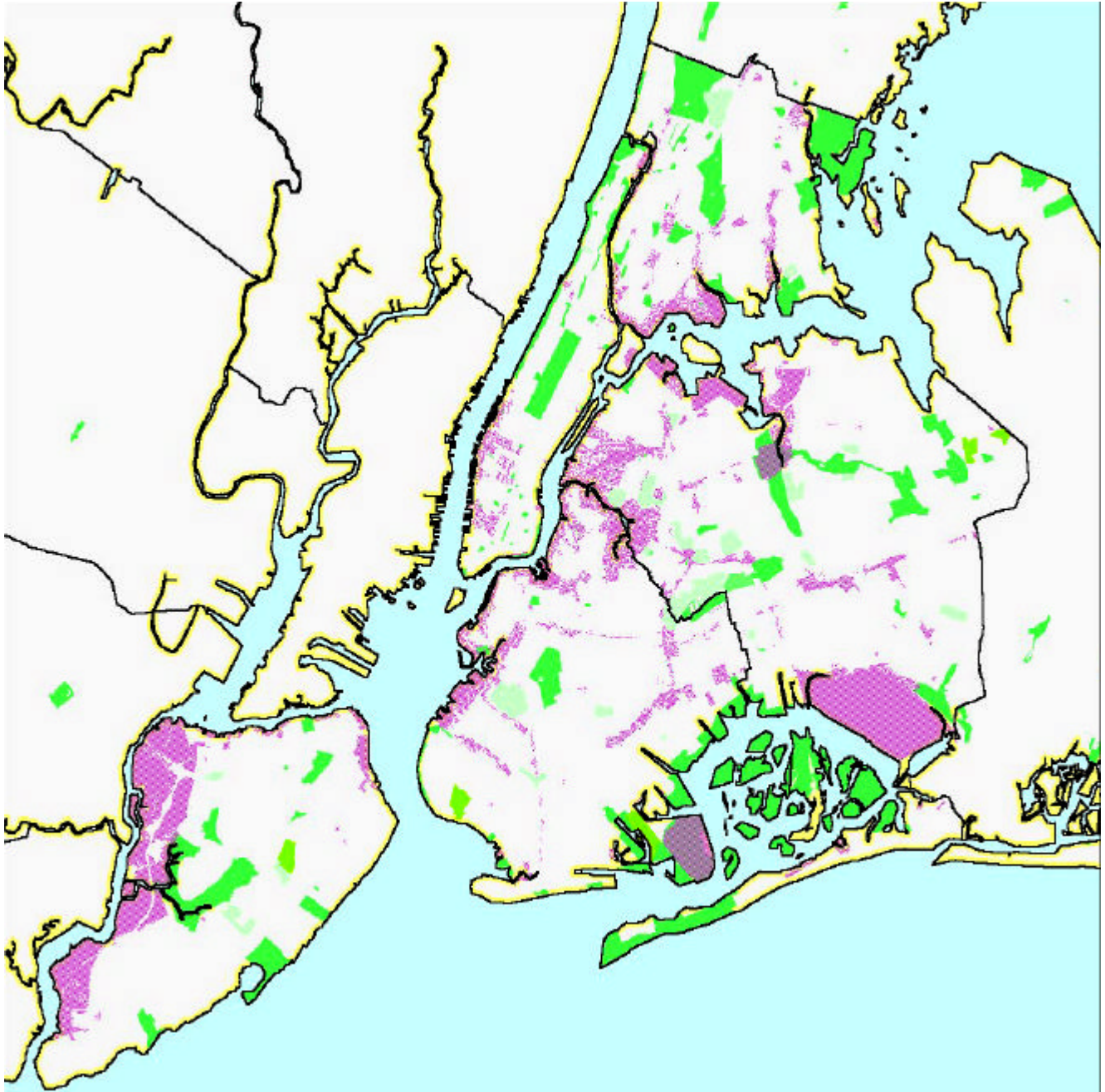


Making it in New York

THE MANUFACTURING LAND USE AND ZONING INITIATIVE



VOL. I: REPORT

Prepared by
The Pratt Institute Center for Community and Environmental Development
For
The Municipal Art Society of New York

June 25, 2001



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Brooklyn, New York
May 31, 2001

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FOREWORD

The Manufacturing Land Use and Zoning Initiative (the Initiative) is a project launched in 1999 by the Municipal Art Society (MAS) in partnership with Pratt Institute Center for Community and Environmental Development (PICCED) to identify issues and opportunities facing manufacturing districts and mixed-use communities in New York City. The overall goal of the project is to provide the civic community, general public and government officials with information, tools and recommendations for evaluating and guiding both short-term and long-term land use policy in manufacturing districts and mixed-use communities.

As a first step, the Initiative has produced a report that provides recommendations on how New York's zoning and land use policies can be used to retain and revitalize the city's manufacturing base, where and when it is appropriate to do so. This report:

- Provides an in-depth land use analysis of different types of manufacturing areas in New York City using eight case studies to inform recommendations;
- Describes manufacturing and mixed-use zoning models found in other cities and evaluates their applicability to New York;
- Analyzes existing mixed-use zoning districts and assesses their success based upon their original objectives;
- Analyzes problems and opportunities relating to environmental performance in manufacturing and mixed-use areas, provides recommendations for performance-based zoning approaches, and introduces strategies for capitalizing on sustainable manufacturing opportunities; and,
- Recommends criteria for the selection of areas that should be retained as industrial districts, and areas that are suitable for rezoning to residential, commercial, transitional, or non-transitional mixed use.

A principal aim of the Initiative is to ensure that the findings reflect the insight and advice of a range of stakeholders. To achieve this, the Initiative:

- Convened a task force representing a cross-section of representatives from manufacturing businesses, local development corporations, government planning and economic development agencies, and environmental justice groups. This task force served as the advisory body to the study.
- Conducted focus groups to gain industry and community input into the study and to develop its recommendations.

ACKNOWLEDGEMENTS

The Manufacturing and Land Use Initiative is a joint effort of the Municipal Art Society and the Pratt Institute Center for Community and Environmental Development. It grew out of a series of discussions with the New York Industrial Retention Network and the Industrial Technology Assistance Corporation. A generous Alfred P. Sloan Foundation grant to the Municipal Art Society funded the effort. Their funds were supplemented, in part, by general support funds available to both MAS and PICCED.

The initiative was informed by countless numbers of people in the manufacturing, environmental justice, community development, and real estate communities. Their insight, wisdom and recommendations were taken to heart, seriously considered and much of it woven into the methodology and recommendations that follow. It should not, however, be inferred from this that any or all the participants endorse the findings and recommendations contained in this report.

To all those that participated and willingly gave of their time, we are indebted. Most importantly, we want to single out each and every one of the team who worked on this study on a daily basis. They were nothing short of terrific. Led by Mercedes Narciso, the team of Leena Shanbhag, Maki Okage and Paula Crespo worked creatively and consistently to produce one of the more thought provoking and stimulating land use and zoning proposals to be put forth in years.

Our thanks also to Brian Sullivan and Eva Neubauer Alligood whose advice and contributions were invaluable as well as Nancy Haycock, Mannix Gordon, Rex Curry, Naomi Johnson, Mo Ramsarup and the entire PICCED staff whose support for those of us who were focused on this effort was immeasurable.

Finally our thanks to Adam Friedman of the New York Industrial Retention Network, Sara Garretson of the Industrial Technology Corporation, Oliver Lednicer of the Manufacturers Association of New York, and Kent Barwick and Frank Sanchis of the Municipal Art Society and those too numerous to mention from the environmental justice movement, community-based organizations and PICCED in helping forge a new paradigm for sustainable economic development in New York City.

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EXECUTIVE SUMMARY

Introduction

As our new generation of civic and elected leaders prepares the foundation for the next phase of New York City's development, there is a need to understand both the historic and continued important role that manufacturing has played as the **silent partner** to other sectors of the economy. It is critical for decision-makers to take into consideration the persistent demand for manufacturing and related land uses. Most importantly, city policy makers need to understand that diversification of our economy is key to the creation of a sustained and healthy economy, particularly one that meets the employment needs of a diverse and rapidly changing population. New York City's land use policies should help foster the development of this kind of diverse economy.

Unfortunately, over the past three decades public policy has all but ignored New York City's manufacturing sector, which provides **250,000 jobs and supports other important sectors of the economy**. The manufacturing sector is no longer characterized by the smoke-stack industries of the past, but by a mix of small and mid-sized production businesses and "niche" firms that are integrally related to the City's economic drivers, such as the finance, creative, cultural and health care industries.

The Impact of Real Estate Pressures

Manufacturing functions continue to play a key role in New York's economy, yet real estate and other land use pressures threaten their existence. Today, manufacturers are in competition for space with an array of equally important land uses such as municipal services, commercial development, open space, housing and even new industrial uses such as technology-related businesses. The City's land use and zoning policies have not kept pace with these changes, and have not been able to effectively balance these competing but interdependent needs.

In New York City's extremely tight, overheated real estate market, manufacturers are at a great disadvantage in the competition for space, even in areas that are zoned for their use. Other uses have the ability to pay much higher rents, and prospective zoning changes in the most desirable manufacturing and mixed use zones have encouraged private owners to land-bank their properties in anticipation of the opportunity to dramatically increase their financial returns in the future. High rents in a speculative real estate market make it extremely difficult for small manufacturers to maintain what are otherwise viable and competitive businesses.

Contrary to the common perception that much space is available and underutilized in manufacturing-zoned areas, our study revealed that in recent years many non-manufacturing industrial uses such as warehousing and distribution have taken up a significant percentage of the space in these areas. Space in manufacturing zones has also been consumed by other industrial uses such as public transportation yards, airports, water and sewer services, solid waste disposal facilities, and parking. Unlike manufacturing, these uses often do not create many jobs. New uses in manufacturing zones such as "Big-Box" retail establishments have adversely impacted manufacturing activity because they increase competition for space, pay marginally higher rents, and increase traffic. At the same time, they leverage far fewer jobs.

Yet another real estate issue that threatens the viability of manufacturing in New York City is that an increasing number of properties in manufacturing and mixed-use zoning districts are being converted to non-manufacturing uses such as commercial and residential space through variances granted by the New York City Board of Standards and Appeals. The cumulative effect of these ad hoc land use changes has been to dramatically chip away at the crucial core stock of manufacturing space in New York City.

Sufficient Space for Manufacturing – Myth or Reality

Our analysis indicates that while there is more space available in outlying manufacturing-zoned areas of the City, several factors make it difficult for manufacturers to relocate to these areas without threatening the viability of their businesses. Many manufacturers must have ready access to their clients, workers and network of associated producers. These outlying areas often lack infrastructure such as mass transit and do not have the building types and supported services that many manufacturers need to operate competitively. Finally, and more fundamentally, isolating and limiting the number of manufacturing-zoned areas in the City violates the principles of social and environmental equity. It relegates to a limited number of areas, usually those near low and moderate-income populations, communities of color, and new immigrant communities, the burdensome uses of today, and those unforeseen burdensome uses of tomorrow. This is both unjust and undesirable.

It is not our assertion that manufacturing uses are of higher value than housing or office development. We recognize that New York is facing a mounting shortage of housing, particularly among low and middle-income residents, and that it must find ways to expand the supply throughout the City. Moreover, the City needs to provide space for emerging technology related industries, particularly biotechnology, telecommunications and new media. However, in a city of the size and diversity of New York, economic development need not be seen as a zero sum game where the ability to take advantage of growth opportunities in one sector is inevitably tied to the demise of other viable sectors. New York does not have to choose between new technologies and more traditional production-based manufacturing. Nor should meeting the demand for additional office and residential space in New York City be incompatible with retaining manufacturing businesses. On the contrary, the City's manufacturers are **silent but crucial partners** to other sectors of our economy.

The Emergence of Environmental Issues

Today, another threat to the viability of manufacturing in New York City is the City's lack of attention to environmental issues. Contrary to the perception that land uses are segregated in New York City through zoning classifications, our analysis indicates that manufacturing-zoned land is comprised of a variety of mixed uses and activities, including residential, commercial and industrial. However, current land use and zoning policies do not address the challenges of siting these uses in proximity to each other, and they fail to promote the health and welfare of residents and workers alike. The concentration of noxious uses such as waste transfer facilities in manufacturing zones, with their associated truck traffic, noise, odors, dust, and toxic air pollutants, has added to the instability of many manufacturing areas. Nearby residents have experienced a marked deterioration in their quality of life, and some have begun to advocate for the re-zoning of manufacturing-zoned areas where, ironically, many of them are employed.

The Need for a Comprehensive Planning and Land Use Strategy

This report urges the City to craft a more comprehensive planning and land use strategy in manufacturing zones that takes into consideration the diverse social, economic and environmental needs of the City. The absence of such a land use and zoning policy has led to speculation and unnecessary displacement of manufacturers. Unfortunately, real estate issues have taken a dramatic toll on manufacturing in New York City. The recommendations of the **MAS/Pratt Center Study** are aimed at achieving a careful balance between the housing, economic development, cultural and environmental needs of a healthy and vibrant city. Underlying our recommendations is a commitment to the City's diversity and to the principles of social, economic and environmental equity. We believe that these inalienable principles must govern our public policies and drive our decision-making processes.

Model Industrial Land Use Policies

Our review of model industrial land use policies in other cities has demonstrated that in order to preserve existing manufacturing and foster new development, it is necessary to establish specific manufacturing zones where other types of development, such as residential, commercial or other industrial activity, are prohibited or very restricted. These zones provide industrial development programs and capital infrastructure investment to support manufacturing businesses and address environmental issues through regulations designed to curtail noxious uses. They also include periodic reviews to reflect new trends in the economy and to reassess economic and land use priorities. In addition, these model policies have created mixed-use zones according to use compatibility and environmental impact standards, thus addressing any potential conflicts that may be created by the mix.

RECOMMENDATIONS

Despite the decline in manufacturing activity since World War II, manufacturing still directly provides over a quarter of a million jobs in New York City. However, the City's range of manufacturing financing, technical assistance and development programs are inadequate and limited in power and scope. They offer financial assistance almost exclusively to owners of manufacturing businesses, even though most manufacturers in New York rent rather than own their space. MAS and the Pratt Center urge the City to craft a more comprehensive planning and land use strategy in manufacturing zones that takes into consideration the housing, economic development and environmental needs of New York City -- now and in the future. Specifically the report recommends four interrelated areas of intervention.

- **Retain and expand manufacturing activity and simultaneously enhance the environment** by developing a "place-based delivery system" serving each manufacturing zone. This system should integrate land use policies and zoning regulations with financial, program development and technical assistance support activities.
- **Balance competing demands for space** by identifying a limited number of areas suitable for rezoning from manufacturing to other uses.

- **Protect jobs and manufacturing, now and in the future, by**
 - establishing specific Manufacturing Development Zones and Non-Transitional Mixed Use Zones;
 - promoting manufacturing development through the implementation of combined zoning regulation, financial incentives (Tax Increment Financing and Industrial Development Agency bonds for developers of rental projects), and infrastructure support; and
 - establishing a Trust for Industrial Space to acquire, develop and manage manufacturing facilities.

- **Dramatically enhance the quality of the environment in manufacturing and mixed use areas of the City** by developing a new paradigm that ties manufacturing growth and vitality to sustainable development and eco-industrial strategies. Also, we recommend that the City and State adopt **brownfields reclamation legislation**.

- **Develop an accurate, consistent and comprehensive database of the City's economy.** This database should be geo-coded, and should include where people are employed. It should be made available on the Internet and should enable us to undertake place-based and sector analysis, community-based planning, infrastructure investment and program development in a rational and informed manner.

These recommendations provide the framework for a diverse and sustainable economy for New York City, and are discussed in detail in the following two volumes, along with our findings. We urge our civic and elected leaders and policy makers to read, debate, and hopefully adopt these recommendations. Taken together, they provide for a diverse economy built upon an environmentally sustainable and economically just foundation.

REPORT SYNOPSIS

TOWARD A NEW INDUSTRIAL AND ECONOMIC DEVELOPMENT PARADIGM

Over the past three decades, land use needs and issues in manufacturing and mixed-use zones have changed dramatically. The nature of manufacturing in the City has evolved significantly from its previous mix of small and large-scale production businesses to smaller-scale “niche” firms that are integrally related to the City’s economic drivers, such as the FIRE, creative/cultural and health care industries. These new kinds of manufacturers play a key role in New York’s economy, yet their existence is threatened to a great extent by real estate pressures. Today, manufacturers are in competition for space with an array of other equally important uses such as residential and commercial development and municipal services. Unfortunately, the City’s manufacturing land use and zoning policies have not kept apace with these changes, and have not been able to effectively balance these competing needs. Manufacturers have been at a great disadvantage in the market because other uses are able to pay much higher rents, and space in the most desirable manufacturing and mixed-use zones is land-banked by private owners in anticipation of zoning changes and increased values. In recent years, the increasing concentration of noxious uses has added to the instability of these areas as nearby residents have experienced a marked deterioration in their quality of life, and have begun to advocate for the re-zoning of manufacturing areas.

It is not our assertion that manufacturing uses are of higher value than housing or office development. We recognize that the City is facing a mounting shortage of housing, particularly among low and middle-income residents, and that it must find ways to expand the supply outside of Manhattan. The City also needs to provide commercial space for emerging technology related industries, particularly biotechnology, telecommunications and new media, if it is to remain competitive in the “New Economy.” However, in a city of the size and diversity of New York, economic development need not be seen as a zero sum game where the ability to take advantage of growth opportunities in one sector is inevitably tied to the demise of other viable sectors. New York does not have to choose between new technologies and more traditional production-based manufacturing. Nor should meeting the demand for additional office and residential space in New York City be incompatible with retaining manufacturing businesses. On the contrary, the city’s remaining manufacturers are silent but crucial partners to other sectors of our economy. They also provide stable, well-paying jobs for city residents with limited skills who would otherwise have difficulty entering and remaining in the job market.

Adequate resources, including land, venture capital, infrastructure and program and regulatory systems, are needed to enable New York City to fully capitalize on the promise of existing and emerging manufacturing related industries. This report urges the City to craft a more comprehensive planning and land use strategy in manufacturing zones that takes into consideration the housing, economic development and environmental needs of New York City -- now and in the future. Moreover, the City, in partnership with existing manufacturing technical assistance organizations, should design a system of incentive-based voluntary improvements to the operations of small and medium-sized manufacturing enterprises to elevate the level of their environmental performance. Our recommendations are linked to resource and infrastructure investments on the part of the public and private sectors. These investments will reap future rewards in terms of the City’s increased economic competitiveness and environmental accountability.

OBSTACLES FACING MANUFACTURING

Although manufacturing activity presently occupies less than four percent of the City's total land area, manufacturers still find themselves competing with other uses for appropriate locations in areas zoned for manufacturing. Important industrial uses like warehousing and distribution take up a significant percentage of the space in manufacturing areas, and are critical to manufacturers and other industrial sectors in New York City. However, unlike manufacturing, they often do not create many jobs. The emergence of new uses in manufacturing zones, such as "Big-Box" retail establishments, which are typically able to pay much higher rents than manufacturing businesses, has also adversely impacted manufacturing activity. High rents in a speculative real estate market make it extremely difficult for small manufacturers to maintain viable businesses. Land use changes in manufacturing and mixed use districts are also happening on an ad hoc basis through variances granted by the New York City Board of Standard and Appeals.

Manufacturing zones include many industrial uses like public transportation yards, airports, water and sewer services, solid waste disposal facilities, parking, etc. In addition, the increasing concentration of noxious uses such as waste transfer facilities in manufacturing zones, with their associated vehicular traffic, odors, dust, toxic air pollutants, and noise has resulted in higher rates of respiratory diseases. Complaints from residents about the deterioration in the quality of their neighborhood have added to the instability of these areas. Finally, the high cost of energy, and the manner in which manufacturers are charged for electricity is an obstacle to the continued viability of manufacturing businesses. Current land use and zoning policies have fallen short in their ability to address these challenges.

GENERAL FINDINGS

Overall

- Despite the decline in manufacturing activity over the past several decades, manufacturing still provides nearly a quarter million jobs in New York City.
- Most of the large manufacturing companies who owned their production plants have left New York to mass-produce goods in cheaper locations, often outside of the country. Those that remain or have opened their doors in recent years are primarily small businesses who lease rather than own their space. Few have the means to build, purchase or substantially rehabilitate new space.

Land Use and Zoning

- During the last ten years, manufacturing uses and vacant land have declined rapidly in favor of primarily automotive and commercial uses. In many cases, these uses can and do locate in M zones. Also, a significant percentage of manufacturing land uses and firms are located outside of M zones. Therefore, the fact that many manufacturers are non-conforming suggests that a significant number of these manufacturing jobs are quite vulnerable and subject to displacement. We believe that the future of manufacturing activity is integrally tied to assuring that there is sufficient space for manufacturing in the City. This in turn requires changes in our land use and zoning policies.

- Important non-manufacturing industrial uses like warehousing and distribution take up a significant percentage of the space in manufacturing areas. Manufacturing zones also include other industrial uses like public transportation yards, airports, water and sewer services, solid waste disposal facilities, and parking. Unlike manufacturing, they often do not create many jobs. The emergence of new uses in manufacturing zones such as “big-box” retail establishments, which can pay higher rents than manufacturing businesses but leverage far fewer jobs has adversely impacted manufacturing activity.
- Manufacturing uses are the predominant land use in the special purpose districts studied in this report. These districts were originally created to allow residential and industrial uses to coexist and to strike a balance between uses. However, these areas have been experiencing rapid increases in residential and commercial uses, activity that has led to significantly higher real estate prices for existing manufacturing uses and encouraged warehousing of industrial properties that could easily be rented for manufacturing uses.
- New York City’s land use and zoning policies in the past two decades have not reflected any major mechanisms to encourage manufacturing retention and development. Existing mixed-use zoning policies that were created to balance manufacturing and other uses have not always made it easy for manufacturing uses to remain and grow in these zones.
- While the City Planning Department has officially rezoned some manufacturing areas, the city’s Board of Standards and Appeals has granted dozens of conversions of manufacturing properties, in essence, initiating a “de facto rezoning” of many areas of the city without the proper environmental and planning checks and balances presently required for rezoning actions. Between January 1997 and June 1998, the BSA approved 39 of these types of variances in South Williamsburg alone and, according to the local community board, the application rate has accelerated dramatically over the past three years. The BSA’s tendency to grant these zoning variances has resulted in the permanent loss of a significant amount of attractive industrial properties during a time when such buildings were in short supply.
- Loft manufacturing space available for rent is in great demand, making it very difficult for manufacturers to find space in districts that are zoned for their use. The vacancy rates for industrial spaces in Brooklyn and Queens, for example, was only 8.26 percent and 6.93 percent, respectively, in 2000.
- In recent years, the high price of commercial space in prime areas of Manhattan has also encouraged those seeking traditional office uses to move into the older industrial areas of Manhattan—such as the Midtown garment district, Soho-Tribeca, Western Chelsea—and into sections of Brooklyn and Queens that are close to Manhattan, like Greenpoint, Williamsburg and Long Island City.
- This study supports the conclusion by some City Planning officials that in some limited areas of the City, manufacturing areas have declined to the extent that rezoning is warranted. However, rezoning should only take place after a careful analysis of the existing land use and manufacturing job concentrations is undertaken for each area that is being considered.

