are impractical, unnecessary or very costly to enclose due to the size of the required equipment or nature of the operation.

For instance, open industrial sites provide locations for the full life cycle of materials used in the vast and multi-billion dollar construction industry in New York, from lumber yards, ready-mix concrete operations and sellers of aggregate, to recyclers of scrap metal and processors of construction and demolition debris. The used auto parts industry also generates significant demand for large, unenclosed sites where discarded motor vehicles can be dismantled. Approximately two million motor vehicles were registered to New York City addresses in 2012, a figure that includes almost 1.8 million personal vehicles, 69,000 commercial vehicles, 48,000 taxis, 40,000 motorcycles and over 1,700 ambulances. (7) All of these vehicles generate huge demand for repair and disposal when they reach the end of their useful life. Open industrial sites provide the locations for used auto parts sales, auto crushing, auto dismantling and dead storage of motor vehicles. Finally, the transfer and/or processing of other solid waste, such as metal, glass, plastic and paper recycling, is accommodated within the city's industrial areas, often on unenclosed sites. Although these industries serve important roles in managing the city's waste and generating economic activity, they also tend to involve operations that, if not properly regulated, can be noisy and environmentally harmful through discharges of stormwater pollutants and air emissions.

In a 2011 survey of the city's industrial areas known to have numerous unenclosed industrial uses, planners with the Department of City Planning identified six categories of industrial uses that tend to locate on unenclosed sites, exist in large concentrations in the city's manufacturing districts and, due to the nature of their operations, may have the potential for certain environmental impacts. These categories include: concrete and asphalt manufacturing; auto dismantling and wrecking; scrap metal processing; construction and demolition debris transfer; waste recycling; and unenclosed storage of granular or particulate materials, petroleum or petroleum products, or heavy metals or toxic products. The Open Industrial Uses Study is focused on these six categories of uses.

SIX FOCUS INDUSTRIES

CONCRETE AND ASPHALT MANUFACTURING

Manufacturing establishments involved in the processing and production of cement, asphalt and their products, such as concrete. The most common of such establishments in NYC prepare ready-mix concrete and hot mix asphalt for direct delivery to job sites.

AUTO DISMANTLING AND WRECKING

An automobile dismantler is an entity involved in processing motor vehicles or trailers by dismantling or processing their associated component parts after dismantling. An automobile junk yard is a facility that stores, takes apart and scavenges parts from motor vehicles for subsequent sale or reuse.

SCRAP METAL PROCESSING

A metal salvage facility separates for recycling or reuse various types of metals from other types of metals or from equipment, appliances and fixtures. A scrap metal processor is a facility that processes only scrap metal materials destined for recycling.

CONSTRUCTION AND DEMOLITION DEBRIS PROCESSING & TRANSFER

Construction and demolition (C&D) debris means uncontaminated solid waste resulting from the construction, remodeling, repair and demolition of utilities, structures and roads and uncontaminated solid waste resulting from land clearing.

WASTE RECYCLING

A solid waste facility where recyclables such as metal, glass, paper, cardboard and plastic are transferred to trucks, railcars or barges.

UNENCLOSED STORAGE

Open yards or facilities that store granular or particulate materials, petroleum or petroleum products, or heavy metals or toxic products outdoors. Typically these materials are found on lots managed by construction or contracting companies involved in the staging of materials, vehicles, and equipment.

INDUSTRIES

Although this study focuses on a discrete set of land uses with similar characteristics, open industrial uses represent numerous industries in the manufacturing, wholesale, commercial, and transportation sectors. The industries located on sites defined as open materials storage are particularly diverse. However, the sites surveyed by the Department of City Planning in 2011 were concentrated in a limited number of industries that, because of their operational characteristics, are most dependent on unenclosed sites and likely to have the type of environmental issues identified in the study.

These specific industries include ready-mix concrete manufacturing, asphalt paving manufacturing, used motor vehicle parts merchant wholesalers, recyclable material merchant wholesalers and contractors' yards within a few construction industries over-represented among sites containing unenclosed materials storage: specialty trade contractors, construction materials merchant wholesalers and other building material dealers.

These industries tend to exhibit similar trends, operational characteristics and competitive landscapes. They are all mature, highly competitive industries that typically serve local markets near dense urban populations where demand for products and services are high. For instance, ready-mix concrete and hot-mix asphalt cannot be transported long distances and must be produced near construction sites. Merchants of used motor vehicle parts rely on these populations as both the market for and source of their products. Construction companies depend on open storage yards in close proximity to job sites to store construction materials and equipment. Their key external drivers are the market for new construction, population growth and, for scrap metal processors in particular, global commodities prices.

Although labor, buildings and depreciation costs are low for open industrial uses, the high cost of new, specialized equipment and permitting requirements can result in high start-up costs. In addition, in a dense city like New York with very high land costs, there is limited availability of adequate, undeveloped land where new businesses can locate. These barriers to entry combined with reliance on local markets have resulted in limited consolidation within these industries and consequently, sites tend to be operated by smaller companies.

All of these industries suffered during the recession beginning in 2008, but have started to recover and are anticipated to grow with the continued recovery of the housing market and population growth. (8)

EMPLOYMENT

The average annual wage of an employee of an open industrial facility in New York City is $52,350.

Labor and Employment

An estimated 6,700 employees in a variety of occupations work for industries located on 632 OIU sites identified in New York CityField observation of the nature of the operations at OIUs sites indicates that the employment is likely concentrated in blue collar occupations such as the clerks who handle shipping and receiving of goods; auto mechanics and general maintenance and repair workers capable of dismantling vehicles and selling the parts; inspectors, testers, sorters, samplers, and weighers involved in the production and processing of ready-mix concrete, asphalt and scrap metal; numerous laborers and drivers involved in moving materials and transporting workers and products to and from contractors' yards, materials storage sites, construction and demolition debris transfer stations and recycling centers; as well as workers responsible for cleaning and repairing equipment and vehicles.

Given the labor-intensive nature of the activities occurring on OIU sites and the dependence of transporting and moving materials in the region, it is expected that laborers and freight, stock and materials movers, drivers of trucks and tractors and auto mechanics constitute a large majority of the employment in these industries.

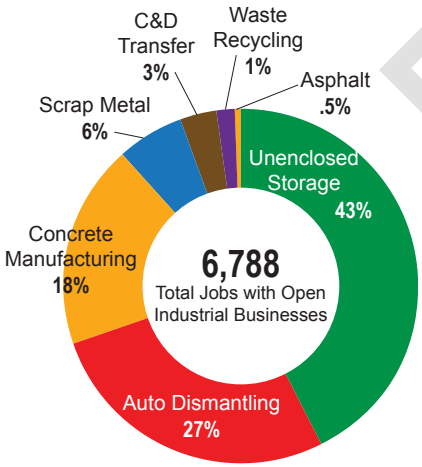
EMPLOYMENT AND WAGES ON OPEN INDUSTRIAL SITES IN NEW YORK CITY (2013)

OIU Category	Industry	Firms	Jobs	Wages
Asphalt Manufacturing	Asphalt Paving, Roofing & Saturated Materials Manufacturing	5	36	$82,021
Auto Dismantling	Motor Vehicle Parts Merchant Wholesalers Auto Parts Accessory Stores Recyclable Material Merchant Wholesalers	120	1,838	$40,993
Concrete & Cement Manufacturing	Ready-mix Concrete Manufacturing	53	1,266	$68,313
Scrap Metal Processing	Recyclable Material Merchant Wholesalers	40	404	$49,331
Waste Recycling Facilities	Recyclable Material Merchant Wholesalers	11	111	$49,331
Unenclosed Materials Storage	Other Building Material Dealers All Other Specialty Trade Contractors Brick, Stone & Related Construction Material Merchant Wholesalers	376	2,903	$52,383
Construction & Demolition Debris Processing & Transfer	Recyclable Material Merchant Wholesalers Solid Waste Collection	27	230	$56,972
		632	6,786	$52,350

Source: NYS Dept of Labor, 3Q, QCEW, 2011 (as compiled by DCP)

The table below shows the annual median wages for the New York City region for occupations believed to be well-represented at open industrial sites compared to wages for all occupations with a classification category. Wages range from a low of just over $27,000 for laborers and freight, stock and material movers, to over $80,000 for supervisors of mechanics, installers and repairers. A comparison of these wages to wages for all occupations within the occupational category indicates that some of the skilled jobs likely to be found on OIUS sites are high-paying for blue-collar jobs.

Percentage of jobs by use category



Source: Occupational Employment Statistics, NYC Region, NYSDOL, 2009-2012, 2013 dollars

WAGES FOR TYPICAL OCCUPATIONS ON OIU SITES COMPARED WITH WAGES FOR ALL OCCUPATIONS IN CATEGORY, NYC

Occupation	Median Annual Wages
All Office and Administrative Support Occupations	**$37,880**
Shipping, Receiving, and Traffic Clerks	$29,520
All Installation, Maintenance, and Repair Occupations	**$49,430**
First-Line Supervisors of Mechanics, Installers, and Repairers	$80,650
Automotive Service Technicians and Mechanics	$35,450
Maintenance and Repair Workers, General	$43,170
All Production Occupations	**$29,480**
Inspectors, Testers, Sorters, Samplers, and Weighers	$32,680
All Transportation and Material Moving Occupations	**$37,260**
Heavy and Tractor-Trailer Truck Drivers	$44,940
Industrial Truck and Tractor Operators	$38,290
Cleaners of Vehicles and Equipment	$49,950
Laborers and Freight, Stock, and Material Movers	$27,320
Refuse and Recyclable Material Collectors	$65,440

Throughout New York City's history, Newtown Creek has been the location of a range of industrial, manufacturing, and shipping activities. Photo courtesy of Mitch Waxman

HISTORY OF ENVIRONMENTAL REGULATION

Laissez –Faire Attitudes

The shores of Manhattan, Brooklyn, Queens, the Bronx, and Staten Island have long been home to the most noxious and polluting uses. Although today these uses are primarily located outside Manhattan, riparian banks, coastal edges and wetland zones citywide have been used as waste and heavy industrial sites throughout the history of New York City. While certain shore areas are now hardened industrial edges, historic maps of areas such as Newtown Creek, Hunts Point, North Shore and Gowanus, dating to the early 18th Century, depict wandering streams and undulating wetland banks used by Native Americans and early settlers for fishing. This began to change during the Industrial Revolution from 1760 to 1840 when machine-based transport and manufacturing processes using new energy sources enhanced the efficiency of goods movement and production. Such industrial activities located along New York City's waterfront to take advantage of shipping routes and connections to regional and global markets that provided raw materials of the rapidly modernizing urban environment, conveying metals, masonry and wood that would be used to build apartments, offices and warehouses for the largest city in North America.

With a rapidly growing population, by the late 19th Century, New York City had become one of the dirtiest and unhealthiest cities in the world, with death rates similar to those of medieval London . (9) Residents demanded solutions, and in 1881, New York City established the Department of Street Cleaning, which was reformed in 1886 and renamed the Department of Sanitation. Under this department, a uniformed army of workers began to haul away refuse. Yet, like most cities around the globe, refuse, raw and untreated sewage and other unwanted materials were dumped into wetlands, rivers and oceans. Wetlands were seen as waste areas in need of filling to create land and minimize the breeding of mosquitoes. Until the 1920s, New York City's waste was collected by horse-drawn carriage, transported to the waterfront where it was dumped into the floodplain as land fill or loaded onto a barge. The barges were then towed farther into New York Harbor where their contents were released into the water. Few regulations prohibited this activity or accounted for controlling such impacts to natural resources during this time, and it was not a federal law in 1896 prohibited dumping of refuse in New York Harbor. Other industrial and manufacturing processes also tended to directly discharge wastewater, refuse and industrial byproducts into wetlands and rivers. The legacy of these uses is evident today as the majority of open industrial facilities in the waste industries continue to be located along the waterfront.

In the late 1800s, the City also began to address the problem of water pollution with the construction of the first water treatment plants at Coney Island (1886), 26th Ward (1894) and Jamaica (1903). Treatment methods at the time, however, were rudimentary, removing only the largest solid materials from the water and treating only a small fraction of wastewater flows. Public concern with the condition of the waterways, which was causing the frequent closure of popular public beaches and oyster bed die offs, resulted in the creation of the New York Metropolitan Sewerage Commission in 1906 and the first Harbor Water Survey in 1909.

The most visible result of these disposal and landfill activities is the evolution of New York City's waterfront edge, which has changed significantly over time increasing the land area. As waste products were dumped into the floodplain edge, filling the land, such zones became higher in elevation and more suitable for active uses. This newly filled landscape along the city's edges created swampy and flood-prone conditions that were not considered inhabitable by residents. Given that the waterfront was vulnerable to flooding and adjacent to unpleasant activities, the land value was low

Image courtesy of The New York Public Library. www.nypl.org

Newtown Creek, viewing west from the Meeker Avenue bridge, and showing industrial plants along the Brooklyn (left) and Queens shores. Photo by Alexander Alland in 1939.

and manufacturing and industry thrived. These areas still remain the sites of the largest clusters of open industrial uses in the city. An 1896 map of Newtown Creek prepared by a sanitary engineer from the Brooklyn Department of Health reveals that the area included numerous heavy industrial uses, including several chemical plants, a gas works, at least two fertilizer companies, a manure barge outfit, fat rendering operations and a dead animal wharf . (10)

This system of waste management and the “laissez faire” attitude of the time could occur with fewer conflicts and less opposition when population density was low and residences were located far from noxious uses. Developers sometimes used restrictions to keep certain noxious uses out of new neighborhoods that were being created, but this was an exception. As the population continued to grow, communities began to experience significant impacts to quality of life and natural resources due to rising contamination in their urban environments. New York City’s Board of Estimate began to address the nascent concerns associated with industrialization and rapid population growth with the establishment in 1916 of the nation’s first zoning ordinance which, in addition to setting limitations on the height and bulk of new buildings and setting standards for yards, courts and other open spaces, also introduced the concept of limiting the locations where industry could operate. These restrictions, however, were limited and typically reflected the interests of wealthier landowners who did not want commercial uses of any kind to locate near their townhomes and estates. It was only in less widely mapped Residence Districts where commercial uses were explicitly prohibited, with the exception of a handful of permitted services deemed necessary for this population – clubs, churches, schools, philanthropic institutions, railroad stations and farms or gardens . (11) Elsewhere in the city, rules were much more liberal about which uses could locate near homes. Business districts allowed for residences as well

as many heavy industrial activities, such as asphalt manufacture, incineration, junk baling and petroleum refining and stone works among others. No use restrictions or regulations applied to Unrestricted Zones, whose boundaries largely reflect those of current manufacturing zones. In these zones, any use could be built anywhere despite the health and environmental risks posed by these uses to residents, which were either unknown or disregarded at the time. Indeed, the value of industrial uses was so great at the turn of the century that it was not uncommon for developers to raze residential buildings to develop factories. This private development, however, occurred lot by lot, resulting in a patchwork of new factories located next to townhomes, apartment buildings and other residences. At the same time, industrialists often developed new housing near or adjacent to their factories to house their workers. As a consequence of these laissez faire attitudes, much housing still exists in manufacturing zones today where current regulations prohibit new residential uses on the basis of potential impacts to public health and safety.

Industrial growth continued unabated in New York City into the 1920s fueled both by the accumulation of unprecedented wealth and the influx of domestic and foreign

Greenpoint Brooklyn in the late 19th century. Great Lakes Coal & Coak Co., steamer discharging 7000 tons of Texas Coke made from Cracking Oil.
(Photo by Wurts Brothers, date unknown)

Image courtesy of The New York Public Library.

Gowanus Canal, north of Hamiton Avenue bridge. At the right are cement mills with bargeloads of crushed limestone from quarries up the Hudson River.
(Photo by Ewing Galloway, about 1930)

Image courtesy of The New York Public Library.

immigrants in search of new opportunity in the City. In its centennial report on the history of the Harbor Water Survey, the New York City Department of Environmental Protection provided this historic depiction of the quality of New York City water: “In the 1920s as immigration peaked, the City’s population soared. Only a few rudimentary wastewater treatment plants were in operation, and many areas of the harbor were dead zones with less than 1 mg/L of dissolved oxygen, a concentration below the current New York State standards for fish survival. Bacteria concentrations in the Upper Bay were too numerous to count.” (12)

Certain relics of this industrial prosperity and rapid urbanization exist throughout the city’s industrial areas today where current heavy industry and many open industrial uses operate, continuing or as successors to prior industrial uses. For example, the asphalt and ready-mix concrete manufacturers that front the Flushing River waterfront today were the former locations of coal and coke storage silos in the 1930s. These were located directly across the river from a great coal ash dump near Willets Point, where there now exists a cluster of automotive repair shops and used parts dealers. Literary New Yorkers may recognize this area as the “valley of the ashes” depicted in F. Scott Fitzgerald’s The Great Gatsby - the sooty rail yard, dump and auto village where hard-working people toiled on the stopover between the rarified and moneyed East Egg and the opportunity of a roaring, limitless 1920s Manhattan. (13) Although the Willets Point area is slated for remediation and mixed-use residential and commercial redevelopment under a sweeping, city-initiated proposal and the City has long since stopped dumping coal ash on the site, many of the auto uses remain on unenclosed sites in an area with no sewer infrastructure. The City is assisting businesses in the effort to find suitable sites for relocation so that the remediation and redevelopment can proceed. Fresh Kills Landfill or other landfills were part of land reclamation using solid waste disposal for park creation.

Many of today’s issues with open industrial uses and pollution in the City’s industrial areas can be traced back to this time of laissez faire attitudes about how to dispose of the detritus of industrialization and population growth – junk cars, garbage, construction and demolition debris, coal ash, scrap metal, and industrial waste products. Not long after the advent of mass production of the automobile by Henry Ford in 1914, communities and policy makers struggled with the problem of what to do with junk cars. Public officials created what was perhaps the City’s first large scale scrap metal yard in 1934 as a way to handle all of the waste collected from the almost 3,400 inoperable cars abandoned on city streets that year. A New York Times article about the creation of the centralized, city-operated scrap depot noted that the abandoned cars were most frequently found on the waterfront and in outlying districts and, according to the then Deputy Commissioner of the Sanitation Department, “the wrecks… [had] little left of them but the wood and metal. Lamps, spark plugs, anything removable, sometimes the leather from the cushions, [had] disappeared.” (14) Auto dismantling, it seems, was occurring, albeit unofficially and illegally, in many of the same locations where the city’s licensed scrap metal yards, auto dismantling operations and used auto parts wholesalers exist today.

In addition to addressing the problem of junk cars, the Department of Sanitation was officially tasked in 1929 with implementing the City’s first wastewater treatment plan. Water quality began to improve with the construction of new and better plants, funded largely by Federal Public Works Administration funds in the 1930s, including the construction of the Ward’s Island Plant in 1937 – the first to use the activated sludge process, a now common method for removing organic waste. Funding for construction

of new plants diminished in 1940s as resources were diverted to the war effort during World War II. Population and industrial growth, however, continued to surge.

Wartime industrial growth resulted in ever-increasing pollution of the City's waterways and industrial areas. As production was stepped up for the war effort, increasingly toxic new processes and chemicals were introduced and the discharge and dumping of pollutants continued unabated. The DEP's 2009 history of the City's annual harbor survey described the condition of the Harbor during its peak in 1940s: "New York Harbor was the busiest in the world in March 1943, during World War II, with 543 ships at anchor. At this time, 1100 warehouses with nearly 1.5 square miles of enclosed space served freighters with 575 tugboats. There were also 39 active shipyards, with a staggering inventory of heavy equipment. At this time, New York City was also a manufacturing hub, producing goods — clothing, chemicals, metal products, food and furniture among them — for the war effort and for civilian use around the country and the world." (15)

In 1948 Congress passed the Water Pollution Control Act, a modest effort to address post-War water quality issues through loans for wastewater treatment plant construction and grants for state and local agencies to investigate pollutant sources. In the 20 years after the war five new water pollution control plants were constructed in New York City. The federal legislation provided minimal funding, however, and gave the government little enforcement authority. Notably, the routine discharge of raw sewage by the City into local waterways was not completely eliminated until the completion of the North River Pollution Control Plant in 1986 . (16)

Postwar suburbanization and an increasingly auto-oriented culture resulted in substantial increases in auto ownership, exacerbating an already decades-old problem of what to do with end-of-life vehicles. By the mid-1950s, over 300 auto wreckers operated in the city, clustered mostly in areas where they still exist: Canarsie and Flatlands in Brooklyn, Flushing and College Point in Queens and Hunts Point in the Bronx. A 1957 New York Times article about the effect of new insurance and licensing laws on the increase in auto wrecking in the city described the "infernos" that caused "dense columns of black oily smelly smoke" above the auto wrecking operations in these neighborhoods. The wreckers literally torched many of the 500,000 "jalopies" that ended up in their yards. (17) "The cheapest and quickest way" to turn a dead vehicle into scrap was, according to the Commissioner of Air Pollution Control at the time, "to turn an old car on its side, pour gasoline onto it, and set it on fire." Polluting oils and automotive fluids were allowed to flow out of the cars onto the unpaved sites, creating "scores of blackened, oil soaked yards" along the "muddy lanes …of Ralph Avenue" in Flatlands and other locations.

Air Pollution Control Regulation

Although New York City has a long history of regulating air pollution through Sanitary Code prohibitions on the emission of dense smoke and cinders, dust or gas, air pollution control was, in general, ineffectual and did not become an independent department until after the establishment of the Department of Air Pollution Control in 1952. By the 1960s, increased public awareness of the health and environmental threats posed by significant air pollution and data showing that New York City had, by many indicators, the worst air quality in the nation, prompted pressure from the U.S. Department of Health, Education and Welfare and from citizens' groups for the City to address its abysmal air quality. The City Council, under the leadership of then-Councilman Robert Low, responded in 1965 with a series of public hearings and report

Images courtesy of the Regional Plan Association

The New York area experienced a severe temperature inversion on November 24, 1966. From the Empire State Building on that date, the view south to the Battery was filled with gaseous emissions trapped by warm, stagnant air. During normal atmospheric conditions, the same gases are emitted, but they are readily dispersed.

on how to address air pollution. The hearings and subsequent report determined that, according to George H. Hakevik's explanation of the history of the Air Code in his 1970 book Decision-Making in Air Pollution Control, "the most significant sources of air pollution in New York City were on-site incineration of refuse, municipal incineration, and combustion of fuel for space heating and electricity generation purposes." (18)

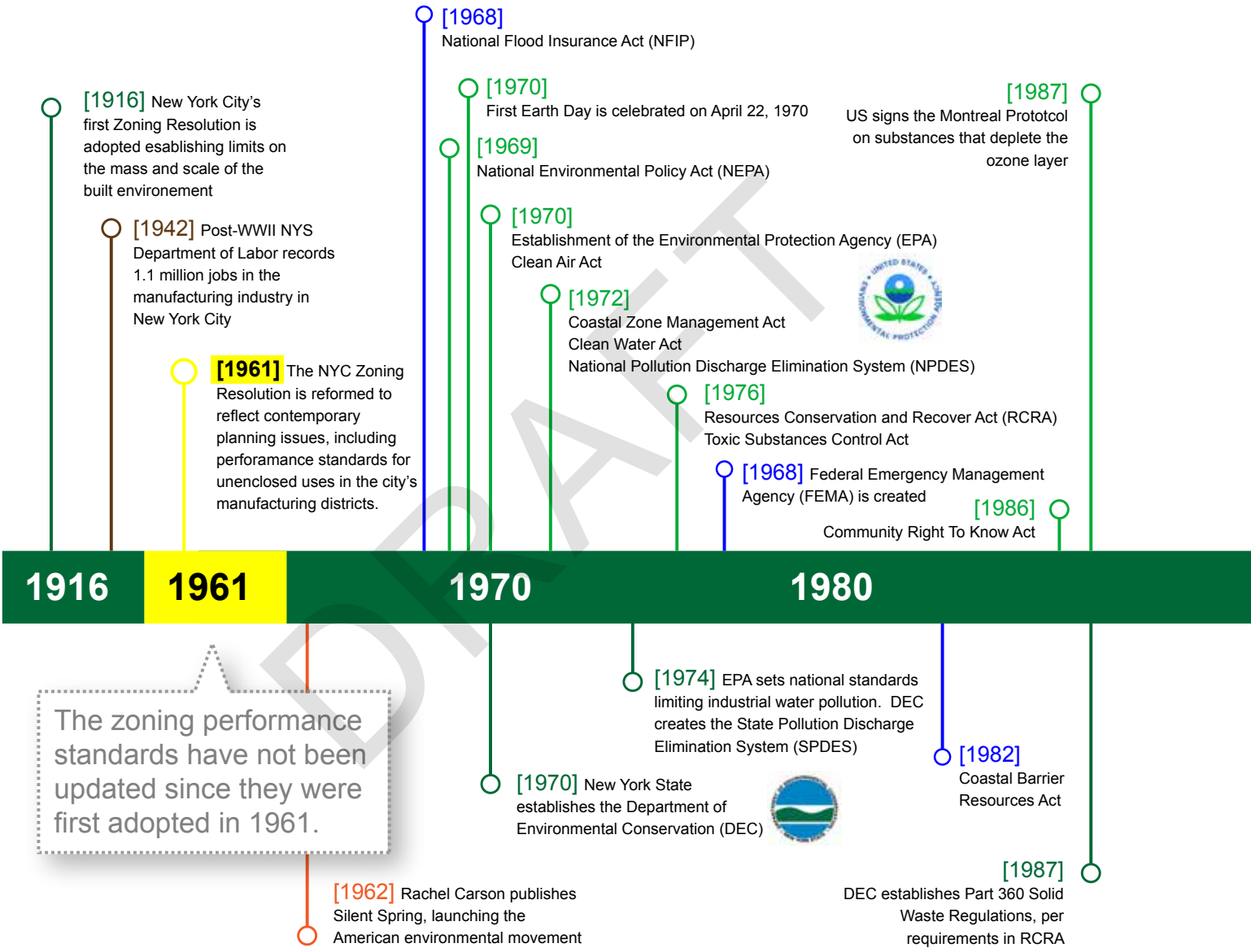
The combustion of bituminous coal and residual (Number 6) fuel oil was the primary source of sulfur dioxide pollution at the time and Consolidated Edison, as the City's main public utility provider, processed almost half of the fuel consumed in the City. Meanwhile, municipal garbage incinerators and 12,000 apartment house and commercial incinerators contributed an estimated 12,750 to 13,300 tons of particulate matter into the air each year. (18) During the time, it was common for a thick fog of black smoke emitting from these incinerators to hang over the air in a dense black fog. As a result of these findings, Low introduced an air pollution control bill in 1966 that proposed the gradual elimination of bituminous coal use, the upgrading of municipal and private garbage incinerators and the banning of refuse incineration in new buildings. The bill required the upgrading of pre-existing incinerators – which were required by the Building Code since 1951 in all new multiple dwellings – within two years for multiple dwellings of six stories or less and within one year for all other multiple dwellings. (18)

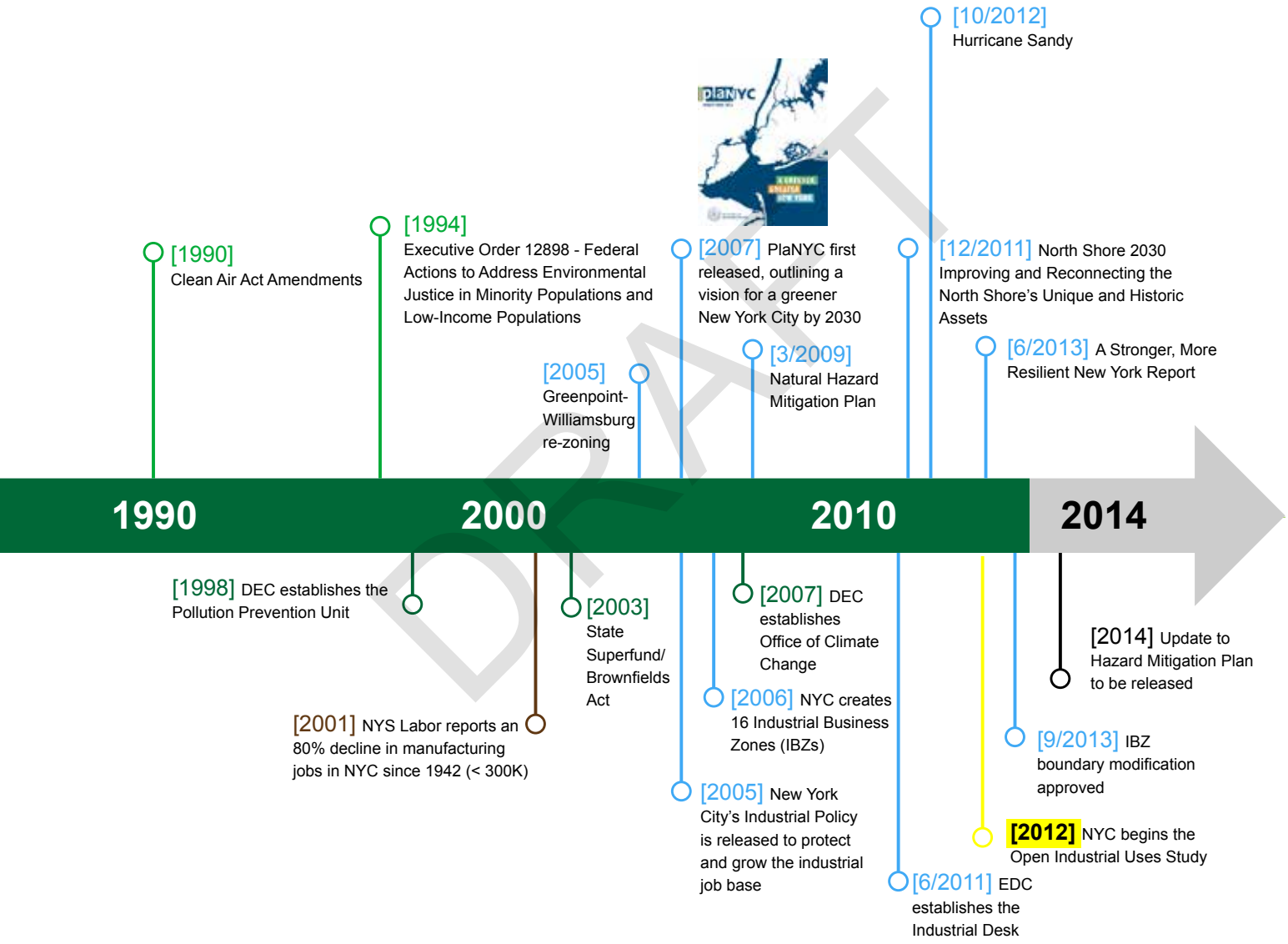
Although the bill – known as Local Law 14 – passed the Council unanimously, provisions for upgrading pre-existing private incinerators were met with fierce opposition from the real estate community due to the excessive costs imposed. Provisions in the bill that allowed pre-1951 incinerators in multiple dwellings to be shut down voluntarily created additional opposition to the bill from the City's own Department of Sanitation, whose commissioner at the time said his agency could not handle the collection and disposal of the additional formerly incinerated residential garbage. The Commissioner of Sanitation at the time publicly stated that 11 of his department's own garbage incinerators could not be upgraded in time, and the New York City Housing Authority expressed doubt that it could meet the deadlines to upgrade incinerators in its apartment houses.