- The review of model industrial land use policies in other cities conducted for this report demonstrates that in order to preserve existing manufacturing and foster new development, it is necessary to establish specific manufacturing zones where other types of development, such as residential, commercial or other industrial activity, are prohibited or very restricted. These zones provide industrial development programs to encourage manufacturing businesses and address environmental issues through regulations designed to curtail noxious uses. They also include periodic reviews to reflect new trends in the economy and to reassess economic and land use priorities. In addition, mixed-use zones are established according to environmental impacts and use compatibility, thus addressing any potential conflicts that may be created by the mix.

Financial and Technical Assistance

- The city's range of financing, technical assistance and development programs geared toward manufacturing companies are inadequate and limited in both power and scope, since they offer financial assistance almost exclusively to companies that own their buildings. In New York City, unlike most other parts of the country, most manufacturing companies are small and a high percentage of them prefer to rent space, rather than own their own buildings.

Environmental

- While manufacturing areas have historically enjoyed a positive image among low-income residents because they served as generators of jobs, they are increasingly perceived as quality of life threats because of their high concentration of noxious uses, such as waste transfer stations and unwanted establishments like adult entertainment centers. In addition, the poor physical condition of manufacturing areas (poor lighting, potholes, illegal dumping) fuels community's negative perception of this industry.

STRATEGIC OVERVIEW

The Initiative urges the City to craft a more comprehensive planning and land use strategy in manufacturing zones that takes into consideration the housing, economic development and environmental needs of New York City -- now and in the future. Moreover, the City, in partnership with existing manufacturing technical assistance organizations, such as the Industrial Technology Assistance Corporation and the New York Industrial Retention Network, various borough-based economic development assistance organizations, labor unions and trade associations, should design a system of incentive-based voluntary improvements to the operations of small and medium-sized manufacturing enterprises to elevate the level of their environmental performance. Our recommendations are linked to resource and infrastructure investments on the part of the public and private sectors in New York City that will reap future rewards in terms of the City's increased economic competitiveness and environmental accountability.

RECOMMENDATIONS

GENERAL RECOMMENDATION

1. As a result of the review and findings in the eight study areas as well as policy findings in New York City, the Initiative calls for the creation of a system that would coordinate and integrate the place-based delivery of program, financial, technical assistance, environmental, and land use and zoning policies. This system will address development in manufacturing districts in a manner that contributes to the retention and expansion of manufacturing activity and simultaneously improves New York City's environment.

LAND USE AND ZONING RECOMMENDATIONS

2. In order to provide special protections to manufacturers who are threatened by competing land uses, M-zoned areas with evidence of a large concentration of manufacturing uses and a substantial number of manufacturing jobs would not only be retained, but also strengthened through the creation of Manufacturing Development Zones (MDZs). While other uses would not be excluded, they would be directed to the M areas most appropriate, and would need a special permit or certification before being allowed to locate. The basis for granting a special permit or being certified would be different in M1, M2 and M3 zones. These zones would be superimposed on existing Manufacturing and Mixed-Use districts.
3. In light of the shortage of housing in New York City, it is not surprising that residential uses have increased in M-districts in the last 10 years. In certain M-zoned districts, the amount of new development for residential/ commercial use is significantly high, and in some areas there are few existing manufacturing facilities left. These districts should be considered for re-zoning to Residential or Commercial, although there should be an effort on the part of the city to protect and grandfather the remaining manufacturers in those areas.
4. Many commercial and some residential districts currently contain a significant presence of manufacturing uses. As a result of new advances in technology, many industrial processes in industries such as printing, apparel, and food processing are no longer noxious and need not be restricted to manufacturing districts. To ease real estate pressures facing manufacturers, manufacturing activities that are not noxious and that are compatible with their neighboring uses should be allowed to locate in commercial zones if they meet environmental performance and compatibility standards.
5. Although mixed-use districts in the combined study areas predominantly contain manufacturing land uses, they are experiencing rapid increases in commercial and residential land use. In order to retain manufacturing, it is important to preserve and strengthen existing Mixed-Use Districts that contain a balanced mix of manufacturing and other uses. To that end, the Initiative proposes two types of mixed-use zones -- Transitional and Non-Transitional.

The Non-Transitional Mixed Use Districts should contain a significant number of manufacturing jobs and have experienced only a modest level of residential or commercial conversion. These districts should be created in manufacturing areas abutting existing successful Mixed-Use Districts with a significant presence of both residential and manufacturing uses.

Manufacturers in these districts should be provided with incentives to improve their environmental performance and should have access to a range of financial, legal and programmatic supports to enable them to remain in the area and not be subject to displacement because of market and real estate pressures. These Mixed-Use Zones should employ financial and programmatic tools such as internal cross-subsidy programs and land trusts to maintain a predetermined mix of uses that are deemed to meet a public purpose objective such as the creation of a diverse, competitive and healthy economy.

Transitional Mixed Use Districts should be created in manufacturing areas where residential and commercial uses have already increased significantly and where there are few remaining manufacturing facilities. Manufacturing uses that are grandfathered should receive incentives to improve their environmental and compatibility standards.

6. The "New Economy" has seen the emergence of many new businesses in biotechnology, media and telecommunications. However, these uses have currently not been categorized, which makes their zoning status unclear. The City needs to define and list these new economic activities in the NYC Zoning Resolution and provide for periodic updating of the zoning resolution to incorporate new manufacturing activities (including eco industrial activities), technologies and processes.
7. Waterfront access plans should be created and implemented in manufacturing and mixed-use zones, where they are presently not required, since access to the waterfront for residents and workers contributes to the health and welfare of both. Access to the waterfront would also help to mitigate any adverse environmental impacts by providing for more open space and by adding to the "green or natural infrastructure" of these areas.
8. Land use changes in manufacturing and mixed-use districts are occurring on an ad hoc basis through variances granted by the New York City Board of Standard and Appeals. These legal ad hoc conversions as well as other illegal conversions of manufacturing properties should be curtailed.
9. The ease with which loft spaces in industrial areas can be adapted to other uses makes them attractive to a variety of users, especially to new technology uses, and also to commercial and residential users. In many M1 zones, these loft buildings have been converted at a rapid pace to residential uses, particularly by artists and artisans looking for live/work spaces. However, these artists are subject to the same real estate pressures as manufacturers when gentrification forces them to move. In M1 zones, with the exception of those with a MDZ overlay, working artists and artisans should be allowed to occupy space in manufacturing buildings with accessory living areas as long as they are certified as artists by the Department of Cultural Affairs, and as long as they can demonstrate that they produce some tangible product or service and need the type of space that can only be found in an M or loft district.

FINANCIAL AND TECHNICAL ASSISTANCE RECOMMENDATIONS

10. Many small and mid-sized manufacturers who rent rather than own their space are ineligible to apply for several real estate assistance programs. The Initiative proposes that financial assistance programs like the Business Relocation Assistance Corporation (BRAC), the Industrial and Commercial Incentive Program (ICIP) and the Energy Cost Savings Program (ECSP) be modified to assist manufacturers who own their own facilities, as well as those who rent space and those who develop space for rental to others.
11. New York City's existing system of incentives and benefits is often fragmented and needs to be streamlined into a more coherent system that would also benefit small businesses who otherwise find it difficult to apply for assistance. We propose establishing a new manufacturing/industrial technical assistance, finance and management support system to assist existing and emerging manufacturing enterprises in meeting the goals outlined in this report. Existing local development corporations (LDCs) should be provided with the funding, technical assistance and training necessary to enable them to evolve into "enhanced" In Place Industrial Park entities. Also, technical and financial assistance should be provided to manufacturing enterprises to encourage them to undertake audits and plans for sustainable manufacturing.
12. A major obstacle faced by manufacturers in New York today is acquiring and retaining affordable space in a speculative real estate market. Most manufacturers are unable to afford high rents, especially in prime waterfront or gentrifying industrial areas. The City should expand economic incentives for the private and non-profit sectors to create additional space for rental to small manufacturers in New York City. A Trust for Industrial Space, Tax Increment Financing and Industrial Development Agency bonds for developers of rental projects are some of the proposed mechanisms to provide institutional support for manufacturing retention and development. In certain MD zones and/or for certain "endangered" manufacturing industries, real estate tax abatements and/or City income tax credits should be offered to landlords who agree to retain manufacturers as tenants at below market rental rates. City and State economic development funding for organizations such as NYIRN, MANYC and ITAC should be expanded so they can provide technical assistance and up-front capital to small manufacturing businesses.

ENVIRONMENTAL RECOMMENDATIONS

13. With advances in technology and pollution prevention, many land uses can now function with minimal environmental impacts. However, these uses are still considered non-compatible, as their use category does not permit their location near residential areas. The Initiative proposes that a performance-based index of compatible uses and activities be prepared that would reference environmental performance standards for inclusion in the New York City Zoning Resolution. Enforcement of performance standards should be conducted in a manner that is consistent and predictable and that focuses on problem solving. Enforcement should encourage remediation and compliance and should not be simply aimed at the levying of penalties.

14. Technological advances in the field of environmental sustainability have helped to highlight the compelling economic reasons that manufacturing companies should achieve higher environmental performance. But they are also important in light of the increased opposition by community residents to negative environmental impacts in their neighborhoods. These environmental issues are caused by manufacturing, non-manufacturing, industrial and other burdensome uses such as water pollution and control plants, power plants and waste transfer stations. To address these issues, owners and developers in M-zones should be provided incentives to implement a range of sustainable development activities. Developers who are undertaking new construction and substantial rehabilitation in M-zones should be encouraged to employ state-of-the-art “green building” technologies to incorporate energy and resource efficiency and to minimize the impact on the environment. In addition, the City should assist in the research, development and financing of eco industrial enterprises that would enhance the quality of life in the City and provide new areas of employment and economic opportunity for area residents.

Sustainable development policies should be applied in all zoning districts and also in places where re-zoning from manufacturing to other uses is proposed. The Initiative also proposes a green infrastructure policy in M-zones through enhanced Zoning Bulk regulations, additions to the Building Code, and new direct financial incentives to encourage owners and developers to provide trees, permeable surfaces, green roofs and other greening mechanisms in order to provide “bio remediation” functions and to act as environmental sinks serving the area. The private sector should be encouraged, through financial incentives and code requirements, to create a new energy infrastructure in M-zones utilizing solar and other renewable technologies, thereby reducing energy consumption through greening and conservation policies and through the provision of alternative energy sources.

The city should also initiate an extensive traffic calming program covering all the M zones, focusing particularly on the border areas of M zones in order to redirect truck traffic away from residential areas. Trucking operators in these areas should be encouraged to convert to natural gas or other energy efficient and non-polluting fuels and also outfit their trucks with global positioning systems (GPS) to monitor and direct their route. And, finally, by passing Brownfields reclamation legislation, New York State and New York City should facilitate the redevelopment of abandoned, idled, or under-utilized industrial and commercial facilities where expansion or redevelopment is complicated by real or perceived environmental contamination.

DATA RECOMMENDATIONS

15. A fully inclusive citywide database of businesses is presently not available to researchers and the public, making it extremely difficult to document an accurate picture of the manufacturing sector. Therefore better data for research on manufacturing in New York City should be collected and regularly updated. This database should be made available on the Internet. It should enable the private sector, the city and technical assistance organizations to undertake place-based and sector analysis, community-based planning, infrastructure investment and program development in a rational and informed manner.

BACKGROUND

OVERVIEW OF NEW YORK CITY'S ECONOMY

For the 100-year period from 1850 to 1950, New York City was the dominant center of production in the United States. Various factors contributed to the City's dominance: its natural advantages (a deep-water harbor connected via the Erie Canal to the expanding western hinterlands), its thriving commercial and industrial waterfront, its access to capital (both domestic and foreign) and an abundant supply of cheap labor through successive waves of immigration. Together, these factors fueled the growth of manufacturing in New York City at a time when no other city in the country offered any effective competition. New York City was home to manufacturers that made and sold everything the growing country needed. It not only had the country's largest oil refineries but also the first electrical generating plants. But the World War II era marked the apex of New York City's dominance in manufacturing, and afterwards a series of larger national and global trends, including American suburbanization and competition of goods from low-wage regions of the world contributed to the decrease in manufacturing jobs. Between 1958 and 2000, New York City experienced a net loss of over 675,000 manufacturing jobs.¹

Today, New York City's economy is experiencing a period of extended growth, and it is seeing the birth of new enterprises and new jobs at rates unparalleled in recent years. In the past two years, the city gained approximately 176,700 jobs,² many of which are part of the high technology industries of the "New Economy." The finance, insurance and real estate (FIRE) sector has been widely credited as the main economic engine fueling this growth and has been the focus of the city's economic development strategies for the past three decades. However, despite the perception that Wall Street is driving the city's economic boom, only 4% of the new jobs created in the past two years exist in the FIRE sector.³ The vast majority of new jobs are in ancillary service sectors such as restaurants and business services. Even manufacturing, which is sometimes perceived as an ancillary service, has seen some promise of job growth in certain sub-sectors such as the food industry. For example, today there are approximately 15,000 people employed in food manufacturing, up from 1,500 just seven years ago.⁴

Despite recent job gains in New York City, the city's unemployment rate as of August 2000 was 5.7% – the second highest of the twenty largest metropolitan areas in the United States. The unemployment rates for the Bronx (7.3%) and Brooklyn (6.9%) are almost twice the national average. Clearly, the city's recent economic resurgence has not benefited all of its residents. There is ample reason for the city to focus its policy efforts on economic sectors outside of the information technology and FIRE industries.

This study suggests that manufacturing is very much alive in New York City, and that it is promising ground for job growth. By implementing some of this study's zoning policy recommendations for retaining and supporting manufacturing, the City can help ensure that New York City's economic growth benefits individuals and low-income communities who have been largely left behind by the boom.

¹ New York State Department of Labor, 2000.

² Ibid.

³ Ibid.

⁴ *Food From New York City: An Analysis of New York City's Food Manufacturing Industry* (Brooklyn, NY: New York Industrial Retention Network, December 1999).

OVERVIEW OF MANUFACTURING LAND USE AND ZONING

Land uses in manufacturing and mixed use zones in New York City areas have changed tremendously in recent years and present both opportunities and challenges for retaining and supporting manufacturing in New York City. New industrial and commercial uses associated with the New Economy are dramatically altering the landscape in these districts. The case studies in this report document that some manufacturing zones in New York City continue to have strong concentrations of manufacturing uses and manufacturing jobs, while others have seen a significant increase in other uses, which are described in detail in this section. Certain study areas are characterized by a concentration of similar businesses such as apparel firms in Chelsea and printing firms in Tribeca. Other areas with strong concentrations of manufacturing, such as Long Island City and Greenpoint-Williamsburg, have a broad diversity of types of manufacturers. In some of the neighborhoods studied, manufacturing remains only in selected sections. In almost all of the study areas there has been an increase in commercial and residential uses as a result of legal commercial uses moving into M-zoned property, illegal residential conversions and/or the proliferation of Board of Standards and Appeals variances which have allowed owners of manufacturing space to convert uses. In some areas, few manufacturing businesses are left and in others, despite substantial increases in commercial and residential uses, there are still large numbers of manufacturers remaining. Some mixed use and special districts have been successful in retaining their stated goal of a balance between manufacturing and other uses, and others have merely served to transition the district to residential and other non-manufacturing uses.

As manufacturing technology has advanced and new types of businesses such as media production, telecommunications and biotechnology have developed, existing classifications and manufacturing land use and zoning regulations have become outdated and cumbersome. Moreover, environmental concerns and opportunities are compelling us to explore sustainable development strategies that will improve the manufacturing industry's viability and economic competitiveness. New land use and zoning policies are needed to address the changing needs for space, and to capitalize on the opportunity to incorporate new types of industries into the city's economy while at the same time retaining traditional manufacturing.

In order to analyze the changes that have taken place in manufacturing and mixed use districts, it is helpful to understand the genesis of zoning classifications in New York City. The country's first comprehensive zoning resolution was enacted in New York City in 1916 and was aimed at protecting property values from the negative impact of overbuilding in lower Manhattan. Thus, industries that were "noxious or offensive by reason of the emission of odor, dust, smoke, gas or noise" were excluded from residential and business districts, and only allowed in "unrestricted zones."⁵ During the next several decades many immigrant and working-class residents settled in these unrestricted districts, which were typically industrial and employment centers in the outer boroughs and in lower Manhattan. Unskilled workers usually could not afford to live in residence-only districts, but found housing and convenient work opportunities in these areas. Thus, even today many of New York City's mixed use neighborhoods retain a strong ethnic character.⁶

⁵ Carol Willis, "A 3-D CBD: How the 1916 Zoning Law Shaped Manhattan's Central Business Districts," *Planning and Zoning New York City: Yesterday, Today and Tomorrow*, ed. Todd W. Bressi. (New Brunswick: Rutgers, the State University of New Jersey, 1993) 10-14.

⁶ Roy Strickland, "The 1961 Zoning Revision and the Template of the Ideal City," *Planning and Zoning New York City*, 50-52

In response to growing demand for more open space, greater architectural freedom, and restrictions on population density, a new comprehensive zoning resolution was adopted in 1961. This new resolution segregated urban functions, discouraged the proximity between workplace and home, and favored development projects modeled on the “tower in the park” concept. New districts were narrowly defined according to uses -- residential, commercial, or manufacturing -- and further subdivided into lower, medium and higher density areas. Areas which had been designated as “unrestricted” prior to 1961 became, for the most part, manufacturing zones where existing residential uses were “grandfathered” as pre-existing non-conforming uses. Today, enlarging existing or constructing new residential development in manufacturing zones continues to be prohibited.

In the 1961 Zoning Resolution, manufacturing districts were subdivided into M1, M2 and M3 categories according to the level of objectionable hazards caused by industry. Each category established performance standards which limit the amount and types of industrial nuisances a particular use is permitted to generate. Thus, the City regulates the performance of manufacturing facilities by specifying the level of nuisance, such as noise, vibration, smoke, odors, toxic or noxious matter, that a business is allowed to create.⁷ These standards apply to specific manufacturing uses, but they do not restrict nuisance generated by other commercial uses and they do not classify traffic as a nuisance.⁸

What follows is a description of the types of land uses that can be presently found in manufacturing and mixed use zones in New York City.

Manufacturing Uses

Today, manufacturing businesses in New York City are a range of small, specialized firms that work in “silent partnership” with the City’s economic drivers such as fashion, advertising, publishing and the arts. They are no longer the oil refineries and mass production plants of the past, but work in niche markets such as food production, furniture design, and printing. They make fresh bread, pastries and pastas for New York City’s hundreds of restaurants and caterers, they supply specialized equipment for the City’s film and theater industries, they manufacture apparel for the City’s premier fashion industry and they produce custom-designed printed materials such as brochures, reports and story-boards for the City’s advertising sector.

High job density manufacturers in industries such as apparel, jewelry and publishing struggle to remain or locate in manufacturing clusters in Manhattan, such as the Chelsea-Garment District and Soho-Tribeca, and in the parts of the outer boroughs that are close to Manhattan, such as Long Island City in Queens and Greenpoint-Williamsburg in Brooklyn in order to benefit from the competitive advantages of being near each other as well as their customer and supplier base. They also need to be located close to major public transportation routes in order to have access to their experienced workforce. Many of these manufacturers rent space in large loft buildings that are prized for other non-manufacturing uses, and there has been enormous pressure for

⁷ New York City Department of City Planning, *New York City Zoning Resolution*, Volumes I-III: New York, 1998, Sect. 42-20

⁸ It should be noted that, despite advancements in performance standards approaches to industrial zoning, this section of the New York City Zoning Resolution has not been updated since the Resolution’s inception in 1961. In addition, while the 1916 ordinance relied on selective prohibition of uses, the 1961 Zoning Resolution became much more rigid in its classification of permitted uses, categorized according to functional or nuisance characteristic. And while the list of commercial and industrial uses included in the Resolution is exhaustive, and has been enlarged over time, it has not been revised since the 1950s. Technological innovation and other changes were not contemplated in the use regulation, and therefore the ability of public review agencies to respond to new uses such as internet companies is hampered.

them to move. A high percentage of the best multi-tenanted loft buildings are no longer available at rents affordable to manufacturers. This is a loss to manufacturers not only because they have to find new, affordable space in a tight market, but because they often have to leave behind the informal networks of other complementary businesses and suppliers that they have been able to create in multi-tenant buildings.⁹

To a large extent, the big manufacturing concerns who owned their production plants have left New York City to mass produce goods in other parts of the country, or even other regions of the world. Those who remain, or who have opened their doors in recent years, are primarily smaller businesses who lease rather than own their space. Few have the means to build, purchase or substantially rehabilitate new space. While the kind of industry that needs a large one-story footprint is probably not easily accommodated in New York City, many of the smaller manufacturers that remain are ideally suited for the multi-story loft buildings that characterize New York City's manufacturing landscape outside of Manhattan. In fact, these buildings have proven to be exceptionally adaptable to new technology firms and existing manufacturing concerns. However, loft space available for rent is in great demand, making it very difficult for manufacturers to find space in districts that were zoned for their use. The vacancy rates of industrial spaces in Brooklyn and Queens, for example, were only 8.26% and 6.93% respectively in 2000 (a more detailed description of the real estate issues facing manufacturers is provided later in this Background section).¹⁰

Contrary to the public perception that New York City contains a great deal of underutilized manufacturing land which should be rezoned for other uses, data analysis conducted for this report revealed that presently, manufacturing land uses occupy less than 4% of the City's total land area and less than 7% of its building area. This is a relatively small percentage share of the total, especially considering that many of the City's manufacturing land uses are located outside of manufacturing-zoned land,¹¹ where expansion and growth of new manufacturing activity is not feasible. Thus, a continuous decline of land available for manufacturing could jeopardize the future of manufacturing activity in New York City.