Ultimately the law would prevail, but only after then-Mayor John Lindsay (who campaigned on cleaning the City's air), introduced amendments to it to address the fraught implementation of the new rules. A compromise amendment was eventually approved by the City Council in 1968 that gave building owners more options on how to comply with the law and introduced phased timetables for implementation. The law required landlords with incinerators serving buildings with 20 or more units to either upgrade incinerators or shut down incinerators and install trash compactors and pay for trash collection fees. Buildings with fewer than 20 units could upgrade or shut down incinerators and have their un-compacted trash picked up by the Sanitation Department.

The local burning of garbage as a way to handle residential waste, a common practice in New York City into the 1970s and 1980s, has ceased due to Local Law 14 of 1966 and subsequent federal guidelines and requirements for reducing air pollution emissions. The Clean Air Act (CAA) was passed in 1970 at the height of the national environmental movement prompted by dense visible smog in many nation's cities and industrial centers at that time. It was subsequently revised in 1977 and 1990. The CAA requires EPA to establish national ambient air quality standards for certain common and widespread pollutants in order to protect public health and welfare.

U.S. ENVIRONMENTAL REGULATION THROUGH HISTORY 1916-TODAY



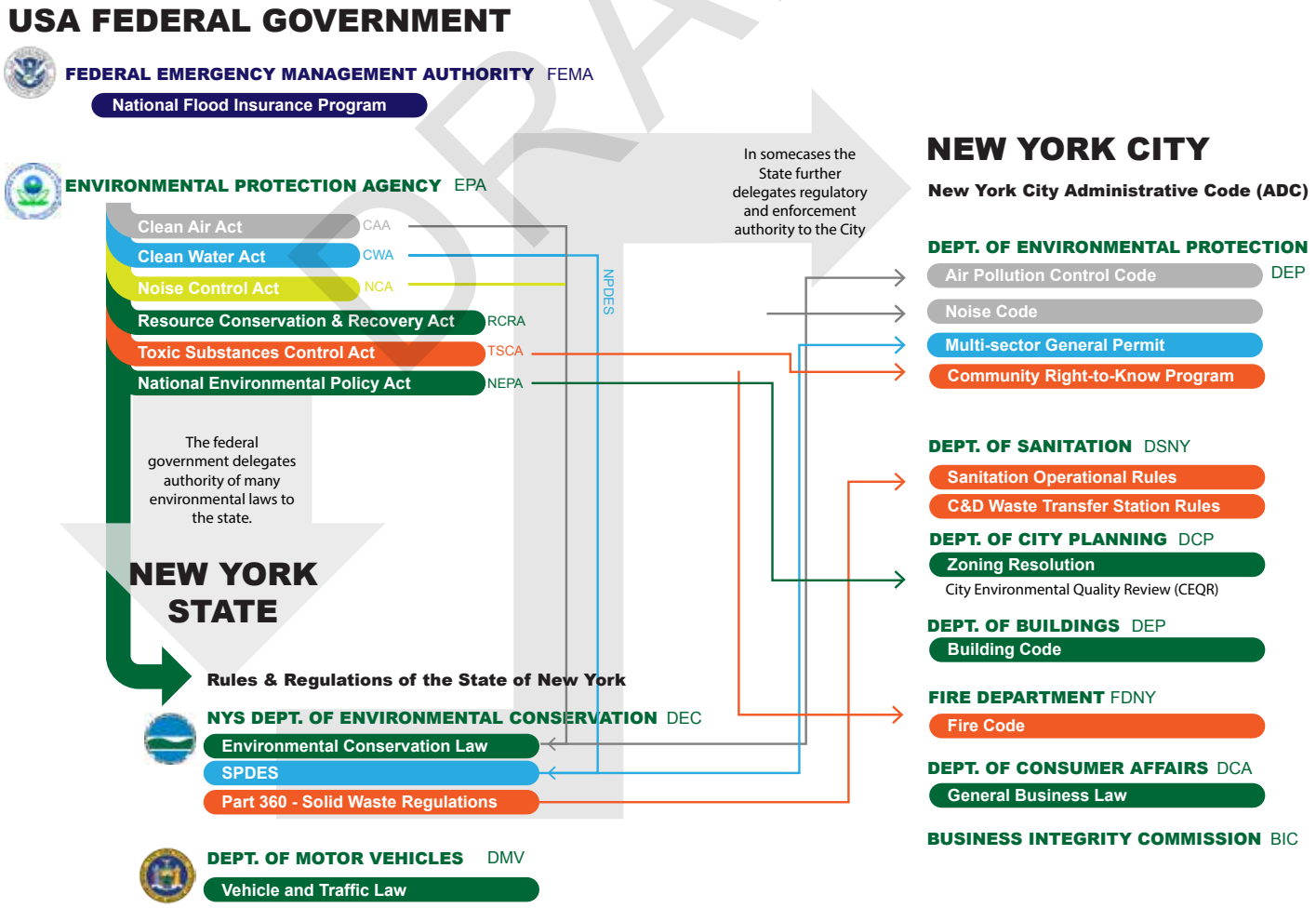

[10/2012]
Hurricane Sandy
PlaNYC
[1990]
Clean Air Act Amendments
[1994]
Executive Order 12898 - Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations
[2007] PlaNYC first released, outlining a vision for a greener New York City by 2030
[12/2011] North Shore 2030 Improving and Reconnecting the North Shore's Unique and Historic Assets
[2005]
Greenpoint-Williamsburg re-zoning
[3/2009]
Natural Hazard Mitigation Plan
[6/2013] A Stronger, More Resilient New York Report
1990
2000
2010
2014
[1998] DEC establishes the Pollution Prevention Unit
[2003]
State Superfund/ Brownfields Act
[2007] DEC establishes Office of Climate Change
[2014] Update to Hazard Mitigation Plan to be released
[2001] NYS Labor reports an 80% decline in manufacturing jobs in NYC since 1942 (< 300K)
[2006] NYC creates 16 Industrial Business Zones (IBZs)
[9/2013] IBZ boundary modification approved
[2005] New York City's Industrial Policy is released to protect and grow the industrial job base
[2012] NYC begins the Open Industrial Uses Study
[6/2011] EDC establishes the Industrial Desk

Nuisance Abatement and Modern Zoning Performance Standards

In 1961 New York City reformed its Zoning Resolution, instituting extensive restructuring of zoning and land use regulations. This new comprehensive zoning regulation included a new section establishing performance standards for the city's manufacturing districts and the City's adoption of a solid waste plan without local incinerators to address the environmental emissions associated with "low performing" uses. Though the resolution was considered a landmark document at the time and based on leading planning theories of the day, the passage of time has proved inadequate respecting certain aspects of the resolution as the city has changed over the years. Specifically, the performance standards have been long obsolete as other laws and regulations have essentially superseded them. Zoning performance standards need to be understood as an artifact of an era in which environmental degradation was little understood and widely tolerated.

The 1958 report "Zoning New York City: A proposal for a Zoning Resolution for the City of New York" by the City's consultants, Voorhees, Walker, Smith and Smith, describes the justification for this reform of the zoning ordinance. Article IV of the report, "Explanation of Manufacturing Use Regulations," notes: "Industries have traditionally been segregated into zoning districts on the basis of the 'use list', which lists industries according to product or process and assigns them to 'light' or 'heavy' districts on the basis of their supposed nuisance characteristics." (19) The regulation discussed that one of the major limitations to this approach is that similar uses in the same industry may exhibit greatly divergent environmental emissions or impacts depending on the technologies or operating procedures employed, and the uses themselves may evolve

Diagram charting the flow of Federal and State authority between agencies. Many Federal and standards are delegated to the State or City for administration and enforcement.



Zoning New York City
by Voorhees Walker Smith & Smith

The following excerpt is taken from *Zoning New York City* by Voorhees Walker Smith & Smith published in August,1958 and describes part of the original justification for the performance standards which are later adopted in the *New York City Zoning Resolution*.

"After careful study it was determined that performance standards were needed to control eight types of nuisances. The proposed performance standards, as contained in Sections 42-20 to 42-28, inclusive, control and limit the creation of the following types of nuisances:

1) Noise
2) Vibration
3) Smoke, dust, and other types of particulate matter
4) Odor
5) Toxic and noxious matter
6) Radiation hazards
7) Fire and explosive hazards
8) Heat, humidity, and glare"

over time as new industries are created. The report thus recommends, based on a study by the 1950 National Industrial Zoning Committee, that New York City adopt "industrial performance standards as a better method of guiding industrial location through zoning. Industrial performance standards consist of scientific yardsticks for measuring industrial nuisances and of standards which define precisely the points on the yardstick at which the various nuisances' characteristics…become objectionable." Under this system, uses sited in M1 districts have the highest standards and those sited in M3 districts, the lowest.

Following the reasoning in Voorhees, Walker, Smith & Smith, today, under Sections 42-00 et seq. of the Zoning Resolution, unenclosed industrial uses may be sited in Manufacturing Zoning Districts and, in the case of those uses classified as Use Group 16, in C8 Commercial Zoning Districts that allow for automotive and other heavy commercial services. Siting of these uses is subject to performance standards identified in Section 42-20 of the Zoning Resolution that regulate noise, vibration, smoke, dust and particulate matter, toxic noxious matter, radiation hazards, fire and explosive hazards, and humidity, heat or glare. Performance standards vary among zoning districts, with M-1 zones having the most stringent standards and M-3 zones having the most permissive standards.

Although zoning performance standards were considered progressive for the time, nuisance abatement was their primary objective, over environmental protection. The performance standards in the Zoning Resolution would become limited and difficult to enforce soon after they were adopted in 1961 since the 1960s ushered in an era of environmental activism that brought about significant local, state and federal environmental laws and regulation to further address pollution and other environmental concerns.

Evolution of Local, State and Federal Environmental Legislation

In 1962, one year after the Zoning Resolution became effective, marine biologist Rachel Carson published Silent Spring, a book widely recognized for its influence in launching the contemporary environmental movement. The book, which drew connections between pesticides and herbicides and impacts to natural ecological systems, elicited a strong public reaction that led to the banning of DDT and other key federal and state laws to protect public health and natural resources. Changing public attitudes and the availability of scientific information that pointed to the relationship between human activity and environmental degradation thus led to the first significant legislation, the 1963 Clean Air Act, which regulated automobile emissions and restricted certain industrial pollutants. A few years later, and following the 1969 Santa Barbara oil spill, the National Environmental Policy Act (NEPA) was established, which created procedural requirements for environmental assessments (EA) and environmental impact statements (EIS) for actions by the federal government.

A year later, on April 22,1970, the United States celebrated the first Earth Day and created the Environmental Protection Agency (EPA), consolidating several other agencies with the stated purpose of "protecting human health and the environment." (20) From 1970 to 1980, the U.S. Congress passed numerous laws that created the foundation for contemporary environmental policy in the United States: the Clean Water Act, the Clean Air Act amendments, the Endangered Species Act, the Resource Conservation and Recovery Act, the Noise Control Act, the Occupational Safety and Health Act, the Toxic Substances Control Act, the Marine Protection Research and Sanctuaries Act and the Coastal Zone Management Act, among others. In 1980,

the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) or “Superfund Act” was established to actively clean up the most polluted industrial sites around the country by giving the EPA the authority to seek out the responsible parties and hold them responsible for the cleanup. Today, New York City has three Superfund sites, including Newtown Creek and the Gowanus Canal, along which are still extensive heavy industrial and manufacturing zones.

In creating environmental regulations to implement these key statutes passed by Congress, the federal government realized that many environmental issues are region-specific and that each State has varying capacities and resources. As a result, effective enforcement could often be delegated to States who have the authority to establish many of their own environmental benchmarks if they were not weaker than the federal statutes provided. Thus, Congress delegated many of the environmental laws to the State governments for implementation. In 1970, New York State established the Department of Environmental Conservation (DEC) with responsibility to regulate and enforce the laws codified in the State Environmental Conservation Law. The State Pollutant Discharge Elimination System (SPDES) was also created at this time to help control discharges of wastewater into the streams, rivers, lakes and marine waters of New York State in order to meet requirements of the National Pollutant Discharge Elimination System (NPDES) pursuant to the Clean Water Act. (21) Public concern about explosions and leaks of toxic chemicals led to passage of the Country’s first Community Right-To-Know law requiring that manufacturers as well as users and storers of certain hazardous materials keep records about the location, quantity, use and any release of those materials. In 1986, the EPA was required to make such information available to the public and to work with States and localities to prevent accidents and develop emergency plans in case of releases of hazardous materials. Today, many OIUs must obtain certain city and/or state permits in order to operate, and standards in such permits frequently are more demanding than the zoning performance standards. A table of the applicable permits and regulations is included in the Appendix to this report. Certain state and city regulatory regimes require regular inspections of the permittees and/or dispatch enforcement officers based on complaints.

The concept of ‘environmental justice’ also emerged in recent years to bring attention to equality issues related to the disproportionate siting of hazardous waste disposal sites in areas with low income or minority populations. In 1990, the Congressional Black Caucus, a bipartisan coalition of academic, social scientists and political activists met with EPA officials to discuss their findings that environmental risk was higher for minority and low-income populations. They alleged that EPA’s inspections were not addressing their communities’ needs. (22) This ultimately led to the establishment of a 1994 Executive Order under President Bill Clinton directing federal agencies to develop environmental justice strategies to help federal agencies address disproportionately high and adverse human health or environmental effects of their programs on minority and low-income populations. The Order was also intended to promote nondiscrimination in federal programs that affect human health and the environment. The Office of Environmental Justice, established within the EPA later that year to administer the Executive Order, officially defined ‘environmental justice’ as “the fair treatment and meaningful involvement of all people regardless of race, color, sex, national origin, or income with respect to the development, implementation and enforcement of environmental laws, regulations, and policies” . (23) Although the Executive Order

did not apply to state or municipal programs, its policies are now widely used by communities and municipalities to guide local regulations and ensure that all people have equal protection of environmental laws and regulations. For instance, 2004-2005 amendments to the New York City Department of Sanitation's siting regulations for new waste transfer stations required that permit applicants not increase capacity in parts of the South Bronx, Jamaica, Queens, and Greenpoint/Williamsburg, Brooklyn where such facilities already are clustered, and established buffers from Residence Districts which varied by the percentage of the City's transfer stations that are in such community district.. This effort to protect communities overburdened with such facilities is consistent with the principles of environmental justice.

In 1987, DEC promulgated 6 N.Y.C.R.R. Part 360, a comprehensive regulatory regime for solid waste management. It established a permitting regime for facilities that handle and transport solid waste, including provisions for recycling, composting, solid waste transfer, beneficial reuse of solid waste, waste-to-energy and landfills.

Continuing efforts to enhance environmental regulation of the State Pollution Discharge Elimination System (SPDES) and the Municipal Separated Stormwater Sewer System (MS4) and its enforcement is expected to lead to more local regulation and enforcement of environmental matters in New York City. Such laws are provided and enforced through the Department of Environmental Protection, the Department of Sanitation, the Fire Department, the Building Department, and the Department of Health. Under these agencies, city-specific laws have also been established and are continually updated through the New York City Administrative Code: the Air Pollution Control Code, the Noise Code, Fire Code, Building Code, Health Code, Community Right-to-Know Act, and Sanitation Rules. For example, the New York City Department of Sanitation manages a specialized permitting with site planning review and inspection regime for solid waste transfer stations within the city. (24)

Flood Hazard Mitigation Regulation

Originally, flood management in the United States was handled largely within the jurisdiction of the federal government, starting in 1917 when the first Flood Control Act appropriated federal funds for the use of flood control measures, along with authorizing the Army Corps of Engineers (USACE) to conduct plans and analysis of flood control improvements and their impacts to navigation routes and energy sources. Under the 1950 Federal Disaster Relief Act, USACE was reaffirmed as the lead agency for flood disaster response, until several decades of major natural disasters in the 1940s and 50s required a new approach. In 1967, Congress passed the National Flood Insurance Act and the 1974 Disaster Relief Act, followed by the establishment of the Federal Emergency Management Agency in 1979 to oversee all disaster response and relief, flood insurance programs, and preparedness planning. The USACE continues to be closely involved with floodplain management and shore protection through the design, construction and operation of infrastructure projects.

After a long history of property damage and loss of life due to flooding, the National Flood Insurance Program (NFIP) was established in 1968 under the National Flood Insurance Act. The program provides flood insurance to property owners in participating communities that adopt and enforce ordinances outlining floodplain management standards. Under the program, qualifying communities (such as New York City) agree to adopt and enforce regulations that meet or exceed FEMA/NFIP's requirements to reduce the risk and impacts of flooding in areas that have been identified to have high or low flood hazard risks.

Pursuant to requirements for participation in the NFIP, New York City since 1983 has had Building Code regulations for flood-resilient construction in the flood zone designated by FEMA. These regulations are currently found in Appendix G of the Building Code. Consistent with NFIP requirements, Appendix G defines general standards for protecting 'development' which is broadly defined as structures, but also includes paving, grading, and the permanent storage of materials and equipment. However, other than the definition of "development," Appendix G provides no further standards applicable to open industrial uses, except for a cross-reference to industry standards for elevating or containing tanks and drums containing hazardous substances.

Appendix G currently applies to all areas designated in the Flood Insurance Rate Maps (FIRMs) for New York City, which were first released by FEMA in 1983, as subject to a one percent chance of flooding in any given year (the Special Flood Hazard Area ("SFHA") or the "100-year flood zone"). FEMA is currently in the process of updating these FIRMs to reflect changes in the floodplain over the last thirty years, and incorporating data from recent coastal storms. Preliminary FIRMs were released in December 2013 and are expected to be finalized in 2015. These maps also identify the Base Flood Elevation (BFE) for a given area, a term that defines the elevation to which the 100-year flood event is expected to rise. They also define several zones within the SFHA, including Coastal High Hazard Areas or V(E) zones; Coastal A zones, which may experience moderate wave action; A(E) zones which may experience low wave action; as well as the "500-year flood zone," the area subject to a 0.2 percent chance of flooding in a given year.

Current Regulatory Context

Today, all three levels of government work to coordinate on these issues, but the historical context has created complex and often overlapping systems. However, the Zoning Resolution is still considered the primary regulation for determining where unenclosed industrial facilities can locate. Since open industrial uses can only be located in any M1, M2 or M3 district, subject to compliance with the applicable performance standards, and those standards have never been updated to account for contemporary environmental and public health science, zoning fails as an effective tool for pollution prevention, let alone environmental regulation, contrary to the intention of its drafters. has resulted in conflicts with adjoining residential communities and with other industrial and non-industrial businesses in the vicinity of unenclosed industrial uses, particularly in the Eastchester and Hunts Point sections of the Bronx; along Newtown Creek bordering Brooklyn and Queens; in the Flatlands and East New York neighborhoods of Brooklyn; in Jamaica, Queens; and along the North Shore of Staten Island.

Today open uses in New York City are concentrated in industries that depend on proximity to buyer and seller markets to operate. However, due to the land-intensive and noisy and/or dusty nature of their operations, they tend to locate in areas of the city where they are permitted by zoning and land is less expensive. In the densely populated New York City metro area, traffic congestion, high land costs and restrictive suburban zoning regulations limit the availability of sites for open uses. Consequently, operators have little choice but to locate their businesses where they have always been – in a handful of more isolated manufacturing areas, mostly along the city's waterways, where a legacy of heavy industrial use prevailsand contamination and clustered noxious uses keep down land prices. The areas where OIUs cluster coincide with the state's Brownfield Opportunity

Areas and as well as several federal Superfund sites.

With continuing population growth, rapid construction, heightened development pressure upon other industrial, commercial and residential land uses on industrial land and an increased interest in waterfront recreation, the quality of the City's natural resources is more important than ever. Although performance standards were intended to avoid nuisances created by industrial land uses, their origins are from an era of more laissez faire attitudes about public health and environmental protection. The standards were prospective, "grandfathering" existing polluting uses, and viewed M3 districts as sanctuaries for "low-performing," but necessary industrial uses. Moreover, performance standards had nothing to say about water pollution, an area of significant contemporary environmental regulation. Zoning performance standards, although innovative at the time of their enactment in 1961, have proved to be inadequate to achieve the public's quickly evolving expectations of clean air, clean water and minimized public health risks from local land uses.

In most cases, the standards described in zoning have been superseded by more stringent and effective regulations that were born during the environmental movement of the 1960s and 1970s. While performance standards in general are a common and effective tool for implementing other environmental regulations, they have proven to be a poor fit for land use regulation. Beyond the anachronistic metrics that apply to the current zoning performance standards, the method in which they are administered – non-routine monitoring during operation only in response to complaint-based enforcement – is not appropriate for zoning, for which compliance is reviewed at the time that plans are filed for new or altered buildings and open uses. Regulations that relate to the ongoing operation of a business, rather than to construction, are better suited to laws and codes that apply to all businesses on a continuing basis, whether or not they undertake construction on the site.

The obsolete zoning performance standards have been superseded by other state and city regulations, in particular the stormwater regulations administered by the state Department of Environmental Conservation (DEC) and the New York City Department of Environmental Protection (DEP), and the Air Pollution Control Code, Noise Control Code and New York City Right-to-Know Program, which are all administered by DEP. These regulations apply both to new and existing uses, and are periodically updated, unlike the zoning performance standards.

The table below shows where the Zoning Resolution Performance Standards have been superseded by other subsequent current environmental regulations.

Performance Standard		Issue	Superseded By	Enforcement
42-21	Noise	Outdated measurement	Noise Control Code	DEP
42-22	Vibration	Outdated measurement	Noise Control Code	DEP
42-23	Smoke, Dust, and Other Particulate Matter	Outdated measurement, inconsistent with current standards	Air Pollution Control Code	DEP
42-24	Odorous Matter	Qualitative without enforcement	Air Pollution Control Code	DEP
42-25	Toxic or Noxious Matter	No enforcement mechanism	Air Pollution Control Code, NYC Community Right-to-Know	DEP
42-26	Radiation Hazards	No enforcement mechanism	NYC Community Right-to-Know Department of Health	DEP, DOH
42-27	Fire and Explosive Hazards	Inconsistent with current standards	Fire Code Building Code	FDNY DOB
42-28	Humidity, Heat, and Glare	No enforcement mechanism	Air Pollution Control Code	DEP

View of Eastchester in the Bronx. Many water dependent uses unenclosed industrial facilities line the Hutchinson River.

Chapter 2: LAND USE CHARACTERISTICS:

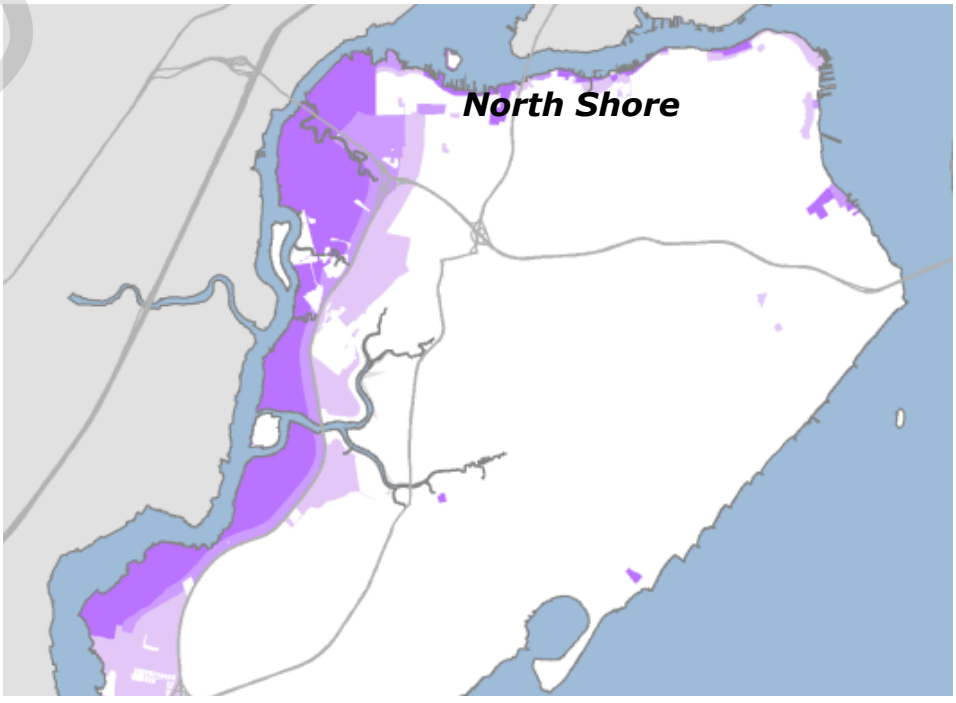
GEOGRAPHIC CONCENTRATIONS AND CLUSTERS

Unenclosed industrial uses are prevalent throughout industrial areas in four of the five boroughs and tend to concentrate along the city's waterways. In 2011, DCP conducted field surveys in six industrial areas as case studies – Eastchester and Hunts Point in the Bronx, Jamaica in Queens, both the Brooklyn and Queens areas along Newtown Creek, the East New York and Flatlands/Fairfield Industrial Business Zones (IBZs), and the North Shore of Staten Island. (25) The information gathered has provided an understanding of the number of such uses in each study area, their size and issues associated with each type of use.

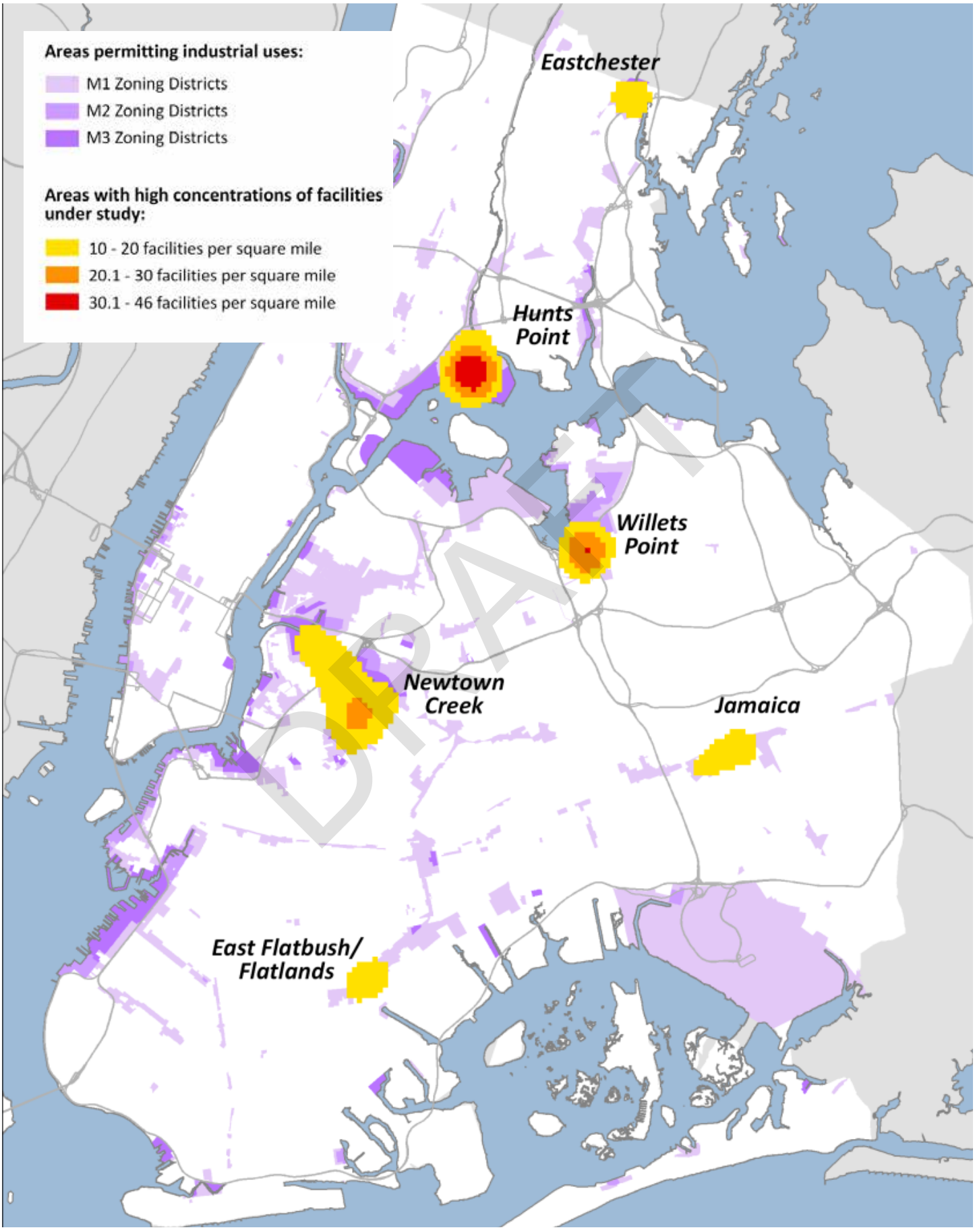
The aforementioned survey identified 595 open industrial uses throughout the city and placed them into eleven unique use categories. Because five of those uses have since been merged or removed from the study, including commercial carting, dead automobile storage and unknown usage, the 2013 study focused on 440 of those 595 sites. The current list of OIU facilities includes nearly two hundred additional sites that were identified through a combination of sources, a total of 632 sites. The primary source for the investigation was a list of regulated facilities that were provided by four regulatory agencies. Both the New York City Department of Consumer Affairs

Industrial Business Zones (IBZs)

New York City's IBZ program was established in 2006 mapping 16 initial areas where expanded business services are available to industrial and manufacturing businesses. Today there are 21 IBZ areas. IBZs strengthen incentives for industrial businesses to relocate within an IBZ Many of the open industrial businesses identified in this study are located one of in NYC's IBZ areas.



Map showing the density of open industrial uses in seven neighborhoods of New York City. Source: NYC DCP Industrial Survey 2011.


Areas permitting industrial uses:
M1 Zoning Districts
M2 Zoning Districts
M3 Zoning Districts
Areas with high concentrations of facilities under study:
10 - 20 facilities per square mile
20.1 - 30 facilities per square mile
30.1 - 46 facilities per square mile
Eastchester
Hunts Point
Willets Point
Newtown Creek
Jamaica
East Flatbush/ Flatlands
DRAFT

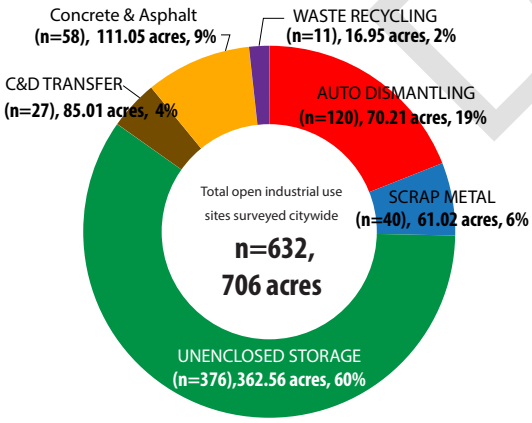
(DCA) and the New York State Department of Motor Vehicles (DMV) maintain online databases to query a variety of licensed operators. The DCA database yielded over 70 scrap metal processing facilities and the DMV database provided over 150 auto dismantling operators. Waste recycling facilities were identified based on a list of solid waste management facilities on the New York State Department of Environmental Conservation (DEC) website organized by the Division of Materials Management. The Department of Sanitation (DSNY) provided a list of more than 20 currently regulated (as of August, 2013) construction and demolition debris transfer stations. Because no regulatory agency maintains a database of concrete or asphalt manufacturing nor unenclosed storage sites, these facilities were identified by NAICS (North American Industry Classification Service) codes. Specifically, internal QCEW (Quarterly Census of Employment and Wages) data for NYC was sorted by several industry codes that could capture the majority of sites in these industries (e.g. 237310, 238111, 238112, 23899, 327320, 423320, 444190). Since none of these sources distinguish between enclosed and unenclosed facilities, Google Street View, Orthophotography imagery, and DCP's MapPLUTO were used to determine if the operations were unenclosed.

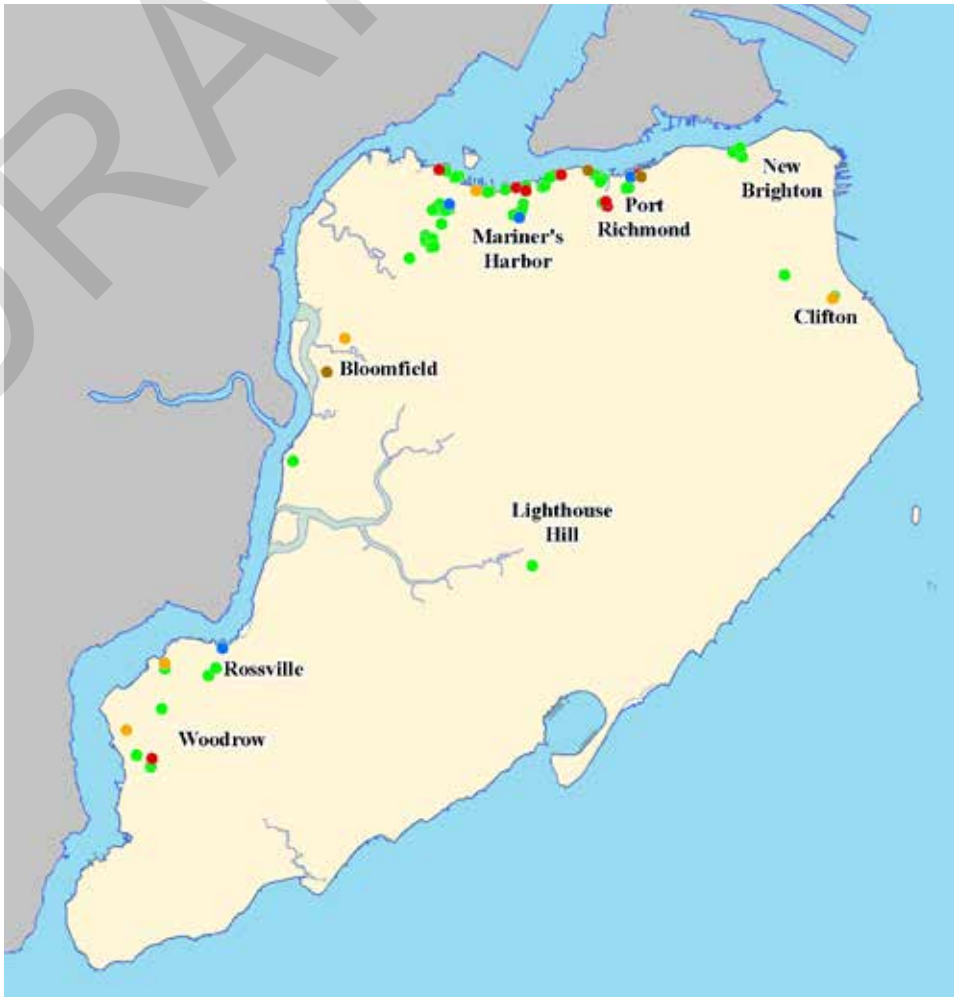
OPEN INDUSTRIAL USES IN NEW YORK CITY

Many of the City's waterfront areas where Open Industrial Uses concentrate are in proximity to communities that are sizable, diverse and, by many socioeconomic measures, distressed. Using data from the 2010 US Census and the 2006-2010 American Community Survey's 5-Year Estimates, DCP has created demographic snapshots of the neighborhoods with the largest concentrations of OIUs, the boroughs they fall within and for New York City as a whole.

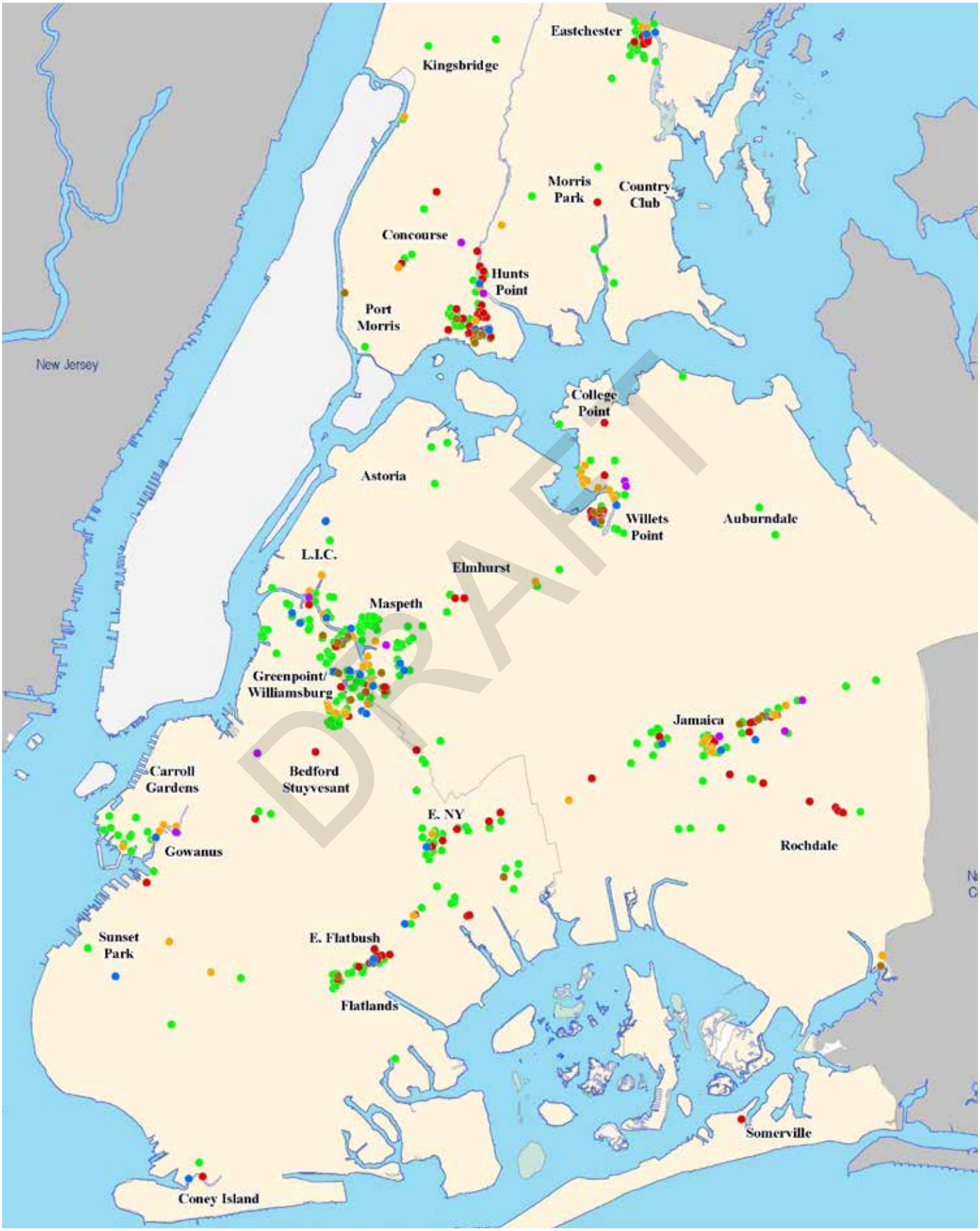
Map Key

- Auto Dismantlers
- C&D Transfer Stations
- Concrete or Asphalt Manufactu
- Scrap Metal Processors
- Unenclosed Storage
- Waste Recycling

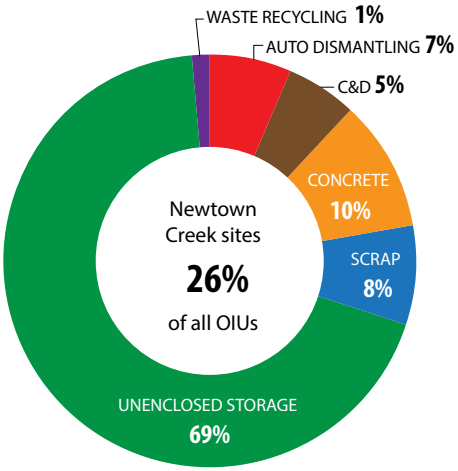




Map showing the location of open industrial uses in New York City. Source: NYC DCP Industrial Survey 2013.


Eastchester
Kingsbridge
Morris Park
Country Club
Concourse
Hunts Point
Port Morris
New Jersey
College Point
Astoria
Willets Point
Auburndale
L.I.C.
Elmhurst
Maspeth
Greenpoint/ Williamsburg
Jamaica
Carroll Gardens
Bedford Stuyvesant
E. NY
Gowanus
Rochdale
Sunset Park
E. Flatbush
Flatlands
Somerville
Coney Island
DRAFT

NEIGHBORHOOD
NEWTOWN CREEK, QUEENS & BROOKLYN



Many of the open industrial facilities in Newtown Creek are water dependent, utilizing barges to transport materials.

Newtown Creek flows between north Brooklyn and part of Queens and environmental issues plague the banks and upland areas along the creek. From the late 1800s to the mid 1900s, approximately 17 to 30 million gallons of oil were spilled from the dozens of oil refineries along its shores. In 2010, the creek received EPA Superfund designation and is currently undergoing cleanup. Additional environmental concerns stem from the fact that the industrial zones along the creek contain dozens of brownfield sites, toxic release inventory sites, (additional sites that report releases of industrial chemicals to EPA through the Toxic Release Inventory program), NYS Superfund sites and groundwater plumes of oil and solvents. The creek also annually receives 1.5 billion gallons of combined sewage overflow (during rain periods, a sewer system that handles residential raw sewage and street runoff can become overburdened and release its contents into the waterbody). During the storm surge in Hurricane Sandy, flooding extended several blocks inland from the creek.

The Newtown Creek area houses 26% of facilities in the study, more than any other area studied. Open industrial use facilities that neighbor the creek can be found in Greenpoint, Williamsburg, Long Island City and Maspeth. Although the majority of sites are used for unenclosed storage, approximately 30 percent of each of the other facility types in the study can be found in the area. Likely because of the several surrounding industrial business zones, these other facility types are all located within manufacturing districts (M1, M2, and M3). However, unenclosed storage sites are distributed differently; seventy-six percent of these facilities are in M1 and M2 districts, while the remainder can be found in M3, commercial and residential districts. Much of the low-lying land where these operations are located were formerly wetlands with risk of flooding: only 28% are located within the 100-year flood plain according to FEMA's Preliminary FIRMs.

Image courtesy of Mitch Waxman

The Newtown Creek area (Brooklyn census tracts 391, 425, 427, 447, 449, 453, 481, 485, 489, 493, 573, 575, 579, 589, 593 and Queens census tracts 1, 199, 205, 219, 229, 525, 531, 535, 539, 595) is home to 69,096 residents. The population is 45% of Hispanic origin; the remainder (all non-Hispanic) are 39% white; 9% black; 6% Asian; and 2% other. Twenty-one percent of residents of this area live below the poverty level, compared to 23% and 14% for Brooklyn and Queens, respectively. The median household income is $51,285 for the Newtown Creek area, compared with $45,215 for Brooklyn and $56,780 for Queens. (26)

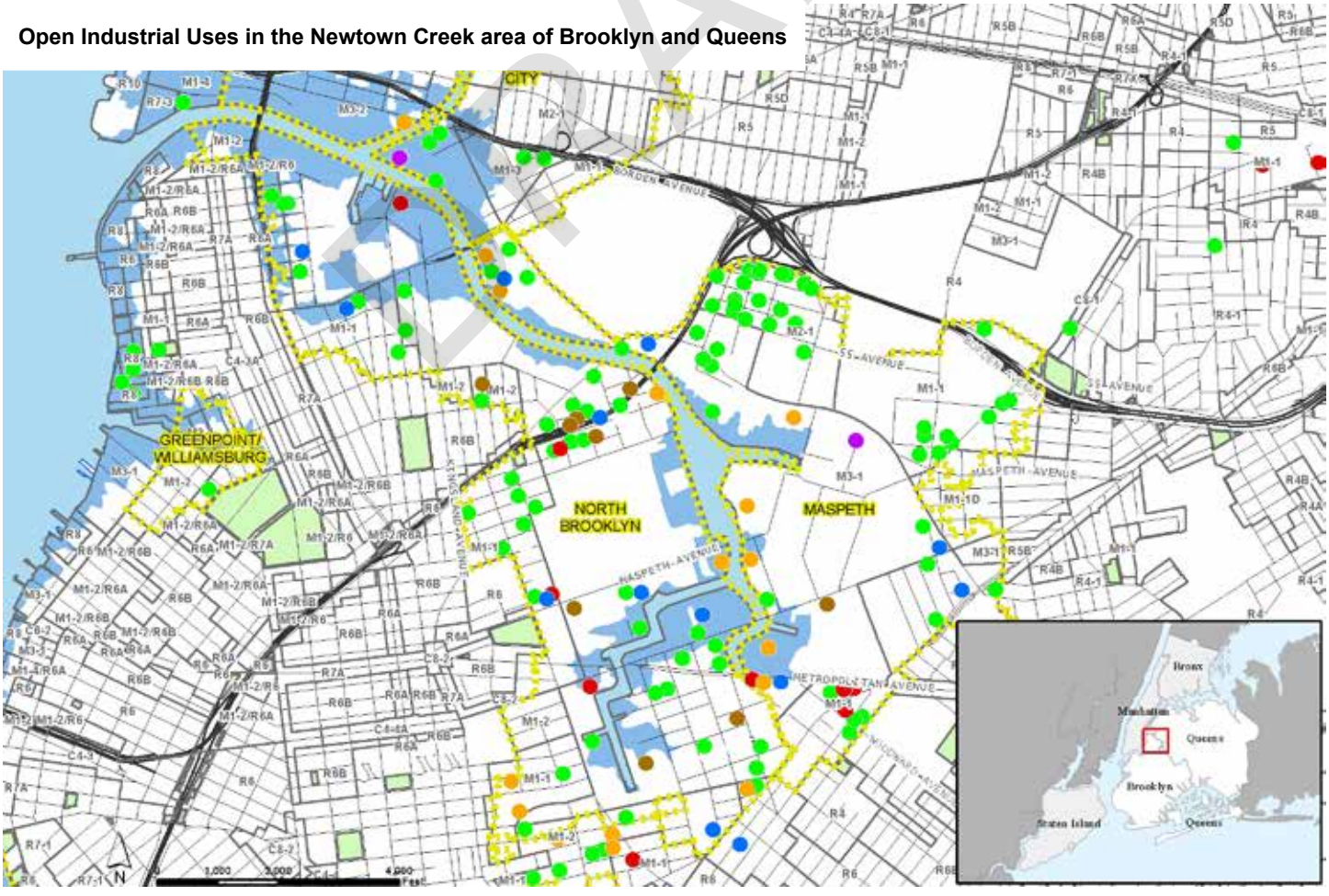
Table: Inventory of open industrial facilities in Newtown Creek

Use Type	# of Facilities	Avg. Site Size (sf)	Within 150' of R-dist.	Within 1/4 m of R-dist	Within IBZ	In 100-year Flood Zone
Auto Dismantling	24	17,878	2	11	24	-
C&D Waste Transfer	5	25,324	-	1	5	-
Concrete & Asphalt	2	37,631	-	2	2	2
Scrap Metal Processing	5	43,788	-	2	5	1
Unenclosed Storage	28	19,869	2	23	28	2
Waste Recycling	1	215,063	-	1	1	1
TOTAL	65	24,943	4	40	65	6

Map Key

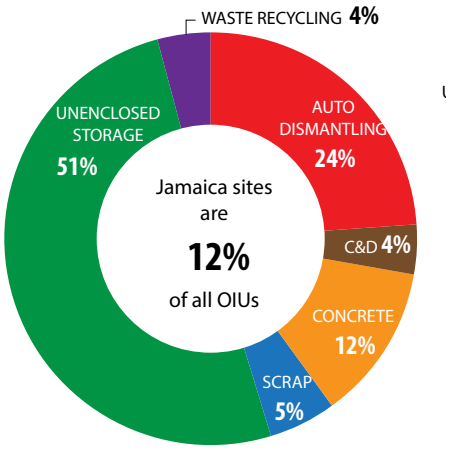
- Auto Dismantlers
- C&D Transfer Stations
- Concrete or Asphalt Manufacturing
- Scrap Metal Processors
- Unenclosed Storage
- Waste Recycling
- FEMA Preliminary Work Maps 100-Year Floodplain
- Park
- Zoning Districts
- IBZ Boundaries

Open Industrial Uses in the Newtown Creek area of Brooklyn and Queens



Source: DCP 2013 Survey of Open Industrial Facilities in New York City

NEIGHBORHOOD
JAMAICA, QUEENS



All six open industrial use types of the study can be found in the central Queens neighborhood of Jamaica. Outside of downtown Jamaica, many OIU sites are located in close proximity to Residence Districts. These communities struggle with truck traffic that is exacerbated by the street grid being disrupted by the LIRR and the Van Wyck Expressway. Specifically, 84 percent of the facilities are located within 300 feet of a residential district and all are located within one quarter mile (1,320 feet) of a Residence District. Of the areas studied, Jamaica also has the highest percentage of facilities that are located within Residence Districts (24 percent). Facilities in Jamaica have the lowest average and median site size (22,332 and 15,495 square feet respectively) of any neighborhood where open industrial uses were identified. Much like in Hunts Point, the small site size of a facility often results in operations being conducted along the sidewalk and in the street. This, coupled with close proximity to residential areas, results in environmental and aesthetic concerns for the community. Jamaica contains an expansive Industrial Business Zone (IBZ) that contains half of the neighborhood's open industrial uses. The IBZ is split into three sections, with the most heavily industrial uses concentrated in the "Tuckerton Triangle," which contains auto dismantling operations that are known to store dead vehicles on Liberty Avenue. This area is located in the Special Downtown Jamaica zoning district, and since the adoption of the Jamaica Plan in 2007, whose objective is to "create a stronger business district near the airport…," many of the auto dismantlers and scrap metal processors located in the "Tuckerton Triangle" area are now "non-conforming uses".

The Jamaica neighborhood (Queens census tracts 204, 206, 208, 212, 238, 240, 246, 444, 446.01, 446.02, 460, 462, 468, 470, 480) is home to 53,751 residents. The

Truck traffic is commonly cited as a concern in industrial neighborhoods. Many businesses also use street parking for queing, washing, or loading activities.

Dust and other debris can be washed into the public right of way when piles and loading areas are located in close proximity to the street or driveway.

population is 39% of Hispanic origin; the remainder (all non-Hispanic) includes 4% white; 22% black; 24% Asian; and 11% other. 23% of residents live below the poverty level, compared to 14% of residents in Queens, and 20% citywide. The median household income is $39,316 for Jamaica, $56,780 for Queens and $51,865 for New York City. (26)

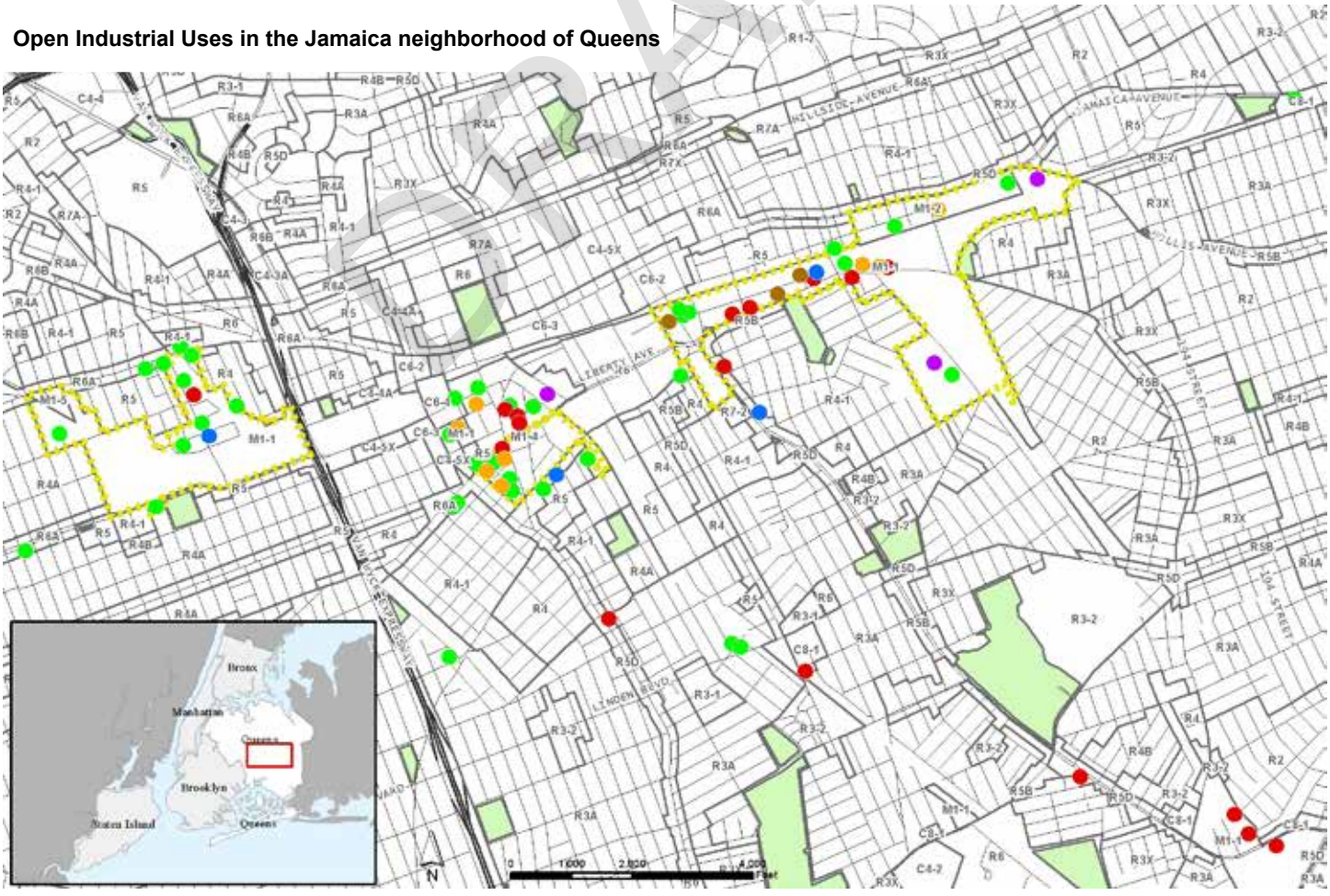
Table: Inventory of open industrial facilities in Jamaica, Queens

Use Type	# of Facilities	Avg. Site Size (sf)	Within 150' of R-dist.	Within 1/4 m of R-dist	Within IBZ	Within 100-year Flood Zone
Auto Dismantling	18	15,063	11	18	7	-
C&D Waste Transfer	3	47,332	3	3	3	-
Concrete & Asphalt	9	34,103	4	9	7	9
Scrap Metal Processing	4	19,768	3	4	2	-
Unenclosed Storage	38	19,087	24	38	17	-
Waste Recycling	3	49,932	2	3	2	-
TOTAL	**75**	**22,323**	**47**	**75**	**38**	**9**

Map Key

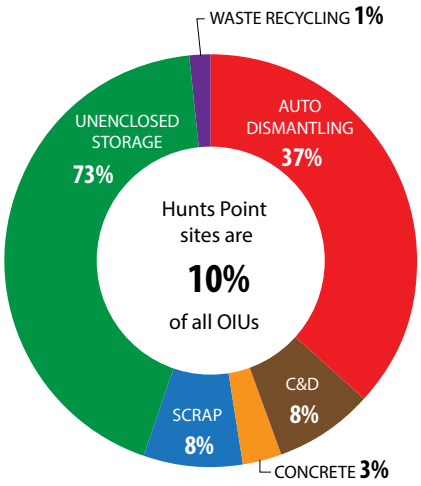
- Auto Dismantlers
- C&D Transfer Stations
- Concrete or Asphalt Manufacturing
- Scrap Metal Processors
- Unenclosed Storage
- Waste Recycling
- FEMA Preliminary Work Maps 100-Year Floodplain
- Park
- Zoning Districts
- IBZ Boundaries

Open Industrial Uses in the Jamaica neighborhood of Queens



Data Source: DCP 2013 Survey of Open Industrial Facilities in New York City

NEIGHBORHOOD
HUNTS POINT, BRONX



Hunts Point in the Bronx is a nearly 690-acre peninsula at the confluence of the Bronx River and East River. Since the early 1900s, the area has been one of the City's prominent industrial areas. Currently, approximately half the peninsula houses the Hunts Point Food Distribution Center, which is one of the largest of its kind in the world. Although most of the land area is dominated by industrial activities, there is a stable residential neighborhood in the northern half of the peninsula. While the open industrial uses in Hunts Point are located farther from residential areas than in other neighborhoods and all are within the Hunts Point Industrial Business Zone, 60 percent are within one quarter mile (1,320 feet) of a Residence District. Eighty percent of the identified uses are either auto dismantling or unenclosed storage, while the other use types are near equally distributed. Second to Jamaica, these facilities also have small average and median site size. This point informs the fact that field surveys identified many businesses operating outside of their tax lot and working in the street and sidewalk. Despite the close proximity to the coast, only 8 percent of the facilities are located within the 100-year flood plain according to FEMA's Preliminary FIRMs.

Hunts Point (Bronx census tracts 93, 115.02, and 117) is home to 12,281 individuals. The population is 71 percent of Hispanic origin; the remainder (all non-Hispanic) is 26 percent black; and 1 percent Asian, 1% white, and 1% other. 44 percent of residents live below the poverty level, versus 29 percent of residents in the Bronx, and 20 percent citywide. The median household income is $23,561 for Hunts Point, $34,300 for the Bronx and $51,865 for New York City. (26)

Auto dismantling facilities are prevalent throughout Hunts Point, as are unenclosed storage facilities. Photo: Auto dismantling facility in Hunts Point.

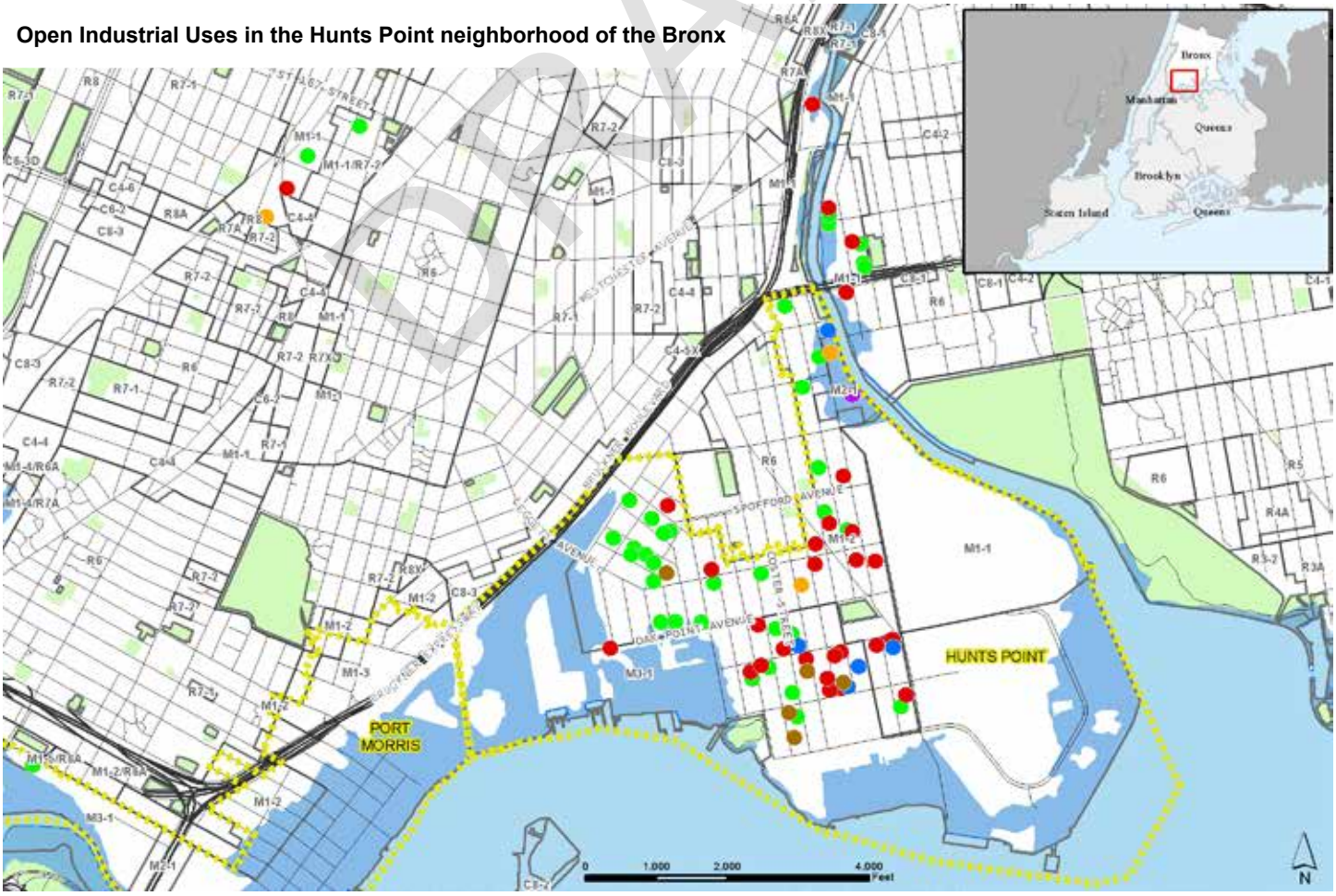
Table: Inventory of open industrial facilities in Hunts Point, Bronx

Use Type	# of Facilities	Avg. Site Size (sf)	Within 150' of R-dist.	Within 1/4 m of R-dist	Within IBZ	Within 100-year Flood Zone
Auto Dismantling	24	17,878	2	11	24	-
C&D Waste Transfer	5	25,324	-	1	5	-
Concrete & Asphalt	2	37,631	-	2	2	2
Scrap Metal Processing	5	43,788	-	2	5	1
Unenclosed Storage	28	19,869	2	23	28	2
Waste Recycling	1	215,063	-	1	1	1
TOTAL	**65**	**24,943**	**4**	**40**	**65**	**6**

Map Key

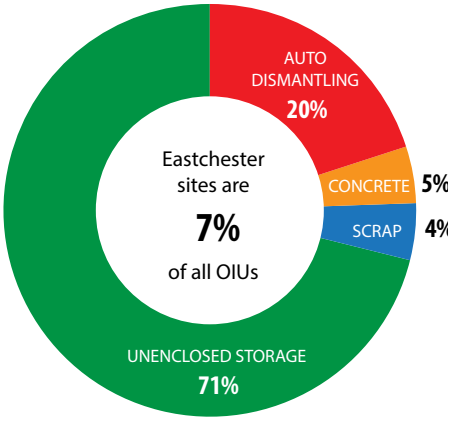
- Auto Dismantlers
- C&D Transfer Stations
- Concrete or Asphalt Manufacturing
- Scrap Metal Processors
- Unenclosed Storage
- Waste Recycling
- FEMA Preliminary Work Maps 100-Year Floodplain
- Park
- Zoning Districts
- IBZ Boundaries

Open Industrial Uses in the Hunts Point neighborhood of the Bronx



Data Source: DCP 2013 Survey of Open Industrial Facilities in New York City

NEIGHBORHOOD
EASTCHESTER, BRONX



Eastchester is a modest-sized neighborhood in northeast Bronx of approximately 0.6 square miles that shares a border with Westchester County. Eastchester is one of the smallest neighborhoods identified in the study, while also having one of the highest densities of open industrial uses. There are no C&D waste transfer stations or waste recycling facilities in this area, but there are two above average size concrete and asphalt manufacturing facilities, an above average size scrap metal processor, two smaller scrap metal processors, and the rest are average size unenclosed storage facilities. There is also a significant number of slightly below average size auto dismantlers that are clustered in an area west of the Hutchinson River and to the north and south of Boston Road. Many auto dismantlers are located on Heathcote Avenue and Peartree Avenue, which field surveys identified as lacking basic infrastructure, such as sidewalks and road paint. Issues such as these have fueled concerns about the industry from the Eastchester Brownfield Opportunity Area (BOA) effort led by the South Bronx Overall Economic Development Corporation.