Other Industrial Uses in Manufacturing Zones

Many of the land uses that are located in areas zoned for manufacturing are not, in fact, production-based manufacturing. Although relatively little manufacturing land has been rezoned yet, and although the number of manufacturers in New York City has been declining, many manufacturers still find themselves competing with other uses for appropriate locations in manufacturing zones.

In the 1961 Zoning Resolution the City lumped together a number of uses considered less compatible with those allowed in residential or commercial districts. Certain industrial uses which by necessity generate heavy truck traffic, such as warehousing and distribution, were assigned to use groups permitted only in manufacturing districts. Because there are fewer manufacturers who produce goods in New York City, the demand for warehouse and distribution facilities for goods produced elsewhere has increased. These uses are critical to manufacturers and other industry sectors. Today, they take up approximately 17.5% of the lot

⁹ For example, there are printers on Varick Street in Manhattan which occupy the same building as some of their suppliers.

¹⁰ Greiner-Maltz Company, Inc., "Brooklyn/Queens Industrial Real Estate Report" (2nd Quarter 2000).

¹¹ This assessment could not be verified by this report at a citywide level, but it is assumed based on the findings for the eight study areas that a large number of manufacturing land uses are located outside of manufacturing-zoned land.

space in all the M-zones within this report's eight study areas, and they occupy significant square feet in industrial loft and one story buildings and on open unenclosed land. Like production-based manufacturing, these uses require lower rents, proximity to roadways, and larger spaces. Unlike manufacturing, they often do not employ many workers.

Aside from distribution and warehousing, there are many other industrial uses that take up large quantities of land in manufacturing areas. They include public transportation yards (subway, bus, railroad); airports (runways, airport structures, repair facilities); port facilities (loading, container storage, barge and tug storage, vessel repair); water and sewer services (filtration, pumping stations, wastewater treatment plants, sludge plants); electricity and gas (generating facilities, storage tanks, transformers); solid waste disposal (public and private transfer stations, landfill, incinerators not currently in use, junk yards); and vehicle and equipment parking, storage, and repair (sanitation trucks, brooms, Department of Environmental Protection vehicles, tow pounds). Similar to warehousing and distribution, these uses often require large sites but, with some exceptions such as airports, employ few workers at the site. In some cases they do support employment and economic activity at other sites (for example, building material storage facilities serve New York City's construction industry, which in turn employs many workers outside of these facilities). While these uses can be found in manufacturing areas throughout the City, they tend to be concentrated in areas outside of Manhattan below 96th Street.

A subset of the industrial uses described above are owned, operated or contracted for by government agencies and are considered critical to the functioning of the City. Unfortunately, they are often also noxious, involving heavy truck and vehicle movement, odors, dust, toxic air pollutants, and noise. Both neighboring manufacturing concerns and nearby residents complain of being negatively impacted by these facilities. Although there are performance standards and environmental laws to regulate their operations, there is little effective enforcement on the part of the government agencies responsible for overseeing their activities. Many public officials mistakenly assume that improved performance is unnecessary in M-zones because few people and businesses are affected.

Other uses that are increasingly found in manufacturing zones are automotive related repair facilities (body shops, car painting and salvage operations, and parking lots) and in some cases even automobile sales. These uses have increased in recent years in nearly all manufacturing areas. Because they essentially require only ground floor use, they are able to take advantage of one story buildings and partially vacant lots. They sometimes serve as a source of partial or temporary income on land that is being held mostly vacant for speculative reasons.

In addition, with the emergence of additional commercial development in manufacturing areas, there has been an increase in accessory parking facilities. A final use that can be found in many manufacturing areas is private storage facilities. Found in both Manhattan and in outlying areas, they require little renovation and are often found in larger loft buildings.

Vacant and Underutilized Land and Buildings

A large proportion of the land currently zoned for manufacturing in New York City is vacant. In the eight study areas included in this report, 8.4% of the combined M-zoned land is vacant. This is due to several facts. First, portions of manufacturing zoned land, especially in western Staten Island, are wetlands and thus cannot be developed. Second, as a result of New York City's maritime history, large parts of the waterfront are zoned manufacturing and although many of the original uses have left, properties remain vacant because of fears of contamination. With the recent focus on Brownfield redevelopment, developers and communities are looking to these sites for new uses and open space. The costs of brownfield remediation, rehabilitation or new development are prohibitive for all but very high revenue producing uses. Third, in gentrifying and waterfront areas, landlords prefer to hold land or buildings vacant hoping that they can get a higher price once the land is rezoned for residential and commercial use.

New Uses

In recent years, a number of new uses have emerged in manufacturing zones in New York City, in part because existing manufacturing zoning provisions do not prohibit these uses, and in part because city policy has encouraged their location in these zones. "Big box" retail operations which often generate a great deal of traffic (such as Home Depot stores) and adult entertainment businesses are two examples. While most category dominant retail uses have always been allowed on an as-of-right basis in M1 districts and many are allowed in M2 and M3 districts, they have recently become more common uses. Examples include a Staples in Brooklyn's Gowanus neighborhood and a Home Depot in Brooklyn's Sunset Park neighborhood. Because these establishments have the capacity to pay much higher rent, they have contributed to the real estate pressures facing manufacturers.

In many older industrial areas, especially those in Manhattan or those located near residential or mixed use neighborhoods, loft buildings have increasingly been converted to commercial and residential uses. Conversion to residential uses, while illegal in many cases, has occurred at a rapid pace partially because of the enormous shortage of housing in New York City across the spectrum of incomes. Following the transformation of Soho into an upscale residential and commercial area, it has become popular to convert older industrial buildings, legally or illegally, into residential, retail and office use. In places such as Greenpoint-Williamsburg and DUMBO in Brooklyn, conversion trends have been in part sparked by artists and artisans seeking live-work spaces. As the pace and scale of conversion and gentrification of these older industrial areas has increased, many of these artists and artisans have begun to feel the same pressures to move as manufacturers. In some cases, illegal use of manufacturing space by artists and artisans is causing friction with other uses. Today, land use and zoning policies in manufacturing zones must address the space issues facing artists and artisans as well as manufacturers in order to mitigate these conflicts.

In recent years, the high price of commercial space in prime areas of Manhattan has also encouraged those seeking traditional office uses to move into the older industrial areas of Manhattan such as the Garment District and Soho-Tribeca, and into the parts of Brooklyn and Queens that are close to Manhattan such as Greenpoint-Williamsburg and Long Island City. As-of-right office use, especially devoted to high technology tenants, has been competing with industrial use for the same space. High tech companies like telecommunications and new media have until recently been growing at a tremendous rate in New York City. For instance,

new media businesses, which were almost nonexistent five years ago, now provide as many as 100,000 jobs in the New York region.¹²

In search of large floor plate spaces, high technology companies have found older industrial buildings appealing. In many industrial areas such as Chelsea and Tribeca in Manhattan, Sunset Park in Brooklyn, and Long Island City in Queens, new high tech facilities have taken over some of the best loft buildings. E-commerce companies have likewise found that industrial buildings offer larger spaces for less rent than conventional office space. In addition, the New Economy businesses have begun to receive the assistance of the City in meeting their space needs. For example, the New York City Economic Development Corporation recently provided funds to encourage the development of space to house dot-com technology firms in manufacturing areas.

It is important to note that in the context of the general softening of the economy, many of these new high tech and e-commerce uses have recently gone out of business or have been unable to cover the high rents that are part of their leases. From a policy perspective, it makes sense for the City to provide real estate assistance to a range of rapidly growing businesses, including manufacturers, in order to ensure that the local economy remains diversified, and is not severely weakened by the decline of any one sector.

New York City's Zoning Resolution has not been modified to incorporate uses that have emerged as part of the New Economy, and most new technology, media, biotech and e-commerce businesses have not yet been categorized. Yet, in many ways these high technology uses are similar in function to production and distribution uses, and therefore should have a legitimate place in manufacturing and mixed use zones. Many of these businesses are job intensive and beneficial to the New York economy, although they often employ a better-educated work force than traditional manufacturing. They therefore do not provide the kinds of employment opportunities needed by City residents without extensive skills and education, and should not be seen as a replacement for manufacturing uses. Moreover, as is the case with residential and commercial uses, new technology companies, while risky, are often able to pay far higher prices for space than manufacturers. New media firms, for example, can pay \$25 to \$35 per square foot for the same space that until recently was leased to printers on the far west side of Manhattan for \$8 to \$10 per square foot.

Today manufacturing zones are home to many different types of uses. The trend towards a greater mix of uses represents the new direction in city planning, allowing for less commuting time and creating a greater sense of place in industrial areas that were until recently devoid of the kinds of amenities such as restaurants, bars, shops and art galleries that make them attractive for further development. Some of the new uses in manufacturing zones, such as high technology companies, clearly are compatible with manufacturing in many respects. However, they end up displacing manufacturers because they can afford to pay substantially higher per square foot rentals. Initially it was assumed that the establishment of a manufacturing zone alone was adequate to maintain lower rentals for manufacturers. This is no longer true. If we are to retain traditional manufacturers, as well as newer high tech enterprises, new land use and zoning strategies and public policies must be devised.

¹²*Tech New York: A Framework for Public/Private Action* (New York: Industrial Technology Assistance Corporation, 2000).

Mixed Uses

In the last twenty years mixed use zoning districts that permit both residential and manufacturing uses have multiplied. Unlike the earliest districts, new mixed use districts are not “special districts” but are mapped with a general mixed use zoning designation. Although manufacturing is presently the predominant use in mixed use districts in our combined study areas (44% of total building area), commercial and residential land use is rapidly increasing. The building area for commercial land use increased by almost 75% and the building area for residential land use increased by 13% in these districts between 1989 and 2000. Although manufacturing has declined in almost all mixed use districts, some districts have been more successful than others at retaining manufacturing uses. In general, those with higher income residents or commercial facilities have eventually seen the displacement of manufacturers. In some locations, the designation of mixed use has simply allowed the wholesale transformation of the area from manufacturing to residential and commercial uses. When more affluent neighbors complain about the quality of life and environmental impacts of manufacturers, they often have the power to ensure that manufacturing uses are moved out of the neighborhood. But the primary reason that manufacturing uses have declined in mixed use districts is that the influx of non-manufacturing uses has caused property values to rise, prompting owners of manufacturing buildings to seek opportunities to replace manufacturers with other uses that can generate higher rental revenues. In mixed use districts with lower income residents, the upward pressures on the real estate market are not as great.

Possible New Uses

The New Economy encompasses not only high tech industries such as biotechnology, telecommunications and new media, but also ecologically friendly businesses which have emerged out of a greater understanding of the need to cut waste, particularly in urban areas. The locational and competitive advantage of a dense urban region such as New York City is likely to create new demand for M-zoned land among growing eco-industries. New York City should position itself to embrace sustainable manufacturing and utilize its existing supply of land in manufacturing and mixed use districts to attract these enterprises.

THE STATUS OF MANUFACTURING IN NEW YORK CITY

Recent research has demonstrated that the manufacturing sector in New York City shows signs of vitality and growth. A 1998 report by the Industrial Technology Assistance Corporation (ITAC) studied 937 manufacturing firms that had grown in the last five years.¹³ Its major findings provide evidence of the strength of manufacturing in New York City:

- The 937 firms surveyed had grown by more than 20 percent over the last three years in either sales, employment or both. They expanded at more than twice the rate of growth in the overall economy. One-third had at least doubled their sales in a three-year period.
- Most firms were relatively young; approximately 70% were created in the 1980s and 1990s.
- The city's growing manufacturing firms are not concentrated in one or two sectors but instead are widely distributed among a variety of sectors.
- The greatest concentration of growing firms is in Manhattan, but there are significant clusters in Brooklyn, Queens, and the Bronx.
- For the firms where Dun & Bradstreet had market data (about half the total), 71 percent sold their products beyond the New York City metropolitan area to U.S. and Canadian markets.

A report published by the New York Industrial Retention Network (NYIRN) in 1999 also documented the strength of manufacturing in New York City. The report found that many manufacturing firms are committed to the City and have faith in their continued competitiveness: 80% of the 233 firms surveyed planned to invest in equipment and machinery, and 36% planned to invest in land and buildings.¹⁴ Another NYIRN study of the garment industry found that apparel firms employ almost 125,000 people, and that they are part of one of the biggest export-oriented industries in the City.¹⁵ According to U.S. Commerce Department statistics, apparel manufacturing and wholesaling firms in New York City have a direct payroll in excess of \$2 billion, generate direct sales of over \$11 billion, pay taxes in excess of \$500 million, and have a total economic impact of \$23 billion.¹⁶

Harris InfoSource data on manufacturing firms in New York City demonstrates that the typical manufacturing business today is relatively small, with an average of 43 employees.¹⁷ The larger mass production firms that used to dominate the manufacturing sector in previous decades have, for the most part, left the City for a variety of reasons including lack of space. Those who have survived tend to be "short-run fabricators" rather than producers, and they are closely linked to designers, engineers, and creative and knowledge-based sectors.

Several hallmark characteristics have made manufacturing an integral component of New York City's economy: the firms that have survived or emerged in recent years are flexible, resourceful, and able to respond quickly to consumer markets. Many small firms have created informal networks producing complementary goods and services. The commercial printing

¹³ *Burst Growth Manufacturing Companies: Leaders for a New Generation of New York City Industry* (New York, NY: Industrial Technology Assistance Corporation, 1998).

¹⁴ *The Little Manufacturer That Could: Opportunities and Challenges for Manufacturing in New York City* (Brooklyn, NY: New York Industrial Retention Network, 1999).

¹⁵ *The Garment Center – Still in Fashion* (Brooklyn, NY: New York Industrial Retention Network, 2000).

¹⁶ Ibid.

¹⁷ Because this statistic is based on data provided by Harris InfoSource, which usually surveys the larger firms, it most likely overstates the average size of manufacturing firms in New York City today. This report utilizes Harris data, however, because it provides the location of manufacturing firms by latitude/longitude and not by street address, allowing for instantaneous geocoding and spatial analysis using a small level of geography. (For more detailed information on this and other data sources, please see the methodology section of the report.)

industry, for instance, is closely linked to the advertising industry, making it possible for art directors to check on their work while it is on the presses. Today, as it was when manufacturing was at its zenith, the most successful and enduring industries are integrally related to local and regional production networks. Many industries today also have a significant export market. For example, 49% of the food manufacturing companies surveyed by NYIRN derive more than 40% of their sales from outside of the New York region.¹⁸

It is encouraging to note that New York City's current industrial trends may make it more attractive to new and emerging manufacturing firms. Although manufacturing has traditionally been considered purely a production activity, it has in recent years become a more flexibly defined industry which is inextricably linked to retail, assembly, distribution and service activities. What is more, technology based business activities such as e-commerce, biotechnology, and telecommunications are increasingly blurring the boundaries between commercial and manufacturing uses. The introduction of high technology companies into the manufacturing and service sectors has increased their share of value added manufacturing from 18% in 1970 to 24% in 1994 and increased the percentage of non-production jobs in the manufacturing sector from 32% in 1976 to 40% in 1998.¹⁹

Moreover, data on jobs in the manufacturing sector show signs of promise. Losses in manufacturing jobs are slowing (in fact, manufacturing employment in New York City increased slightly in the first quarter of 2000), and a robust core of specialty and niche manufacturers has been joined by new smaller and more flexible firms that are better able to take advantage of changing opportunities. More than 30 percent of New York City's manufacturing sectors experienced job increases in 1997.²⁰ In sum, while changed, the vitality of manufacturing in New York City is surprising given local and global pressures against it and the adverse impact that an overheated real estate market has had on manufacturing space.

It is important to acknowledge that it is extremely difficult to get an entirely accurate picture of manufacturing in New York City because of the lack of comprehensive data.²¹ In the absence of a door-to-door survey of each manufacturer in the city, pre-existing databases have to be utilized. These databases have numerous flaws which obscure the true current picture.²² The eight case studies presented later in this report are the first attempt to date to provide a thorough and comprehensive understanding of land use and zoning in New York City's manufacturing neighborhoods.²³

This study focuses on the land use and zoning needs of New York City's manufacturing firms of today. In addition, this study is concerned with industries that are presently hampered by increased rental costs and the diminution of manufacturing space. Finally, we are concerned with the land use and development needs of the next wave of manufacturers that are likely to take advantage of opportunities in environmental industries.

¹⁸ *Food from New York.*

¹⁹ Progressive Policy Institute, *The New Economy Index* (On-line report, 1998).

²⁰ *Burst Growth.*

²¹ Some industry-specific surveys, such as the New York Industrial Retention Network's recent study of the Garment Center, have been done. However, to date no survey has been done of all manufacturers in New York City.

²² These flaws are described in greater detail in the methodology section.

²³ Some area-specific efforts to measure manufacturing activities in New York City have been undertaken. For example, the study of Red Hook in Brooklyn by the South Brooklyn Local Development Corporation and the study of Long Island City by the Queens Office of City Planning have been very informative. However, for the purposes of this report, we required a database that allowed for citywide comparisons and for comparisons over time. Therefore, we chose to rely on citywide data sources for consistency. The intent of the case studies was to identify patterns and changes over time to inform city land use and zoning policies. It was not the purpose of this report to undertake a census or to develop a profile of manufacturing employment for the areas studied.

The Benefits of Manufacturing

As demonstrated by the data presented in the previous section, manufacturing has shown signs of growing strength in New York City. Although it is no longer the City's main economic engine, it still plays a key, albeit sometimes overlooked role in the City's economy. A healthy manufacturing sector offers benefits that can be classified in three main areas: employment, supply chain benefits, and diversity in economic development. These three benefits are described below.

- **Employment**

One of the primary dividends that manufacturing pays to New York City's economy is jobs. In June 1999, manufacturing employment constituted 8.4 percent of New York City's job mix, with a total of 247,183 employees.²⁴ It was the City's fourth largest employment sector. In Brooklyn and Queens, manufacturing activity was even more significant since it accounted for 11.1 percent and 10.8 percent of the job mix respectively.²⁵

Manufacturing is also a critical sector in New York City's economy because it has an employment multiplier of 1.77. That is, according to the IMPLAN input-output model,²⁶ every 1,000 manufacturing jobs create another 777 jobs in other sectors. This is much greater than for major sectors like health services (1.42) and business services (1.41), and greater than major sectors like air transport (1.52) and construction (1.51). The employment multiplier for retail is only 1.2.

Moreover, the employment opportunities offered by manufacturing are especially important to populations with barriers to work, including new immigrants with limited English language skills and people who lack educational credentials. More than 60 percent of manufacturing workers have only a high school degree or less. In addition, 52 percent of foreign-born workers and almost 63 percent of workers with English language problems are employed in manufacturing.²⁷ Immigrants are a significant force in New York City's economy. Between 1990 and 1994, New York City received an average of 29,000 immigrants per year (and 24,000 per year between 1982 and 1989). Of the total new immigrants, about 48 percent of them report having manufacturing-related occupations.²⁸

Although the FIRE, creative/cultural, health care and high technology sectors have been correctly credited with high levels of job creation in New York City in recent years, there is still ample reason to ensure that New York City continues to offer stable, appropriate employment opportunities to individuals who do not have the skills to take advantage of the jobs created in these growing areas. Jobs in these and ancillary service sectors tend to pay either very high or very low wages, with little in between. Blue-collar manufacturing jobs tend to be more stable than service jobs and provide career ladders for men and women in all ethnic groups whose educational opportunities have been limited. In an era when the city

²⁴ New York State Department of Labor, June 1999.

²⁵ Ibid.

²⁶ IMPLAN (IMpact Analysis for PLANing) was originally developed by the USDA Forest Service in cooperation with the Federal Emergency Management Agency and the U.S. Department of the Interior's Bureau of Land Management to assist the Forest Service in land and resource management planning. The IMPLAN accounts closely follow the accounting conventions used in the "Input-Output Study of the U.S. Economy" by the U.S. Bureau of Economic Analysis. The IMPLAN input-output model is available for each county in the U.S. and is maintained by the Minnesota IMPLAN Group, Inc. of Stillwater, MN.

²⁷ *The Little Manufacturer*, 5.

²⁸ New York City Department of City Planning, *The Newest New Yorkers 1990-1994* (New York, NY) 21-31.

is concerned with moving hundreds of thousands of New Yorkers from welfare to work, it is critical to retain jobs that enable people to gain a firm foothold in the labor market.

According to the U.S. Department of Commerce, Bureau of Economic Analysis, manufacturing workers in the United States earn higher wages and receive more generous benefits than workers in other industries such as construction, services and retail trade. In 1997, the average manufacturing worker earned \$39,500 a year (with a total compensation including salary, benefits, bonuses and Social Security contributions of \$48,000), compared to the average U.S. worker who earned \$33,500 a year (with a total compensation of just over \$40,000).²⁹ While New York City manufacturers are smaller than the national average, and on the whole pay less, manufacturing jobs in New York City nevertheless still usually provide better pay and more generous benefits than retail and entry level service jobs. According to the New York City Office of the Comptroller, in the year 2000 manufacturing jobs paid over 21% more on average than retail jobs (\$12.89/hour versus \$10.62/hour).³⁰ In addition, many New York City manufacturing jobs are unionized (which is not typical of many service and retail jobs), and therefore offer workers better job security.³¹

- **Supply Chain Benefits**

Through supply chains, manufacturers play a critical role not only to each other, but to other economic sectors as well. Manufacturing businesses that have historically been successful and remain so today are able to respond quickly and flexibly to changes in demand for their goods. In New York City, successful firms have created a web of relationships through which they can supply goods quickly upon demand. In many cases, rapid turnaround and close proximity of the supplier is critical to both the contractor and the supplier. This is especially true for New York City's preeminent design industry. For instance, fashion and jewelry designers rely on manufacturers in the five boroughs to produce their new products in a timely manner so that they can test market their goods and make adjustments as necessary. Other design industries that have thrived in New York City such as custom furniture, architectural woodwork, metalwork and lighting require that their products be custom built on a client-by-client basis. Without manufacturers with specialized services to meet their needs, many of the leaders of New York's design industry would either be driven out by the high cost of importing their goods, or would not have the flexibility necessary to produce and refine their products as needed. The inextricable link between designers and producers means that if one fares poorly, the other will be negatively affected.