Forty-four out of the forty-six sites in this neighborhood are located within manufacturing districts, primarily M1, and are within a distance of one quarter mile (1,320 feet) of residential areas. The remaining two facilities are non-conforming unenclosed storage in residential districts. All auto dismantlers, concrete and asphalt manufacturers, and scrap metal processors are located within the Eastchester Industrial Business Zone (IBZ), while 35 percent of unenclosed storage sites are found in the IBZ. Overall, only 20 percent of the Eastchester open industrial uses are within the 100-year flood plain according to FEMA's Preliminary FIRMs.

Unenclosed storage is prevalent in Eastchester, where there are also many unpaved streets.

Eastchester (Bronx census tracts 456, 462.01, 462.02, and 484) is home to 41,359 people. The population is 26 percent of Hispanic origin, while the non-Hispanic population is 62 percent black; 9 percent white; 1 percent Asian and 2 percent other. 13 percent of residents live below the poverty level, compared to 29% across the Bronx. The median household income is $46,654, which is greater than the borough-wide median of $34,300 and slightly less than the New York City median of $51,865. (26)

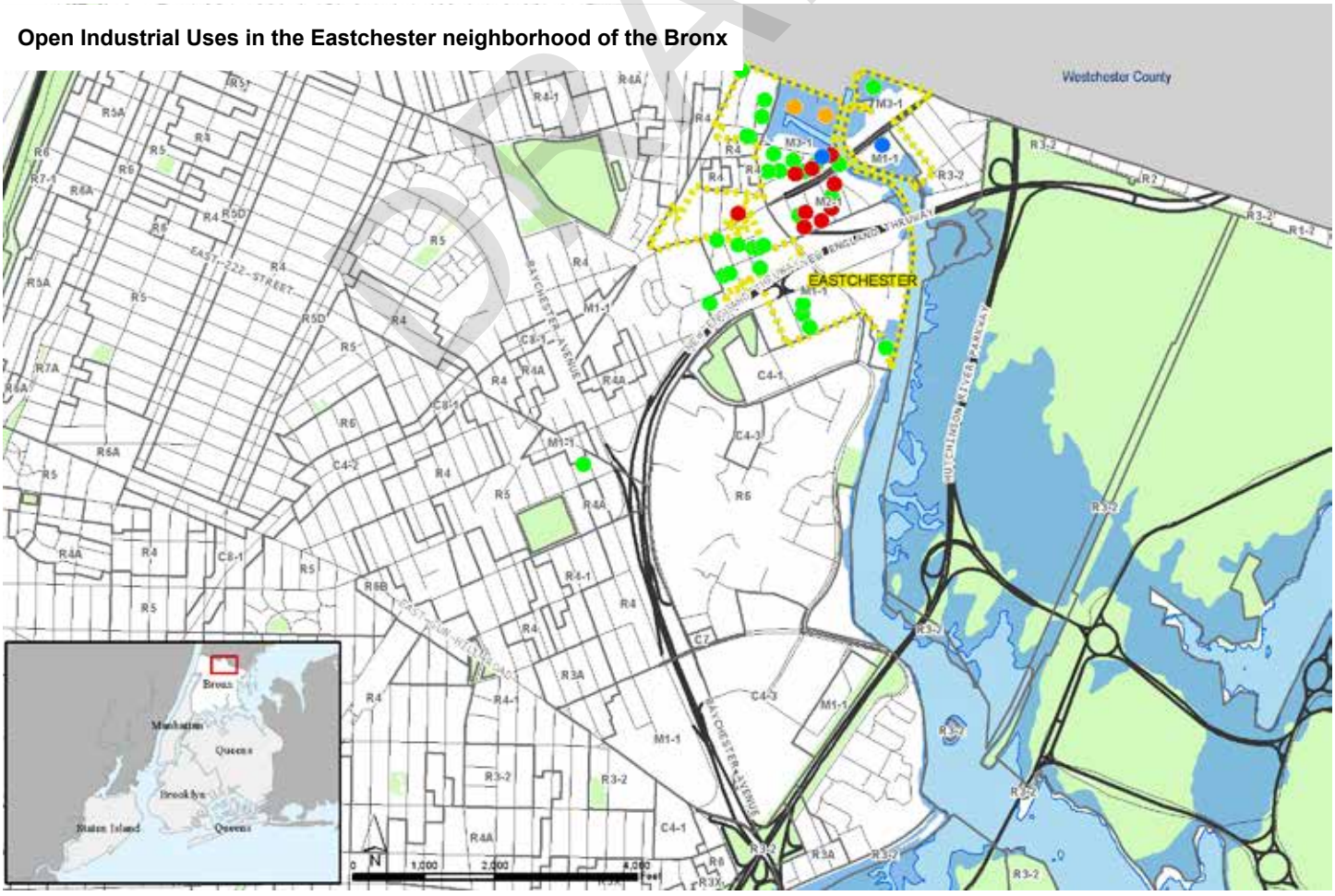
Table: Inventory of open industrial facilities in Eastchester, Bronx

Use Type	# of Facilities	Avg. Site Size (sf)	Within 150' of R-dist.	Within 1/4 m of R-dist	Within IBZ	Within 100-year Flood Zone
Auto Dismantling	9	23,958	-	9	9	1
Concrete & Asphalt	2	190,783	-	2	2	2
Scrap Metal Processing	2	316,749	1	2	2	2
Unenclosed Storage	32	25,000	10	32	10	4
TOTAL	**45**	**45,127**	**11**	**45**	**23**	**9**

Map Key

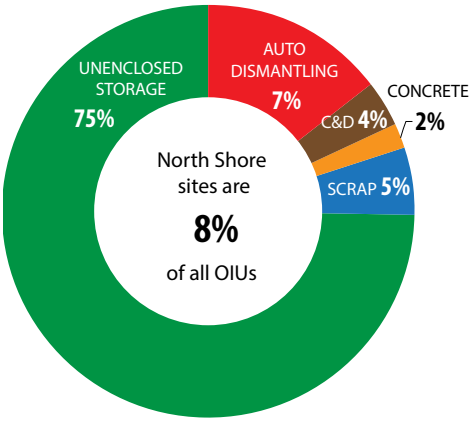
- Auto Dismantlers
- C&D Transfer Stations
- Concrete or Asphalt Manufacturing
- Scrap Metal Processors
- Unenclosed Storage
- Waste Recycling
- FEMA Preliminary Work Maps 100-Year Floodplain
- Park
- Zoning Districts
- IBZ Boundaries

Open Industrial Uses in the Eastchester neighborhood of the Bronx



Data Source: DCP 2013 Survey of Open Industrial Facilities in New York City

NEIGHBORHOOD
NORTH SHORE, STATEN ISLAND



The most diverse range of development in Staten Island is found within its North Shore. This working waterfront area includes various industrial maritime activities that rely heavily on barge transportation and operate in close proximity to historic commercial and residential neighborhoods. Of particular concern are the heavy manufacturing districts (M3) near residential areas.

With an average site size of over 63,000 square feet and a median size of over 30,000 square feet across all use categories, facilities on the North Shore operate on the largest area of land compared to the other regions. With such large site sizes, business activity spilling into the street is less of a concern when compared to other study areas. In addition to having the largest site areas, these facilities also operate in close proximity to Residence Districts with 73 percent within 150 feet and more than 98 percent located within one-quarter mile (1,320 feet) of a Residence District. Although most sites are close to residential areas, 90 percent are located within manufacturing districts (primarily M3). Furthermore, of the study areas, the North Shore also has the highest number of facilities (25) located within the 100-year flood plain according to FEMA's Preliminary FIRMs. This raises some environmental concern, as the bulkheads along the waterfront are frequently in disrepair. The neighborhood is dominated by unenclosed storage facilities, followed by six dismantlers and one each of the other use types.

The North Shore is dominated by unenclosed storage facilities, followed by less than ten auto dismantlers and even fewer of the other use types.

Image courtesy of Mitch Waxman

The North Shore (Staten Island census tracts 7, 9, 11, 67, 75, 77, 81, 97, 105, 125, 133.01, 133.02, 141, 201, 207, 213, 223, 231, 239, 247, 319.01, 319.02)) is home to 80,424 people. The population is 36 percent of Hispanic origin; the remaining non-Hispanic population includes 28 percent black; 28 percent white; 5 percent Asian; and 3 percent other. 24 percent of residents live below the poverty level, compared to 11 percent of Staten Island's population and 20 percent citywide. The median income is $49,963 for the North Shore, $73,496 for Staten Island, and $51,865 for New York City. (26)

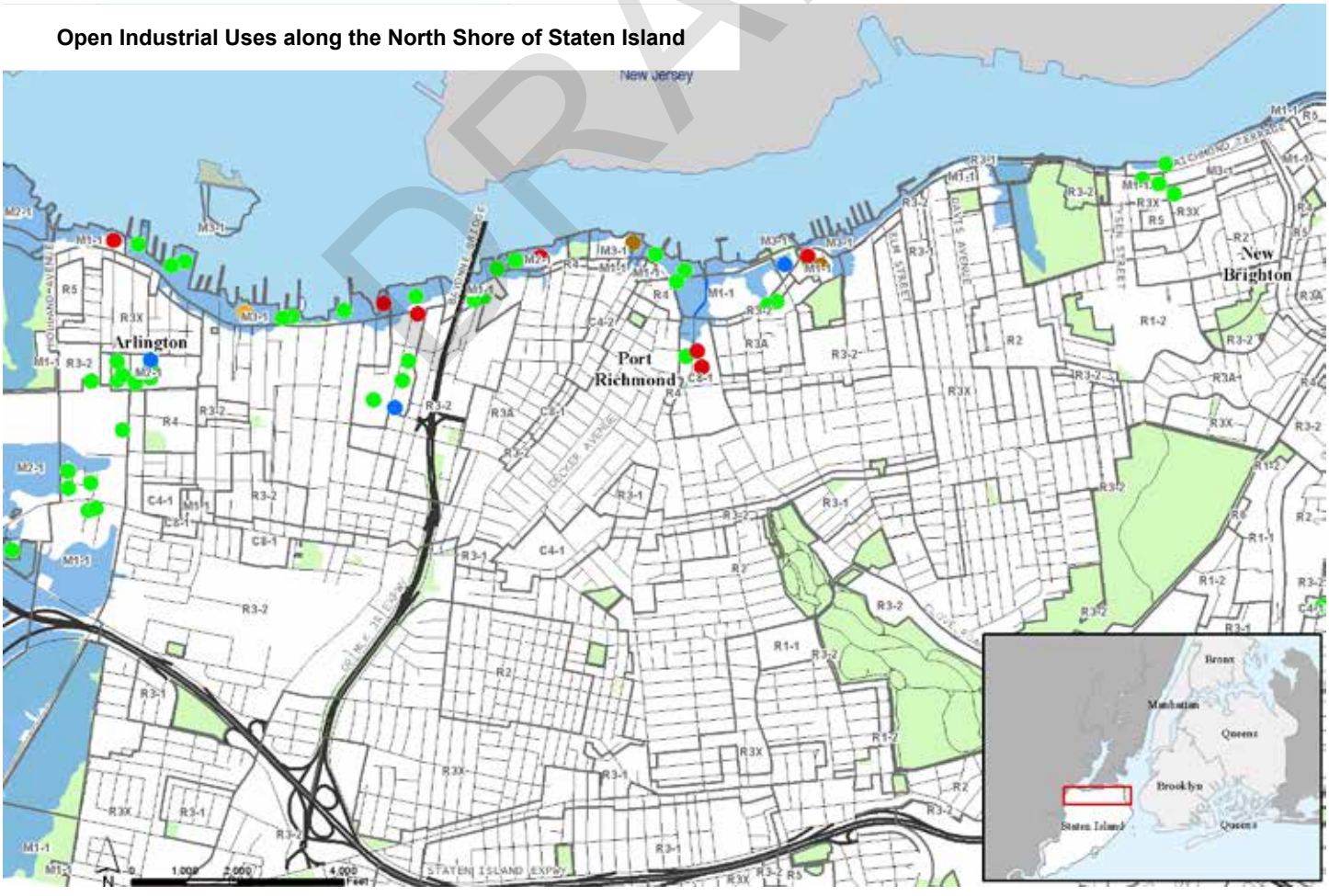
Table: Inventory of open industrial facilities on the North Shore of Staten Island

Use Type	# of Facilities	Avg. Site Size (sf)	Within 150' of R-dist.	Within 1/4 m of R-dist	Within IBZ	Within 100-year Flood Zone
Auto Dismantling	8	70,243	6	8	-	6
C&D Waste Transfer	2	82,295	1	2	-	1
Concrete & Asphalt	1	29,036	1	1	-	1
Scrap Metal Processing	3	46,407	3	3	-	1
Unenclosed Storage	41	63,428	29	40	-	16
TOTAL	**55**	**63,551**	**40**	**54**	**-**	**25**

Map Key

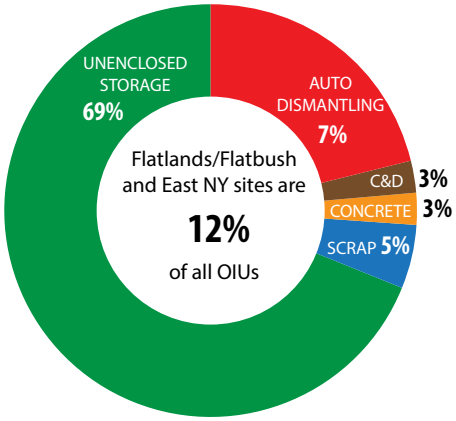
- Auto Dismantlers
- C&D Transfer Stations
- Concrete or Asphalt Manufacturing
- Scrap Metal Processors
- Unenclosed Storage
- Waste Recycling
- FEMA Preliminary Work Maps 100-Year Floodplain
- Park
- Zoning Districts
- IBZ Boundaries

Open Industrial Uses along the North Shore of Staten Island



Data Source: DCP 2013 Survey of Open Industrial Facilities in New York City

NEIGHBORHOOD
FLATLANDS, & EAST NEW YORK, BROOKLYN



The Flatlands and East New York neighborhoods of eastern Brooklyn are predominantly low-income and mixed-use areas. In East New York, the Department of City Planning is conducting a study funded by a U.S. Department of Housing and Urban Development Sustainable Communities grant that seeks to capitalize on the large amounts of vacant and underutilized land, as well as its transit-rich opportunities (LIRR and multiple subway lines), to develop affordable housing and better access to retail and services.

This area contains the second largest number (after the Newtown Creek area) of open industrial uses and the second largest number of facilities in an Industrial Business Zone (IBZ). Similar to other neighborhoods, there are far fewer unenclosed storage facilities in the IBZ compared to the other use types. Open industrial uses in this area are predominantly (86 percent) located in M1 districts, all of which are within one-quarter mile (1,320 feet) of a Residence District and half are within 150 feet. Facilities in this area represent the second highest percentage (8 percent), after Jamaica, of sites in a Residence District. Behind Jamaica and Hunts Point, the overall average and median site size of facilities in the neighborhood is the third smallest. By industry, auto dismantlers and scrap metal processors are operating on above average size areas of land, while the sizes of the other use types are below average. Because of the inland location of the neighborhood, none of the facilities are within 100-year flood plain according to FEMA's Preliminary FIRMs.

Flatlands (Brooklyn census tracts 650, 672, 674, 676, 678, 680, 682, 688, 690, 692, 720, 722, 724, 726, 728, 730, 732, 734, 736, 738, 740, 742, 744, 746, 776, 944.01, 944.02)

By industry, auto dismantlers and scrap metal processors are operating on above average size areas of land, while the sizes of the other use types are below average. Because of the inland location of the neighborhood, none of the facilities are within the FEMA preliminary 100-year flood plain.

and East New York (Brooklyn census tracts 1070, 1078, 1098, 1104, 1106, 1110, 1116, 1118, 1120, 1124, 1150, 1152, 1160, 1162, 1164, 1166, 1168, 1170, 1192, 1194, 1196, 1198, 1200, 1208, 1210, 1214, 1220) are home to 156,720 residents (64,762 in Flatlands and 91,958 in East New York). The population is 21% from Hispanic origin; the remaining non-Hispanic population is 65% black; 8% white; 3% Asian; and 3% other. 11% of residents in Flatlands live below the poverty level, compared to 33% in East New York. Combined, 24% of residents in these neighborhoods live below the poverty level, which is equal to the 24% found across Brooklyn. Median household income is $45,215 across Brooklyn. It is $61,935 in Flatlands, $33,177 in East New York, and $51,865 in New York City. (26)

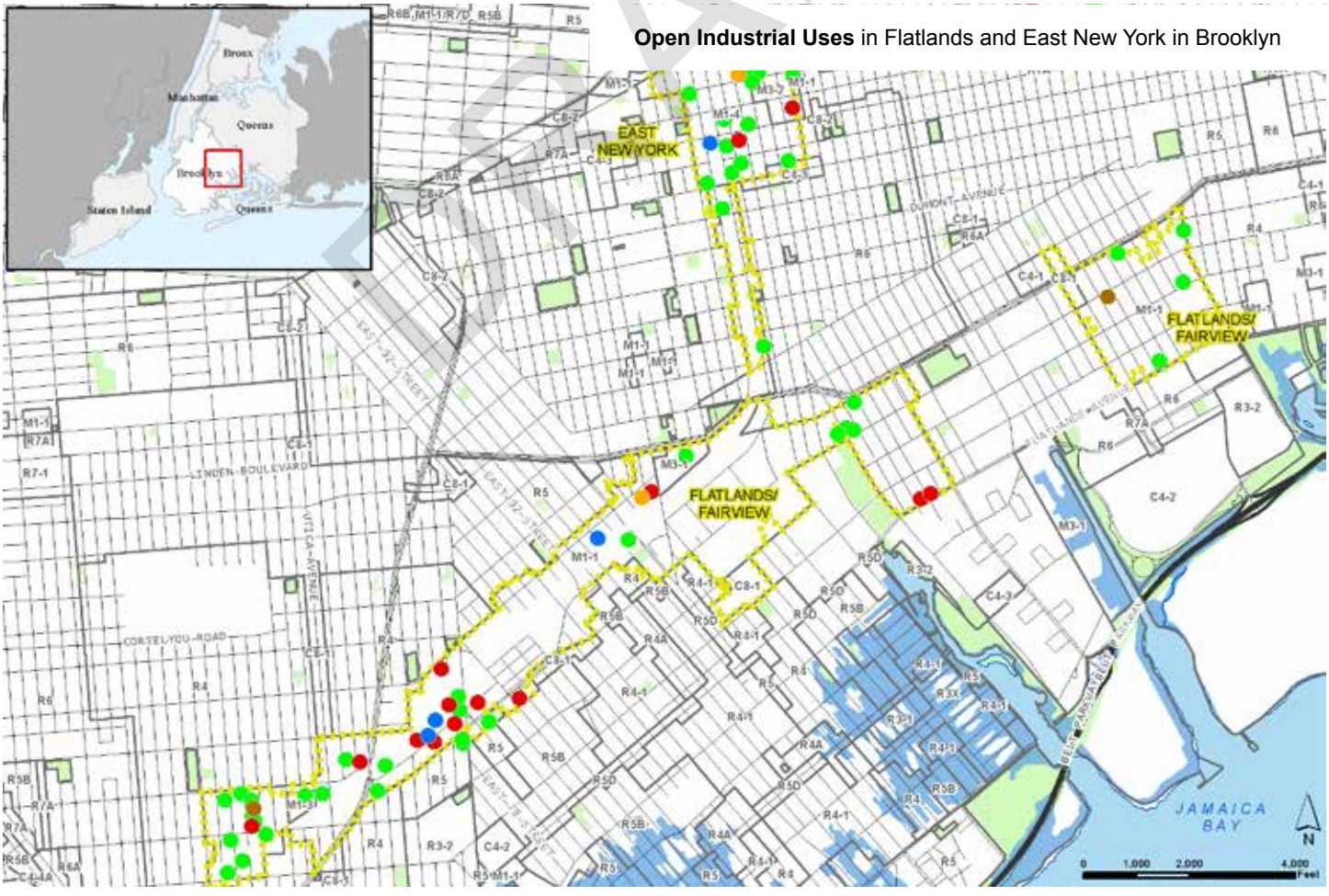
Table: Inventory of open industrial facilities in Flatlands and East New York in Brooklyn

Use Type	# of Facilities	Avg. Site Size (sf)	Within 150' of R-dist.	Within 1/4 m of R-dist	Within IBZ	In 100-year Flood Zone
Auto Dismantling	17	29,816	9	17	14	-
C&D Waste Transfer	2	29,113	-	2	2	-
Concrete & Asphalt	2	36,208	-	2	2	2
Scrap Metal Processing	4	101,221	-	4	4	-
Unenclosed Storage	55	29,525	30	55	38	1
TOTAL	80	33,328	39	80	60	3

Map Key

- Auto Dismantlers
- C&D Transfer Stations
- Concrete or Asphalt Manufacturing
- Scrap Metal Processors
- Unenclosed Storage
- Waste Recycling
- FEMA Preliminary Work Maps 100-Year Floodplain
- Park
- Zoning Districts
- IBZ Boundaries

Open Industrial Uses in Flatlands and East New York in Brooklyn



Data Source: DCP 2013 Survey of Open Industrial Facilities in New York City

ENVIRONMENTAL CONCERNS

In the summer of 2011, planners from the Department of City Planning (DCP) conducted field surveys of the areas where concentrations of OIUs were known to exist. The surveys sought to catalog the types of open uses in the city's industrial areas, as well as document their characteristics (i.e. lot size, intensity of use) and investigate quality of life complaints expressed by local communities. The following describes some of the quality of life conditions that were noted at the over 600 sites surveyed by DCP in 2011.

Construction and Demolition Debris
Some sites surveyed were found to be too small to accommodate adequate space for trucks. Surveyors also witnessed fugitive dust and partially paved sites. Many sites were too small for onsite queuing, resulting in trucks blocking traffic and sidewalks.

Auto Dismantlers
Scrapped cars were often stockpiled on unimproved and waterfront sites, which often have poorly maintained bulkheads. Facilities were unenclosed with dismantling operations occurring on unpaved surfaces. Surveyors noticed that these facilities were often unpaved and had pools of standing liquid. In many instances, piles exceeded fence heights and in some cases operations occurred on public sidewalks and streets, beyond the lot boundaries.

Scrap metal
Activity occurred on small sites resulting with large stockpiles of metal. Scrap metal processors often had pile heights above fence heights, as well as little or no paving.

Recyclables
Dumping, sorting and bailing of recyclables, such as metal, glass and plastic containers or paper and cardboard often occurred in open yards. Blowing debris often surrounded sites. Onsite pooling of storm water and runoff from operations was also a common observation.

Certain issues are conditions unique to NYC - High density, small sites, absence of buffering adjacent to residences, tendency of open industrial uses to locate in flood zones.

Cement and Asphalt Products Manufacturing

Many surveyed sites lacked enclosed truck washing facilities. The lack of fencing and containment witnessed on many waterfront sites poses increased risk of aggregate, such as concrete, sand, lime and asphalt, blowing into waterways. Surveyors observed instances of uncontained dust and wash water, often tracked off the site and into the street and sewers.

Unenclosed active storage of usable materials

These sites stored usable materials such as granular or particulate materials, petroleum or petroleum products or heavy metals or toxic materials that may be used frequently by construction, maintenance and contracting companies. These sites were often unpaved. There were primarily two categories of concern at these facilities: potentially hazardous materials and contaminants and piles of raw or semi-processed materials that can be a source of dust. This includes aggregate, salt piles and hazardous materials contained in drums. Many sites storing or using petroleum products often show evidence of stained surfaces from leaking equipment. On sites prone to flooding, any of the above materials could be carried off site into adjacent residential areas or waterways. These sites may also store more inert materials that are non-hazardous and include wooden pallets, lumber, operable construction vehicles, equipment and similar uses. These materials are not inherently dangerous, but if conveyed off-site by wind or water, they may become hazardous debris.

PRECEDENTS: OTHER U.S. CITIES

Zoning is the primary tool used by municipalities across the country to regulate land use. Zoning regulations can complement or address gaps in other city, state or federal regulations affecting the industries addressed in this study, or can be used as a tool for buildings or zoning inspectors to verify compliance with other regulations at the time of occupancy. Special zoning regulations to address the potential impacts associated with unenclosed industrial uses like those identified in this study are common among many U.S. cities, setting standards for performance, design, operation, parking, loading and permitted locations, among other requirements. Almost none are as permissive as those in New York City with regard to where they are permitted and the level of public review, which allows most of them as-of-right (no public review) in all manufacturing districts provided that performance standards are met.

A review of zoning codes for peer cities – populous, dense, industrial cities with a concentration of the industries where open uses concentrate – reveals that cities tend to take a combination of three approaches to land use regulation for open uses: concentrate in limited, isolated locations; permit but very closely regulate through conditional use permits that allow for broad conditions to be placed on projects and require public review; and outright prohibitions on new unenclosed establishments. While few if any cities prohibit asphalt and concrete manufacturing, rarely are they allowed anywhere but in limited and isolated heavy manufacturing districts. The same is true of unenclosed scrap metal processing, vehicle dismantling, construction and demolition debris transfer and waste recycling – a group of uses collectively defined in many zoning codes as “junkyards”. Newark, New Jersey has for years prohibited all new “materials salvage yards” and “junkyards” . (27)

Other cities have adopted or proposed new zoning regulations that, while seeking to limit or control the operations of open uses, also acknowledge that these uses are more than junkyards and in fact represent a number of industries of growing importance as urban populations grow and public policies seek to promote and even require recycling. Several cities have recently adopted more contemporary codes that acknowledge the various activities occurring on these sites as well as address contemporary planning concerns related to air and water quality, waste management and flood resilience.

When Chicago revised its entire zoning code in 2004, five categories of recycling facilities were established to address most of the open uses in this study. They classify facilities by a range of five facility classes where the least impactful (Class I, those that involve only recyclables collection and minimal processing) are permitted in most industrial districts, while the most objectionable (Class IV and V, involve heavy processing including auto crushing and shredding or the processing of construction and demolition debris) are permitted as-of-right in only heavy manufacturing districts. Lower impact classes of recycling facilities are allowed by the zoning in some light manufacturing districts as conditional uses . (28)

Los Angeles takes an approach to regulating open uses that is, like Chicago, more nuanced in its definitions and regulations, but, like New York City, is more permissive in where they may locate. The city has adopted several categories of recycling facilities that are permitted as-of-right in M2 (Light Industrial) and M3 (Heavy Industrial) districts, with the less intensive uses permitted in other commercial and mixed commercial and industrial zones as conditional uses . (29) Similar to New York City, M2 and M3 districts in Los Angeles allow more potentially noxious uses than other manufacturing and commercial zones in order to limit conflicts between uses. Recycling facilities

that involve processing are permitted only in M2 and M3 districts. All of these facilities are required to demonstrate that they will meet specific management practices to minimize pollution, provide a source of running water on site and utilize wind or dust mitigation measures to prevent blowing debris. If these conditions cannot be met, a conditional use permit is required. Los Angeles permits auto dismantling, junkyards, and open materials storage as-of-right in M2 and M3 districts, but limits scrap metal processing to M3 districts. Los Angeles monitors this relatively permissive land use regime through annual inspections of most open industrial uses.

Among the more restrictive contemporary codes for open uses is the proposed new zoning code for Baltimore, Maryland. An overhaul of that City's zoning code currently under review by Baltimore's City Council also reconsiders the definitions and regulations for open industrial uses. Under that proposed code, the City plans to ban all new "junk or scrap storage yards" and "vehicle dismantling facilities" , although pre-existing uses would be able to expand by up to 25 percent in land area provided that the site meets requirements for storm water pollution controls and the operator submits a pollution prevention plan for city and state review . (30) (31) Although Baltimore would permit unenclosed recycling collection facilities in all industrial and some commercial districts as a conditional use, all facilities that process recyclables would be permitted only within fully enclosed facilities in industrial districts. In the interest of protecting the Chesapeake Bay and other surrounding waterways, Baltimore plans to prohibit new construction and demolition debris processing facilities and the outdoor storage within the 100-year floodplain of materials that are buoyant, flammable or explosive within the 100-year floodplain. (32)

Many open industrial businesses are water- dependent uses, such as this C&D facility along Newtown Creek in Queens.

Few of the cities reviewed use performance standards to regulate industrial uses, although some, such as Los Angeles, do include them in a limited way for specific uses (such as noise limitations for scrap metal processors) in conjunction with other site design standards and restrictions.

Image courtesy of Mitch Waxman


300LCV

Chapter 3: STORMWATER

ENVIRONMENTAL CONCERNS

New York City owes its existence to its location on New York Bay at the convergence of the Hudson and East Rivers. The city's extensive coastal and riverine urban area includes 520 miles of shoreline. Accordingly, the quality of the city's surface water resources has significant implications for public health, ecological diversity, recreation, and commerce and city finances. Moreover, a portion of the city has an important groundwater supply in the form of a sole source aquifer for drinking water, while other parts of the city have other groundwater resources that require protection under federal and state law. Protecting and restoring water quality and proper urban stormwater management are challenging issues for the city, as increases to impervious surface areas from new development contribute to polluted runoff. Although New York Harbor and its tributaries are the cleanest they have been in 100 years, the New York State Department of Environmental Conservation (NYSDEC) reports that all major waterways in New York City continue to be listed in the New York State inventory of impaired waters (Listed Impaired Waters in NYS Section 303 (d)) including: New York Bay, Hudson River, East River, Harlem River, Raritan Bay, Arthur Kill, Newark Bay, Kill Van Kull, Bronx River, Erie Basin and the Atlantic Ocean Coastline in Queens. (34) 'Impaired waters' is a federal and state designation required by the Clean Water Act based on periodic assessments of water quality and where certain uses are not fully supported. According to the New York State Section 303(d) List of Impaired/ TMDL Waters, over 70 percent of New York City's waterways are contaminated as a result of urban stormwater runoff, or a combination of contaminated sediment and urban runoff, while the remaining 30% can be attributed to contaminated sediment from legacy pollutants.

While the pollutants in New York City's waterways come from a variety of sources, open industrial facilities can contribute to water contamination when stormwater runoff is exposed to unenclosed materials and activities. Stormwater runoff occurs when precipitation flows over impervious or semi-pervious surfaces rather than seeping into the ground. Runoff can pick up oils, grease, sediment, bacteria, debris, litter and other contaminants and convey them into a storm sewer, a combined storm and sanitary sewer or directly into coastal or riverine waters. Hazardous materials carried by stormwater can also leach into the soil or ground water, contaminating the soil and underground aquifers. This leaching of chemicals and other pollutants often occurs when dismantled cars and discarded appliances are stockpiled in scrap yards, and when wind and precipitation are exposed to amassed aggregate, materials, equipment and construction debris in open yards. Without proper controls, OIUs located adjacent to waterways or in flood zones pose further threats to coastal waters and tributaries during a severe storm or flood as a result of strong winds or elevated waters that can

Left: Facilities that are located along waterways pose increased hazards to water quality.

disperse unsecure materials offsite.

For example, after a one-inch rain event, a typical one-acre open industrial facility discharges 27,000 gallons of stormwater, potentially accumulating loose materials as it flows over the site. Citywide, open industrial facilities surveyed by the study cover approximately 700 acres of land, discharging 18,900,000 total gallons of stormwater runoff in a one-inch storm or 3,300 cubic feet per second of stormwater. (35) Depending on the uses and activities on the site, a variety of common non-point sources ("pollution [that] comes from many sources and is caused by rainfall or snowmelt moving over and through the ground that picks up and carries away natural and human-made pollutants, finally depositing them into lakes, rivers, wetlands, coastal waters and ground waters") contribute to stormwater pollution in runoff at OIU sites: (36)

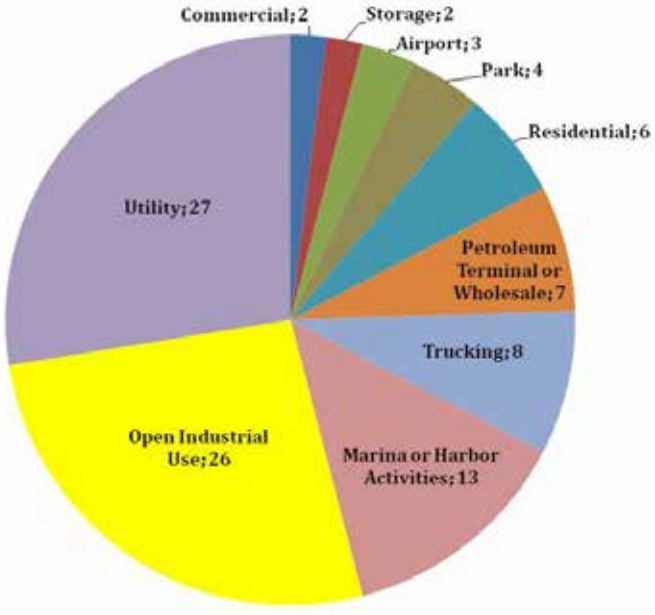
- Spilled motor fluids (oil, hydraulic fluid, coolants)
- Hazardous materials (batteries, chemicals, used parts)
- Bulk materials storage (salt, aggregates, compost, mulch, fertilizer)
- Vehicle wash water runoff

Under the current regulatory system, paved surfaces are not required (except for C&D facilities) and many open industrial sites are unpaved or loose gravel lots. The absence of an impervious surface with appropriately installed stormwater drainage can create a wide range of issues, such as inadvertently directing runoff into surface water or storm sewers, tracking mud and debris during wet weather onto adjacent streets or leaching chemicals into the ground. As such, many OIU sites that drain directly into the city's municipal sewer infrastructure are known to create costly maintenance problems; concrete dust and other particulate matter can block city drains triggering a system backup and flooding in the streets or on private property. By better controlling the pollution and sediment in stormwater runoff and leachate associated with the hundreds of OIUs throughout the city, New York City is expected to achieve an improvement in the water quality of its rivers, canals, wetlands, estuaries and harbor while also saving money on reduced fines and sewer maintenance costs.

CLEAN WATER ACT VIOLATIONS 2008-2013

Violations of the Federal Clean Water Act by Open Industrial Uses: Auto Dismantling, Concrete/Asphalt, Unenclosed Storage, and Scrap Processing.

Source: Clean Water Act Violations (NPDES Violations) courtesy of EPA ECHO Database.



Industrial stormwater runoff also poses environmental threats by contributing to Combined Sewer Overflows (CSOs). Sanitary wastewater flow volumes are relatively constant, but CSOs occur periodically when, during moderate rain or snow storms, the combined sewer system receives water volumes that exceed the system design capacity and untreated stormwater and wastewater overflow directly into the waterways through combined sewer outfalls.

The New York City Department of Environmental Protection (DEP) manages certain programs that control industrial pollutants in wastewater discharges to the sanitary sewer system and oversees the mandatory data collection and reporting on the storage of hazardous materials by land users in the city. DEP also maintains 70 sampling stations for water quality throughout the New York Harbor and reports the data annually in the New York Harbor Water Quality Report. In the 2012 issue of the aforementioned report, DEP states:

"…heavy metals and other toxic chemicals, such as cadmium and mercury, solvents and pesticides, enter our wastewater treatment plants every day. Many of these substances come from industries and business that dispose of chemicals in their wastewater as part of their regulated industrial processes. Some toxins in wastewater begin as air pollutants that have fallen to the ground and are carried by rain water to our plants and waterways. Wastewater treatment plants cannot destroy all of these substances so they remain in small amounts in the treated wastewater discharged to local waterways."

One of the primary aims of this study is to recommend measures that limit the dispersal of stormwater pollutants through the municipal sewer system that originate from open industrial facilities. The following section provides an overview of existing Federal, State and City environmental regulations as well as permitting requirements for industrial facilities. The remaining sections identify issues and regulatory gaps, and evaluate opportunities to strengthen compliance and local regulation.

REGULATIONS

Federal

The Clean Water Act was passed by U.S. Congress in 1972. It establishes authority for all national regulation of the discharge of pollutants from point sources into United States waters, and is the statutory basis for the National Pollution Discharge Elimination System (NPDES) permit program. The NPDES program controls water pollution by regulating point sources that discharge into waters of the United States , such as through pipes or trenches from municipal and industrial facilities. (37) The Clean Water Act also establishes effluent goals and limits for reducing high levels of toxic substances in the water to improve surface water quality for ecological, agricultural, and recreational purposes. The Act further provides authority to the States for the administration, permitting, and enforcement components of the NPDES program . (38) In New York State this is administered through the Department of Environmental Conservation State Pollution Discharge Elimination System (SPDES), as specified in the Environmental Conservation Law.

State

Currently, there are two types of permits that may apply to open industrial facilities – the individual SPDES or the Multi-Sector General Permit (MSGP). Most OIU categories under this study are included in the sectors of industrial activity covered

Water Quality Monitoring

The following organizations and programs provide additional resources on surface water monitoring and testing:

New York State Department of Environmental Conservation (NYSDEC)

As mandated under the Clean Water Act (CWA) Section 305(b) and Section 303(d), the agency produces a periodic water quality report that identifies waters of the state where water quality standards are not met and uses are not supported. The testing focuses on floatables, nitrogen and pathogens, and does not include specific industrial pollutants, such as heavy metals.

Contaminant Assessment and Reduction Project (CARP)

CARP is a cooperative effort of the States of New York and New Jersey, with assistance from EPA and the Army Corps of Engineers, as well as private scientists and engineers, to understand and to reduce contaminants in the New York – New Jersey Harbor. www.carpweb.org

Riverkeeper

This advocacy group tests river and harbor water and reports to the public through the Riverkeeper website on water quality and pollutants of concern. They provide up-to-date data on whether it is safe to swim, boat and fish. They also use their research to influence public policy and to litigate against potential polluters. Information from their water quality testing locations throughout the region is available online. In the past year, they have brought several lawsuits against open industrial operations sited on the waterfront for the dumping of contaminants through stormwater runoff.

by the MSGP permit and are required to seek appropriate coverage. According to DEC, few of these facilities, however, have individual SPDES permits, which are generally required for industrial facilities whose processes result in water discharge and not facilities where the discharge is limited to stormwater runoff. Under the terms of the MSGP permit, facilities are required to provide stormwater pollution prevention plans and annual monitoring reports of stormwater runoff conditions. Additionally, water treatment systems (i.e., oil/water separator, solid/water separator, etc.) and/or best management practices are encouraged to ensure that they meet the effluent limits established by the SPDES program. However this study has observed that a significant number of open industrial facilities do not comply with these conditions. A comparison of the total list of open industrial facilities in New York City with the list of MSGP or SPDES permit holders suggests that almost half of the facilities do not have this required permit. USEPA Enforcement and Compliance History database (ECHO) and NYSDEC permit compliance documentation also show that open industrial SPDES permit holders are frequently cited for permit violations when they exceed the effluent limits or fail to submit the required water quality reports. (39)

City

While the above State regulations apply to industrial facility discharges, nuances in the City's sewer system can also determine additional local regulatory requirements and appropriate abatement measures. For example, facilities draining to both the combined sewer system – which handles both sanitary waste and stormwater – as well as the separate sewer system – which includes a traditional sanitary sewage system that is connected to the City's wastewater treatment plants, and a second system that collects only stormwater runoff (i.e., MS4) which discharges to local waterways – are subject to DEP's Sewer Use Regulations, including the Industrial Pretreatment Program (IPP). IPP is a federally authorized program that works to control commercial discharges by requiring industries targeted by federal and local pretreatment regulations to remove specific toxins from their wastewater before it is released into the City's sewer system. There are approximately 300 sites in the program citywide, but only a handful of open industrial facilities are covered because few have process wastewater discharge entering a combined or sanitary sewer, though contaminated stormwater runoff may enter the sewer system otherwise (i.e., non-point source pollution). (40)

Facilities in both combined and separate sewer areas are also subject to the Sewer Certification and Sewer Connection Permitting Process to certify the adequacy of the existing abutting sewer to receive site storm and sanitary discharge from a development. A sewer certification is required for any new connection to a City sewer, a private sewer, a private drain, a septic system, or an approved outlet.

However, new development or redevelopment sites draining to the combined sewer system would also be subject to the Rules Governing House/Site Connections to the Sewer System (Amendment of Title 15, Rules of the City of New York). Thus, any horizontal building enlargement or proposed increase in impervious surface (as defined in the City's Construction Codes) would be subject to stricter release rates to the abutting combined sewer and, thus, greater increased onsite storage of rainwater. Such measures create additional capacity in the combined sewer system, thereby reducing the volume and frequency of CSOs.

Finally, NYSDEC is in process of issuing a SPDES permit for stormwater discharges from MS4s owned and operated by the City of New York. The intent of this SPDES permit is to manage urban sources of stormwater runoff to protect overall water quality

and improve water quality in impaired waters (i.e., those which can receive runoff from the MS4). Among the requirements of the MS4 permit, the City would be responsible for enforcement of the aforementioned MSGP program, and would also develop a plan to require unpermitted industrial and commercial facilities within MS4 areas that generate significant contributions of pollutants of concern to impaired waters to gain appropriate permit coverage. The permit does not cover areas of the City serviced by the combined sewer system, as storm and wastewater carried through that system flows to wastewater treatment plants and are covered under a separate permit. The OIUS interagency working group has coordinated the recommendations of this study to ensure that any proposed regulatory amendments will assist with future MS4 compliance.

ISSUES

Zoning performance standards do not include stormwater controls

Stormwater management criteria are not currently listed among the Zoning Performance Standards, yet polluted stormwater runoff is well documented from open industrial sites.

Standard operating procedures (SOPs) and best management practices (BMPs) are not common practice at open industrial facilities

Operational procedures and protocols can significantly reduce the risk for air pollutants and stormwater pollutants to be released into the environment; however, they are difficult to regulate and enforce (i.e. the use of spill pads during equipment maintenance, or taking care when draining and transferring automotive fluids to prevent spills). Outreach to businesses as part of the proposed package of recommendations will also aim to educate businesses on SOPs and BMPs to reduce pollution.

Many facilities do not comply with existing regulations and enforcement is challenging

Between 2008 and 2013, the EPA enforced against almost 100 violations of the Federal Clean Water Act in New York City. A quarter of those violations were attributed to open industrial facilities: auto dismantlers, concrete or asphalt manufacturers, scrap metal processors and unenclosed storage facilities. In a one-year period from 2011 to 2012, of violations for exceeding allowable effluent limits established in the MSGP permit approximately 50 percent were from OIUs sites. The majority of such facilities were auto dismantlers. At the time of this study, fewer than 30 percent of OIU facilities surveyed by DCP that discharge either directly to receiving waters (i.e., without a sewer connection) or through the MS4 actually held MSGP or individual SPDES permits. This suggests that many existing OIU facilities are not complying with any permit requirements set by the federal or state laws, and those that do participate in the programs may be having difficulty meeting the requirements.

Existing programs do not monitor for many toxic substances used at OIU sites

The SPDES program focuses on specific pollution sources, such as legacy pollutants (such as PCBs), oil and grease and microbes or bacteria, while testing for some heavy metals, toxic substances and hazardous materials is not performed regularly. Individual SPDES stormwater permits typically set standards for oil and grease and total suspended solids (sediment), but many OIUs lack such permits. Water quality testing is also provided more broadly by NYSDEC, DEP, and Riverkeeper (a non-governmental organization), yet there is a need for still wider testing and monitoring of the quality of stormwater discharges from OIUs, especially for heavy metals, petroleum and other contaminants from industrial facilities.

FINDINGS OF THE STUDY

This study identified a range of controls commonly incorporated at industrial sites that are designed to manage stormwater runoff and reduce off site impacts to water quality without duplicating measures and controls required by the SPDES stormwater regulations. This includes both physical infrastructure controls and operational standard operating procedures (SOPs) or best management practices (BMPs). Many industry associations have identified specific BMPs for limiting environmental impacts. Recommended best practices for industrial stormwater management nationwide were derived from existing national regulations, state permitting programs and other publications that describe SOPs, such as "Developing Your Stormwater Pollution Prevention Plan: A Guide for Industrial Operators" issued by the EPA. (41) The EPA and NYSDEC also publish industry-specific requirements and compliance guidelines, such as the DEC guide "Environmental Compliance and Pollution Prevention Guide for Automobile Recyclers." (42) The study also consulted similar programs in other states or municipalities where comprehensive stormwater management programs have been deployed, such as in the States of New Jersey, Oregon and Washington.

Recommended stormwater management infrastructure typically includes sufficient drains or conveyance trenches to collect and carry stormwater to detention basins, and treatment and filtration equipment. At a minimum, all OIU sites in the City should be required to connect to the nearby stormwater sewer system (whether separate or combined), whenever available and feasible. Common stormwater management practices for industrial operations involving onsite retention and greywater reuse may result in further soil and groundwater contamination on industrial sites without proper treatment. Such practices should be reviewed on a case by case basis to determine whether they are appropriate.

Appropriate filtration and treatment equipment for stormwater is highly encouraged at open industrial use facilities. When determining the type of water treatment system, for example an oil/water separator or a solid/water separator, the anticipated activities at the OIU site should dictate the selection. For example, a C&D/non-putrescible waste site would benefit more by having a solid/water separator, while an auto dismantling site where more oil and other petroleum products would be expected, should have an oil/water separator. The MSGP also provides industry-specific best practices that should be considered when developing a SWPPP.

Engineering techniques and site design can be employed to minimize the volume of stormwater runoff to be treated at specific facilities. Installation of treatment equipment can catch pollutants prior to their discharge from the site, but are only effective if regularly maintained. Typically, the tank sizes of oil/water and solids/water separators are based on the surface area to be treated based on a 10-year rainfall event (about 2 inches per hour). Thus, the more surface where stormwater runoff is exposed to potential contaminants (whether solids or petroleum products), the larger the tank capacity will be. Paving sites and controlling site runoff through treatment systems reduces discharges to soils, groundwater, surface water bodies and the combined sewer system. Paving will additionally reduce the spread of contaminated particulate matter. Chemicals in the DERTA list could additionally be classified and regulated in a similar fashion to flammable materials on the Fire Department's list which must be in enclosed non-combustible structures. This would ensure the highest level of protection for the most hazardous materials.

"Green infrastructure" typologies were also analyzed as possible stormwater management infrastructure approaches. Unlike typical piped drainage systems, green

CATEGORIES OF POLLUTION PREVENTION CONTROL

pave/grade

treatment of the ground's surface to minimize tracking of dirt and dust from the site, channel storm/waste water on the site, and form a more protective barrier protecting the soil and ground water contamination from leachate.

elevate

raise operations or materials by increasing the base land elevation or mounting

stabilize/reinforce

soil confinement structures, retention systems or vegetative frameworks that mitigate and guard against erosion or sediment deposition

conveyance/flow

infrastructure that moves or controls the movement of water such as gutters, trenching, swales and hydraulic fixtures

infiltrate/discharge

systems and technologies designed to capture, detain/retain, filter , stratify liquids, and/or control the outflow or release of water from the facility site

risk assessment

Steps evaluating the potential risks and hazards at a given location

clean up procedures

Procedures pertaining to the clean up of a hazardous spill

proper handling of materials

Process or operational procedures and practices pertaining to the handling of materials, aimed at preventing spills or

locate

defines parameters for entry and exit points, as well as parking and loading/unloading

shield or suppress

installation of a protective material, construction, planting or system that inhibits or deflects the diffusion of airborne vectors, pollutants, debris, and/or sound.

buffer

placement of equipment or activities from sensitive receptors to lessen noise or air quality impacts

perimeter

Vertical treatments including fences, walls, hedges or other barriers (permanent)

cover

application of a protective material or structure other than a building to reduce dispersal by gravity, water runoff, and wind

intercept

positioning a material or system that prevents materials from falling or spilling during transmission, loading processes, or migrating off-site

enclose

structure consisting of four walls and roof

inform

universally accessible signage that may reduce exposure to risks or impacts by notifying employees and visitors of hazards, site limits, emergency equipment, and relevant operating procedures

infrastructure systems use vegetation and soil to convey, filter, and detain stormwater flows. While green infrastructure approaches are cost-effective for managing both stormwater flow and reducing pollutant loads on a range of site types and infiltration in bioswales can help treat oil and grease in runoff, the technology must be used carefully at industrial facilities to insure that contaminated is not infiltrating into the soil or groundwater in even more concentrated volumes. Maintenance practices are also critical to the proper functioning of these systems, as landscape-based improvements are dynamic, and easily overgrown or blocked due to sedimentation. At industrial facilities, green infrastructure would generally only be recommended as a secondary filtration or detention control after a primary treatment process adequately removes contaminants from the storm or wastewater to the maximum effect practicable. Available space within the site may limit the use of green infrastructure as a control for stormwater management. A site with limited space would need to utilize an underground structure to treat and store stormwater.

RECOMMENDATIONS

Using pollution control budgets as a guideline for costs, the study identified a targeted pollution control package to suggest how the most cost-effective controls could be implemented without imposing a substantial burden on the City's open industrial use businesses. In identifying the priority controls that would be the most cost-effective and practicable, the consultant conducted a financial feasibility study using prototypical site analysis, capital, operating, and maintenance cost estimates, and median annual revenue for the industries based on North American Industry Classification System (NAICS) data. Using the estimated median annual revenue, cost burden budgets based on percentages of long-term annual revenue were estimated for 1 percent, 3 percent and 5 percent of revenue to understand the range of pollution controls that could be supported given a low, medium and high burden on the firm. Considering impacts on the firms, and assuming that the average firm makes between 10 percent to 15 percent of total revenue in profits, a 1 percent impact on revenues would reduce profits by 10 percent or be passed onto customers as higher prices. This method of evaluation is based on the EPA's method for estimating the cost of environmental regulations, and is common practice in the industry. Imposing any cost burden higher than 5 percent of the revenue would be detrimental and considered the tipping point for a company to stay in business at this location or move elsewhere. Based on regulatory review and engineering analysis the study recommends proposed amendments as follows:

1. Replace the out-dated Zoning Performance Standards for OIUs with references to current performance standards found in other, more stringent and contemporary city and state regulations, such as the NYS Environmental Conservation Law, NY and City Noise Code, Air Code, Fire Code, Health Code, and Building Code.
2. Amend the Zoning Resolution to reference other environmental codes applicable to OIUs, such as the NYSDEC SPDES requirements, NYC-DEP Site Connection and MS4 requirements, NYC-DEP Community-Right-To-Know, NYC-FDNY Fire and Safety Permits, and NYC-DSNY and NYS DEC Part 360 Solid Waste Facility Permits (as applicable), requiring that all regulated uses comply with these codes and provide proof of compliance to the NYC-DOB.
3. Amend the Zoning Resolution to include prescriptive site design standards, including the pavement and grading of all surfaces where storage or activity are taking place, and the installation of an approved drainage system that conveys, captures, and treats stormwater runoff prior to discharge into the city sewers or state waters. Open industrial businesses shall comply with the new provisions for dust-suppression in the Air Pollution Control Code requiring that all unenclosed material piles be covered to prevent precipitation from coming into contact with the piled materials.
4. Develop additional programming to provide technical assistance to open industrial use businesses regarding best management practices for stormwater management, consistent with leading industry and/or regulatory agency recommendations, such as the EPA manual, Developing Your Stormwater Pollution Prevention Plan: A Guide for Industrial Operators (only where required by a SPDES permit) and other applicable industry specific guidelines and manuals.

Right: This unenclosed storage facility is located along Newtown Creek, dumping and leaching along the waterfront edge visible in the cloudy nature of the water.

Image courtesy of Mitch Waxman

Image courtesy of Mitch Waxman

Chapter 4: AIR QUALITY

ENVIRONMENTAL CONCERNS

In the 50 years since the Zoning Resolution first established standards for smoke and particulate matter, the control of air pollution has greatly advanced. Nevertheless, air pollution remains a leading environmental concern for the health of New York City's residents. While the City's air quality is the cleanest it has been in over 50 years, , fine particulate pollution alone causes an estimated 2,000 premature deaths a year. (43) (44) Levels of fine particulate matter pollution (PM) in the ambient air is the main cause of air pollution in New York City and is largely attributed to motor vehicles and boilers. At open industrial sites, particle pollution is also a concern. Fine PM consists of many components, including acids such as nitrates and sulfates, organic chemicals, metals and soil or dust particles. (45) Particle pollution varies in size but open industrial use facilities that produce dust can release inhalable coarse particles which are larger than 2.5 micrometers and smaller than 10 micrometers in diameter.

The NYC Department of Health (DOH) and Queens College (QC-CUNY) monitor and evaluate how air quality differs across New York City. This partnership created the New York City Community Air Survey (NYCCAS), which studies how pollutants from traffic, buildings and other sources impact air quality in different neighborhoods. (46) They have over 100 monitoring locations throughout the City which measure common pollutants that cause health problems, such as particulate matter, nitrogen oxides, elemental carbon, sulfur dioxide and ozone. At OIU sites, certain unenclosed uses, such as concrete, asphalt and uncovered storage of materials, are more likely to generate dust or airborne particulates than others. At the neighborhood level, vehicular traffic associated with all open industrial uses, such as waste carting or delivery trucks, are the primary sources of emissions. Many of the common pollutants monitored by DOH - ozone, carbon monoxide, nitrogen oxide and sulfur dioxide - are specifically associated with combustion engines and emissions from cars, trucks, buses, power plants and off-road equipment. Citywide, industrial neighborhoods with heavy truck traffic and frequent queuing tend to be more burdened by common air pollutants generated by mobile sources than other neighborhoods. Lead (Pb) is another common air pollutant released in dust from scrap metal processing facilities.

The EPA also manages national air quality monitoring networks that are located throughout the country. The monitoring stations record data on ozone, particulate matter, sulfur dioxide and lead. The New York State DEC also maintains air quality performance standards and measures air pollutants in over 80 locations across the state. The State uses a variety of measurement methods to track air quality and report the findings online. (47)

Left: Scrap metal piles stored along Newtown Creek in Queens. Metal and other recyclable materials are sorted and loaded on to barges and transported to national and international destinations for processing.

REGULATIONS

Air pollution in New York City is regulated through laws and standards at all governmental tiers. At the federal, state and local level air pollutants from stationary sources are subject to air permit requirements, emission standards, control technology requirements, ambient standards and guidelines and enforcement procedures.

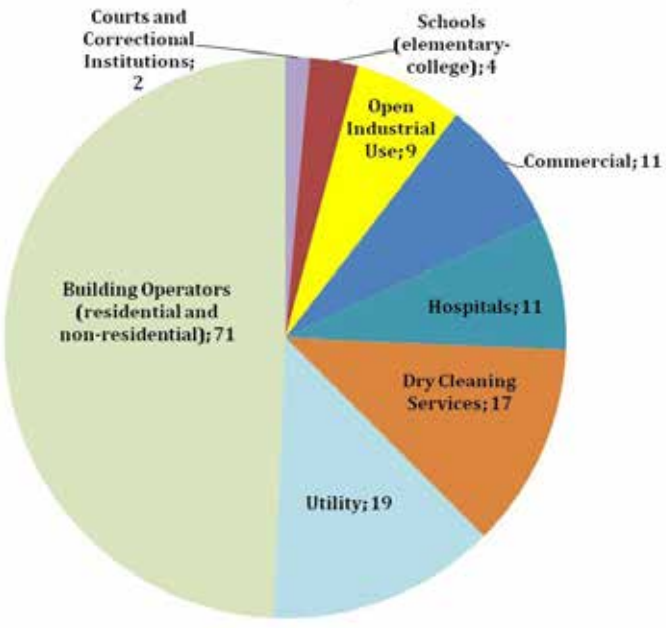
Originating with the 1970 Clean Air Act and the 1967 Air Quality Act, the majority of contemporary regulations governing air emissions were passed subsequent to the 1961 Performance Standards in the Zoning Resolution. Substantially reformed in 1977 and 1990, the current Clean Air Act (42 CFR Chapter 85) establishes ambient air quality standards and air permit programs, while empowering the EPA to promulgate rules and to delegate responsibility to state governments to prevent and control air pollution at its source. Local air quality is subject to the National Ambient Air Quality Standards, which are applied at places where the general public has access. Open air locations where only workers have access are subject to Occupational Safety and Health Administration (OSHA) regulations. This study examines the ways to control air pollution from the OIU primarily in the ambient air beyond the facility boundary.

The New York State DEC has been delegated responsibility for implementing air programs for New York State. DEC regulates sources of air pollution under Title 6 Chapter 3, Air Resources, of the New York Codes, Rules and Regulations (6 NYCRR). The State has established several air permit programs depending on the type and size of the air pollution source. The State regulations contain ambient air quality standards and emission limits for individual source categories and process sources.
New York City's Air Pollution Control Code (APCC) pre-dates federal or state enabling legislation. In 1952 the City established the Department and Board of Air Pollution Control, which, in 1966, issued the first air control bill, known as Local Law 14 (five years after the Zoning Performance Standards were written). This law established the framework for today's Air Pollution Control Code (APCC) under Title 24 Chapter 1 of the New York City Administrative Code, administered by DEP. The APCC sets standards for emissions, burning and refuse systems, equipment and apparatuses and requires permits and certificates for the use of any equipment or processes that impact New York City's air resources. For any facility, an installation permit is required for any equipment capable of causing the emission of an air contaminant into the open

CLEAN AIR ACT VIOLATIONS 2008-2013

Violations of the Federal Clean Air Act by Open Industrial Uses: Scrap Processing (5), Concrete and Asphalt (2), and unenclosed storage facilities (2).

Source: Clean Air Act Violations courtesy of EPA ECHO Database



air, unless specifically exempted. DEP issues pre-construction installation permits, inspects the equipment once it is installed and then issues an operating certificate after the inspection.

The New York City Department of Sanitation (DSNY) enforce regulations pertaining to non-putrescible waste transfer stations (construction and demolition debris) that require control of dust control air emissions from open piles of debris. Specifically, a water source to be used for spraying piles must be installed adjacent to the piles and used regularly to suppress the release of dust into the air by wind. If a facility does not have an adequate waste water drainage system, this practice can also lead to drainage control issues.

As seen above, the APCC, state and federal regulations governing industrial emissions are far more comprehensive and detailed than those found in the zoning Performance Standards. The state and local permitting programs for industrial sources under these regulations offer far more protection.

New York City recently revised the APCC to incorporate updated federal and state regulations for emission standards. In response to the issues raised in this study, the revision included language in an amendment that strengthened the DEP's ability to enforce against open industrial facilities that may generate dust pollution. The amendment, which was approved by the City Council in November 2013, states that any material with the potential to generate dust be must be stored or transported in such a way that particulate matter (dust) will not become air-borne. Also under the updated APCC, all heavy-duty waste trucks that operate in the City will be required to achieve EPA standards for 2007 model year engines by 2020. These will reduce PM emissions by at least 85%.There are over 8,000 trucks in the commercial fleet, 85 percent of which would be potentially affected.

ISSUES

The quantitative Performance Standards written in 1961 are duplicative or inconsistent with other standards that govern manufacturing uses in New York City.

The APCC provides the most up-to-date, appropriate and enforceable mechanisms for quantitative standards. The outdated Performance Standards for dust and smoke do not enhance the protections offered by these Codes.

Current regulations do not require the design of open industrial facilities to follow national best practices for the prevention of airborne pollution.

As discussed below, national best practices incorporate design features that minimize airborne pollution and supplement the recent changes to the APCC.

FINDINGS OF THE STUDY

The Open Industrial Uses Study examined local, state and national literature on best management practices and control techniques for mitigating air quality impacts for open industrial uses. (48) A paved surface, properly maintained, can reduce the amount of dust suspended into the air by tires on roadways. Physical barriers such as walls or fences are the most effective at restricting the dispersal of airborne particulate, but should be accompanied by direct covers, such as tarps (where feasible), to maximize their effectiveness where feasible (where piles are not actively worked on an ongoing basis. These simple measures are cost-effective and common practices at facilities that store aggregate or bulk materials in open piles.

The most important issue to consider with respect to air quality impacts at open industrial facilities is the relative location of sensitive land uses to the nearest publicly accessible area. Depending on the proximity of such area, more or less extensive air quality controls should be applied. Typically, the bigger the on site buffer zone, the lower the need for emissions controls at the source, as there is a larger area for the dispersion of air pollutants.