Manufacturing also plays a key role in service industries such as restaurants. Market delis, for example, must be able to contract with suppliers to provide them with large quantities of custom made food products upon demand. If these goods had to be brought into New York City from the outside on a daily basis, the costs of transportation (and consequently of the end product) could skyrocket. Moreover, the City would have to contend with the added traffic, pollution and noise that would accompany the increased trucking of goods from the outside.

Just as manufacturing is inextricably linked to design, it is also a crucial "silent partner" to other key industries such as publishing, advertising and marketing.³² If New York City

²⁹ Information cited on the web-site of the National Association of Manufacturers, March 2001. Source: U.S. Department of Commerce, Bureau of Economic Analysis.

³⁰ New York City Office of the Comptroller, *Economic Notes*, August 2000.

³¹ Interview with James Parrot, Deputy Director, Fiscal Policy Institute, March 2001.

³² *Designed in New York Made in New York* (New York, NY: Municipal Art Society, 1997) 8.

allows the demise of manufacturing to occur, there could be ripple effects in many seemingly unrelated industries. In sum, this report urges policy makers to craft strategies for supporting and strengthening the links between manufacturers and the recognized drivers of New York City's economy.

- ***Diversity in Economic Development***

The third important benefit to retaining manufacturing in New York City is that it helps ensure diversity in the City's economy. While other sectors, namely FIRE, have been the City's primary economic engine in recent years, it is important to take note of the huge market failures experienced by other cities that concentrated almost all of their public and private investments in one economic sector. Pittsburgh's municipal economy experienced a huge downturn with the demise of the steel industry, as did Detroit with the exodus of the automobile industry. Each was left particularly vulnerable because of the lack of diversity in its economy. Indeed, New York City's diversified economy has been one of its greatest strengths historically. Today the City is well advised to provide the kinds of incentives and supports to retain and grow manufacturing as it has for FIRE and other industries in order to ensure New York's economic health in the future.

Taken together, these three main benefits to manufacturing are significant. The obstacles to retaining and expanding manufacturing, which are described in the next section of this report, are also significant. It is our assertion, however, that it is worth overcoming these barriers in order to ensure that New York City continues to realize the benefits of manufacturing. This report makes recommendations about how city land use and zoning policy can be crafted to assist in retaining and expanding manufacturing, where appropriate. At the same time we recognize the need for the City to meet other needs such as housing, open space and commercial development, and to balance the many conflicting demands on the City's limited supply of land. The recommendations contained in this report are aimed at balancing those needs while helping to build a healthier economy through manufacturing retention.

Obstacles Facing Manufacturing in New York City

While we believe that there are important reasons to retain manufacturing in New York City, there are many obstacles that need to be considered. In order to better understand the interrelated factors which currently affect industrial development, these obstacles have been grouped under the following categories: lack of affordable industrial real estate, difficulty in financing new industrial facilities and infrastructure, existing manufacturing land use and zoning policies, quality of life issues in manufacturing districts, and high energy costs.

- ***Lack of Affordable Industrial Real Estate***

As noted previously, the major problem facing manufacturers is not the lack of land zoned for their use, but the affordability of the real estate that is available. New York City manufacturers are particularly vulnerable to the "peaks" and "valleys" of the economic cycle. During a "peak," manufacturers cannot compete with other uses which have the ability to pay much higher rents. Although many benefit from economic expansion in that their sales volumes grow during a strong economy, they are often driven out of the City when their space needs grow. And once a manufacturer leaves the City, it almost never returns because of the high cost of relocation. During a "valley," many manufacturers also experience real estate problems because their businesses shrink and they can no longer afford the space they occupy.

One of the reasons that manufacturers today are particularly vulnerable to the pressures of the market is that many of them are small to mid-sized businesses who lease rather than own their space. While ownership is an appropriate strategy for insulating some manufacturing companies from the vagaries of the market, it is neither feasible nor desirable for the majority. Many of New York's manufacturers are small, and therefore do not have the management staff capacity to develop new space. Engaging in real estate development has the potential to siphon management's attention away from core business functions such as marketing. From a public policy perspective, it makes sense to encourage small and mid-sized firms to make investments in equipment or training to improve their competitiveness, rather than to lead them to engage in new activities such as real estate that require new areas of expertise. Finally, renting space rather than owning gives manufacturers the flexibility they need to grow and contract as their businesses change.

Recent studies have documented the enormous toll imposed by rising real estate costs on manufacturing businesses in New York City. For example, the New York Industrial Retention Network's 1999 survey of manufacturers found that:³³

- 58% believed their real estate situation had worsened over the twelve months before the survey;
- real estate issues ranked higher than taxes among manufacturers;
- manufacturers based in Manhattan and Queens had the worst view of their real estate situation -- 77% of the Manhattan businesses and 60% of the Queens businesses believed that their situation had worsened over the twelve months before the survey; and
- the problem is particularly alarming in Manhattan because approximately 57% of New York's manufacturing jobs exist there.

The Big Squeeze, a report produced by the Center for an Urban Future in 1999, echoes this finding that the lack of affordable real estate as the number one problem for small business owners in New York City.³⁴ The study found that:

- according to industrial real estate brokers, prices in Queens and Brooklyn had risen between 20 to 50 percent;
- in Queens, the vacancy rate for industrial space had dropped from 13.5 percent in 1995 to 9.4 percent in 1998;
- in Brooklyn, the vacancy rate for industrial space had shrunk from 15.1 percent in 1996 to 10.9 in 1998;
- vacancy rates for property in the most desirable industrial areas of the city, including Long Island City, Sunset Park, Greenpoint, Maspeth, Hunts Point, Williamsburg and Red Hook, are extremely low; and
- much of the available industrial space is not suitable for manufacturers because it does not meet their basic needs: proximity to their client base in Manhattan, access to highways to transport goods to and from their sites, and proximity to subways to enable them to recruit and retain employees.

Another dimension of the real estate crunch being experienced by manufacturers is that in some of the prime industrial areas, such as the Brooklyn waterfront, property owners are

³³ *The Little Manufacturer*, 1.

³⁴ Jonathan Bowles, *The Big Squeeze: How Rising Rents and the Real Estate Crunch are Forcing Small Businesses Out of New York* (New York, NY: Center for an Urban Future, 1999).

holding their buildings vacant in the hopes that their area will be rezoned for non-manufacturing uses such as residential and commercial development. Others in mixed use zones are simply waiting for gentrification to boost their prices even higher, and will only offer short-term leases to manufacturers. Many manufacturers cannot afford to rent space when speculation is rampant because the cost of relocation after three to five years is untenable. Although there is no statistically accurate means of measuring the extent of this type of speculation, there are indicators that this is of serious concern to those interested in manufacturing retention.³⁵ One of the unfortunate by-products of speculative blight in manufacturing districts is that it conveys the false impression that there is a lack of demand for manufacturing space. This is not the case.

One measure of real estate speculation, or “landbanking,” is the amount of land in manufacturing zones which has been recently converted to parking as a principal use. In many cases, vacant property that is being used exclusively for parking (that is, where parking is not ancillary to another use) is being temporarily held off the market to manufacturers because the owner anticipates conversion to other uses in the future. In this report’s eight combined study areas, auto storage/service land use (as measured by lot area) increased by 50% between 1989 and 2000.

Yet a final element of the real estate problems facing manufacturers is that as new uses such as big box stores and waste transfer stations have been introduced into manufacturing zones, the ability of manufacturers to compete for real estate has been weakened. This is because big box retail operations and waste transfer stations are typically able to pay higher rents. They also consume large tracts of land and generate both automobile and truck traffic, which is often in direct conflict with manufacturing operations.

During the past two decades, when many manufacturers were forced out of areas such as Soho and Tribeca in Manhattan, the City provided relocation assistance and these businesses were able to move to areas of Brooklyn and Queens that are near Manhattan and have good inter-borough public transportation infrastructure. Today, demand for space in these areas is extremely high, and manufacturers have difficulty in competing with other uses that can pay higher rents. Although there is a limited amount of land available in less densely developed manufacturing zones that are distant from Manhattan, such as East New York in Brooklyn, there are obstacles for displaced manufacturers to consider. Many manufacturers cannot afford to locate in remote areas that are poorly served by mass transit because they will become cut off from their customers base and the experienced workers they employ. Furthermore, locating in these less developed outlying areas often requires that the manufacturer engage in real estate development. While there are advantages to the larger lots, lower buildings and proximity to highways in these outlying areas, as mentioned previously, site and/or building rehabilitation or new construction are often beyond the financial capabilities of small firms.

³⁵ In the Center for an Urban Future’s study *The Big Squeeze*, a real estate broker for Kaplan-Belo Inc. reported that after showing their properties to prospective industrial tenants (and getting offers), five building owners in Northern Brooklyn pulled their properties off the market. The broker believes the landlords are holding their buildings vacant with the idea that prices will rise even further. Another person knowledgeable about manufacturing real estate in Brooklyn, David Sweeny of the Greenpoint Manufacturing and Design Center, estimates that one-quarter of the vacant industrial space in Brooklyn is being held off the market for speculative reasons.

Case study of the food industry

Real Estate and Location

A primary issue for food manufacturers is identifying appropriate space that will allow for efficient production and growth. Many growing companies are at risk of leaving the City because they do not expect to be able to find space in New York. Sixty percent of the companies participating in the survey have been operating in New York City for over 20 years, and 36% of the respondents are manufacturing at the company's original location. Many of these longstanding New York City companies are now looking for expansion space to accommodate their growing businesses, but many believe there are few opportunities to stay in the City. According to the survey, over one-half (51%) of the companies are looking to relocate their businesses in the next three years, and 38% are considering leaving the City to find affordable and appropriate space. This is a total of 1,374 present-day jobs in food manufacturing that are at risk of leaving the City.

Of those responding to the survey, 81% would like assistance with finding space, arranging financing, or obtaining City, State, and/or Federal assistance. This indicates both a desire to remain in New York and an interest in incentive programs such as the City's Industrial Relocation Grant, the Relocation Employee Assistance Program and the Industrial and Commercial Incentive Program.

Table 1: Crime and Safety Conditions by Borough

	Major Advantage/ Advantage	Disadvantage/ Major Disadvantage
Bronx	30%	70%
Brooklyn	33%	67%
Manhattan	66%	33%
Queens	17%	83%
New York City	32%	68%

In addition to those companies that have indicated a desire to relocate, and consequently are at risk of leaving New York City, all companies from the survey made strong statements regarding crime and safety and their businesses' location.

waste transfer stations poses a great threat to the continued viability of food processing facilities. Waste transfer stations are allowable in all manufacturing zoned districts and in most cases without an environmental impact statement. The Department of Sanitation, which oversees the selection of sites for new waste transfer stations, is under court order to develop specific regulations to guide the site selection process.

In the face of many obstacles, companies developed a variety of creative solutions to satisfy their need for additional production space. Follow-up interviews with companies in different boroughs provided examples of alternatives for addressing the City's space "crunch":

Contracting for extra production space: A specialty food company that has been in business in Manhattan since 1921 is now expanding both their product line and sales region, and is seeking additional production capacity. While the company has been looking for additional kitchen space for their own employees, they are also now seeking to sub-contract for production of their branded products with another baker. While this may be a very reasonable and common practice, it might raise alarms from a policy perspective. The subcontractor need not be in New York and this practice may encourage an owner to move an increasing amount of their production out of New York.

Misperceptions about real estate: Many company owners believe that the City's remaining industrial areas are too unsafe for their business. One area in particular that has room for growth but suffers from negative perceptions is East New York. A Brooklyn company that has been in operation since 1972, recently moved their business to East New York because the company plans to expand its product line and bring all of its production, packaging and storage under one roof. According to the owner, "East New York offers available space and expansion opportunities at very competitive prices; ample parking and loading space with no real threat of vandals; a large local labor pool; and very good access to Manhattan, Brooklyn and Queens." Misperceptions exist about East New York as well as other areas such as the South Bronx, and companies are missing opportunities to expand. However, space is in increasingly short supply even in these areas, and while there may be some space available in the short-term, better marketing of these areas will not address the underlying shortage.

Sharing space: This pie company grew from small scale production in the owner's home into a full-fledged production facility when the owner met a Brooklyn cake decorator who was also looking for professional production space. They were brought together by a real estate broker who happened to be working with both companies. Since entering this arrangement, with shared production space and equipment, the pie company has grown significantly.

The challenges these companies face and the various ways in which they have responded provide some creative examples and a foundation from which City officials and development professionals can assist companies in their continued growth.

Source: *Food from New York City: An Analysis of New York City's Food Manufacturing Industry* by New York Industrial Retention Network (December 1999)

- ***Difficulty in Financing New Industrial Facilities and Infrastructure***

It is apparent based on analysis of the real estate issues facing manufacturers that many, if not most, manufacturers could use assistance in addressing their space needs. Several New York City and New York State financing programs are available to manufacturers, however many are not presently well suited to the needs of today's manufacturers. Many programs are only eligible to businesses who are seeking to buy property or who have large equity investments in a facility. While such programs may work for large manufacturers with the capacity to engage in real estate development, they are not appropriate for small manufacturers who must devote all their energy and capital for machinery purchases, production and marketing. It is extremely difficult for any business to seek owner-occupancy in New York City because of the high cost and complicated nature of real estate. Public finance policy should promote the development of multi-tenanted industrial facilities so that more space can be made available for start-up manufacturing firms or for those needing to expand operations.

Despite the shortcomings of existing programs and the difficulty in financing new industrial facilities, since the late 1980s there have been several success stories about retaining manufacturing in New York City by addressing real estate issues. The first example involved a public agency in the development of affordable manufacturing real estate. The Public Development Corporation (PDC) rehabilitated Building B in the Brooklyn Army Terminal in Sunset Park and provided substantial relocation assistance to firms choosing to locate there. By the year 2000, the Brooklyn Army Terminal was fully occupied and the City's Economic Development Corporation (EDC), the successor to PDC, is embarking on the rehabilitation of a second building. By committing to the financing and operation of this manufacturing building, the City (through PDC) was able to protect it from the market driven demands for increasing rental levels.

A second success story involved the development of affordable real estate by a nonprofit organization utilizing government and private financial assistance. The Greenpoint Manufacturing and Design Center (GMDC) developed a manufacturing cooperative by acquiring a deteriorated industrial building in Greenpoint, Brooklyn from the City for \$1 and making the required investments to rehabilitate the building to meet the manufacturers' needs. Like the PDC, the GMDC was able to offer reasonable rents because it was a nonprofit organization and because it located in what was at the time of the purchase of its building, not a market-driven site. They were also able to make incremental improvements to the building, thereby not incurring the burden of a large up-front debt service during their start-up and rent-up period. Today, due to the success of this model, GMDC is in the process of developing eight additional manufacturing buildings.

Another example of the success of retaining manufacturing in New York by developing property involved a private developer who rehabilitated two Civil War piers in Red Hook, Brooklyn for light manufacturing uses. These facilities were developed with minimal government assistance in an area with low real estate values, and they are almost fully tenanted. Again, as with the GMDC buildings, the incremental rehabilitation of these buildings and the low cost of property acquisition allowed the renovation to be funded through cash flow proceeds. In addition, the developer made extensive use of recycled materials and an in-house construction crew, thereby further reducing the cost of development. Other private for-profit examples include the multi-tenanted mixed use development of older industrial loft buildings for both commercial and manufacturing tenants such as the Chelsea Market building and the Falchi building in Long Island City, Queens.

These buildings have long term leases for both manufacturing and commercial tenants and despite the fact that they are privately owned and managed, provide intensive assistance to their tenants in accessing public and private financing for small manufacturing enterprises.

These examples above all share common features:

- the initial rehabilitation was handled by an owner/developer who then sub-leased to manufacturing tenants;
- the project received public subsidies primarily through the reduction of the cost of the land and/or buildings and also had access to private financing;
- the buildings were rehabilitated in an incremental, pay-as-you-develop manner; and
- the buildings offer a number of amenities to their tenants, including technical assistance in some cases.

- ***Existing Manufacturing Land Use and Zoning Policies***

New York City, unlike other major metropolitan areas such as Chicago and Portland, has not taken major steps over the past two decades to protect manufacturing through its land use and zoning policies. It has neither actively sought to drive out industry, nor has it proactively put into place mechanisms that would allow manufacturing to overcome today's barriers and thrive. The City has, however, devoted a great deal of thought and study to the questions posed by manufacturing land use and zoning. For instance, in 1993 the Department of City Planning conducted a major land use report, entitled the *Citywide Industry Study*, which sought to provide a comprehensive picture of manufacturing in terms of the number of jobs it provided, the amount of land it utilized and the obstacles it faced. The report concluded that because industry is hampered by poor transportation, high crime, obsolete buildings, lack of suitable new sites and high taxes, and because large portions of industrial areas seem to be underutilized, the City should implement zoning changes in manufacturing areas to encourage the development of wholesale and retail trade. It made few recommendations for manufacturing retention.

In summary, the report accepted the inevitability of the demise of New York City's manufacturing base and made the case that industrial land should be opened up to other uses. Since the time of the publication of the *Citywide Industry Study*, the City has presumed that manufacturing is in an inevitable state of decline, and that city land use, zoning and economic development strategies will have a very limited impact on the health of this sector. As documented by numerous recent studies, however, there is reason to be optimistic about the current state and near future of the manufacturing sector, especially with regard to small and mid-sized businesses who are integrally linked to New York City's economy. In addition, the emergence of new productivity-enhancing and environmentally friendly manufacturing approaches stemming from the growing industrial ecology and sustainable development movement may bring about a resurgence in manufacturing in metropolitan areas such as New York. Manufacturing and land use policies are important tools for assisting industries to retain their foothold in the City and to continue to provide economic and social opportunities to city residents.

The following small sections describe New York City's current land use and zoning policies which are negatively affecting manufacturing development:

Development of Big-Box Retail

Following its 1993 publication, the City began to implement some of its recommendations by encouraging light and medium manufacturing zones to be used as sites for suburban-style retail developments, such as Home Depot. While most category dominant retail uses have always been allowed on an as-of-right basis in M1 districts and many are allowed in M2 and M3 districts, they have recently become more common. Examples include a Staples store in Brooklyn's Gowanus neighborhood and a Home Depot store in Brooklyn's Sunset Park neighborhood. Because these establishments have the capacity to pay much higher rent, they have contributed to the real estate crunch facing manufacturers. Moreover, they have contributed to the traffic and pollution problems that have prompted community advocates to call for the halt of all commercial and industrial uses in their mixed use zones.

Rezoning Actions

The Department of City Planning has also begun to act on the recommendation of the *Citywide Industry Study* that some manufacturing and mixed use areas be rezoned. Over the past three years, it has initiated rezoning actions in several waterfront mixed use areas, primarily in the Bronx and Brooklyn. The findings of this study support the conclusion that in some limited areas of the City, manufacturing uses have declined to the extent that rezoning is warranted. However, we believe that rezoning should only take place after a careful analysis of the existing land use and manufacturing job concentrations is undertaken for each area that is being considered. Our case studies provide comprehensive data that should be used by City Planning officials to guide any proposed rezoning actions. In addition, findings from our study provide evidence that manufacturing activity is very strong in many manufacturing and mixed use districts. Therefore, certain zones should be retained, and others should be elevated to "Manufacturing High Performance Zones" to provide special protections for existing manufacturers and promote the development of new manufacturing enterprises.

Siting of Noxious Uses

Another issue regarding city land use and zoning policy is that noxious uses such as waste transfer facilities and other infrastructure uses have become increasingly concentrated in manufacturing zones, and are thus having an adverse quality of life impact on surrounding uses. This issue is described in greater detail in the following section. One of the consequences of the lack of fair and appropriate criteria for siting these noxious uses is that nearby low-income communities have begun to associate manufacturing zones with the burdens of environmental pollution, and are therefore in some cases in the forefront of the call to rezone manufacturing districts. This is problematic because many residents of these low-income communities benefit from manufacturing jobs, and are in favor of manufacturing retention, particularly if new environmental performance standards are incorporated into the City's zoning code. This study provides evidence that the development of new environmental performance and compatibility standards, along with the implementation of "fair share" criteria for the siting of noxious uses, would relieve some of the pressure to rezone M areas for other purposes.

“Back Door” Conversions through the BSA

Even without the sanction of formal rezoning actions, land use changes in manufacturing and mixed use zones have been accomplished on a property-by-property basis through variances granted by the New York City Board of Standards and Appeals (BSA). A variance is a mechanism which grants the owner an exception to the ordinance when a literal enforcement of its provisions will result in unnecessary hardship. The exception allows a change in use or bulk of the property. Although variances cannot be granted without a public hearing at the local community board, applications are rarely denied through this process. While the appeal process based on a hardship was originally conceived as an exception to the local zoning code, variances have increasingly become the norm.

Unlike other U.S. cities such as Portland, New York City’s zoning ordinance provision regarding variances is relatively weak and open to wide interpretation. The BSA requires that a property owner prove “practical difficulties” or “unnecessary hardship” due to “unique physical conditions” which make it unlikely that a “reasonable” return can be made. Typically, the owner simply has to make the case that 1) because his/her building is multi-storied, it is difficult to earn a reasonable return from manufacturing uses (multi-storied buildings are actually quite suitable and typical for manufacturing use in New York City, but they are not typical in other parts of the country); and 2) pro forma analysis of the rate of return on the property proves that a “reasonable” return cannot be made with manufacturing. However, the economic analysis presented by owners through this process is often flawed because it is based on a property purchase price that was inflated because the buyer anticipated a change in use from the start.

Another weak aspect of the provision is that variances should not “alter the essential character of the neighborhood or district.” Although it is true that a use change for one building is not likely to transform a neighborhood, this provision does not take into account the cumulative effect of a number of variances. Such weaknesses in the zoning ordinance’s variance provisions have made it possible for a growing number of conversions from industrial to residential and other purposes to take place. This has contributed to the problem of a shrinking pool of available industrial space. Between January 1997 and June 1998, the BSA approved thirty-nine of these types of variances in South Williamsburg alone,³⁶ and according to the local community board, the request rate has accelerated dramatically over the past three years. The widespread granting of variances has not only short-term effects but long-term ones. Even when property owners merely expect that they may be granted a variance in the future, they tend to keep industrial spaces off the market.