The other important factor in controlling air pollution from the OIU is the layout of the facility. Depending on operational limitations, facilities can be planned in a way to place fugitive dust sources away from perimeter sidewalk or other publicly accessible area. This will add to the buffer between emission source and such area, as well as diminish air quality impacts at the receptor.

Retrofitting equipment and vehicles is one way to control air pollution at the emission source. There are several options to retrofit diesel equipment in order to reduce particulate matter, air toxics and nitrogen oxides. The most widespread is to install diesel particulate filters (DPF). There are DPFs that use active or passive regeneration to oxidize carbon and get rid of soot. DPFs are installed as engine muffler replacements or additions. The EPA and many states have financial incentive programs (like SmartWay under the Diesel Emission Reduction Act, DERA) that help finance diesel retrofits. DPF can be installed on most non-road equipment, but there are engines that are not suitable for this technology. These include models older than 1990, engines that consume excessive lubricants that can clog the filtering device and those that already meet Tier 4 (the most advanced) emission standards and therefore have already reduced particulate emissions.

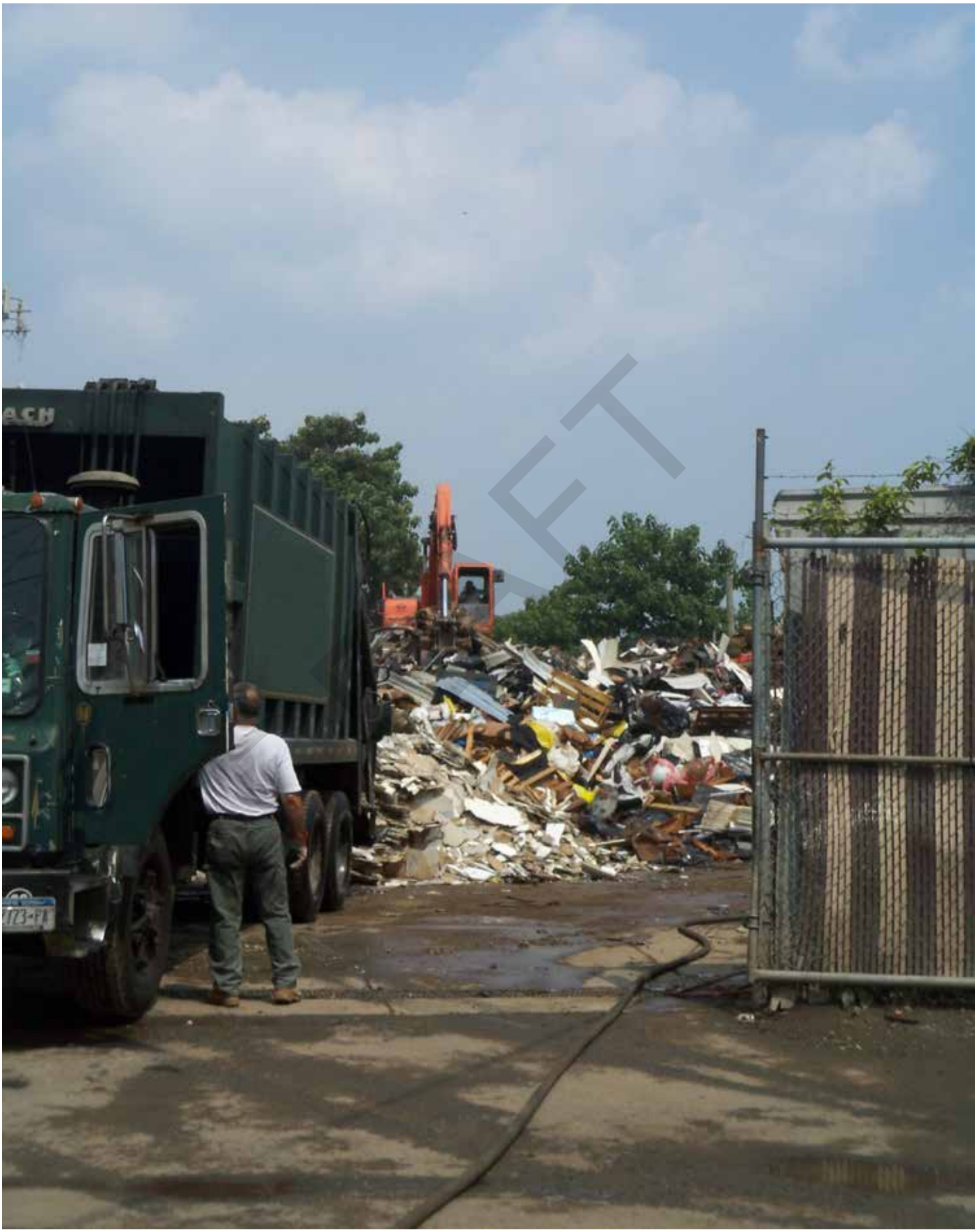
RECOMMENDATIONS

Using pollution control budgets as a guideline for costs, a targeted pollution control package was identified to suggest how the most cost-effective controls could be implemented without imposing an undue burden on the city's open industrial use businesses. In identifying the priority controls that would be the most cost-effective and practicable, the consultant conducted a financial feasibility study using prototypical site analysis, capital, operating, and maintenance cost estimates, and median annual revenue for the industries based on North American Industry Classification System (NAICS) data. Using the estimated median annual revenue, cost burden budgets, based on percentages of long-term annual revenue, were estimated for 1 percent impact on revenues would reduce profits by 10 percent or be passed onto customers as higher prices. This method of evaluation is based on the EPA's method for estimating the cost of environmental regulations, and is common practice in the industry. Imposing any cost burden higher than 5 percent of the revenue would be detrimental and considered the tipping point for a company to stay in business at this location or move elsewhere. Based on the analysis prepared by the consultant, this

study recommends proposed controls that fall only into the 1 percent and 3 percent budgets as follows:

1. The study recommends that the Zoning Performance Standards for OIUs be replaced with references to performance standards in other more stringent and contemporary city and state regulation, such as the Environmental Conservation Law, Noise Code, Air Code, Fire Code, Health Code, and Building Code.
2. Amend the Zoning Resolution to reference other compulsory environmental codes applicable to open industrial uses, such as the NYC-DEP Community-Right-To-Know, NYC-FDNY Fire and Safety Permits, and NYC-DSNY Permits (as applicable), requiring that all regulated uses comply with these codes and provide proof of compliance to the NYC-DOB.
3. Amend the Zoning Resolution to include prescriptive site design standards, including paving certain surfaces where processing and vehicle movement occurs with impervious materials and the installation of containment fences around unenclosed storage piles.

High fences are effective measures for containing materials at waste recycling facilities.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Chapter 5: SITE PLANNING FOR NEW OPEN INDUSTRIAL USES

ENVIRONMENTAL CONCERNS

New York City's industrial neighborhoods are unique environments, home to diverse and divergent uses. Owing to the density of the city, the historic lack of separation between residences and industry and the variety of types of manufacturing processes – from food production to asphalt - it is inevitable that unenclosed industrial facilities exist in close proximity to residential, commercial, or other manufacturing uses that demand specific environmental characteristics. During the process of this and other recent planning studies, stakeholders, such as economic development representatives, environmental groups and community advocates have cited several specific issues related to the character of industrial neighborhoods and quality of life concerns.

- **Conflicts on adjacent uses:** Most OIUs can locate in any manufacturing district without enclosure within 200 feet of a Residence District; processing and storage must be fully enclosed. Lax and outdated regulations are insufficient to protect Residence Districts, higher performing uses, and other sensitive receptors from environmental impacts.
- **Aesthetic concerns:** Aesthetic concerns: Industrial neighborhoods show heavy wear and tear on public and private infrastructure. These neighborhoods also have lower numbers of street trees and landscaping.
- **Solid walls:** Opaque fences and walls near site operations, but also impede view corridors to important natural resources, such as waterways. This issue is of particular concern on the North Shore of Staten Island where very large open industrial uses located in unusually close proximity to Residence Districts often block waterfront vistas. In other areas, opaque fences are frequently unsightly.
- **Traffic related to trucks and heavy equipment:** Traffic related to trucks and heavy equipment: Many industrial businesses also use the public right-of-way for parking or truck queuing. Furthermore, streets are blocked by parked or queuing trucks due to inadequate off-street loading areas.

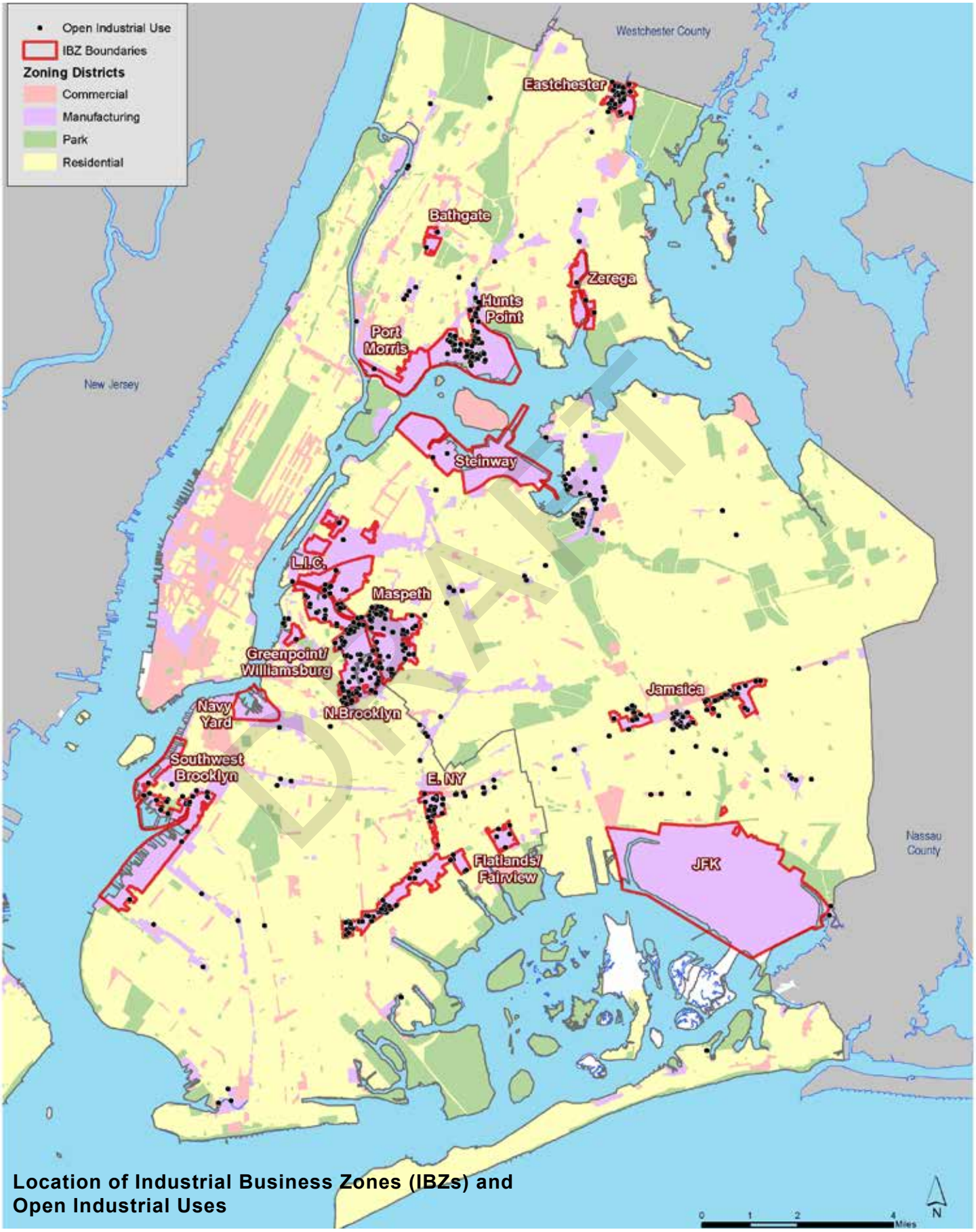
REGULATIONS

A construction and demolition debris transfer station on Staten Island's North Shore.

Land Use

Current zoning requires that new OIUs must comply with zoning use requirements that address where they can locate, performance standards, enclosure and fencing. New OIUs are also subject to parking and loading requirements.

Most of the OIUs that are the subject of this study are considered part of Use Group 18, the heaviest of industrial use designations that, according to the Zoning Resolution, "consists primarily of uses that either involve considerable danger of hazards to public health or cannot be designed without considerable expense to



Location of Industrial Business Zones (IBZs) and Open Industrial Uses

Source: DCP 2013 Survey of Open Industrial Facilities in New York City

conform to high performance standards." However, a Use Group 18 use may locate in any zoning district for which it meets the applicable performance standards. Since the performance standards rapidly became outdated and no longer represent a significant barrier to establishing open industrial uses in districts considered "higher-performing," OIUs are widely found in light (M1), and medium (M2), as well as heavy (M3) manufacturing zones.

Cement and asphalt manufacturing plants are part of use Group 18A, subject to enclosure requirements in M1 districts and in M2 and M3 districts within 300 feet of a Residence District (Z.R. 42-412). However, stored materials other than cement and asphalt may be unenclosed, except in M1 districts within 200 feet of a Residence District if effectively screened by a solid wall or fence (Z.R. 42-422).

Unenclosed wholesale "building materials or contractors' yards and lumber yards of less than 20,000 sq. ft. in lot area" are considered Use Group 17 and are permitted in all manufacturing districts except in an M1 district within 200 feet of a Residence District.
Some of the industries related to auto dismantling and used motor vehicle parts sales use unenclosed sites for "dead storage of motor vehicles", which is considered part of Use Group 16. Use Group 16 is a semi-industrial use which is permitted in all manufacturing districts as well as C8 districts, commercial districts that do not permit residential uses and are typically characterized by a prevalence of automotive and wholesale uses. However, this use would be subject to enclosure requirements in C8 districts.

Additionally, lumber yards without restriction on size, unenclosed auto dismantling facilities, scrap yards, recycling facilities and non-putrescible waste transfer stations are considered part of Use Group 18B, permitted in all manufacturing districts, subject to performance standards which, as noted above, may not effectively limit site location (while zoning also permits putrescible waste transfer stations to be unenclosed, except in M1 districts, this has been superseded by Department of Sanitation regulations that effectively require enclosure).

Fencing

The Zoning Resolution requires a solid opaque fence of at least eight feet in height around the perimeter of a zoning lot containing unenclosed industrial uses in Use Groups 17 and 18B. Additionally, for Use Group 18 cement and asphalt plants, open storage of materials in M2 and M3 districts within 200 feet of a Residence District is subject to the same requirement. The Building Code limits the height of any fence to 10 feet or less, which can be waived where it conflicts with other requirements. The Sanitation Department also enforces city rules for perimeter fencing at C&D non-putrescible waste transfer stations and establishes limits depending on proximity to a Residence District. Fences for C&D processing facilities are required to be 10 feet tall, and 15 feet if within 300 feet of Residence District.

Parking and Loading Spaces

OIUs that do not have significant buildings onsite are exempt from off-street parking requirements, which are based on the amount of floor area constructed. In contrast, off-street loading requirements apply to the lot area, if the facility is located on an open lot. However, because many open uses do not seek building permits or a certificate of occupancy, this provision has not been effective.

Map showing the location of open industrial uses relative to the IBZ boundaries.

1

2

3

4

5

6

1 | Truck queuing and parking in the street impacts neighbors and residences.

2 | End of life automobiles stored on unpaved surfaces can continue to leak hazardous fluids into the ground and water supply.

3 | Industrial materials are often stored without proper containment, and spill into the public right of way.

4 | Many piles are visible from the street.

5 | The height of material piles often exceeds allowable limits.

6 | Disorderly, unkempt properties impact neighborhood character and quality of life.

For the low-density manufacturing districts in which most OIUs are found, no loading berths are required for the first 8,000 s.f. of lot area and one berth is required for the next 17,000 (Z.R. 44-52). Many OIU sites are smaller than this.

Quality of Life

There are a number of provisions in the Zoning Resolution intended to enhance neighborhood quality of life and urban design and help to mitigate issues such as poor air quality and storm water runoff, but they do not apply in manufacturing districts, including requirements for street tree planting (Z.R. 26-40), landscaping of parking lots (Z.R. 37-90) and waterfront view corridors and waterfront yards (Z.R. 62-50).

Non-Conforming Uses

Zoning allows most pre-existing uses that do not conform to current regulations to continue operating as “non-conforming uses”. Consequently, approximately 65 existing OIUs continue to operate in residence or commercial zoning districts, or in special districts where new unenclosed uses are not permitted.

Generally, a non-conforming OIU in Use Group 18 can be changed to another non-conforming OIU in Use Groups 17 or 18. A non-conforming OIU in Use Group 17 can be changed to another non-conforming OIU, but only in Use Group 17.

Article V, Chapter 2 of the Zoning Resolution has special rules that appear to have been intended to terminate non-conforming OIUs in Residence Districts. However, the termination of the non-conforming use is tied to a requirement that the assessed value of any improvements be at a level that may have been characteristic of the early 1960’s, but today is so low that few, if any, sites would be covered. Thus, non-conforming OIUs in Residence Districts have continued in operation.

Another rule appears to be intended to terminate industrial uses that are non-conforming with respect to the enclosure regulations (Z.R. 52-75). However, the rule is drafted in such a way as to effectively exclude OIUs.

Three recently created Special Purpose Districts have modified regulations for OIUs. The City Planning Commission has been designating special zoning districts since 1969 to achieve specific planning and urban design objectives in defined areas with unique characteristics. Special districts respond to specific conditions; each special district designated by the Commission stipulates zoning requirements and/or zoning incentives tailored to distinctive qualities that may not lend themselves to generalized zoning and standard development.

The Special Hunts Point District (HP) in the South Bronx is adjacent to the Hunt’s Point Food Market, the city’s primary wholesale food distribution center. The district strengthens the expanding food industry sector and creates an area of high-performance industrial and commercial uses between the stable Hunts Point residential area and the heavy industrial areas. In the Special Hunts Point District, Use Group 18 OIUs are prohibited in both the Residential Buffer and Food Industry Subdistricts to provide buffers by prohibiting most new heavy industrial uses regardless of performance standards, unless compatible with food businesses. Existing OIUs are thus subject to the regulations for non-conforming uses.

In the Special Downtown Jamaica District, OIUs are prohibited in the M1-4 district. The district’s use regulations encourage mixed use development in denser transit-

oriented locations convenient to shoppers and its bulk provisions allow taller buildings with higher floor area ratios at the transit hubs. Existing OIUs are thus subject to the regulations for non-conforming uses.

In the Special College Point District, new Use Group 18B OIUs are prohibited. This district was created to maintain an attractive, well-functioning business park setting for business uses and ensure that there are minimal effects on adjacent residential blocks. Existing open industrial uses in Use Group 18B are thus subject to the regulations for non-conforming uses. Other open industrial uses are permitted, with enhanced screening requirements. Street tree planting and landscaping for front yards and parking lots are required for Use Group 17 and 18 uses. All uses must meet M1 performance standards and provide enclosure or screening to minimize impacts upon neighboring uses. (49)

ISSUES

As originally conceived in the 1961 comprehensive revision of the New York City Zoning Resolution, the City's heaviest industrial districts (M3 zones) were meant to be the location of the most noxious uses. M1 and M2 districts were intended to allow only less noxious uses or those more noxious uses that had upgraded their controls or emissions and had few community impacts.

The obsolescence of the zoning performance standards has meant that the distinctions between zoning districts have broken down. While many advances have been made in environmental regulation and the protection of the public from noxious influences, New Yorkers' expectations as to quality of life have also increased dramatically. Residence Districts are across the street or in close proximity to manufacturing districts with active open industrial uses that, in the view of residents, are not in some cases good neighbors.

The conflicts between residents and open industrial businesses are exacerbated by the concentration of these businesses in a handful of neighborhoods. While in many cases the OIUs predate nearby residential development, or the current residents represent successors to members of European immigrant groups who settled in proximity to onetime manufacturing facilities, Census data for the neighborhoods where OIUs are concentrated suggest that at present, these housing units are more likely to be occupied by minority or low-income households, underscoring environmental justice concerns in proximity to the City's manufacturing districts that contain OIUs.

The use definitions in zoning are outdated and do not acknowledge the various activities occurring on these sites, which could create potential zoning interpretation issues and limiting the extent to which land use regulation can be coordinated with overlapping city, state and federal regulations.

Building Code and Zoning Resolution fencing requirements for open industrial facilities do not mitigate pollution, and impact the character of industrial neighborhoods.

The character and condition of fences at unenclosed industrial facilities can negatively impact the neighborhood character and quality of life in industrial areas. Uninterrupted, opaque fences are common in these neighborhoods, and create an unattractive streetscape. Many open industrial businesses also fail to post an address or other signage that would otherwise inform neighbors of the name of their business or how to get in touch with someone responsible for the site. Some government agencies also

Right: A contractor yard with unenclosed material storage.

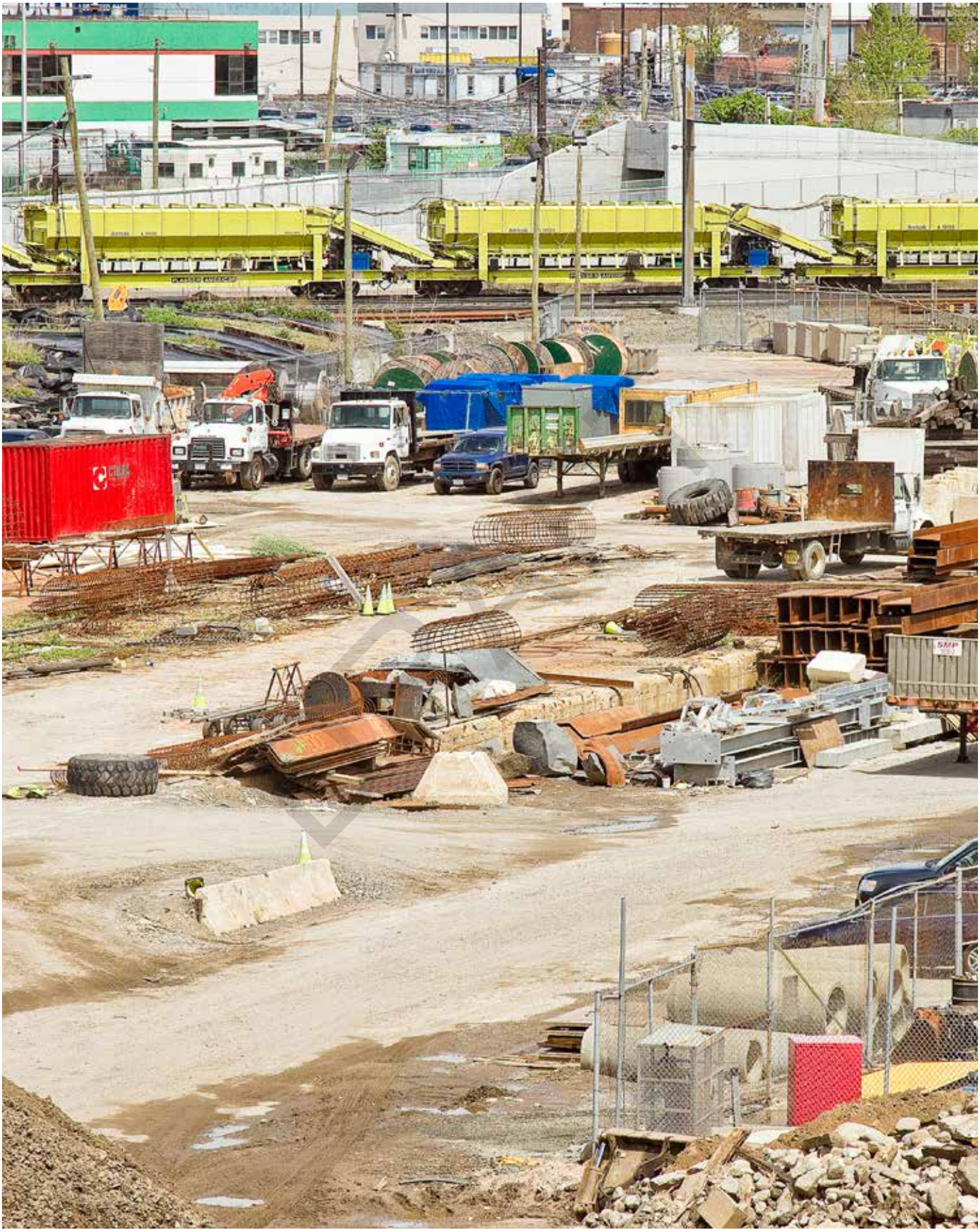


Image courtesy of Mitch Waxman

cannot view the activities that are occurring on the site, making enforcement difficult.

Buffer requirements in zoning are insufficient to address contemporary land use patterns.
Residence district proximity to industrial districts is prevalent throughout New York City, with OIUs sometimes located directly across the street from locations that permit residences. Although zoning currently requires that OIUs in M2 and M3 zones enclose within 300 feet of a Residence District, these rules do not apply to most OIUs that meet performance standards. (Z.R. 42-20, 42-15, 42-41) The ineffectiveness of the performance standards, however, has rendered the buffering requirements obsolete in many locations. Furthermore, many OIUs – such as open materials storage on the North Shore of Staten Island and auto dismantlers in Flatlands – predate the buffer requirements and have always been located proximate to districts that permit residences. The buffering requirements should be updated to acknowledge existing land use patterns and better address the impacts of OIUs located adjacent to residential districts.

Off-Street Loading Berth requirements are rarely applied to open industrial facilities, exacerbating local traffic congestion and poor air quality.
There is not a minimum requirement for off-street queuing space or loading berths in New York City. Most OIU sites rely on trucks to transport the materials, and a minimum loading area should be provided on site for new facilities.

FINDINGS OF THE STUDY

The Open Industrial Uses Study team reviewed zoning codes from numerous American cities to establish an understanding of contemporary best practices in land use regulation of the uses identified in this study. This analysis revealed that no peer city studied is as permissive as New York City with regard to where industrial uses can locate, the conditions under which they can operate and the level of public scrutiny. As mentioned earlier, several peer cities – Chicago, Los Angeles and Baltimore – have recently adopted or proposed revisions to their zoning codes to strengthen site planning requirements and re-define OIUs with more contemporary definitions that acknowledge the distinctions between the industries involved and promote recycling.

An interagency working group comprised of representatives from twelve city and state agencies met regularly with the OIUS team to discuss the study and overlapping regulations affecting the uses addressed in the study. Through this process, regulatory gaps and potential complementary codes amendments were identified that could address the issues identified in the study. Through this analysis, it was determined that the current zoning definitions are inconsistent with New York State Department of Environmental Conservation and New York City Department of Sanitation definitions of regulated OIUs. The process also determined which menu of physical design standards could complement other codes – DEC and DEP's stormwater and wastewater discharge permits in particular – to achieve the study's objective of reducing pollution.

Surveys of industrial areas with concentrations of OIUs in 2011 by Department of City Planning staff provided the basis for baseline conditions and field confirmation of anecdotal concerns raised in the context of other planning initiatives, such as Vision 2020: New York City's Comprehensive Waterfront Plan and North Shore 2030. During

these surveys, staff collected data on the type of use and activities occurring, adjacent uses, the average site size, the condition of the site and the types of materials stored. Field surveyors also observed enforcement and neighborhood character issues related to OIUs, such as traffic and on-street vehicle queuing, noise, dust, debris, maintenance work and storage occurring within the public right-of-way, and pooling of oils, wastewater and other debris. As a result of these studies, DCP confirmed that a typical OIU locates on a small site with minimal investment in onsite improvements and contributes to a number of concerns that degrade the quality of life for workers at neighboring properties and for residents who live nearby. The surveys also confirmed that in certain neighborhoods – Jamaica, Flatlands and the North Shore of Staten Island – OIUs are located in very close proximity to Residence Districts. (See Neighborhood and Land Use Characteristics for more information on the 2011 field surveys).

RECOMMENDATIONS

1. Create better zoning and use group definitions to reflect actual activities occurring on OIU sites that are consistent with other relevant city and state definitions.

2. Replace performance standards in zoning with site design standards that address the environmental and quality of life concerns associated with OIUs.

3. Replace perimeter fencing requirements in zoning with requirements for containment of storage and activity areas. Containment fencing or walls should surround the storage piles, except at access points for loading and unloading.

4. Remove fencing height limitation in the Building Code

5. Consistent with a Department of Sanitation rule that requires C&D facilities to post identifying signs, a signage requirement should be added to the Building Code that applies to all open industrial uses to support better identification of sites for improved enforcement of applicable regulations. A sign should be required to be posted at all entrances to the facility to indicate the business name, hours of operation, the types of materials it accepts and does not accept, the types of permits it holds to operate pursuant to City and State regulations and the expiration dates of said permits, and the telephone number of the business.

6. Require a minimum number of loading berths in zoning for all new OIUs in new locations.

7. Establish a setback requirement to locate piles away from the facility entrance and exit to limit tracking of debris and dust into public sidewalks and streets.