- ***Quality of Life Issues in Manufacturing and Mixed Use Zones***

While manufacturing areas have historically enjoyed a positive image among low-income residents because they served as generators of jobs, they are increasingly perceived as quality of life threats because of their high concentration of noxious uses, such as waste transfer stations, and unwanted establishments, such as adult entertainment centers. The environmental justice movement in New York City grew out of a concern about the health impacts of some of these uses in low-income communities near manufacturing zones.

³⁶ *The Big Squeeze*, 17.

Waste transfer stations, for example, have always been an allowable use in M-zones but have become increasingly concentrated in certain parts of the city as privatization and the closing of the Fresh Kills Landfill have accelerated the number of facilities needed.³⁷ These facilities not only harm the environment because of the hazardous materials they store, but they also generate numerous other problems. The large number of trucks used for carting the waste to and from transfer stations add to existing high levels of area pollution while simultaneously increasing traffic hazards. These facilities also tend to be land intensive with a low density of jobs per acre, and they shrink the stock of space available for manufacturing uses. Moreover, they sometimes have an adverse impact on nearby businesses, particularly food-related firms. Businesses in proximity to waste transfer stations report having higher than normal absentee rates among their employees due to pollution problems.

In recent years, concern about the link between poor environmental conditions and health issues such as high asthma rates in many low-income communities has prompted residents to mobilize against noxious uses through advocacy and litigation. Lincoln Hospital, the closest major health facility to Hunts Point in the Bronx, has reported a tripling of asthma-related deaths since the opening of a nearby medical waste incinerator. Over a dozen legal actions have recently been initiated by the New York Lawyers for the Public Interest and citywide coalitions such as Organizations of Waterfront Neighborhoods (OWN), the New York Environmental Justice Alliance (NYEJA), and the Coalition United for Responsible Energy (CURE). Community initiated 197a plans for the Bronx neighborhood of Hunts Point and the Brooklyn neighborhoods of Red Hook, Sunset Park, DUMBO, Vinegar Hill, Williamsburg and Greenpoint have called for the rezoning of some manufacturing zones in order to protect the health and welfare of area residents. Through these plans, communities have requested that environmentally burdensome uses such as waste transfer stations, incinerators, sludge facilities, and power plants be either banned or only allowed through special permit. In addition, these plans have called for quality of life improvements by increasing public access to waterfront areas as a method for alleviating the severe lack of open space and for the enjoyment of the nearby residents, workers, and New York City residents at large. Currently, many manufacturing areas are along the waterfront and therefore are not publicly accessible.

The challenge facing city land use and zoning policy makers is to address the legitimate concerns of local residents while continuing to find appropriate sites for these types of uses. Waste transfer stations, public transportation yards, utility stations, vehicle storage and repair depots and other industry-related concerns are all vital to the functioning of the city, and are allowable uses in manufacturing zones. In fact, some of these uses are growth industries and providers of jobs for low-income residents. While advocates within the environmental justice movement are opposed to the concentration of burdensome uses near low-income communities, they are also very interested in the economic revitalization of their neighborhoods. City policy makers should strive to craft more equitable policies for the siting of potentially noxious uses, and to improve the regulatory oversight of those who are

³⁷ Despite the closure of the Fresh Kills Landfill in Staten Island, there has been no new solid waste management policy in New York City that adequately addresses the needs of the City and its residents. Instead, ad hoc measures that include increasing the capacity of existing waste transfer stations and adding more stations in the outer boroughs (especially the Bronx and Brooklyn) have been taken. Commercial putrescible and non-putrescible waste is trucked by private waste management companies to waste transfer stations for shipment via trucks or rail outside the city. Unfortunately, these transfer stations, listed as one of the "manufacturing" growth sectors in the *Citywide Industry Study*, are concentrated in certain manufacturing zones and operate with little regulatory oversight.

in operation.³⁸ This is important not only to the health of low-income residents who live near these uses, but also to the vitality and future of the manufacturing sector in New York City, which must be perceived as an asset to city residents in order to survive and expand.

In sum, it is prudent for the city to take steps to counter the perception that manufacturing zones and low-income mixed use communities have become dumping grounds for everything that other communities do not want in their backyard. Over time, this has led to the progressive alienation of adjacent residential communities who now fear further deterioration with each new proposal. Protecting manufacturing zones or creating industrial retention areas will depend greatly on community support for manufacturing uses. We believe that this support can be obtained by developing a comprehensive manufacturing strategy for New York City that incorporates both the economic and environmental concerns of industry and local residents.

- ***High Energy Costs***

Finally, another obstacle that manufacturers face is the high cost of energy, particularly the manner in which they are charged for electricity. Electric companies base their charging structure on peak usage levels even if the peak usage only lasts for a very short period of time.³⁹ This approach unfairly burdens manufacturing firms who rely on short, unsustained high levels of electricity usage. Although major energy shortages like those taking place in California have not yet manifested in New York City, there is also a concern among manufacturers that energy shortages could affect businesses here in the near future.

³⁸ As a result of recent litigation regarding waste transfer stations, the New York City Department of Sanitation published new siting criteria for public comment. While these draft criteria are laudable as a first step, they require further revision in order to address some of the serious concerns of community residents. The new criteria provide some restrictions related to the siting of waste transfer stations in M-1 zoning districts, but they allow for their location within 300 feet of housing and schools. Furthermore, there are no guidelines for siting in the heavier manufacturing M-2 and M-3 zones. Finally, the new regulations do not include any fair share criteria that would take into account the clustering of existing waste transfer stations and other environmentally burdensome uses. Nor do they mandate urban design, greening and other mitigation measures that would minimize the adverse impacts of these facilities.

³⁹ Many manufacturers use the highest daily level of electricity for a short moment early in the day as part of the process of "opening up shop."

CURRENT MANUFACTURING DEVELOPMENT PROGRAMS IN NEW YORK CITY

As described in this section, an array of financing, technical assistance and development programs exist in New York City to assist manufacturers. However, while there are numerous benefits to these programs, the City could do much more to help small and medium-sized manufacturers, particularly those who rent rather than own their spaces, to access these resources.

New York City's In-Place Industrial Parks (IPIP)

In 1980, New York City launched the In-Place Industrial Park (IPIP) program to improve the environment for manufacturing firms and to assist them to access other city and state programs. Eight areas throughout the city were designated as IPIPs. The program is a service partnership between New York City's Economic Development Corporation (EDC), the businesses which operate within the parks' boundaries, and non-profit Local Development Corporations (LDCs). For each of the eight IPIPs, there is an LDC which manages the park and operates business assistance programs for the firms within its boundaries. EDC works with the LDCs by coordinating on-site management, security, infrastructure improvements, and business services.

The following chart lists New York City's eight IPIPs, including each of the IPIP's managing LDCs and the geographic-based incentives that are associated with each park. Long Island City's IPIP is the only one that does not have accompanying geographic-based incentive programs.

IPIP	Borough	Managing LDC	Geographic-based Incentives
Bathgate	Bronx	Bathgate LDC	New York State Empire Zone
Port Morris	Bronx	South Bronx Overall Economic Development Corporation	Bronx Empowerment Zone, Port Morris Empire Zone
Hunts Point	Bronx	Hunts Point Economic Development Corporation	Bronx Empowerment Zone, Hunts Point Empire Zone
East New York	Brooklyn	LDC of East New York	East Brooklyn Empire Zone
East Williamsburg	Brooklyn	East Williamsburg Valley Industrial Development Corporation	North Brooklyn-Brooklyn Navy Yard Empire Zone
Sunset Park	Brooklyn	Southwest Brooklyn Industrial Development Corporation	Southwest Brooklyn Empire Zone
Jamaica	Queens	Greater Jamaica Development Corporation	Jamaica Empire Zone
Long Island City	Queens	Long Island City Business Development Corporation	none

IPIPs were originally intended to serve as state-of-the-art industrial parks that address the problems that were causing manufacturers to leave New York. While many IPIPs are almost fully occupied, others have buildings and lots that remain vacant. This is due to a variety of drawbacks that make them unattractive to manufacturers, including locational issues such as distance from their customer and employee base, the lack of amenities such as restaurants, mass transit, and open space and the perception of crime and poor city services in the neighborhoods they occupy. In recent years, some of these IPIPs have started to market to firms other than manufacturers.

While IPIPs do provide technical assistance benefits to firms located within its boundaries, they do not offer special tax incentives or other financial benefits, and thus are quite limited in power and scope. The major advantage of locating within an IPIP is access to the managing LDC and the services it provides. For example, a business within an IPIP may confront the problems associated with illegal parking and its negative effects on loading trucks for deliveries. Because of its location within an IPIP, this business can turn to the managing LDC for assistance in contacting the appropriate city agency so that the problem is addressed expeditiously.

In addition to the liaison services the LDCs provide to IPIP firms, it is important to note that almost all of the IPIPs are located within areas that are supported by other geographic-based incentive programs such as New York State Empire Zones, Federal Empowerment Zones, and local Economic Development Zones.

Financing & Other Industrial Development Programs

Apart from the In-Place Industrial Park program, the City and State of New York offer a variety of incentive programs which have the potential to benefit manufacturing firms. Most of the benefits are conferred via tax exemptions and credits. The following is a description of these programs.

Real Estate Assistance Programs

- ***Industrial and Commercial Incentive Program (ICIP) for Manufacturing Buildings***

This New York City tax abatement and exemption program is eligible to small manufacturers and developers with manufacturing tenants. Those who make improvements or renovations to their buildings equal to 10% of the property's assessed value can apply to receive an exemption on the increase in property taxes due to those improvements. Spending 25% of the assessed value of the property can make a firm eligible for an abatement of the real estate tax. While the program is relatively simple to access, it could be substantially improved if its benefits could be prorated. The spending threshold (whereby a substantial portion of a building must be renovated) renders it inaccessible to numerous small manufacturing tenants who are interested in simply renovating a portion of a building. The program was renewed by the City and State in Summer 1999, but it was not altered to enable applicants to prorate the benefits.

- ***NYC IDA Financing of Building Purchase and Renovation***

This New York City Industrial Development Authority (IDA) program charges interest rates that are 20%-25% below market rates to fund investments in buildings and equipment that total at least \$850,000.

- ***NYS JDA Financing of Building Purchase and Renovation***

For projects that do not meet the high threshold (\$850,000) required by the IDA program, the State's Job Development Authority (JDA) provides low interest loans through the use of tax exempt financing. Federal triple tax-exempt Industrial Development Bonds (IDBs) are used to finance loans to manufacturers seeking to either construct or renovate industrial space. Generally, JDA can finance 40% of a loan and takes a second position behind conventional bank lending. The major shortcoming of this program is that due to federal regulations of the IDB program, only owner-occupied buildings are eligible. "Speculative" industrial projects whereby a for-profit or not-for-profit developer plans to renovate a space and then lease it to manufacturing tenants are not eligible. As described earlier in this report, this restriction renders the program less effective for many industrial development projects in New York City. Many small businesses do not have the capacity or means to engage in real estate development, and instead seek to lease space from property owners and developers. The program also has the disadvantage that projects must not cost over \$10 million. Again, this is a particular barrier in New York City. Both of these shortcomings must be addressed at the federal level through a change in regulations governing the IDB program.

- ***NYC Relocation and Employment Assistance Program (REAP)***

This New York City program is targeted to manufacturing firms relocating all or part of their business from outside of NYC or Manhattan south of 96th Street to designated "Expansion Areas" in the City.⁴⁰ REAP provides a 12-year credit of \$3,000 per relocated employee against the NYC Corporate Tax, the Bank Tax or the Unincorporated Business Tax. The move-in property must be eligible for the Industrial and Commercial Incentive Program (ICIP), as a result of an expenditure on a property leased from the IDA, Port Authority, or New York State.

- ***NYC Commercial Expansion Program (CEP)***

In Summer 2000, a new Commercial Expansion Program was enacted in New York City to encourage growth and retention of businesses located outside Manhattan's primary business centers. The initiative provides a commercial and industrial rent abatement in areas outside of Manhattan south of 96th Street and triples the amount of tax credit per job under the City's Relocation and Employment Program (REAP) for businesses moving jobs from Manhattan south of 96th Street. The value of the enhanced REAP program is limited, however, because of a requirement to meet a high capital investment threshold.

⁴⁰ These expansion areas include C4, C5, C6, M1, M2, and M3 zones in the Bronx, Brooklyn, Queens, Staten Island, and Upper Manhattan (north of 96th Street).

- ***NYC Relocation Fund for the Printing and Graphic Arts Industry***

This New York City program provides financial assistance to commercial printers and graphic arts companies that have relocated within New York City. Out-of-pocket moving costs paid to third party vendors can be partially reimbursed. Eligible firms can receive the lesser of 50% of eligible moving costs or \$200,000. While this funding is useful to companies who are eligible to apply for it, it does not nearly cover the cost of relocating a printing operation, which can run upwards of \$1 million.

- ***NYC Industrial Relocation Grant Program***

This New York City program was the successor to the Business Relocation Assistance Corporation, however its funding has been spent.

Energy Assistance Programs

- ***NYC Energy Costs Savings Program***

This New York City Program helps reduce energy costs for eligible industrial and commercial businesses that are relocating, renovating or expanding within New York City. It can reduce service and delivery charges to manufacturers by up to 45%. To qualify for ECSP savings, all industrial or commercial firms must be located in or moving within New York City, have energy costs directly metered or sub-metered, and be relocating, renovating, or expanding. Firms must qualify for the Industrial and Commercial Incentive Program and meet the requisite investment threshold. The program is administered by the NYC Department of Business Services' Office of Business Retention and Energy Programs. Prior to deregulation of the electric utility industry, the program was fairly straightforward and enabled manufacturers to realize savings on the cost of power itself. Today, however, because the program only discounts the delivery portion of a manufacturer's bill, it is not as useful to manufacturers.

- ***NYC Electricity Sales Tax Credit***

Through this program, businesses are entitled to claim a credit for the city's 4% sales tax that is assessed on electricity used directly and exclusively in the manufacturing, processing, or assembling of tangible personal property for sale.

- ***NYC Public Utility Service Economic Development Power Program***

Qualifying businesses may receive low-cost electricity generated by the New York Power Authority under contracts with the New York City Public Utility Service for terms up to ten years. Businesses that are energy intensive, such as two-shift manufacturing facilities and computer intensive back office operations, can save up 30 percent or more on electricity bills.

- ***NYS Electricity Sales Tax Exemption***

This is a state program which entitles businesses to an exemption from the state's 4.25 % sales tax on electricity, fuel oil, natural gas and steam that is used directly and exclusively in the manufacturing, processing or assembling of tangible personal property for sale. In addition, once a business files for this exemption, it will automatically receive an allocation of low-cost hydroelectric power from the New York City Public Utility Service.

- ***New York Energy Smart***

The New York State Energy Research and Development Authority (NYSERDA) is a public benefit corporation created in 1975 by the New York State Legislature. NYSEDA's principal goal is to help businesses, municipalities and residents of New York State solve their energy and environmental problems while developing new, innovative products and services that can be manufactured or commercialized by New York State firms. NYSEDA programs help businesses identify cost-effective ways to save energy and improve profitability through the following measures: productivity improvements; product development; green and improved buildings; environmental impact reduction; engineering analysis; new construction financial incentives; rate analysis and aggregation; and the New York Energy Smart Loan Fund. These programs, known collectively as New York Energy Smart, are funded by a Systems Benefit Charge noted on utility bills. The programs are available to all Con Edison electricity customers.

Equipment Purchase Assistance Programs

- ***NYC Industrial Development Authority (IDA) Financing of Equipment Purchases***

The New York City Industrial Development Authority provides triple tax-exempt bond financing for equipment purchased on behalf of eligible New York City manufacturers. The equipment financing program enables qualified borrowers to finance equipment at interest rates of approximately 75 percent of conventional financing rates.

Other Assistance Programs

- ***NYS Linked Deposit Program***

This program, run by the Empire State Development Corporation, can save a business a few interest rate percentage points for short term financing.

- ***NYC Industrial Rate Abatement***

If an industrial company relocates to any manufacturing zone or to a C4, C5, or C6 commercial zone, it may be eligible for a rent credit. The landlord applies for an abatement on real estate taxes on the building and is then required to pass the savings on to the tenant by reducing the rent by the same amount. The criteria for eligibility for this program are that 1) the building that a business is moving into must be larger than 25,000 square feet 2) and/or the business owner or landlord must make minimal improvements to the space. This program is hampered by the fact that the landlord must deal with the hassle of the paperwork, and yet must pass on the savings to the tenant.

- ***Federal Empowerment Zones***

These are geographically delimited areas located in upper Manhattan and the South Bronx. Benefits for businesses located within these zones include a wage tax credit (up to \$3,000 per part or full-time employee who lives in the Empowerment Zone) and a Section 179 Increased Deduction (up to \$18,000 for the first year of service for eligible properties).

- ***NYS Empire Zones***

These special zones (formerly known as Economic Development Zones) were established by New York State to attract businesses into certain depressed areas through special incentives. The areas designated in New York City are Hunts Point (The Bronx), the Brooklyn Navy Yard, Southwest Brooklyn, and East Williamsburg (in Brooklyn), East Harlem (in Manhattan), South Jamaica (in Queens), and the North Shore (in Staten Island). Firms locating within these zones can be eligible for a number of tax exemptions. Beginning in 2001, three new incentive programs will be added to the existing program.

- ***NYS Strategic Training Alliance Program (STRAP)***

STRAP was created as part of Governor Pataki's "Jobs 2000" legislation to identify and address employer demands for skilled workers. A total of \$34 million was appropriated for use over three years. The program strives to address identified skilled worker shortages within an industry or within a single employer's establishment, promote skills upgrading for incumbent workers (particularly upgrading skills for high technology jobs), and ensure that employers throughout the state have a skilled and qualified workforce.

The training needs and costs are defined by the employer and reviewed by the NYS Department of Labor and the Empire State Development Corporation for reasonableness and appropriateness. The funds cannot be used for the acquisition of training equipment or for capital expenditures. While there is no award limit, all requests for funds are reviewed using a cost-benefit formula.

Eligible applicants include an employer or an employer in conjunction with a labor organization, a strategic alliance or network or association of employers with common problems or concerns, or one or more local workforce investment boards representing a strategic alliance and established pursuant to the federal Workforce Investment Act. Any of the aforementioned entities, regardless of size, that have incumbent worker training needs and a plan for addressing them may be eligible.

In sum, while there are a number of financing programs available to manufacturers, many are difficult for small and medium sized businesses to access. One of the major obstacles facing New York City manufacturers is that those who are renters rather than owners of their space (the majority of today's industries) are ineligible to apply for several of the real estate assistance programs. With regard to the city and state electricity sales tax savings programs, their effectiveness is compromised to the extent that many firms cannot easily document that their electricity is used "directly and exclusively" in the manufacturing process. Physically rerouting electric service lines to separately meter discrete functions within a firm's production plant is sometimes prohibitively expensive, and thereby renders some manufacturers ineligible for these programs. In addition, because firms are only eligible to apply if they have already obtained ICIP, the program has the same barriers to access as ICIP.

Moreover, because these programs are disjointed and each require a separate (and sometimes lengthy) application process, many small businesses simply do not have the capacity to apply. The city does not have a coherent, integrated system of incentives and benefits for manufacturing retention, and the numerous government agencies which administer these programs cannot provide one-on-one technical assistance to each applicant. We recommend that the City move to streamline these various benefit programs into a more coherent system, and that it provide increased funding to the not-for-profit agencies who provide technical assistance to manufacturers wishing to access these programs.

Technical Assistance Organizations

Several technical assistance organizations exist to support the retention and expansion of manufacturing in New York City. Among them are:

- ***Garment Industry Development Corporation (GIDC)***

GIDC is a non-profit consortium of labor, industry and government dedicated to strengthening New York's apparel industry and keeping jobs in fashion. Through a multi-tiered strategy, GIDC serves a broad range of industry stakeholders including workers, manufacturers, contractors, private label manufacturers and international buyers. Its wide range of services includes skills training for management and workers, technology and engineering assistance, export promotion, and domestic sourcing.

- ***Industrial Technology Assistance Corporation (ITAC)***

ITAC offers New York City's manufacturing and technology firms a broad range of technical and business services to help them compete regionally, nationally, and globally. ITAC, a not-for-profit economic development organization, is New York State's Technology Development Organization for the City and is an affiliate of the National Institute of Standards & Technology Manufacturing Extension Partnership. ITAC has assisted more than 1,000 New York City companies with technical, sales and marketing, and financial services that have improved their performance, and provided quality jobs for New Yorkers.

- ***Manufacturers Association of New York City (MANYC)***

MANYC's mission is to create an environment that enables manufacturers to stay and grow in New York City and to provide good jobs for the city's residents. They do this by shaping a legislative and regulatory environment responsive to local economic growth and by increasing understanding among policy-makers, the media and the general public about the importance of manufacturing to New York City's economy. Its approach is to identify key issues of high importance to the local manufacturers, research issues and develop recommendations for change, and educate state and local elected and appointed officials on the needs of manufacturers.

- ***New York Industrial Retention Network (NYIRN)***

NYIRN was created to strengthen New York City's manufacturing sector, to save well-paying manufacturing jobs, and to build the capacity of network participants to engage in economic development. NYIRN operates by mobilizing a diverse pool of stakeholders to act as an "early-warning" system by identifying companies that are at risk, developing remediation strategies, and linking manufacturers to network participants who can help implement those strategies. NYIRN's "network" includes over 100 local development corporations, labor unions, government agencies, financial institutions and other entities that are concerned with sustaining the City's manufacturing base.

Within its first four years of operations, NYIRN helped approximately 740 companies (with 22,000 employees) to obtain the services they needed to grow and remain in New York. In addition to individual company assistance, NYIRN has published three reports on the status and needs of the manufacturing sector and has launched initiatives in the printing and food manufacturing industries to develop industry-specific economic development services, including training programs and the development of a food industry building (undertaken in collaboration with the Greenpoint Manufacturing and Design Center).

NEW YORK CITY'S MIXED USE ZONING POLICY: BALANCING THE MIX

"Mixed use zoning" in New York City emerged as a reaction to traditional zoning and planning policies which aimed to segregate residential from commercial and industrial uses.⁴¹ The segregationist approach to zoning emphasizes the quality-of-life issues associated with the coexistence of dissimilar uses. However, there are certain benefits to mixed use areas that should be recognized. These include: permitting multiple activities for residents and businesses, preserving manufacturing-zoned land for business development, producing decent jobs for low-income residents who have limited education, job skills, and transportation options, permitting the option of proximity between home and work, minimizing commuting time and maximizing walk to work opportunities, allowing adaptive reuse of existing infrastructure to accommodate smaller scale industries, and permitting greater economic opportunities for older neighborhoods.⁴²

Reasonable proximity between industrial and residential uses results in reduced commuter and child care costs because people spend less time commuting between home and the workplace. In addition, active industrial sites provide a presence on the streets when residents are not at home, while street activity associated with residents provides security when industries tend to be closed for evenings and weekends. The disadvantages to residential uses of their proximity to industrial uses include truck loading (which can cause impassable streets), increased need for refuse disposal, the lack of available on-street parking, vibration, noise duration and level, and odor and fumes attributed to production and/or storage.

Existing Mixed Use Zoning Districts

The segregation of uses imposed by the 1961 zoning resolution was an attempt to reflect the city's perception of how land use patterns would change and an attempt to regulate future development. Many manufacturing districts were imposed on areas already developed with a mix of uses based on the assumption that either the market and/or urban renewal would result in the demolition of small homes, and that parcels of residential uses could be incorporated as part of an industrial development or expansion. However, this segregation was often in conflict with actual land use patterns in some mixed use areas, and the effects of zoning restrictions on existing residential uses were ultimately detrimental to the larger community.⁴³ Since the 1970s, the city has created numerous amendments to the zoning resolution to allow for both mixed use development and mixed use districts. Currently, there are four different types of mixed use zoning districts that address the coexistence of residential and industrial uses. (See Appendix A: New York City Mixed Use Zoning Summary.)

⁴¹ The concept of mixed use zoning often refers to the mix of residential and commercial uses, and is commonly found in urban environments. By contrast, the mix of industrial and residential uses is less common. It is a land use pattern that developed in older, generally waterfront industrial neighborhoods. For the purposes of this study, the term "mixed use" refers to the mix of industrial, residential, commercial and/or community facility uses occurring in the same district.

⁴² Virginia Hopley, "Mixed Used Districts and Economic Development: The Case Study of Red Hook, Brooklyn," Master's thesis, Columbia University, 1994.

⁴³ Isabel Hill, *Mixed Industrial and Residential Development* (Brooklyn, NY: Department of City Planning, 1991) 4.

Special Purpose Districts

Industrial-residential mixed use areas in New York City were legitimized in 1973 when the first Special Mixed Use District was created in the Northside of Williamsburg. The Department of City Planning, under pressure from community residents, sought an amendment to the resolution to allow development of replacement housing for those displaced by an urban renewal plan that facilitated the expansion of one of the area's industrial plants. This action allowed the area to preserve its existing mix of manufacturing and residential uses.

A special purpose district is created by an amendment to the text (and map) of a zoning ordinance. It is intended to either protect a particular area from development pressure or to preserve its appearance. Of the 38 special purpose districts that have been created by the City Planning Commission to date, five have been applied in industrial-residential mixed use neighborhoods: Williamsburg's Northside, Coney Island, Franklin Street in Greenpoint, Hunter's Point in Queens and Lower Manhattan. All of the districts allow manufacturing and residential development to locate side by side. However, mixed use buildings or properties are not permitted, except very restrictively in the Franklin Street Special Purpose District.

Another example of a special purpose district is the Special Garment Center District. This District was created in 1987 to preserve space at affordable rents for apparel-related production within the traditional Garment Center and to maintain the benefits accrued by the concentration of related businesses in one location. Manufacturing space within the Preservation Area⁴⁴ of the Special District can only be converted if the equivalent amount of space is dedicated in the Preservation Area for apparel manufacturing and other production work. However, our review of the Garment Center Special District indicates that high rents are for the most part responsible for the displacement of manufacturing jobs out this district, a condition that is aggravated by the fact that most of the leases are to expire in two years⁴⁵. Thus, without appropriate intervention and enforcement of the current regulations the garment industry is likely to be displaced from Manhattan and probably from other suitable locations in the City. This district is an example of the lack of zoning enforcement, since not only residential uses (which are not permitted) increased, but commercial uses (which are limited) grew at exorbitant rates.

Loft Zoning

In 1971, to address widespread industrial vacancies and a growing pattern of illegal residential conversions in older Manhattan manufacturing buildings, the Department of City Planning introduced an amendment regulating conversions in Soho and Noho. Commonly known as "Loft Zoning," this regulation includes two distinct applications, the Loft Law for Artists and Loft Zoning for permitted conversions.

The Loft Law was specifically tailored for artists and allows those certified by the City's Department of Cultural Affairs to live and work in the same quarters.⁴⁶ As industrial uses continued to decline, this district was further modified to expand the areas affected and to permit greater use of loft buildings for combined residential and industrial activity. Loft Zoning regulations apply to residential conversions of non-residential buildings in existence before 1961 in Manhattan Community Districts 1 to 6, Brooklyn Community Districts 1, 2 and

⁴⁴ The Preservation Area covers the mid-blocks between 35th and 40th Streets.

⁴⁵ Robert Moskow, "Hanging by a Thread," *Crain's NY*, March 26-April 1, 2001.

⁴⁶ This amendment introduced joint live-work quarters as a new light manufacturing use listed in Use Group 17D.

6, and Queens Community Districts 1 and 2 and is under discretionary review for becoming applicable to Brooklyn Community District 8.

The Loft Law allowed conversion of manufacturing space for loft uses if a percentage or set-aside of space for industrial uses was made and/or if the developer contributed to a business relocation fund. This was achieved by requiring owners to make a "conversion contribution" either directly to the relocating tenant or to the City's agency responsible for assisting dislocated businesses, the Business Relocation Assistance Corporation. However, the "conversion contribution" requirement is no longer in existence.

Mixed use areas with large concentration of loft buildings are likely to experience transformations similar to those that have taken place in SoHo, NoHo and Tribeca. Buildings legalized under the Loft Law were intended to protect both the tenant artists and their landlords by establishing regulations to control rent increases. However, the cost of upgrading these buildings and making them comply with the law is very high due to their size and location in high-priced areas. In addition, the lack of financing programs for the rehabilitation of these structures has created many conflicts between landlords and tenants over renovation costs, and had contributed to the reduction of conversions. In some cases, the legalization process has halted altogether. Thus, in June 1999, of the 835 buildings registered under the Loft Law, only 460 were compliant.⁴⁷

Loft buildings not included in the Loft Law have seen a different evolution. The lack of zoning enforcement in manufacturing loft areas in Soho and Tribeca has enabled non-manufacturing businesses and new residents⁴⁸ to occupy these buildings, and has contributed to a gradual gentrification of residential/commercial mixed use districts. Loft buildings have become a high-priced commodity that is in great demand, often pushing out existing manufacturers. Unrestricted conversions of loft buildings into high-priced condominiums have increased property values in Soho and Tribeca between three to ten times in only five years, and this demand is increasing and expanding into Brooklyn.⁴⁹

M1-D Districts

The proliferation of Special Purpose Districts eventually undermined the City's capacity to enforce zoning and therefore led the Department of City Planning to develop a proposal for a generic mixed use district. Adopted as a zoning amendment in 1989, this new group of generic manufacturing districts are generally known as M1-D districts. The M1-D zoning designation is very restrictive, and is directed toward industrial preservation with some infill residential development. Because it is aimed at particular land use configurations, its application is only feasible in certain lower density manufacturing districts, particularly those outside of Manhattan. To date, the M1-D designation has been mapped in Dutch Kills, Queens, and in two sections of Sunset Park, Brooklyn.

⁴⁷ Dennis Hevesi, "The Loft Law's Pursuit of Lofty Goals," *New York Times*, June 20, 1999.

⁴⁸ Kirk Johnson, "Where a Zoning Law Failed, New York City Finds Seeds of a Revival," *New York Times*, April 21, 1996.

⁴⁹ Tracie Rozhon, "The Market in Lofts Grows, at Lofty Prices," *New York Times*, December 15, 1996.

Special Mixed Use District (MX)

In 1997, the Department of City Planning introduced the generic Special Mixed Use District to allow for more flexible development of manufacturing land including waterfront areas. MX, as it is commonly known, is aimed at revitalizing existing mixed use communities by lifting restrictions on the development of manufacturing-zoned land. Its flexibility constitutes a breakthrough in the segregated nature of zoning. It allows as-of-right development (development without requiring further governmental review, permissions or exceptions) of a wide range of residential, community facility, commercial and manufacturing uses. It also allows the vertical integration (in one building) of this wide variety of uses, and allows for more live-work uses. From this perspective, this zoning designation is a positive step towards acknowledging and legitimizing new and emerging uses. At the same time, however, it lacks a strategy for preserving existing manufacturing uses and preventing displacement by residential and commercial uses. To date, there are two MX districts in New York City. The first, enacted in 1997, is located in the Port Morris section of the Bronx, and the second, enacted in 1999, is in the DUMBO (Down Under the Manhattan Bridge Overpass) area of Brooklyn. A third district is undergoing discretionary review for the Flushing/Bedford area in Bedford-Stuyvesant in Brooklyn.

For each of these types of districts, there must be a special review process which cannot be replicated in another location. The Department of City Planning is no longer considering establishing Special Purpose Districts to accommodate mixed use. Instead, it is mapping its generic mixed use text on a case-by-case basis. In each case, the creation of a new mixed use zoning district involves an application for zoning map and text amendments, which is carried out through the Uniform Land Use Review Procedure (ULURP) process.⁵⁰ In theory, ULURP is a mechanism to allow communities concerned with a zoning action to review it and make recommendations. It is not a planning process, however, and its proscribed time schedule only permits community boards and the general public to react to plans. These plans are generally submitted by developers, and are ultimately approved or rejected by elected officials.⁵¹

Applications for expanding or contracting an existing special purpose district or to map the generic M1-D and MX districts can also be introduced by property owners as a zoning change (although MX also requires a simple text change specifying the area to be mapped for mixed use regulation applicability) which requires a community planning process. Applications for Loft Zoning entitlement are customarily introduced by property owners on an as-of-right basis and thus, do not involve a planning process either. None of the existing mixed use zoning districts allow for mechanisms to evaluate, review or update their regulations to account for socioeconomic, environmental or technological changes that occur over time.

⁵⁰The Uniform Land Use Review Procedure (ULURP), established in section 197-c of the New York City Charter, is a standard process for evaluating and deciding upon certain discretionary planning proposals (rezonings, special permits and special approvals). Requests for action may be submitted to the Department of City Planning (DCP) by the body itself, Community Boards, Borough Presidents, or the City Planning Commission. Once the application is certified, notices are sent to the above-mentioned entities and to the City Council. Sequentially, the Community Boards, the City Planning Commission, and the City Council hold public hearings and submit recommendations. The City Council ultimately approves, modifies or disapproves the application. Once approved, the Mayor reviews the application and may veto it.

⁵¹Susan R. Motley, "Planning The Equitable City," *Planning and Zoning New York City*, 209.

Do Mixed Use Zoning Policies Assist in Manufacturing Retention?

Although M1, M2, and M3 districts are typically identified by the public as strictly industrial use districts, a range of uses is actually permitted in these districts, pursuant to the Zoning Resolution. Commercial uses are permitted in M-zones, although there are some restrictions for specific uses that limit their size to 10,000 square feet. Certain establishments that exceed this size may be permitted pursuant to the granting of a special permit, however. In some cases, a commercial use is not allowed in each of these manufacturing districts. There are many retail developments that exist in manufacturing districts. In Brooklyn alone, there is a Staples in Park Slope, Home Depot and Costco in Sunset Park, K-Mart/Bay Parkway Shopping Center in Gravesend, Pathmark in Coney Island and the Kings Plaza Mall in Mill Basin. Others are being planned.

This is an important consideration for the designation of future MX districts close to highways because of the likelihood that they will be targeted for such large-scale commercial development. These commercial developments attract customers from a wide area, often causing the neighborhoods to transform into "destination-type" commercial districts with increased auto use and parking needs. Without size and density restrictions on commercial development, some areas whose existing urban fabric and infrastructure is unsuitable for this level of activity will become overwhelmed by overcrowding, excessive noise, and unanticipated traffic. In addition, manufacturers in mixed use neighborhoods who are under intense market pressures because of large-scale commercial development are likely to feel the effects of rising rents and pressures to relocate.

New York City's mixed use zoning districts and their relationship to manufacturing can be summarized as follows:

- Special Purpose Districts employ a very restrictive use provision and regulatory process that appears to be very effective in preserving manufacturing activity while encouraging other uses.⁵² However, the extensive level of review involved in establishing these districts has hampered the City's capacity to administer and enforce the ordinance. Thus, without a fundamental policy change, additional applications are not likely to occur.
- M1-D districts also employ a restrictive use provision and regulatory process that allows some residential development but mainly helps to preserve manufacturing and other industries. However, this district applies to limited land use configurations, and thus cannot be replicated in many areas of New York City.
- Loft Zoning contains a restrictive use provision but allows commercial development as-of-right and lacks affirmative strategies for encouraging manufacturing retention and development. Therefore these districts are prone to gentrification, especially in waterfront areas under development pressures.
- MX is the least restrictive of the mixed use districts, since it allows as-of-right development of a variety of uses, with some use restrictions based on noxious/hazardous materials consideration. It does not address manufacturing preservation. Therefore, this type of district is likely to transform neighborhoods from mixed residential-commercial-manufacturing to mixed residential-commercial areas.

⁵² It should be noted, however, that as of yet, no evaluation data have been collected on these districts, and it is therefore difficult to ascertain the true level of their effectiveness.

Environmental Concerns in Mixed Use Zoning Districts

Many light industrial and residential uses can coexist successfully. However, some industrial uses involve activities that can generate negative environmental impacts such as noise, odors, fumes, dust and excessive truck traffic, any of which can threaten public health and safety. Even when regulated by existing environmental laws, industrial activity maintains the risk of the accidental release of hazardous substances.

Mixed use zoning policies in New York City are premised on the belief that all but the most noxious industrial uses can coexist with residential and commercial uses. However, New York City's mixed use ordinances do not help determine which kinds of light manufacturing uses are compatible in the same building or side-by-side with residential uses. They are predicated on the assumption that most heavy manufacturing uses will continue their exodus from New York City. However, as described in the manufacturing land use overview, many heavy manufacturing facilities falling in the noxious use category continue to operate within or in close proximity to mixed use and/or residential areas. The Greenpoint and Williamsburg sections of Brooklyn, for instance, contain over 1,000 heavy manufacturing facilities such as sugar refining, metal finishing, and chemical and plastic manufacturing. While these facilities are located primarily in M zones, they are all in close proximity to mixed use or residential areas. These two areas are the third highest producers of toxic release in New York City, and contain the City's highest number of facilities storing hazardous substances.⁵³

Transfer stations, trucks, parking facilities, and warehouses also generate air pollution, odors, noise and traffic. Industrial and commercial facilities using toxic chemicals, such as electroplating, furniture refinishing, auto-repair and dry cleaning may, even when well designed, managed and operated, have operational upsets, accidents, or fugitive emissions that can seriously impact nearby residents.⁵⁴

In mixed use neighborhoods, the remaining "non-stack" industries also present health problems. In all manufacturing districts, including MX districts, existing light and heavy manufacturing uses are permitted to continue to operate under "grandfathering" rules. Although there is a substantial body of experience with mixed use regulation in New York City, there has been no substantial research on what constitutes a successful mix of uses. No environmental and health regulations relating to toxicity and environmental risks are incorporated into existing mixed use zoning definitions of compatibility.

While all mixed use zoning districts in New York City require industries to comply with performance standards, these standards apply to specific manufacturing uses rather than to their level of performance. Furthermore, these mixed use zoning districts lack provisions to restrict nuisances generated by commercial uses. Finally, they overlook traffic as a nuisance and therefore lag behind other cities which have designed transportation performance standards in mixed use districts.

⁵³ Angotti, Thomas and Eva Hanhardt. "Problems and Prospects for Healthy Mixed Use Communities in New York City," Unpublished draft, August 1999 (forthcoming in *Planning Practice & Research*).

⁵⁴ Ibid, 2.

Many mixed use areas adjoin manufacturing districts which allow noxious uses such as waste transfer stations, sewage treatment plants, and trucking operations. Thus, in some cases residents of mixed use areas, as opposed to mixed use zones, are as close as three blocks away from heavy manufacturing uses and consequently suffer from compromised quality of life in their neighborhoods. Greenpoint and Williamsburg in Brooklyn, for example, report citizen air and noise complaints at a rate that is more than twice the city average. Pollution easily travels three blocks and trucks often route directly through residential areas.

MX zoning is the first of the mixed use districts to incorporate standards and environmental regulations for different types of mixed use buildings. The MX ordinance integrates use categories in the Zoning Resolution with a process/hazard-based control limiting selected toxic substances. This control is formulated by establishing proximity restrictions based on the degree to which the facility uses, stores, or emits substances identified by federal, state and local regulations as having environmental health and other effects on residents. Consequently, the MX establishes a use categorization that relates to the use provision of the overall zoning resolution and restricts uses according to process or emissions and nuisance.⁵⁵ This aspect of the MX designation, however, applies specifically and exclusively to mixed use buildings or adjacent buildings sharing a perimeter wall.

MX zoning also allows findings regarding potentially hazardous materials, noise or air quality from the environmental review required by the ULURP process to lead to “environmental designations” for a property. These “E” designations, which can also be found in M-zones, require the owner of a property to undertake soil and ground water testing, and to conduct remediation of any contamination or window wall attenuation before obtaining construction permits. Such properties, commonly referred to as brownfields, are in need of state action to address remediation standards, liability relief and financial assistance in order to facilitate the proper reuse of these sites in a timely, safe and productive manner.

In sum, the MX regulation establishes environmental restrictions and remediation requirements for mixed use development within a building and its contiguous lots, or for development on “E”-designated properties. However, it makes no mention of development or use restrictions in close proximity (same block or district) to existing environmentally hazardous facilities or restrictions based on other nuisances affecting the quality of life in these communities, including regulations for transfer stations and recycling facilities. These industrial-related uses are not included in EPA regulations since they are considered Transportation/Public Utility or Commercial uses, not manufacturing uses. Thus, provisions to regulate these noxious activities, which involve nuisance and related vehicular traffic and emissions (ordinarily addressed elsewhere through performance standards), are absent from the MX or the Manufacturing Use Provision at large.

⁵⁵New York City Department of Environmental Protection, *Mixed Use Zoning -Zoning Text Framework*, a draft internal memo (New York, February 1997) 2-7.

MODEL INDUSTRIAL LAND USE POLICIES IN OTHER URBAN AREAS

During the 1980s and '90s, cities across the country made efforts to implement zoning provisions to protect industrial areas from commercial and residential encroachment and to prevent industrial displacement caused by escalating land values. Industrial protection zoning is intended to retain jobs in resilient industrial sectors that are struggling for space in urban areas affected by stiff real estate competition.

One of the major land use tools used by other cities is the “industrial sanctuary.” Recently, the introduction of high-tech enterprises into the industrial sector, including computer, multimedia, and Internet services, have changed the way manufacturing districts are being used. Several of the same cities which have been seeking to protect industrial enclaves have also been assessing the future needs and impacts of high-tech manufacturers. Preliminary analyses have led to the conclusion that industrial protection zones should be transitional rather than permanent, except for industries “whose survival may be essential because of their place in the larger web of industrial and commercial relationship in the area.”⁵⁶ This section reviews zoning ordinances in several urban areas that are designed as tools for industrial preservation and development. It should be noted that because these land use tools have only been developed in recent years, there is not yet much research and data available to help analyze their efficacy. The lessons outlined below are based on research conducted for this report. For more detailed information on the industrial land use policies and zoning ordinances of Chicago, Portland, Seattle, Vancouver, and New York City, please see appendixes B, B-1, and B-2.

Chicago

In the late 1980s, the city of Chicago established Planned Manufacturing Districts (PMD) as a device to restrict non-industrial development in manufacturing areas facing economic threats from rising land costs because of rapid commercial and residential development. To date, the City has established four PMDs, as well as “Industrial Corridors” in several areas of its manufacturing-zoned land. In addition, in order to accommodate changes produced by the New Economy, Chicago has been introducing high tech business incubators into its PMDs.

Chicago's industrial land use approach offers the following lessons:

- Planned Manufacturing District and Industrial Corridor policies have been instrumental in manufacturing retention and development in Chicago. This is mainly due to the following factors: exclusionary use restrictions prohibit residential and most commercial uses in these areas; a wide range of industrial development programs are offered by the City; and the city has invested considerable capital improvement funding in industrial infrastructure.
- The city has been able to respond to the recent emergence of New Economy, high-tech industries through changes to its PMDs.
- Chicago's environmental regulations have been successful at governing pollution and other nuisances produced by industry, but they have not gone to the next step of preventing pollution and incorporating sustainable manufacturing strategies into industry practices.⁵⁷

⁵⁶ Schwab, Jim. “Planning for Industrial Survival,” *Zoning News* (Chicago: American Planning Association, September 2000), 1.

⁵⁷ However, the Chicago-based Joyce Foundation has funded the Tellus Institute's Risk Analysis Group's Sustainable Communities Program to explore remanufacturing and its environmental and economic potential for the eight-state Great Lakes Region. The project will develop estimates of potential economic and environmental benefits in selected industrial sectors, and will identify barriers to remanufacturing in the region.

Portland

Through an amendment to its Comprehensive Plan in 1990, the city of Portland established the goal of preserving industry. It created five types of industrial zones to implement this policy in its zoning code. These land use policies were not seen as permanent, however, since the city's Comprehensive Plan undergoes a major review every five years to assure that it remains an up-to-date and workable framework for development.

Since the establishment of the industrial zones, some areas have become obsolete for industrial purposes and are slated mainly for commercial office space use. Other areas have been more successful because of multi-modal transportation and other factors that have allowed industries to prosper. The state is currently evaluating the impact of the growth of high-tech industries (internet and multimedia services) in an area of the city to determine the extent to which industrial protection zoning can accommodate New Economy needs.