8. Provide regulations for enhanced buffering and landscaping in proximity to residentially zoned districts

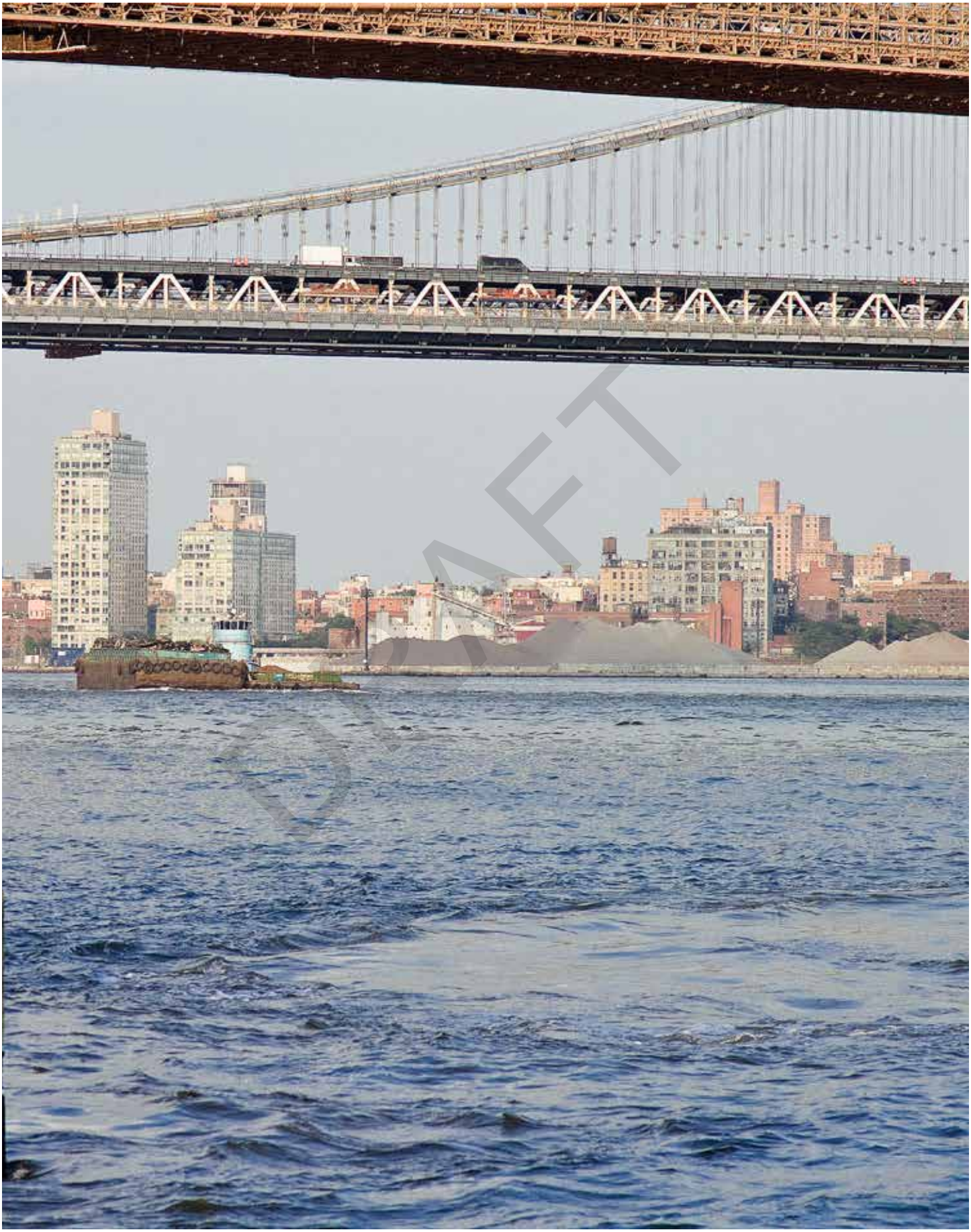


Image courtesy of Mitch Waxman

Chapter 6: FLOOD HAZARD MITIGATION

ENVIRONMENTAL CONCERNS

Climate change has significant and growing impacts to industrial facilities in the New York City region. While climate change includes hazards triggered by the fluctuation of temperatures and weather patterns, of particular concern for open industrial facilities are increased flooding risks associated with sea-level rise and increasing levels of severe storms with related stormwater erosion and other impacts. Many OIU facilities are already vulnerable to flooding today; approximately 30 percent of all open industrial facilities in New York City are sited within the FEMA preliminary work maps 100-year floodplain, or the area defined to have a 1 percent probability of inundation in any given year. Prior to Hurricane Sandy, DCP determined that about 70 percent of the total areas of OIUs across the 600 sites in the city were sited within the Office of Emergency Management's designated hurricane evacuation zones. Inundation maps of Hurricane Sandy indicate that 60 percent of open industrial facilities flooded during the storm in 2012. These facilities and operations are acutely susceptible to wet weather flow issues due to the exposure of their industrial processes to tidal and storm waters. In the DEC Spill Database, over 1,500 spills were attributed to Hurricane Sandy, ranging from extremely significant (>400,000-gal) to minor (<1-gal). Spill sources in the inventory were linked primarily to motor fuel and oil tanks for heating supply located in commercial and industrial facilities (un-enclosed and enclosed) and also private residences and utility companies. (50) (51) Though this list is not exhaustive, many open industrial operators located in the floodplain and interviewed during the study mention spills, damage and loss during the storm. Certain residential neighborhoods are also more vulnerable to climate risks and associated hazards when adjacent to areas where hazardous materials are commonly stored. An example of this is the Waterfront Justice Project led by the Environmental Justice Alliance, a project that looked closely at the Significant Maritime Industrial Areas (SMIAs) and their relationship to environmental justice communities and waterfront vulnerabilities. (52)

View under the Brooklyn Bridge across the East River of unenclosed aggregate storage on the Brooklyn waterfront. A donjon tug in the foreground transports solid waste.

There are two major pollution impacts from wet weather flow: storm water from heavy rainfall and coastal flooding. Moderate to extreme storm water events have the potential to mobilize chemical and biological pollutants from an unsecured open yard into receiving waterbodies or storm water collection systems. Under extreme conditions and flooding, pollutants and debris from these facilities can also be hydraulically transported to neighboring properties and waterways. The second pollution impact is associated with coastal flooding. Pollution impacts from coastal flooding may be particularly damaging to human health and the environment. Not only are there impacts from flood related pollutant mobilization from the facility, but coastal flooding can bring hazardous materials and petroleum contamination from the water bodies

onto the facility. Due to the unenclosed nature of the facilities, contaminants may also mix with materials on the site and render these materials hazardous or interact with other materials in potentially hazardous combinations. Therefore, it is important, from a pollution prevention perspective, to incorporate practices and technologies that eliminate or minimize the effects of wet weather flow events.

Unsecured materials that are not listed as hazardous but are buoyant, such a lumber or raw natural products, can also be dispersed when afloat in flood waters or airborne in wind. These materials are not inherently hazardous, but are a danger to navigation and communities as floatable debris.

REGULATIONS

Currently New York City does not have regulations that would prevent open industrial facilities from locating in floodplain areas or storing or using hazardous materials in high risk zones. Although preventive approaches can be simple (elevate or isolate), retrofitting existing facilities is potentially challenging and costly. While national FEMA and city standards exist for the construction of buildings in the floodplain, and DEC (6 NYCRR Part 360-1.7) regulations restrict siting of solid waste facilities in floodplains, and general provisions apply, the City has not developed specific standards for flood-proofing unenclosed storage or open industrial activity in the floodplain that would give businesses guidance for implementation. The Department of Environmental Protection has also amended the Community Right-To-Know- regulations to require Risk Management Plans (RMPs) at facilities which are designated by the Flood Insurance Rate Maps (FIRMs), in zones listed in Appendix G of the Building Code, to account for flooding.

Approaches to dealing with flooding have changed dramatically in the 21st century. The high cost and volume of infrastructure located in vulnerable areas has increased, as has the risk and loss associated with both minor and major flood disasters. Harbors and riverbanks historically have been ideal locations for cities on account of their connections to regional and international markets and commerce, yet a changing climate, shifting environmental conditions and a dynamic coastline are transforming the location and sizes of floodplain zones.

Flexible flood proofing approaches can be deployed at waterfront sites to protect of unenclosed material storage and activities from inundation and dispersal by flood waters.

Improperly handled hazardous materials pollute both the air and water, and are particularly vulnerable to flooding in waterfront areas. Whether released directly into the air or conveyed by a flood, toxic contamination from unsecured hazardous material storage may contribute to the levels of water contamination related to flooding. Hazardous materials are identified in NYC Division of Emergency Response and Technical Assistance (DERTA) regulations with the following definition (with a specific list of exceptions): “Any chemical which is a physical hazard or a health hazard and which is listed on the hazardous substance list or special health hazard list” (a list maintained by DEP). The Fire Department separately maintains lists of hazardous materials that are regulated through its fire permitting program. NYSDEC and USEPA have extensive regulations with regards to the handling and disposal of hazardous materials and hazardous waste.

In cooperation with the National Flood Insurance Program (NFIP), New York City Department of Buildings administers Appendix G of the Building Code, which institutes flood-resistant construction requirements and applies broadly to “development located in areas of special flood hazard”, otherwise known as the areas designated as the 1-percent flood zone by Flood Insurance Rate Maps (FIRM). (53) (54) Consistent with the broad standards set by NFIP, Appendix G applies to “site improvements, including but not limited to temporary or permanent storage of materials… grading, paving…[and] operations.” As such, Appendix G applies to open industrial facilities located in the floodplain, in the same manner that buildings, structures and other “developments” are covered by permits. Both existing and new open industrial facilities in the floodplain are required to apply for and receive this floodplain permit. Within the code, under section G104.5.1, permitted facilities must also certify that they comply with either wet or dry floodproofing measures in accordance with American Society of Civil Engineers Standard 24 for Flood Resistant Design and Construction. However, ASCE 24 only specifies standards for the construction of buildings, structures, or “tanks” and therefore is largely inapplicable to open industrial facilities. ASCE 24 does require that drums containing hazardous liquids be elevated or secured.

Many complementary initiatives in New York City have paved the way for flood resilience planning at residential and commercial properties, and have been referenced in the development of recommendations for unenclosed industrial facilities. These include the Mayor’s Office’s post-Sandy report A Stronger, More Resilient New York, as well as Department of City Planning reports Designing for Flood Risk and Urban Waterfront Adaptive Strategies, and the Flood Resilience Zoning Text Amendment, approved in October 2013. The Department of Environmental Protection’s NYC Green Infrastructure Plan also provides guidelines for the use of green infrastructure to mitigate erosion, manage stormwater, and lessen the impacts of flooding.

ISSUES

NFIP, DEC NYCRR Part 360 regulations and the Building Code apply to the storage of materials and unenclosed activities in the floodplain and require that these uses be floodproofed; however specific flood hazard mitigation standards for open industrial facilities are not defined.

New York City’s flood permitting regime in Appendix G applies generally to buildings, structures or tanks at OIUs, but does not provide standards for safe storage of materials stored truly in the open in the flood zone. An extensive review of existing regulation documented a significant regulatory gap in flood hazard resiliency and hazard mitigation for OIUs.

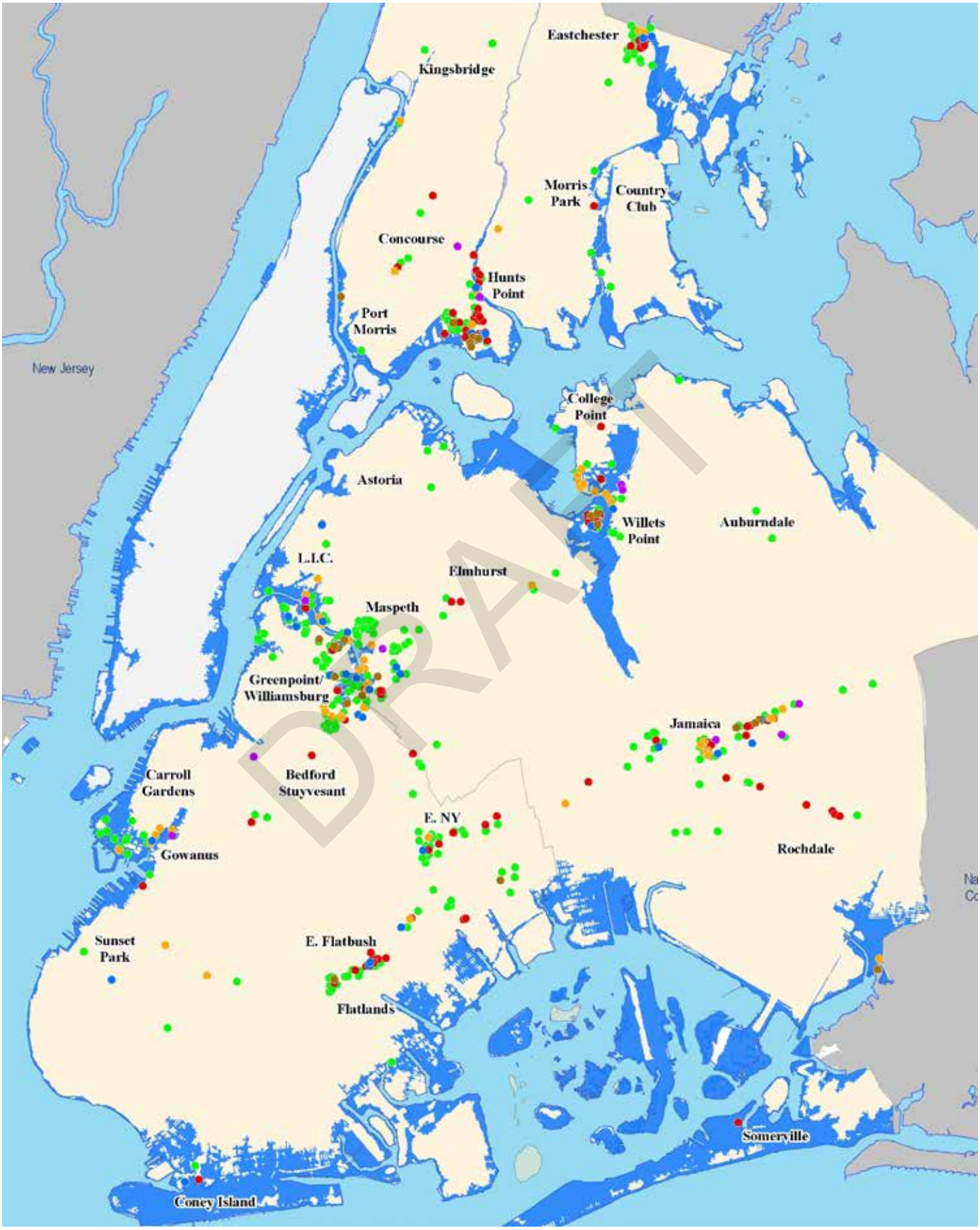
FINDINGS OF THE STUDY

To investigate flood hazard planning and climate change resiliency at OIU sites, both conventional and emerging technologies and processes were researched and evaluated. Conventional hydraulic and pollution prevention control measures also typically aim to minimize both the migration of contaminants from and into the facilities. These conventional control measures consist of practices such as elevating critical infrastructure and hazardous materials above flood waters; open-air covers to limit water leaching of materials; instituting hydraulic controls for storm and waste waters; using hard structures to minimize tidally induced flooding; and capturing and using storm water in the industrial process. In addition to these hydraulic control measures, conventional pollution prevention measures include minimization of the use and storage of hazardous and petroleum products, materials substitution of hazardous materials with more benign products and suggestions for process modifications to limit contact with storm and tidal waters. Emerging pollution prevention measures include technologies that hold promise for abating the effects of wet weather flow. These include, but are not limited to, technologies such as vegetative barriers with the potential to intercept surface and groundwater and sequester or degrade organic and inorganic contaminants (phytoremediation) and packaged wastewater treatment systems for small facilities that can treat and recycle process and storm water.

Engineering controls appropriate for use at open industrial sites subject to wet weather flow can protect unenclosed materials from inundation or dispersion due to flooding. The controls typically fall within two primary categories: dry and wet floodproofing approaches. Dry floodproofing involves installing waterproof barriers that prevent flood waters from entering, while wet floodproofing (may not be applicable to all OIUs)

Location of 100-Year Floodplain and Open Industrial Uses

Map showing the location of open industrial uses and the FEMA Preliminary Work Maps 100-year flood plain. Over 30 percent of open industrial uses are located in the floodplain.



Source: DCP 2013 Survey of Open Industrial Facilities in New York City

provides resistance to damage from flooding, while allowing the flood waters to enter. While full enclosure may also be effective, it is very expensive and may not be a financially feasible requirement for the specific focus industries under this study.

Elevating or dry floodproofing a site by building waterproof flood walls for existing sites may be cost-prohibitive and also may result in environmental repercussions and flood hazards to adjacent areas negatively impacted by the displaced floodwaters. Various recommended measures to elevate hazardous materials storage above the base flood elevation or otherwise improve the flood resiliency of hazardous materials stored at OIUs include the following:

- Install a perimeter wall to a height of the base flood elevation that surrounds all or portions of site.
- Install a flood gate at vehicle entrances. The flood barrier should be capable of being automatically deployed by the floodwaters.
- Install and maintain a waterfront buffer between bulkhead and waste piles.
- Place materials on secured shelves/platforms or in elevated permanent structures.
- Place materials in a secured watertight or waterproof container that is above the flood elevation or that can be placed above the flood elevation in the case of an emergency.
- Secure buoyant hazardous material containers that could become “floatable”.
- On large sites, where feasible, locate outside of the floodplain.
- Strengthen the shoreline along waterfront properties.

Soft engineering practices, temporary infrastructure and emergency operational procedures are also effective flood-proofing measures and are often more cost effective than “hard” approaches. Hazardous materials should always be elevated (including battery storage) above the base flood elevation during extreme storm events or relocated into a warehouse/enclosed dry floodproof structure. Examples of such practices, infrastructure and procedures include:

- Isolate/secure, elevate, or evacuate hazardous materials.
- Isolate/contain unenclosed materials processing/handling area sand material storage areas.
- Install backflow preventers to stormwater drainage system.
- Install temporary/removable floodwalls around specific areas of the site.
- Shut off fuel supply systems.

Many industrial facilities will be able to successfully isolate and contain material piles using 2- or 3-sided permanent or temporary walls. Removable flood walls are effective and flexible options for industrial facilities intended to keep out the water completely or nearly completely by creating a sealed barrier around the asset. Removable walls also avoid interference with day-to-day operations and can be erected in the event of a severe storm. Temporary systems require that an unobstructed buffer be maintained along the open sides of the unenclosed materials processing, handling, and storage areas so that sufficient room will be available to erect a temporary floodwall or waterproof barrier system. Such perimeter protection can only provide wet floodproofing given that floodwaters may be able to permeate the barrier. FEMA provides additional guidance on flood-resistant construction in a 2007 manual Selecting Appropriate Mitigation Measure for Floodprone Structures which has detailed chapters on barriers, wet floodproofing, dry floodproofing, elevation and drainage improvements. (55)

RECOMMENDATIONS

1. Amend Appendix G: Flood Resistant Construction to include provisions for wet floodproofing and dry floodproofing of materials and activities at open industrial facilities, consistent with NFIP requirements. Appropriate standards for the open storage of materials and solid waste management should be addressed in the Building Code to clarify applicability of requirements under the NFIP program in order to protect open industrial facilities and communities from flood hazards.
2. Coordinate with ongoing initiatives focusing on waterfront adaptive strategies and shoreline design with City, State and non-profit partners to ensure guidelines, proposal and projects meet the operational needs of maritime and waterfront industrial operators while reducing vulnerability to coastal storms.
3. Pending available funding, this study recommends that the Department of City Planning study best practices for cost-effective retrofits of industrial buildings and water-dependent uses, and identify potential regulatory accommodations or other needs to facilitate them.

A rebuilt shoreline condition in Hunts Point incorporates a mix of natural and structural systems for protection.

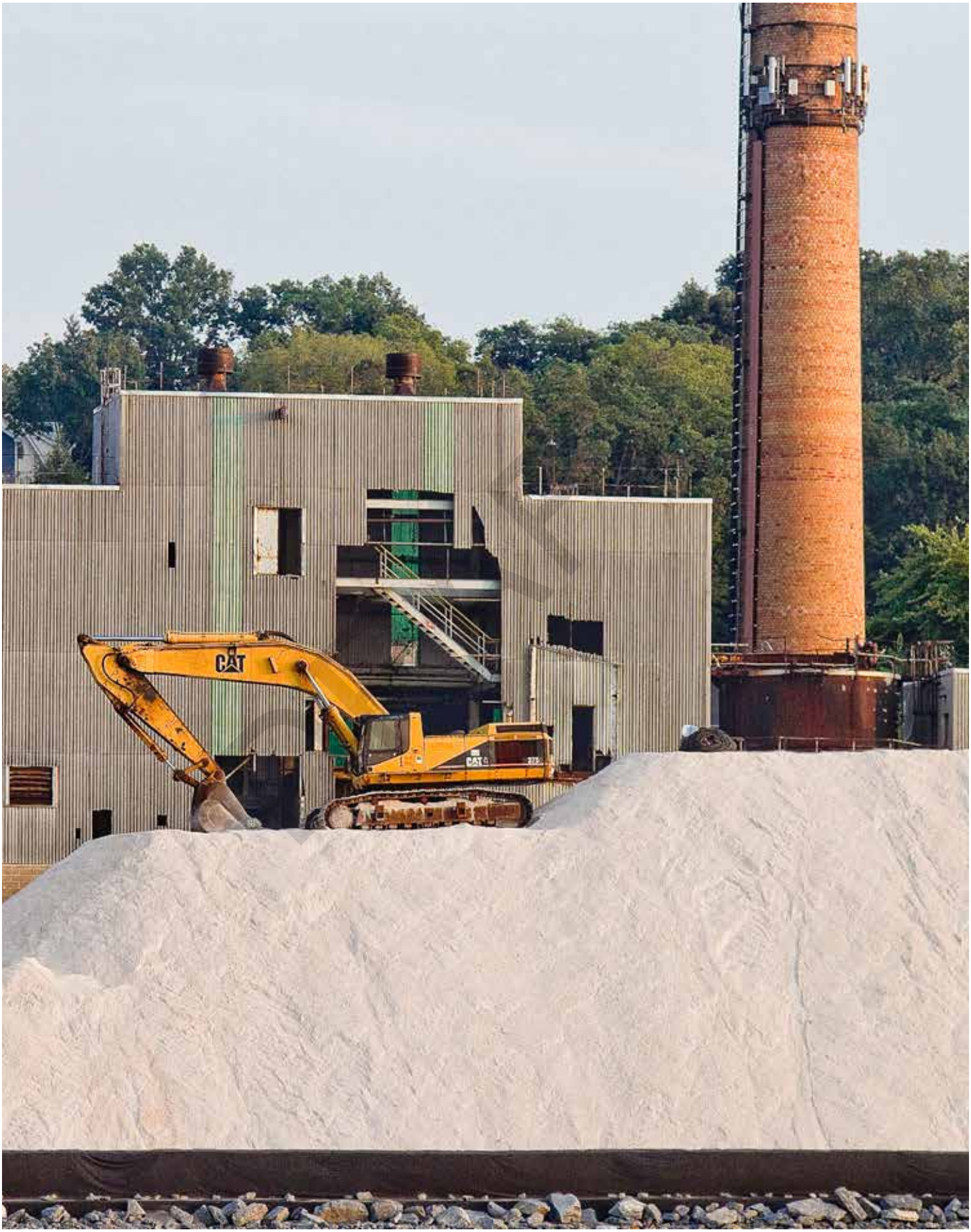


Image courtesy of Mitch Waxman

Chapter 7: Summary of Recommendations

Several peer cities have adopted more current land use controls that recognize the evolution of state and federal environmental regulations; the environmental, health and neighborhood character impacts created by unenclosed heavy industrial uses, the increased importance of recycling in the management of the waste stream, and the transformation of industries that operate on open sites. While many of these codes provide useful strategies for New York City to regulate open uses – such as the need to better define the diverse uses and to better control their impacts through regulations related to pollution control and conflicts with adjacent uses – most still strictly limit where new open industrial uses are permitted.

There are several reasons why New York City warrants a different approach. First, New York City is vast. There are estimated to be over 600 sites on 700 acres that are occupied with what could be classified as OIUs in all types of manufacturing districts – light (M1), medium (M2) and heavy manufacturing (M3) and in numerous industries. They are strategically located near markets for customers and suppliers as well as in the few locations where sufficient sites are available.

A review of certificates of occupancy for open industrial uses indicates that many such uses had a certificate of occupancy for an open industrial use, but not the one operating at present, indicating that turnover of open industrial businesses on specific sites is likely to occur. However, very few new previously vacant or undeveloped sites have been occupied with open uses given the high cost and limited availability of undeveloped land in New York City. Therefore, an influx of new open uses on vast swaths of undeveloped land is not typical here. The City likely has its universe of open industrial sites established, and new growth, either on limited available sites or through more efficient use of existing sites, is likely to occur to meet growing demand for the services these industries provide. It should be noted that peer cities such as Chicago and Los Angeles do have large industrial zones outside the city limits in their respective metropolitan areas. The ability to move these uses outside of New York City's boundaries is hampered by restrictive zoning and high land values in many suburban jurisdictions.

Salt piles stored on the North Shore of Staten Island. The piles are covered with a fabric cover when the operators are no loading or unloading to reduce the dispursal of materials by wind or water.

A better land use regime for New York would be to continue to allow open uses in most industrial areas, but complement existing state and federal environmental regulations with explicit and prescriptive site design standards based on contemporary environmental best practices to address storm water runoff, fugitive dust, flood risks and neighborhood character.

RECOMMENDATIONS FOR IMMEDIATE ACTION

The Open Industrial Uses Study team recommends specific and targeted regulatory amendments aimed to replace outdated environmental performance standards in zoning and add clarity and transparency to a complex regulatory network. In addition to the proposed regulatory changes described in detail below, the Department of City Planning in conjunction with the New York City Economic Development Corporation, New York City Industrial Development Agency (IDA) and the New York City Department of Small Business Services, should create a tax incentive, outreach and technical assistance program to aid affected businesses with understanding the new requirements and affording the cost of improvements. A sales-tax abatement program for OIU sites was approved by the IDA board in November, and is currently under development. These specific regulatory changes and incentive programs address the study's goal to identify feasible, effective regulatory controls to address pollution concerns and business conditions associated with open industrial uses in New York City's industrial areas.

Implementation of many of the recommendations outlined in this report will require public review and legislative actions, including environmental review, as well as a zoning text amendment subject to approval by the City Planning Commission and the City Council and local law changes subject to City Council approval. Prior to referral of a text amendment and as part of a mandated public review process, the Department of City Planning will conduct extensive outreach to multiple stakeholders for comment on the proposed changes. The affected stakeholders represent a diverse group of individuals and organizations, including industrial businesses; elected officials; property owners; local residents; civic associations; advocates for the environment and environmental justice; local development corporations and nonprofit organizations; workers; labor unions; and officials from state and local government agencies. All comments received during outreach to stakeholders will be carefully considered prior to initiation of the public review process.

Throughout the course of this work, additional controls and potential issues were identified that, while beyond the scope of this study, could nonetheless also be effective in improving business and environmental conditions related to open uses, such as green infrastructure and policies with regard to the storage of hazardous materials and resilient industrial construction in flood zones. These and other recommendations warrant further analysis and are described below in more detail as suggestions for further study.

New Definitions

Like many cities in the U.S., New York City zoning classifies most OIUs -unenclosed scrap metal processing, vehicle dismantling, construction and demolition debris transfer and waste recycling – as "junkyards." Other cities have adopted or proposed new zoning regulations that, while seeking to limit or control the operations of open uses, also acknowledge that these uses are more than junkyards, and in fact represent a number of industries of growing importance as urban populations grow and public policies seek to promote recycling. Furthermore, these uses are in evolving and highly regulated industries. The proposed regulations will apply to a specific set of uses with certain issues, necessitating more accurate and specific recommendations that are in line with other relevant regulations of the New York City Department of Sanitation and the New York State Department of Environmental Conservation. This study therefore recommends that New York City adopt new zoning definitions for these uses that are consistent with other City and State regulations (in some cases, simply cross-

Scrap metal processor in the Gowanus area of Brooklyn.

referencing other laws and regulations) and also acknowledges the various activities occurring on these sites.

Retroactive Pollution Prevention Controls

The proposed regulatory changes include a zoning text amendment that will require existing and new open industrial uses, whether currently conforming or non-conforming to applicable use regulations in zoning, to comply with new physical design standards for effective onsite pollution prevention controls. It should be noted, however, that not all of these businesses would be affected by the new requirements. An unknown number of businesses may already comply with the proposed standards. If compliance can be demonstrated on plans certified by an engineer, these firms would not be required to make additional improvements. While some existing firms may already comply with some or all of the site design standards, others, including approximately 30 construction and demolition debris facilities that comply with sanitation department requirements and an estimated 300 sites with outdoor storage of nonhazardous or non-granular materials, are exempt for the site design requirements. Only an estimated 30 percent of the city's estimated 630 OIUs located within FEMA's 100-year floodplain would be subject to the building code amendments requiring elevation or isolation of unenclosed materials and equipment during a storm event.

These explicit, prescriptive controls will establish transparent and uniform site design standards in lieu of the existing zoning performance standards, which have been superseded by other, more stringent codes and have proven to be an ineffective means of regulating environmental conditions in industrial areas. The specific recommended design standards include:

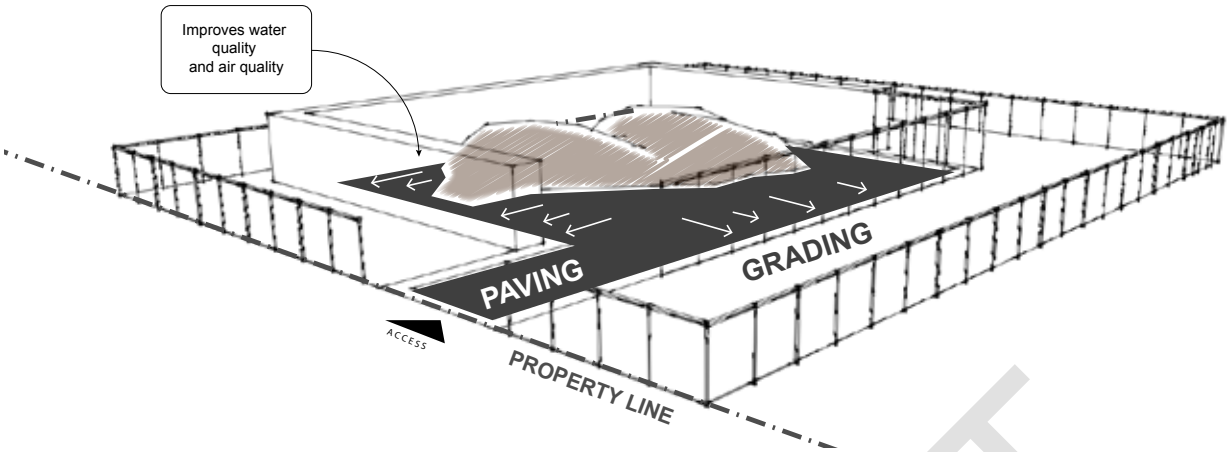
- Paving and grading of activity and storage areas with an impervious surface, sloped to direct run-off into a drainage system to capture stormwater;
- Installation of a drainage system for the paved area, including appropriate treatment, filtration and detention systems configured and designed to treat captured contaminated water before it is released into sewer systems or waterways ;
- Installation of a containment wall or perimeter fence around any storage or activity area that holds materials that can be dispersed by air or water, constructed so as to contain the product that is being stored;
- A limitation on the height of material piles such that no pile shall be higher than the height of the fence or wall; and
- Covering of all open materials piles where feasible (piles not actively worked)

Open uses affected by the new requirements will include industries that, due to the land-intensive nature of their operations, locate on largely unenclosed sites and can pose certain objectionable influences on surrounding businesses and residents. These uses include concrete and asphalt manufacturing, scrap metal processing, auto salvage and wrecking, construction and demolition debris transfer stations, waste recycling facilities and the unenclosed storage of materials (without processing).

These standards will apply retroactively to all of the above uses except existing construction and demolition debris transfer stations, which are already subject to restrictive design standards and frequent inspections under Department of Sanitation and New York State DEC regulatory requirements for non-putrescible waste transfer stations and C&D debris processing facilities, respectively. Operators of existing OIUs will have five years to comply with the retroactive requirements.