Portland's industrial land use approach offers the following lessons:

- To foster industrial development while maintaining land use flexibility, the City, through its comprehensive plan, created three types of industrial development zones and two types of mixed industrial/commercial development zones. These industrial development zones are designated according to the level of nuisance created as well as the mix of land uses permitted.
- Residential development is all but prohibited in these zones except in limited areas and circumstances. In order to become permitted, residential uses must undergo a rigorous review process and comply with established density limits. Commercial development is also limited in most industrial zones. It is permitted only when it is ancillary to industrial activity.
- The industrial and mixed use character of these areas has been preserved through restrictive use and development standards regulations that control population density, business location and growth, and provide guidelines for urban appearance and enhancement.
- Environmental nuisance regulations have also been established in the city zoning ordinance and are updated periodically.
- The success of Portland's land use approach is due in part to its reliance on a comprehensive plan that is accountable to local and regional agencies as well as to residents. The Plan is revised every five years to accommodate growth and account for changing land use patterns, as well as to evaluate the performance of the different development zones.

Seattle

One of the goals of Seattle's 1994 Comprehensive Plan was to establish and preserve industrial areas through four types of industrial zones. These zones were designed to provide opportunities for manufacturing, advanced technology and a wide range of industrial-related commercial functions, such as warehouse and distribution activities. The intent was to allow existing businesses to expand, as well as to facilitate the location of new businesses in these zones.

In order to make adjustments to the 1994 Plan, Seattle is undergoing a review process that includes the identification of areas showing employment and residential growth, and areas where growth has fallen short of projections. Thus, an evaluation is not available as of yet. However, the overview of Seattle's plan and its industrial land use approach offers the following lessons:

- As in Portland, part of the success of Seattle's land use approach can be attributed to its reliance on a comprehensive plan that is accountable to the community at large and is inclusive in its local participatory approach.
- Again, as in Portland, the City established four types of industrial development zones, according to the land uses permitted as well as density, height, screening, or performance standards requirements applicable to each zone.
- Residential development is all but prohibited except in the landmark districts, and proposals must undergo a rigorous review process. Selected retail and service activity, however, is permitted as well as office development, in order to accommodate the growth of new technologies in the industrial zones.
- Regulations in industrial zones promote manufacturing development, control population and business location and growth, and provide guidelines for urban appearance and enhancement.
- Environmental regulations established in the zoning ordinance are framed within state codes and are enforced by the City's Department of Construction and Land Use. Location, control and enforcement of noxious and environmentally harmful uses in any of the industrial zones is addressed through the identification and discretionary regulation of High Impact Uses.⁵⁸

San Francisco

Recent increases in the number of high-tech firms in San Francisco are affecting the preservation of already limited manufacturing-zoned land. Since 1977, manufacturing areas of the city where live-work housing intended for craftsmen and artisans was allowed as-of-right have been used by developers to accommodate the fast growing needs of the dot.com market, forcing the city to establish an industrial protection zone that bars live-work uses in these areas.

⁵⁸ A high impact use refers to a business establishment that is considered to be dangerous and/or noxious due to the probability and/or magnitude of its effects on the environment; and/or has the potential for causing major community or health impacts. The Seattle ordinance defines High Impact Uses according to their effects on the environment, and controls their location by establishing a rigorous discretionary review process for every application.

Concurrently, the growth of dot.com offices, whose use definition is blurry, presents an interesting challenge to land use regulations. If treated as an office use, a cap on the city's new office development threatens its growth. However, if treated as a manufacturing use, its unplanned growth could price out established manufacturing industries in a zone intended to protect manufacturing. All this has recently generated substantial planning and political debate. A proposition to limit commercial office development was narrowly defeated in the November 2000 election.⁵⁹

Pittsburgh

For the last two decades, the city of Pittsburgh has been transitioning from a center of heavy industry to a new economic paradigm of mixed use activity. The city expects to see a transition to high-tech research and development industries. In 1999, the city adopted a new ordinance that created a series of mixed use districts according to existing land use patterns. Some of these districts, called Special Planned districts for mixed use include light manufacturing and retail uses. General Industrial Districts serve as industrial protection zones that allows limited housing development in older industrial buildings.

Vancouver

In 1995, the city of Vancouver, Canada adopted policies to guide future land use decisions and retain most of the City's industrial land base for industries and service businesses. The implementation of these policies included a review of the zoning regulations to update definitions of industry in order to accommodate service businesses, and to revise the uses that should be allowed to locate in or be excluded from industrial areas.

Among the districts that were created as a result of the Industrial Land Strategy, as the policy is called, are two mixed use districts (about 20 blocks each) that establish degrees of separation between residential, commercial and light manufacturing uses. This is done through the use of a compatibility matrix established to evaluate proposals for development. The degrees of separation are based on a table that establishes the compatibility of uses with residential development and whether they are allowed as-of-right, with conditions, or not allowed within mixed use buildings or 25 feet from a residential component. Most of the light manufacturing uses are not allowed as-of-right in mixed use buildings, but the level of compatibility can be improved through a performance evaluation system based on the specific use, scale and design of the proposed use or the existing adjacent uses (See appendix C: Vancouver's Residential Compatibility Matrix for more details). The success or failure of these districts will be evaluated in the next revision of the Industrial Land Strategy, scheduled for 2005, or at the City Council's request.

⁵⁹ Proposition L would have limited commercial office construction in neighborhoods and was designed to stem the explosion of dot-com growth and escalating office rents. It would have also included new fees on commercial development and live/work lofts. But it failed with a final vote of 49.8% in support of the measure and 50.2% against it.

MANUFACTURING SUSTAINABILITY IN AN URBAN CONTEXT

There are several reasons why the viability of manufacturing in an urban context is tied to environmental issues. This section describes these interrelated issues.

Industry's need for better environmental performance

While there are compelling economic reasons for manufacturing companies to achieve higher environmental performance, there are also some practical reasons. One major reason that manufacturing has difficulty in garnering public and political support is that it is frequently associated with air and water pollution as well as waste dumping and a general decline in the quality of many urban neighborhoods. In recent years, residents of communities adjacent to industry have increased their opposition to the negative impacts associated with M-zoned areas. In some cases, the negative environmental impacts have been caused by non-manufacturing noxious uses permitted in M-zones, such as waste transfer stations, sludge facilities, and power plants, and in other cases they have been caused by manufacturers who are not good neighbors to nearby residential areas. However, the cumulative effect of the concentration of burdensome uses and environmentally detrimental facilities in M-zones has prompted some community residents to call for the rezoning of manufacturing districts in order to protect their health and welfare⁶⁰ Thus, environmental issues are threatening the future of manufacturing in New York City.

The time has come for government, industry and communities to work towards heretofore mutually exclusive goals – a healthy environment and the retention of New York City's productive labor-intensive manufacturing base. As a result of recent technological advances that emerged from the field of environmental sustainability, however, these inter-related goals can and should be achieved, and are mutually attainable.

Historically, environmental contamination has been the by-product of many manufacturing and industrial production processes and consequently, industry is frequently thought of as a polluting and energy-consuming land use. Manufacturing has for the most part been considered to be unsuitable in or even near residential communities, although many low-income residents continued to live near manufacturing zones in urban areas. While industries that emit pollutants are regulated by the U.S. Environmental Protection Agency, the New York State Office of Environmental Conservation and the New York State Department of Environmental Protection, inadequate government review (federal, state or local) is used to control the cumulative and quality of life impacts of industrial activities on the neighborhoods that surround manufacturers.

It is usually the poor and marginalized who generally live in or adjacent to industrial/mixed use neighborhoods and are adversely impacted by manufacturing and related industrial uses because they do not have the economic resources or control over land use decisions to avoid environmental hazards in both the workplace and in their own communities.⁶¹ They suffer from

⁶⁰ Our review of established and ongoing community-initiated 197a plans for Red Hook, Williamsburg, Greenpoint and Sunset Park in Brooklyn, and Hunts Point in the Bronx indicates that often the plans called for rezoning some of the areas in order to protect the health and welfare of area residents. In each case, the community requested banning or requiring the special permitting of waste transfer stations, sludge facilities, power plants, etc. The idea for the high performance zoning districts, the adoption of compatibility standards, and the call for manufacturing development zones emerged from these participatory planning processes.

⁶¹ Angotti, Thomas and Eva Hanhardt. "Problems and Prospects for Healthy Mixed Use Communities in New York City," Unpublished draft, August 1999 (forthcoming in *Planning Practice & Research*).

increased respiratory-related ailments and experience higher rates of auto and truck related accidents due to the traffic and congestion caused by industry⁶².

In addition, land use findings in this report demonstrate that most of the M-zoned districts (M1-M3) in the study areas themselves already contain residential uses, which indicates that this condition is probably found throughout New York City. Thus, as residents become more actively involved in the environmental health of their communities, the City is likely to face additional pressures to address their concerns.

For all these reasons, it is imperative to first, establish environmental performance standards based on the cumulative impacts of industrial activity on these manufacturing and mixed use zones in order to protect the workers and the residents of these and adjoining neighborhoods; and second, help industries in the urban core and to move toward cleaner and less energy intensive production methods and outputs.

The Clean Air and Water Acts of the 1960s and 1970s have provided thresholds on emissions, and federal regulations regarding hazardous waste disposal have made it more expensive to landfill toxic materials. However, these types of regulations tend to focus primarily on requirements for "end of the pipe" pollution control solutions such as filters, creating little incentive for firms to go beyond compliance with the environmental laws and regulations and to achieve higher environmental performance by reducing the amounts of toxics they use.

Yet, in recent years there has been a growing body of evidence that environmental conservation in manufacturing processes not only has the potential to improve the quality of life in residential communities adjacent to industry, but also to increase the economic competitiveness of industry. Businesses as well as environmental interest groups are beginning to find that achieving higher environmental performance does not necessarily have to come at the cost of lowering profits. In fact, there is a growing body of evidence that for larger companies, pollution prevention strategies (as opposed to pollution control strategies) reduce direct and indirect effects of industrial processes and emissions on the environment while reducing production costs and increasing savings.

Three case studies illustrate the above:

- In 1987, Robbins Award in Attleboro, Massachusetts, a manufacturer of jewelry and custom-designed awards engineered a completely closed-loop system for managing and recycling its contaminated wastewater. Using wastewater purification and metal recovery techniques, they were able to considerably reduce their water consumption by 48%, chemical use by 82% and toxic waste generation by 89% in three years. "The \$220,000 investment in the system repaid itself by 1991, with ongoing yearly savings of \$71,000."⁶³

⁶² According to *Asthma Facts* (a publication of the New York City Childhood Asthma Initiative), the asthma hospitalization rates for many of the areas we studied in this report rose dramatically between 1988 and 1997, and they tended to be higher than in other parts of their respective boroughs and the City overall. While we do not know the cause of the asthma, we do know that one of the major factors is poverty and that proximity to sources of air pollution, while it may or may not be a causal factor, can produce major respiratory irritants. For example, in the Hunts Point-Mott Haven section of the Bronx (which includes the Hunts Point study area), the asthma rate in 1988 was 11.6 per 1,000 people from age 0 to 14; in 1997, it was 23.2 while it was 8.3 for the entire Bronx in 1988 and 16.6 in 1997. The citywide rates were 6.42 and 9.94 for 1988 and 1997 respectively. In the Hunts Point study area, however, our findings indicate that land is predominantly occupied by utilities, not by manufacturing (see appendix E-03 Hunts Point). Also, according to Dun & Bradstreet, in October 2000 wholesale and transportation combined accounted for 58% of the total industrial jobs, while manufacturing accounted for 35%. Although it was beyond the scope of this report to find a direct correlation between the incidence of asthma and industrial activity, a direct connection cannot be dismissed.

⁶³ Jim Schwab, "Industrial Performance Standards for a New Century, "Planning Advisory Service Report Number 444", 28

- Cleo Wrap, a printing company replaced solvent based inks with water based ones in the production of wrapping paper. They were, thus, able to virtually eliminate the creation of hazardous waste and saved \$35,000 annually in waste disposal costs, avoided regulatory burdens and lowered their costs for fire insurance⁶⁴.
- In 2000 the Ortho-Clinical Diagnostics, Inc, of Rochester, New York, which employs approximately 1,000 workers and is a manufacturer of diagnostic clinical chemistry systems for professional laboratories, hospitals, and doctors reduced the size of the clinical chemistry chip. This resulted in a reduction of hazardous waste in excess of 200,000 lbs annually. The costs of the change were repaid within the first 16 months with subsequent savings that amount to \$3 million annually⁶⁵.

Need for physical improvements in M-zones

Yet another dimension of the problem of manufacturing sustainability in an urban context is the poor physical condition of many M-zones. Streets are often littered with potholes, vacant lots are strewn with garbage, and discarded items are illegally dumped at street corners. Negative perceptions of M-zones are held not only by nearby residents, but also manufacturers, particularly those who are relocating from mixed use areas in Manhattan to M-zones in the outer boroughs. Improvements in city sanitation and policing services and traditional infrastructure investments such as street repairs, sewer upgrading and proper lighting can make a significant contribution to the upgrading of the quality and image of these areas.

The physical condition and quality of the environment in M-zones can also be dramatically improved through the implementation of green infrastructure investments. These measures, which include planting trees and other forms of vegetation, are a strategy for saving money, preventing pollution and undertaking environmental remediation through energy efficiency. Urban areas typically experience the “urban heat island effect,” and tend to be hotter than rural areas. According to the U.S. Department of Energy, one of the simplest and cheapest strategies for counter acting this effect is to increase the number of trees and other plants. The energy savings can be significant.⁶⁶

⁶⁴ Hirschhorn, Joel S. and Kirsten U. Oldenburg. “Prosperity without Pollution,” Van Nostrand Reinhold, New York 1991, 102.

⁶⁵ New York State Department of Environmental Conservation, 2000 Winners of New York Governor’s Award for Pollution Prevention.

⁶⁶ Trees are a relatively inexpensive way to accomplish these energy savings. According to a study by researchers at Lawrence Berkeley Laboratory, it costs about \$0.01 to reduce peak-load energy demand 1 kilowatt-hour (kWh) by planting trees. The cost of saving that same kWh by improving the efficiency of electrical appliances is about \$0.025. One kWh generated by a new peaking power plant costs \$0.10. A one cent investment in trees therefore results in a 10 cent saving in energy production.

Case study: Green roofing

Green roofing is an example of a green infrastructure investment that holds much promise for urban areas. The growing popularity of green roofing solutions in North America is building on the environmental and economic success they have achieved in Europe.

A surface covering of plant life reduces the high levels of thermal radiation—the “urban heat island effect”—that often occur on black roof surfaces. In fact, green roofs can reduce energy usage in hot urban areas by 35 to 50%. Another important benefit of green roofing concerns storm water management. Rather than drain off the roof and become an economic and environmental burden on a city’s infrastructure and natural ecosystem, green roofs absorb a significant portion of storm water.

Other benefits of green roofing include: extending the life of underlying roof waterproofing membranes, improved air quality by dust reduction, suppression of noise, and the psychological and aesthetic values often associated with a “green” ambiance.

When used broadly, the term “green roof” can also include measures other than planting vegetation that help reduce the urban heat island effect. These include painting roof tops white or silver or using reflective paving surfaces.

Source: *Vegetated Roof Covers: A New Method for Controlling Runoff in Urbanized Areas*, a draft manuscript for publication in the proceedings of the 1998 Pennsylvania Stormwater Management Symposium at Villanova University, October 21-23, 1998 and *Dollar and Sense: Green Roofing*, Wastenot Summer-Fall 1999 (a publication of the Royal Architectural Institute of Canada)

Implementing Performance Standards

In light of changes in industrial and commercial practices resulting from improved technology and pollution prevention, our present means of determining compatible uses in manufacturing and mixed used districts is outdated. The New York City Zoning Resolution states that “uses listed in each use group have common functional or nuisance characteristics.” However, today, forty years after the Zoning Resolution was originally written, there are numerous land uses whose operations are designed to function with minimal environmental impacts, but whose “use category” does not permit their location in areas near or adjoining residential areas. On the other hand, some activities that are permitted in residential and commercial zones have been found to pose possible health and nuisance problems.

For example, printing is listed as a single “use” even though there are a many types of printing processes, including screen, flexographic, lithographic, and gravure. Each of these processes involves different materials and substances and different “nuisance characteristics,” and therefore some types of printing are far more appropriate to site near residential uses than others. In addition, printers who have incorporated pollution prevention strategies and have eliminated the use of chemical solvents could potentially safely co-locate with residential uses. By contrast, under the current use group system, “cleaning establishments” are not considered to pose environmental hazards and are permitted in commercial zones near or in residential areas, regardless of which kind of cleaning processes they employ. However many dry cleaners use the chemical compound known as “perc,” which has the potential to pose health hazards. Some cleaners now use non-toxic cleaning processes which do not pose a health hazard and thus, are more compatible with their neighbors.

Not only are the Use Provisions of the Zoning Resolution due for an update, but Performance Standards also need to be revised to account for technological advancements, and to address the complexities of our de facto mixed use manufacturing zoning districts. Performance

Standards in New York City's Zoning Resolution only apply to manufacturing activity and districts (M1, M2, M3). However, over the last several decades in other cities in the United States, performance standards have been increasingly used to establish the desired qualities of development instead. Performance-based provisions have been used to determine the appropriateness of all types of development by measuring and controlling the effects of proposed projects rather than prescribing permitted uses found in conventional zoning ordinances⁶⁷

Performance-based standards represent an alternative to traditional zoning because they allow adaptation to new manufacturing processes, new enterprises, new technologies and changing market forces. But they also protect the public objectives of land use controls and environmental quality. In return for higher environmental standards, greater safety and community improvements, they provide greater flexibility to the developer by allowing greater siting opportunities for any development that meets specified, state-of-the-art performance standards. Performance standards can, for example, limit the intensity of development, control the environmental and other impacts of development on nearby land uses, limit the effects of development on public infrastructure, and protect the natural environment. This performance-based approach eliminates dependency on narrowly defined and highly specific use districts found in the existing New York City zoning ordinance.

One land use tool that could assist New York City in bringing manufacturing into the 21st century is the adoption of a performance standards-based compatibility index into the Zoning Resolution, much like the one successfully developed and implemented in Vancouver (See Appendix C). Through this tool, for each zoning district (starting with M and mixed use zones), the index would establish the degree of separation required between commercial, manufacturing and residential activities based on their compatibility with each other. Criteria might consider permitted emissions, pollution prevention or control, levels of hazardous substances used or stored, engineering design, enclosure, size, scale, hours of operation, and landscaping. Since most performance standards relate to controls already established by New York City's environmental laws and regulations, the zoning resolution's new compatibility index would simply reference them. In this way the compatibility index would automatically be updated based on new technologies or environmental knowledge and would not be duplicating or contradicting environmental laws and regulations as is currently the case with the existing performance standards in the Zoning Resolution. Other issues, such as glare, traffic and landscaping which are currently not included in environmental laws and regulations would have to be either added to the environmental regulations or specified in the Zoning Resolution.

A particular benefit of this approach would be that enforcement of the performance standards would not be split between the environmental agencies and the Buildings Department, which is currently vested with enforcing the provisions of the zoning resolution. One of the greatest problems relating to existing performance standards is the fact that enforcement is perceived to be neither effective nor fair. Both businesses and communities complain that it is impossible to determine which performance standards apply and who is responsible for enforcement. Often businesses that are attempting in good faith to comply are penalized for accidental releases, while chronic violators continue to pollute. Although the Department of Environmental Protection has a business assistance unit, little if any financial resources are offered to industries striving to improve their environmental performance.

⁶⁷ Douglas R. Porter (editor), "Performance Standards for Growth Management," *Planning Advisory Service Report Number 461*, 1

Performance standards, would serve as the basis for determining whether the impacts of a particular activity in a particular location conform to that zone's standards for compatibility. For example, industrial facilities would be permitted in different zoning districts based on the degree to which hazards and nuisances are brought under control, not according to whether the use is included in a list of permitted uses in that zone. Clearly, there is a broad array of manufacturing and industrial uses that, depending on how they perform or can be expected to perform, can successfully be located in Mixed Use Districts or in M Districts adjoining residential communities. On the other hand, there are other uses whose processes and operations are, by their very nature, toxic and/or noxious and should never be located near or adjoining residential or mixed use areas.

Activities seeking to have greater siting flexibility, could improve their compatibility rating by meeting a higher environmental performance standard by assuring that the proposed use, manufacturing activity, and the scale and design of the facility is appropriate. Performance standards would address the degree of hazard, air pollution, smoke, dust, noise, glare, odor, erosion and sediment, runoff, liquid, solid or airborne wastes, fumes, traffic, and vibration generated by an activity. The standards and criteria for allowing an activity might consider pollution prevention or control, levels of hazardous substances used or stored, engineering design, enclosure, size, scale, hours of operation, and landscaping.

It is clear that modifications to our current zoning use classifications to take into consideration performance standards are crucial if we are to address environmental issues and at the same time assure the retention and expansion of employment in New York's manufacturing sectors. Establishing a performance approach to land use decisions in these manufacturing districts or even citywide would require a concerted effort by the City's planning and environmental agencies to develop strategies that effectively define, administer and enforce the new regulations.

Opportunities to capitalize on sustainable development

In the effort to ensure the viability of manufacturing in New York City, it is useful to examine opportunities to increase productivity and cut costs that have emerged through the environmental sustainability movement. The "next industrial revolution" is predicated on changes in how we calculate the cost of "natural capital" and "waste." It acknowledges that enormous subsidies and income transfers are necessary to support the cost of natural capital and the processing of our waste products. Energy, transportation, water, and waste processing all need to be subsidized in order for industry to be profitable. Businesses are already calculating these costs and are moving toward new environmentally efficient strategies as a means of lowering these costs.

In light of these emerging practices, there is mounting evidence that the nature and location of manufacturing will shift dramatically in coming years. New York City should position itself to embrace sustainable manufacturing and utilize its existing supply of land in manufacturing and mixed use districts to attract environmental businesses. The spatial implications of the changes in manufacturing industry practices are hard to predict and quantify. However, given the growing realization that transporting goods from region to region is extremely expensive, it is reasonable to speculate that there may be an interest in the re-emergence of regional production and the location of manufacturing facilities closer to the sources of their production materials and end users. The following section describes some of the emerging concepts of manufacturing sustainability in urban contexts.