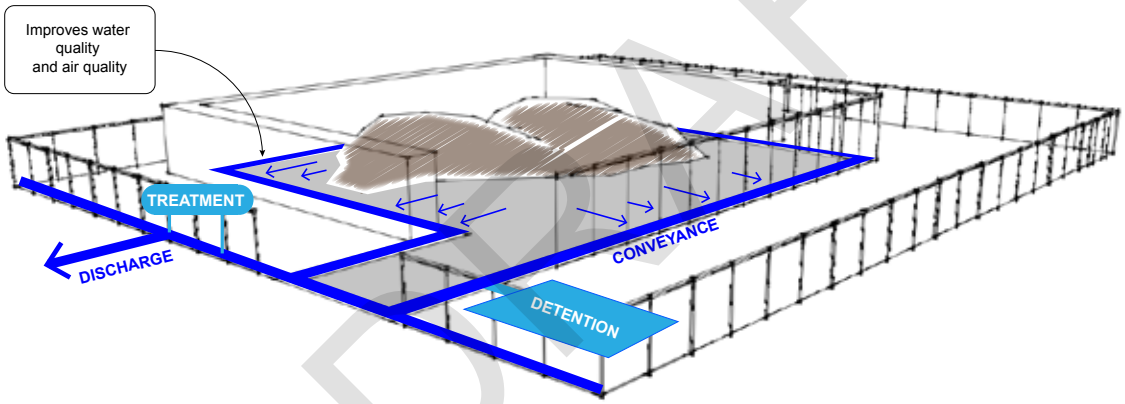
PAVING AND GRADING

Surfaces should be graded, constructed, and surfaced, and maintained so as to provide adequate drainage and to prevent the release of dust.



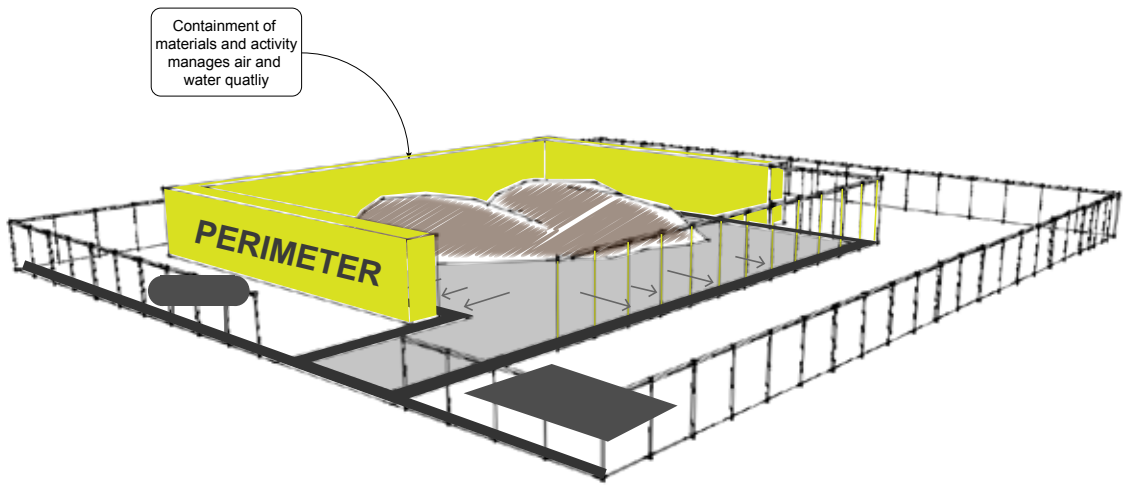
DRAINAGE INFRASTRUCTURE

Proper drainage rates shall be attained through conveyance trenches that are connected to detention storage and treatment equipment that meets the drainage, flow, and filtration requirements of DEP and DEC



CONTAINMENT

Storage areas must provide perimeter screening and covers, where practicable, to protect piles against wind-borne dispersion.



COMPLEMENTARY CODE AMENDMENTS

In accordance with Department of Buildings procedures, all open industrial facilities will need to apply for an alteration permit for the proposed site improvements. The site plan needed to meet the new requirements would be certified by the applicant's architect or engineer. As a condition of obtaining an alteration permit, proof of existing permits required by other City and State agencies will be required. The Department of City Planning will work with the Buildings Department to ensure that open uses are pursuing the appropriate permits for the proposed changes. Any OIU that does not complete the required site improvements within five-years will be terminated. The Board of Standards and Appeals may permit an extension to the five-year period, if a facility demonstrates that additional time is needed to amortize the expenditures.

Loading, Screening and Planting Requirements for New Uses

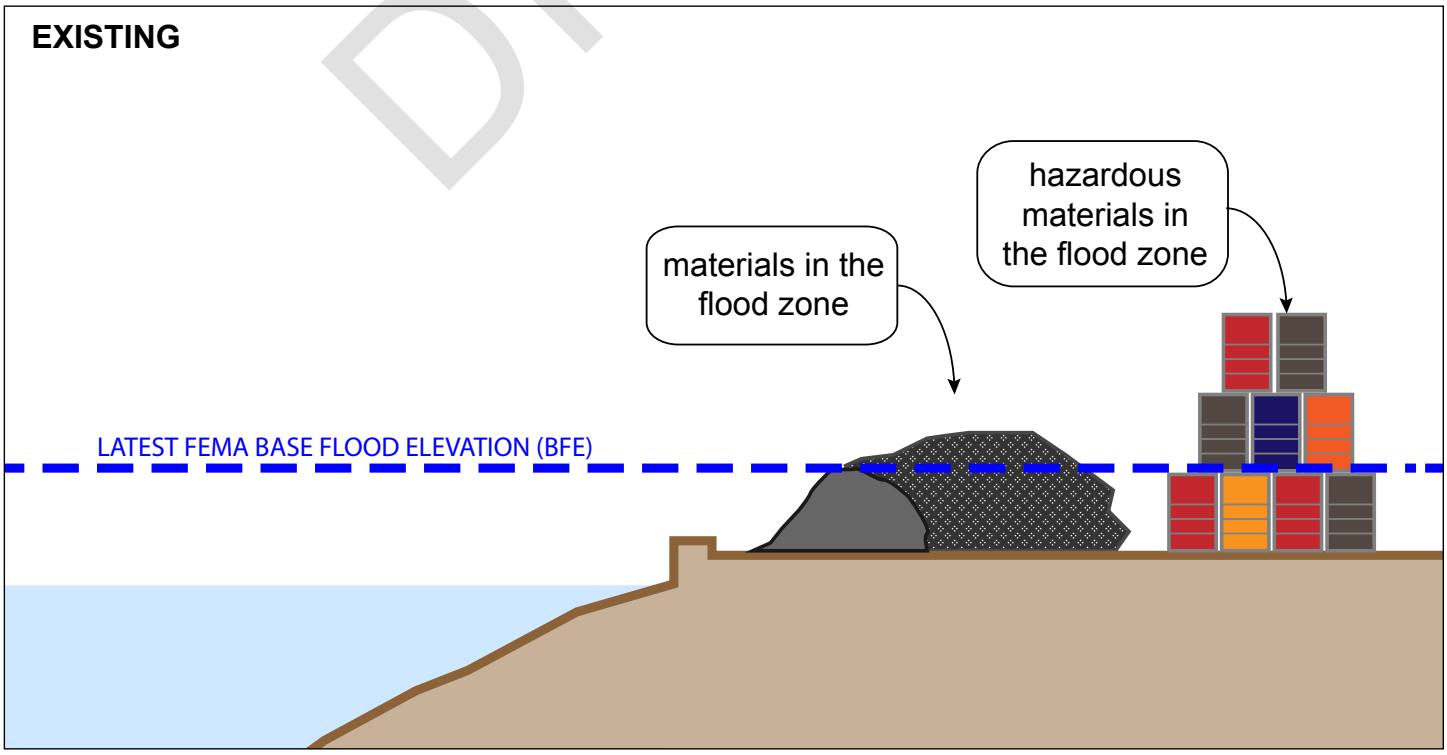
In addition to the site design standards described above, any site occupied by a new OIU (including construction and demolition debris transfer stations) at a new location will also be required to provide off-street loading berths, including on sites with no building area, in order to reduce neighborhood congestion and conflicts with adjacent uses caused by on-street queuing of vehicles, a common problem in areas where these uses cluster. The loading berth requirement will be based on the gross land area of the activity and storage areas utilized by the operation. All new OIUs at new locations will be required to have at least one off-street loading berth, capable of handling a typical tractor-trailer without sidewalk encroachment.

New uses abutting a Residence District boundary or across a street from a Residence District must provide a minimum buffer for screening along the property line. The buffer may be densely planted or a wall of sound-deadening material.

Complementary Code Amendments

The proposal also recommends complementary amendments to the Building Code to eliminate inconsistencies, add clarity to existing requirements, and provide for enhanced enforcement with respect to environmental controls. Currently the Building

Revise Building Code Appendix G: Flood-resistant construction standards to include flood proofing standards for unenclosed industrial facilities and hazardous materials stored in the flood zone.

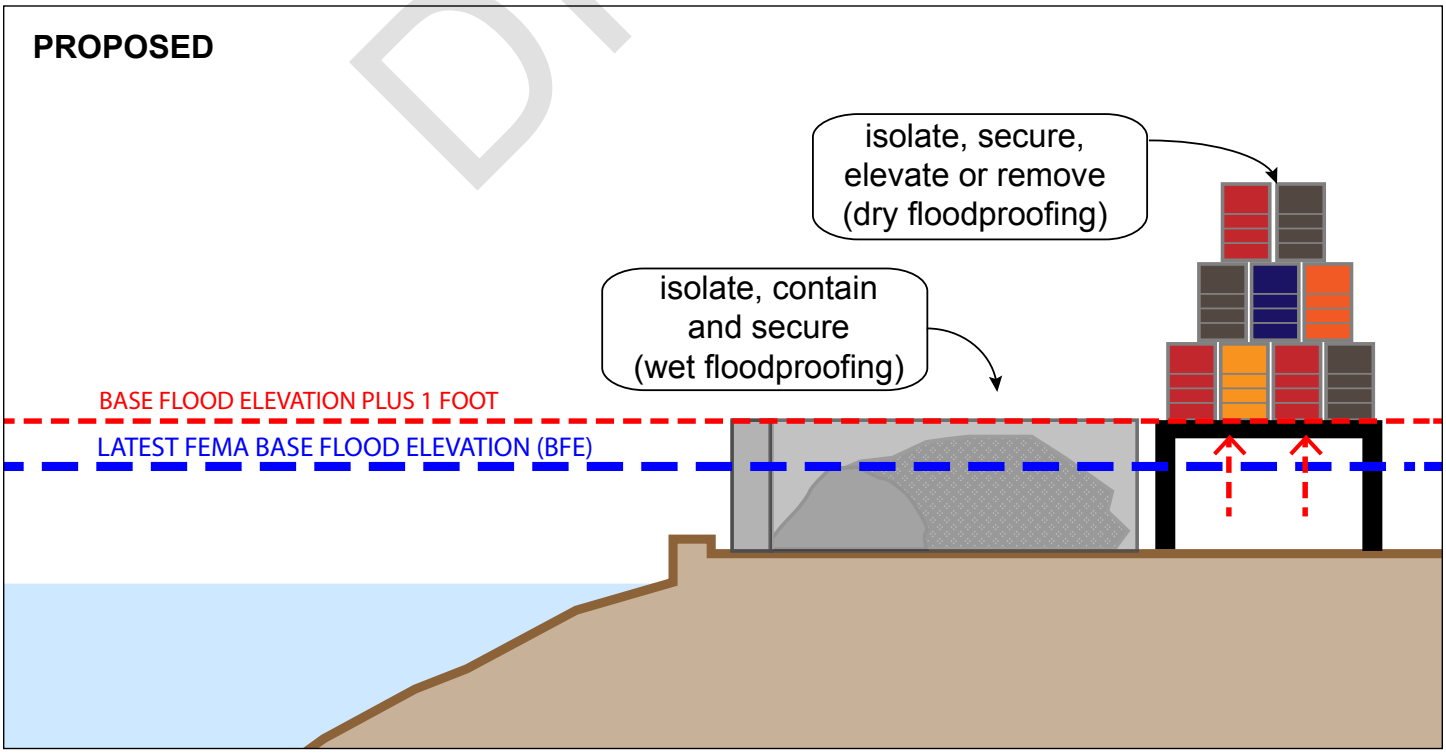


Code limits fences to 10-feet in height. The proposed amendments would remove this limitation to allow for taller fences enclosing storage piles without a waiver. Allowance of higher fences will provide for better containment of larger material piles. Consistent with a Department of Sanitation rule that requires C&D facilities to post identifying signs, the Department recommends a signage requirement be added to the Building Code that applies to all open industrial uses to support better identification of sites for improved enforcement of applicable regulations. The signs would be required to include the name of the business, hours of operation, types of material that it accepts and does not accept, the types of permits to operate pursuant to City and State regulations and the expiration dates, and the telephone numbers of the business and of the regulators.

Building Code Appendix G: Flood Resilient Construction includes standards for development within the FEMA designated 100-year floodplain. This section of the code currently applies to all development, including open yards and unenclosed industrial operations, however specific standards for such facilities are not explicit, but provided only as a reference to American Society of Civil Engineers report ASCE24. The Department recommends that Appendix G be revised to specify flood hazard mitigation standards for open industrial sites and for hazardous materials stored in the flood zone.

The New York City Department of Sanitation requires compliance with and monitoring of performance standards for all its permitted non-putrescible waste transfer stations (construction and demolition debris). Amendments to DSNY siting rules for non-putrescible waste transfer stations are necessary to be consistent with proposed amendments making zoning performance standards inapplicable to this use.

Although the zoning text amendment would make zoning performance standards inapplicable to OIUs, existing, complementary environmental regulations would continue to apply to all relevant open uses through other City and State codes that are



administered and enforced to greater effect by the appropriate agencies. The zoning text amendment would reiterate that superseding environmental codes apply in place of Zoning Resolution performance standards, and would reference the following regulations: the Air Pollution Control Code, the Noise Control Code, the Community Right-to-Know Law, the Fire Code, the Health Code, the Building Code, the New York State Pollution Discharge Elimination System, and use-specific DEC regulations in 6 NYCRR Part 360 Solid Waste Regulations and ECL Article 27, Title 23 Vehicle Dismantling Facilities.

BUSINESS ASSISTANCE PROGRAMS

In order to provide incentives for industrial companies to implement cost-effective pollution prevention controls and stronger safeguards for the storage of hazardous and non-hazardous materials at open industrial facilities, the study supports the recent adoption by the New York City Industrial Development Agency (IDA) of a financial assistance tool for OIUs in the form of a sales tax exemptions for each company on purchases of building, construction and renovation materials, and installation and associated services for the purpose of assisting such businesses with the renovation and improvement of their properties.

The study team also recommends that a targeted outreach program be developed to educate the affected businesses about the changes to the regulations and to assist with permit coordination and compliance. The program may also serve as a resource for useful information compiled during the study which includes standard operating procedures and best management practices developed by environmental agencies and trade associations. This program should also disseminate additional information about other available funding and incentive sources available to open industrial facilities for renovations or environmental controls.

SUMMARY OF RECOMMENDATIONS

The regulatory changes presented here address the six primary objectives of the study.

1. Identify and implement cost-effective pollution prevention controls to reduce air, land, water and noise pollution from OIUs.

The proposed required zoning controls and complementary code amendments will do much to mitigate potential pollution without posing a heavy financial burden on businesses based on the cost to business methodology used by the engineering consultant. The costs were analyzed according to the standard methodology used by the EPA in its economic impact statements for federal environmental regulations. The proposed pollution prevention controls will limit the amount of contaminants in storm water runoff and better control dust and other wind-borne pollutants, providing improved protection of the City's coastal areas.

2. Improve the business environment and generate new investment in nearby industrial areas.

The proposed regulatory changes will result in a number of improvements to the living and working environment in and near open industrial uses. These include better air quality due to reductions in blowing dust and debris; better harbor and waterway water quality due to significantly enhanced storm water drainage and treatment; fewer impacts on public infrastructure caused by clogging of storm water drains by dust, cement aggregate, paper and other debris from OIUs; and overall improvements to the appearance to the neighborhoods resulting from less debris, higher standards for fencing and landscaping and investments in site improvements to reduce tracking of materials onto public streets and sidewalks and pooling water and other fluids on cracked or unpaved surfaces. These quality of life improvements should enhance

working conditions in these areas, improving the business environment for the many industries that locate there.

3. Increase transparency and predictability of environmental standards for business owners, while improving the ease of enforcement for regulators.

A number of the recommendations will address the transparency, predictability and enforceability of environmental regulations applicable to open uses, including changes to the zoning definitions of open uses to make land use more compatible with other agency regulations; a revised Department of Buildings permitting process for OIUs that will require permits for their operation that require proof of other required permits and licenses; explicit, universal zoning requirements to address common issues; signage requirements that identify OIUs and their required permits; and technical assistance programs to assist businesses permitting and compliance.

4. Reduce emissions and off-site impacts caused by unenclosed industrial uses.

The proposed required zoning controls and complementary code amendments will do much to mitigate potential pollution caused by fugitive dust and storm water contamination, allowing for improvements to air and water quality for all New Yorkers.

5. Safeguard facilities along the waterfront and increase climate resilience by better regulating storage of chemicals and other industrial materials in coastal areas.

Proposed amendments to Building Code Appendix G: Flood Resilient Construction includes standards for flood protection of materials on open sites within the FEMA designated 100-year floodplain.

6. Evaluate the need for incentive and technical assistance to businesses which would be required to make facility upgrades.

The study recommends specific financial and technical assistance to businesses to assist in upgrades.

RECOMMENDATIONS FOR FURTHER STUDY

This study identified several additional potential recommendations or issues that, while outside the scope of this work, are worth additional consideration for their potential for additional environmental protection and improved flood resiliency.

Registration Program for Open Industrial Businesses

Better enforcement and compliance of the myriad regulations that apply to the industries identified as OIUs would be advanced by the development of a registration program for OIUs. A registry of OIUs would also allow the New York City Office of Emergency Management to contact companies located in flood zones in advance of a storm event, notifying business owners of the need to enclose, isolate, secure or remove vulnerable equipment and materials before a storm strikes. The Department of City Planning will continue to work with the New York City Department of Environmental Protection to assess the feasibility of creating a registry of OIUs in New York City to aid in monitoring and enforcement of the proposed regulations and assist in ongoing outreach to businesses that might benefit from future financial and technical assistance.

Monitoring of Environmental Emissions at Open Industrial Use Sites

Evaluation of the new standards against existing conditions would be made possible by a monitoring program that documents and analyzes air and water quality in proximity to open industrial facilities or in areas of high concentration of such uses. The ability to discuss and compare impacts against clear and measurable standards would improve enforcement and clarify policy issues with authorities, businesses and communities on environmental impacts.

Incentivizing Additional Pollution Prevention Controls

Certain types of infrastructure were identified as effective at controlling emissions at open industrial facilities, but are not proposed as mandatory. This includes “green infrastructure” technologies that provide low-impact design approaches to stormwater management and water treatment. While not universally applicable at industrial facilities, they are widely encouraged as cost-effective means of achieving specific environmental objectives. City agencies and non-governmental organizations that work to create incentive programs to improve the environmental performance of businesses should consider options that can encourage voluntary adoption of additional pollution prevention controls for OIUs and similar businesses.

Analyzing Storm Resiliency in Industrial Areas

A renewed focus on the use of land within floodplains in New York City in the aftermath of Hurricane Sandy raises questions about the City’s policies with regard to the storage of hazardous materials within flood zones, the resilient construction of new buildings within industrial areas and potential issues created by climate change and sea level rise. A second phase of the Department of City Planning’s post-Sandy neighborhood planning studies is slated to include an in-depth analysis of issues faced by the City’s industrial areas. The scope of work for these studies should address the issues identified here.

Performance Standards for Enclosed Industrial Uses

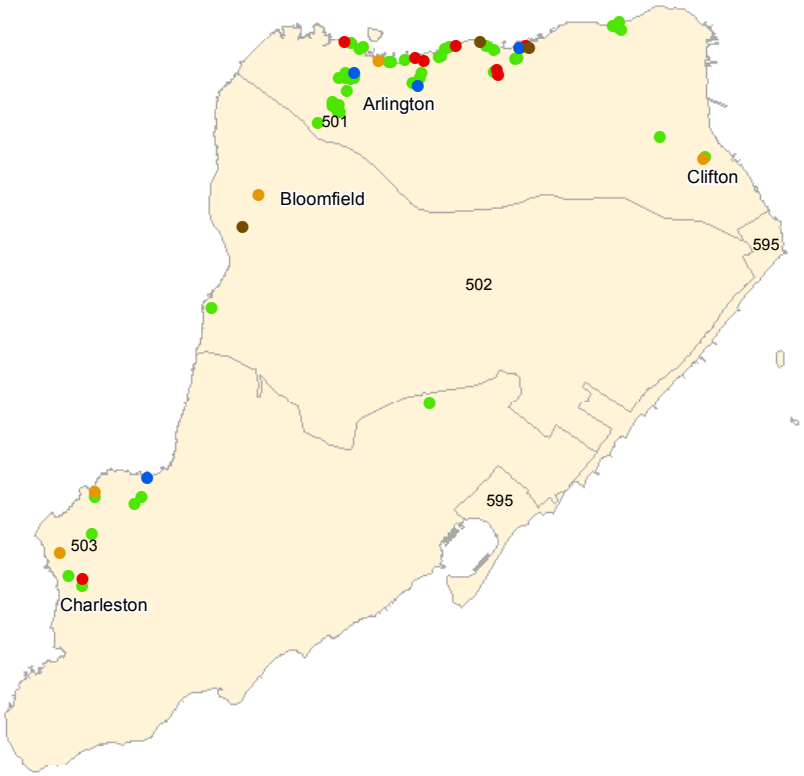
While this study has shown that the zoning industrial performance standards are obsolete for open industrial uses and superseded by more up-to-date and effective environmental regulations, the same could likely be said for enclosed industrial uses as well. Enclosed uses are more varied than open uses and likely pose different environmental and regulatory issues than considered here. However, creation of appropriate, environmentally sound site design standards for enclosed industrial uses should be a follow-up to this study.

As the City continues to evaluate its post-Sandy emergency response and preparedness procedures special consideration should be given to the location of Open Industrial Uses, whose exposed materials and equipments pose particular risks to the investment of the businesses as well as to public safety and the environment.

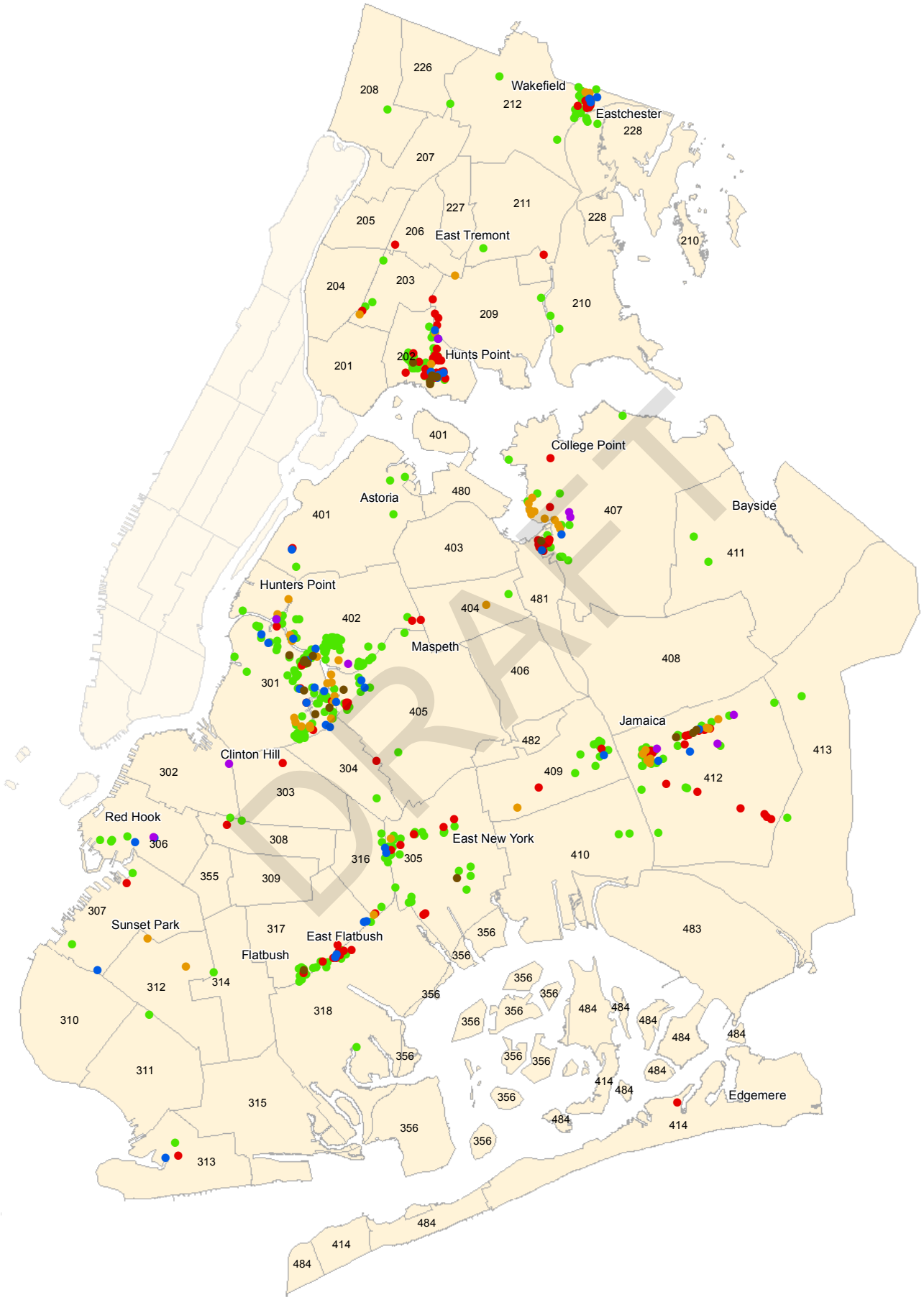
APPENDIX A: LOCATION OF OPEN INDUSTRIAL USES IN NEW YORK CITY

Approximate inventory of all open industrial facilities in New York City, as of the publication of this report. The boundaries and number labels represent the borough community boards.

This map does not include the location of municipal or City/State/Federally-owned open industrial facilities. This list is fairly comprehensive, but does not necessarily represent all facilities citywide.



- Auto Dismantlers
- C&D Transfer Stations
- Concrete or Asphalt Manufacturing
- Scrap Metal Processors
- Unenclosed Storage
- Waste Recycling



Source: DCP 2013 Survey of Open Industrial Facilities in New York City

APPENDIX B: LIST OF REGULATIONS

	Agency	C&D Processing Transfer Stations	Concrete & Asphalt Plants
FED	Environmental Protection Agency	Title 40 Protection of the Environment	Title 40 Protection of the Environment
	Federal Emergency Management Agency	National Flood Insurance Program	National Flood Insurance Program
		(All federal acts under Title 40 apply to all uses)	
NEW YORK STATE	Dept. of Environmental Conservation	ECL §17 State Pollutant Discharge Elimination System (SPDES)	ECL §17 State Pollutant Discharge Elimination System (SPDES)
		6 NYCRR § 360: Construction & demolition debris processing facilities	6 NYCRR §240 Asphalt and Asphalt Based Surface Coating
		Hazardous materials are not permitted	6 NYCRR §220 Portland Cement Plants
	Dept. of Transportation		
	Dept of Motor Vehicles		
NEW YORK CITY	Dept. of Environmental Protection	ADC §24 Air Pollution Control Code	ADC §24 Air Pollution Control Code
		Local Law 113 Noise Control Code	Local Law 113 Noise Control Code
		Site Connection Permit	Site Connection Permit
		Community Right to Know Program	Community Right to Know Program
		Industrial Pretreatment Program	Industrial Pretreatment Program
	Dept. of Sanitation	16 RCNY §4 Transfer Stations	
	Dept. of Planning	Zoning Resolution	Zoning Resolution
		§42-15 Use Group 18	§42-15 Use Group 18
		§42-20 Performance Standards	§42-20 Performance Standards
		§42-40 Enclosure Requirements	§42-40 Enclosure Requirements
	Dept. of Buildings	2008 Building Code	2008 Building Code
		§30 Storage of Certain Waste Materials	§30 Storage of Certain Waste Materials
		§2-33 Concrete Washout Water	
		§5-04 Concrete Production Facilities	
		Appendix G: Flood Resilient Construction	Appendix G: Flood Resilient Construction
	Fire Department	Fire Code (AC Title 29)	Fire Code (AC Title 29)
	Dept. of Consumer Affairs		
	Business Integrity Commission	Carting Registration	

Scrap Metal Processing	Auto Dismantling	Waste Recycling	Unenclosed Storage
Title 40 Protection of the Environment	Title 40 Protection of the Environment	Title 40 Protection of the Environment	Title 40 Protection of the Environment
National Flood Insurance Program	National Flood Insurance Program	National Flood Insurance Program	National Flood Insurance Program
ECL §17 State Pollutant Discharge Elimination System (SPDES)	ECL §17 State Pollutant Discharge Elimination System (SPDES)	ECL §17 State Pollutant Discharge Elimination System (SPDES)	ECL §17 State Pollutant Discharge Elimination System (SPDES)
6 NYCRR §360 Recyclables Handling and Recovery Facilities	6 NYCRR §27 Vehicle Dismatling Facilities	6 NYCC §360 Recyclables Handling and Recovery Facilities	
6 NYCRR §371 Listing of Hazardous Wastes	6 NYCRR §371 Listing of Hazardous Wastes	Hazardous materials are not permitted	
HAY Article 4 §89 Junkyard & Scrap metal processing facilities			
15 NYCRR §81 Regulation of Junk & Salvage businesses	15 NYCRR §81 Regulation of Junk & Salvage businesses		
ADC §24 Air Pollution Control Code	ADC §24 Air Pollution Control Code	ADC §24 Air Pollution Control Code	ADC §24 Air Pollution Control Code
Local Law 113 Noise Control Code	Local Law 113 Noise Control Code	Local Law 113 Noise Control Code	Local Law 113 Noise Control Code
Site Connection Permit	Site Connection Permit	Site Connection Permit	Site Connection Permit
Community Right to Know Program	Community Right to Know Program	Community Right to Know Program	Community Right to Know Program
Industrial Pretreatment Program	Industrial Pretreatment Program	Industrial Pretreatment Program	Industrial Pretreatment Program
Zoning Resolution	Zoning Resolution	Zoning Resolution	Zoning Resolution
§42-15 Use Group 18	§42-15 Use Group 18	§42-15 Use Group 18	§42-14 Use Group 17
§42-20 Performance Standards	§42-20 Performance Standards	§42-20 Performance Standards	§42-20 Performance Standards
§42-40 Enclosure Requirements	§42-40 Enclosure Requirements	§42-40 Enclosure Requirements	§42-40 Enclosure Requirements
2008 Building Code	2008 Building Code	2008 Building Code	2008 Building Code
§30 Storage of Certain Waste Materials	§30 Storage of Certain Waste Materials	§30 Storage of Certain Waste Materials	§30 Storage of Certain Waste Materials
Appendix G: Flood Resilient Construction	Appendix G: Flood Resilient Construction	Appendix G: Flood Resilient Construction	Appendix G: Flood Resilient Construction
Fire Code (AC Title 29)	Fire Code (AC Title 29)	Fire Code (AC Title 29)	Fire Code (AC Title 29)
GBL§6-C Scrap Processors			
Carting Registration		Carting Registration	

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