Industrial Ecology

Industrial ecology is a concept and practice that integrates sound environmental and economic policies, and thus holds great potential for retaining manufacturing in the urban core.⁶⁸ It represents a radical paradigm shift that abandons the concept that there are unlimited resources and unlimited amounts of space to deposit industrial wastes. Instead, it provides a vision that closely resembles the closed-loop model of natural ecosystems in which the circulation of materials is maximized and the amount of waste generated is minimized.

Industrial ecology is based on the goal of dematerialization, which lowers the amount of inputs (raw materials and energy) that are necessary to produce the same amount of outputs. Although the magnitude of dematerialization called for in industrial ecology is a recent development, the concept has historic roots. For example, metal industries, especially steel, have used scrap materials for decades. In the 1970s the oil industry prompted manufacturers to redesign cars to weigh 20% less in order to conserve energy. Thus, dematerialization not only generates environmental benefits but also serves as a cost-effective business strategy. Despite the multi-faceted benefits that arise from applying principles of industrial ecology, its practice has not yet become widespread. New York City has the opportunity to provide incentives for manufacturers to incorporate these strategies and to remain economically viable and environmentally sustainable.

Case study: Stonyfield Farm

Stonyfield Farm, best known for its large line of yogurts, is a successful example of a food manufacturer that has implemented principles of industrial ecology and therefore saved significant amounts of financial resources while simultaneously decreasing negative environmental impacts. An independent firm completed two comprehensive "Ecological Audits" of the company to evaluate the environmental impact of every aspect of its operations including: water, energy and chemical use, solid waste, packaging, transportation, employee safety, procurement and communication.

Over 70% of the "waste" at Stonyfield is either re-used or recycled. Recovered materials include cardboard, metals, paper, plastic films, yogurt containers, and wooden pallets. Through re-use and recycling, the company saves over \$70,000 annually *and* prevents thousands of tons of material from reaching landfills or incinerators.

Energy efficiency measures have also made economic and environmental sense for the company. Although its yogurt sales are growing rapidly, the energy use per pound of product has been decreasing due to: a redesigning of the yogurt making-process, energy efficient lighting fixtures and hot water heat recovery systems to capture "waste" heat.

Finally, Stonyfield Farm invests in carbon offsets, projects that absorb greenhouse gases from the atmosphere or prevent their generation. The company is the first U.S. manufacturer to offset 100% of the CO₂ emissions from its facility energy use. Investments thus far have included reforestation of riparian habitat in Oregon, a Straw Bale House Construction Demonstration Project in China, and Coal Mine Methane Capture and Utilization in Ohio and other states.

Source: Stonyfield Farm's web site, www.stonyfield.com (accessed on 2 April 2001)

⁶⁸ Industrial ecology is a term first coined by two General Motors engineers, Robert Frosch and Nicholas Gallopoulos, in their 1989 Scientific American article, "Strategies for Manufacturing." These engineers called for a fundamental change in production that would seek to improve and protect the natural environment while simultaneously increasing business profitability by closing the gap between inputs and outputs. One business's waste would become another's resources, ultimately alleviating pressures associated with natural resource depletion and pollution.

Eco-industrial Parks

Eco-industrial parks are emerging as the primary arena for testing and implementing industrial ecology.⁶⁹

Similar in some respects to standard industrial parks, eco-industrial parks are specifically designed to allow firms to share infrastructure as a strategy for enhancing production and minimizing costs.⁷⁰ They help businesses to enhance their economic and environmental performance by sharing materials, services and costs. This leads to increased efficiency, waste minimization, innovation and technology development, access to new markets, strategic planning, and attraction of financing and investment.

Forms of eco-industrial development include:⁷¹

- co-located parks where businesses are in a fixed boundary and linked to each other by hard infrastructure; and
- virtual parks where increased resource and energy efficiencies are achieved through material flows in a region. These are best applied to communities with large existing industrial bases so that sustainable business practices can be incorporated without the high costs of relocation and capital investment.

Because the cost of transporting exchanges can be very high, and because traditional means of transport (i.e., fossil-fueled trucks) can be environmentally detrimental, co-located parks seem to be a more desirable option.

Eco-industrial parks are not only helpful in achieving business profitability and environmental sustainability, but also civic goals. As citizens take the initiative to foster sustainable development, they work to ensure a healthy environment in their communities and in their workplaces. By taking a larger role in the recruitment and management of industrial projects, community residents become engaged in civil relationships with their industrial neighbors. Communities can offer industry benefits through day care, training programs and other community resources. Businesses also begin to recognize that pro-active environmental strategies are good marketing tools in terms of their public image.

The development of eco-industrial parks in the United States is often linked to brownfield reclamation. Brownfields are abandoned industrial sites that are assumed to be contaminated, and are huge burdens on New York City neighborhoods in terms of blight and decreased property taxes. It makes sense for eco-industrial parks to locate in former industrial areas with established transportation and labor networks, especially because the high expense of brownfield reclamation can be justified when the subsequent use breaks the cycle of contamination. Eco-industrial parks offer a way to retain urban industry while preventing future pollution and other types of environmental deterioration. In New York City, where manufacturing is under intense pressure to serve as a “good neighbor” to residential and

⁶⁹ Eco-industrial parks are supported in the United States by the President's Council on Sustainable Development (PCSD), the United States Environmental Protection Agency, and the United States Department of Energy. There are currently 24 eco-industrial parks in existence or in development in the United States. Four are demonstration sites for the PCSD: in Chattanooga, TN, Brownsville, TX, Cape Charles, VA and Baltimore, MD.

⁷⁰ U. S. Department of Energy (DOE), Center of Excellence for Sustainable Development, Eco-Industrial Parks, <http://www.sustainable.doe.gov/business/ecoparks.htm>, 1/24/00, p 1

⁷¹ The term “eco-industrial park” has been used loosely by developers and communities. Some types of industrial clusters to which the term has been applied are: single by-product exchange or network of exchanges; a recycling business cluster, a collection of environmental technology companies, a collection of companies making “green” products, an industrial park designed around a single environmental theme (i.e., a solar energy driven park), and a park with environmentally friendly infrastructure or construction. Eco-industrial parks are very site-specific and thus the details of development vary from facility to facility.

commercial uses, eco-industrial parks offer a viable means for manufacturers to thrive and serve as good neighbors

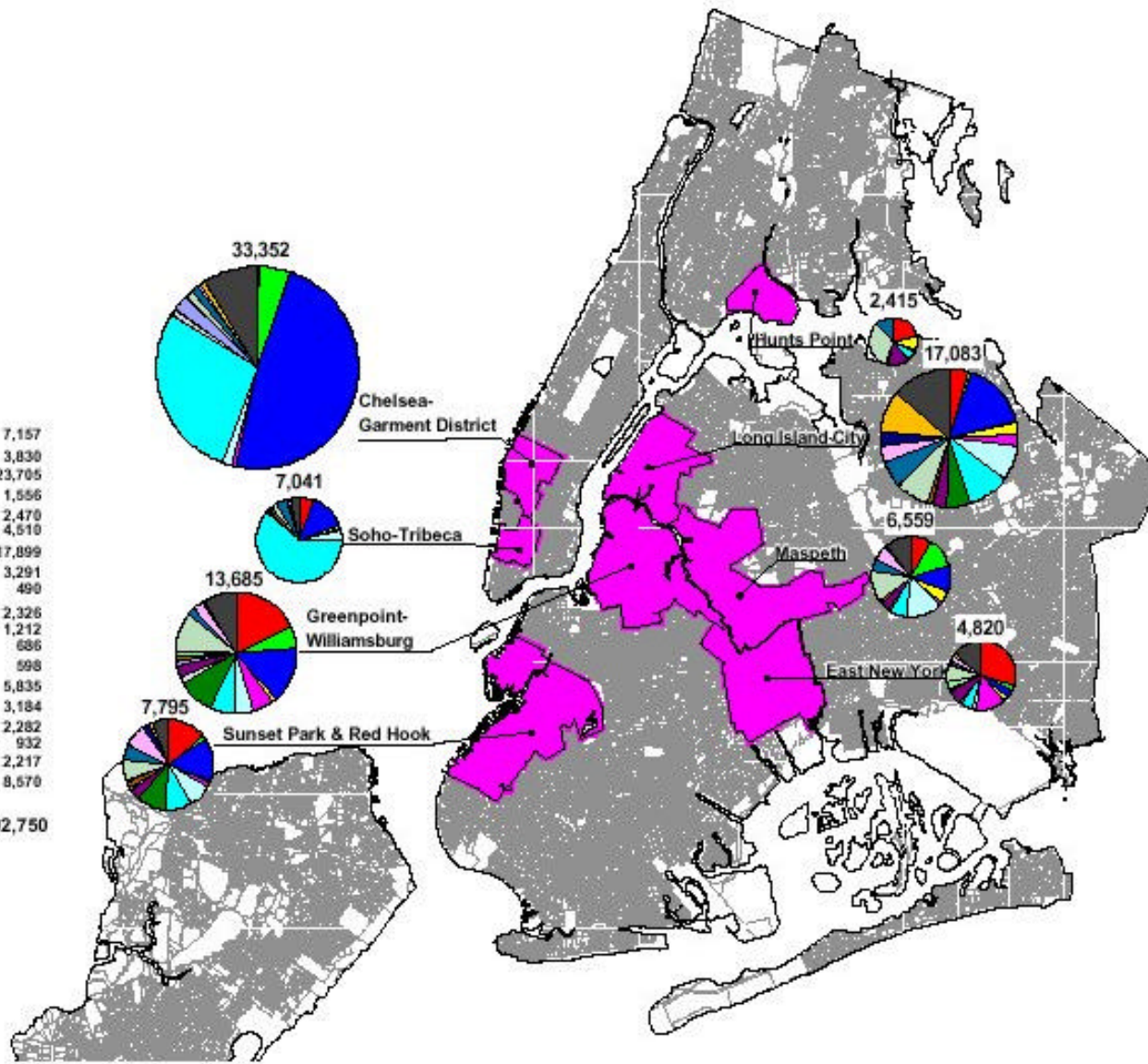
There is a need to find ways of adapting the principles and lessons of Eco-industrial parks in the more traditional manufacturing areas of urban environments such as New York City. In these areas, small and mid-sized enterprises dominate, and land is owned by a variety of property owners. How the lessons from the cooperative approach of Eco-industrial parks can be applied to urban manufacturing areas is a promising question and challenge to explore.

Conclusion

The nexus between local planning, transportation, land use and zoning policies and global warming has since the Rio Conference on the Environment and the Kyoto Protocols been well established. The United States, Canadian and European Union, while differing on the level of detail and timing, all acknowledge the importance of local actions in minimizing our dependence on natural capital, reducing waste and lowering CO2 emissions. International trade agreements and other actions will over time have a significant impact on what, how and where we produce and how we transport our products from one area to another.

The Manufacturing Land Use & Zoning Initiative

Manufacturing Jobs by SIC Code, 2000
In 8 Study Areas



GENERAL & SPECIFIC FINDINGS

GENERAL FINDINGS

General Land Use Findings

New York City and Boroughs

- Almost 80% of New York City's 7.1 billion square feet of land is evenly shared by residential and "other" uses, such as transportation, utilities, open space and institutions¹. Building area, however, is dominated by residential uses (over 67% of total built floor area), distantly followed by commercial uses (at just over 13%) (See Figures 1, 2 and 3).
- Auto-related uses comprise the lowest share (1.8%) of New York City's overall land uses. However, during the last 10 years, auto land uses have experienced a rapid increase (over 33%), especially in Queens and Brooklyn, which also contain the highest share of the City's auto uses.
- Commercial land uses are evenly distributed among the five boroughs (although in terms of built square footage they are concentrated in the Manhattan CBD) occupying only 3% of the land and 13% of the building area. Between 1989 and 2000, however, commercial land uses experienced a fairly even increase, averaging about 10% citywide². This increase is significant, considering that current commercial uses occupy a substantial amount of New York City's building area, and suggests that much of the growth in commercial use has occurred in the existing built inventory.
- During the last 10 years, the City has experienced a decline of manufacturing land and a substantial decrease of its vacant land uses in favor of auto-related and commercial uses. Today, manufacturing land uses occupy less than 4% of the City's total land area and less than 7% of its building area. This is a relatively small percentage share of the total, especially considering that many of the City's manufacturing land uses are actually located outside of manufacturing-zoned land³, where expansion and growth of new manufacturing activity is not feasible. Thus, a continuous decline of land available for manufacturing could jeopardize the future of manufacturing activity in New York City.

A review of each borough highlights the following:

- The Bronx, occupied mostly by "other" and residential uses, contains a significant proportion of New York City's auto uses, which have moderately increased during the last ten years. The Bronx has also experienced a sharp decline in its vacant land inventory during the same period.

¹ Other uses in this report include transportation, utilities, parks, schools, community facilities, institutional uses, or any other use not included in the remaining land use categories (Auto Storage/Service, Manufacturing, Residential / Mixed Residential-Commercial, Commercial and Vacant).

² Excluding Staten Island for which data was not available in 1989.

³ This assessment could not be verified by this report at a citywide level, but it is assumed based on the findings for the eight study areas that a large number of manufacturing land uses are located outside of manufacturing-zoned land.

- Brooklyn is predominantly residential and has a significant share of “other” uses. It also contains the highest share of the City’s manufacturing land uses, which have experienced a decline during the last 10 years, albeit at a negligible rate. Brooklyn also contains a substantial share of the City’s auto-related uses, which have sharply increased during the 10-year period.
- Queens is predominantly residential. It contains the highest share of New York City’s auto-related land uses, which have experienced rapid growth during the 10-year period. Queens also contains the highest share of the City’s vacant land, which decreased sharply during the same period.
- Manhattan, mostly occupied by “other” and residential uses, also contains the lowest share of New York City’s manufacturing land uses, but (due to its high density character) still has a significant share of the City’s manufacturing building area. During the last 10 years, Manhattan has experienced the fastest decline of manufacturing land area. Manhattan also comprises the lowest share of the City’s vacant land, which has also declined in the last ten years.
- Staten Island, like the Bronx, is primarily occupied by “other” and residential uses. This borough contains a substantial share of the City’s vacant land.

Study Areas Combined

- Almost one half of New York City’s manufacturing land uses [and more than half of the manufacturing buildings] are located within the eight study areas (See Figure 4). Thus, land use decisions affecting manufacturing activity in these areas will affect the future and stability of this entire sector and the City at large.
- Between 1989 and 2000, the study areas, like the rest of the City, experienced a decline of manufacturing and vacant land. Auto-related and commercial uses, however, increased at rates much higher than the City’s (See Figure 5 and 6). A land use breakdown by study area highlights the following:
 - Manufacturing land uses declined in all the study areas except in Sunset Park-Red Hook, where manufacturing land increased by 12%. Soho-Tribeca and Chelsea-Garment District experienced the fastest decline.
 - Vacant land decreased in most areas except Soho-Tribeca and Hunts Point, where it experienced significant increases. The decrease was fastest in Long Island City and Maspeth.
 - Commercial uses increased in all the study areas, but expanded particularly dramatically in Long Island City.
 - Auto-related uses increased in the outer borough study areas, but decreased in Chelsea-Garment District and in Soho-Tribeca. Growth was most dramatic in East New York, Greenpoint-Williamsburg, and Maspeth.
- Nearly one quarter of New York City’s auto-related land uses are located within the eight study areas. Considering that auto uses occupy less than 2% of the City’s overall land, that during the 10-year period auto-related uses experienced the fastest increases citywide, and that most of these uses are and must locate in manufacturing zoning districts, one can conclude that the study areas not only comprise a disproportionate share of the City’s auto uses but also that land use decisions in manufacturing zoning districts must take into account the location (and thus the competition) of auto uses for M-zoned land.

- The study areas comprise 109 manufacturing zoning districts M1 through M3. However, 86 of those districts (78%) contain residential land uses (See Figure 7). Furthermore, between 1989 and 2000, residential land uses, which increased in the combined study areas at a rate twice as fast as in the rest of New York City, decreased within the M districts, albeit at only half a percentage point. This is significant, considering that 50% of the study areas manufacturing jobs are located in these M districts, and that most those districts are de facto mixed use districts. All of the above suggests that zoning and land use decisions affecting these manufacturing zoning districts must be carefully considered in order to balance the preservation of manufacturing jobs against residential development pressures, and the environmental health of New York City' communities.
- Most of the manufacturing-zoned land in the study areas is zoned heavy manufacturing M3 (43%) and light manufacturing M1 (41%). However, only 14% of the study areas' manufacturing jobs are located in M3 districts, while 46% of all manufacturing employment is located in the M1 districts (See Figure 8).
- One third of the study areas manufacturing firms [and almost one third of the jobs] are located in residential and commercial districts, where they are considered non-conforming uses (See Figure 9). This is significant considering that manufacturing activity cannot expand in these districts, and businesses that lease rather than own their land are likely to be more rapidly displaced from areas under intense market pressures.
- "Other" is the predominant use in the eight study areas combined. Although transportation, utilities and miscellaneous comprise most of "other" uses land, a breakdown by area highlights the following (See Figure 10):
 - In Chelsea-Garment District, transportation and utilities occupy almost one half of "other" uses land. Most of "other" building area, however, is comprised of indoor public assembly and educational facilities.
 - In Soho-Tribeca, transportation and utilities at a lesser degree also occupy more than one half of "other" uses land, while most of its buildings are occupied by educational facilities and miscellaneous uses.
 - In Hunts Point, utilities occupy more than one half of "other" uses land, while miscellaneous comprise 51% of "other" uses buildings. Homes and asylums comprise more than one third of Hunts Point other uses buildings.
 - In Long Island City, almost two thirds of "other" uses land is occupied by utilities. However, one half of its buildings is comprised of educational facilities, and 17% by government facilities.
 - In Maspeth, miscellaneous is the predominant "other" land use, occupying more than one half of the land. Educational facilities, however, comprise the predominant "other" uses building area.
 - In East New York, miscellaneous occupy almost one half of "other" land uses, while educational facilities comprise over one half of its buildings.
 - In Greenpoint-Williamsburg, transportation and utilities comprise more than one half of "other" uses land area, while educational facilities and transportation comprise one third each of "other" uses buildings.
 - In Sunset Park-Red Hook, transportation is the predominant "other" use, occupying more than one half of its land and buildings.

Among all the diverse uses included into the “other” uses category, only transportation and utilities, as well as noxious commercial uses such as waste transfer stations must locate in M districts, while the remaining “other” uses can generally locate in any district [subject to different levels of review]. Thus, the above summary suggests a tension between industrial and non-industrial activity competing for land and building area in M districts. In addition, between 1989 and 2000, “other” uses in the study areas combined experienced an increase in land area but a decrease in building area, suggesting a decrease of industrial uses building area in favor of commercial, residential and auto-related uses (See Figure 5).

- Auto-related uses, the fastest growing land use in the study areas combined, include auto service (service garages and gas stations) and parking. In general, auto service uses occupy two thirds of the land and three quarters of the auto uses buildings, while parking occupies one third of the land and one quarter of the total auto building area (See Figure 11). A breakdown by study area highlights the following:
 - In Chelsea-Garment District, parking is the predominant subcategory of auto uses, occupying more than one half of the total auto land and building area.
 - In Soho-Tribeca, auto service occupies more than one half of the total auto uses land. However, parking occupies more than one half of the total auto uses building area.
 - In Hunts Point, auto service is the predominant subcategory of auto uses, occupying 89% of the land and 96% of the auto uses buildings.
 - In Long Island City, auto service is also the predominant subcategory, occupying two thirds of the land area and 89% of the total auto uses building area.
 - In Maspeth, parking and auto service almost equally share the auto uses land. However, auto service is the predominant building area use, occupying 96% of the total auto uses buildings.
 - In East New York, parking and auto service also share the land, occupying 40% and 60% each respectively. Auto service, however, occupies most of the building area (97%).
 - In Greenpoint-Williamsburg, like above, parking and auto service share the auto uses land, but auto service occupies most of the building area (92%).
 - In Sunset Park-Red Hook, auto service is the predominant subcategory of auto uses, occupying 80% of the land and 92% of the buildings.

An overview of auto uses land activity between 1989 and 2000 reveals the following:

- Over one half of the current auto uses land in the study areas combined derives from a different use in 1989, mostly vacant and manufacturing. (See Figure 12).
- In Hunts Point, Long Island City, and Greenpoint-Williamsburg manufacturing uses land provided a significant amount of current auto uses land (between 17% and 31%).
- Vacant land provided two thirds of the current parking uses land. Only in Long Island City, manufacturing land provided a significant amount of the current parking uses.
- A significant amount of current auto service uses land (20%) was converted from manufacturing land.

In sum, auto service uses remain the predominant subcategory of auto uses land throughout the study areas, although parking uses have increased very rapidly. Most of the changes into auto uses land were originated from vacant land. Manufacturing land, however, also provided a substantial amount of the current auto uses land. The above findings suggest a tension between auto uses and manufacturing land for space.

Special Districts

The special districts included in this report include not only special mixed use districts but generic mixed use districts such as M1-D and Loft Zoning districts. The Garment Center District, although not a manufacturing/residential mixed use districts is nonetheless included because it represents the densest district in both manufacturing building area land uses and manufacturing employment among the study areas and the City at large.

- The combined mixed use districts represent less than 4% of the total study areas land, but contain 19% of the total manufacturing firms and 17% of the jobs, although most of these firms and jobs are located in the Garment Center District.
- Although manufacturing is the predominant use in these districts with respect of land and building area, residential and commercial combined occupy most of their land and buildings (See Figure 13). In addition, between 1989 and 2000, manufacturing experienced a decline of land at almost twice of New York City' rate, as well as considerable building area (See Figure 14), and the scarce vacant land and buildings all but disappeared. Commercial and residential land and building area uses, however, increased very rapidly during the same period.

The review of land uses changes in the mixed use districts in the study areas highlights the following:

- Between 1989 and 2000, manufacturing land uses declined in all districts except Chelsea-Garment District's M1-5/R8A district, which experienced a moderate increase (7,000 Sq. Ft.) at a very high rate, and Sunset Park-Red Hook's M1-2D district, which experienced a substantial increase (143,000 Sq. Ft.) at a moderate rate (See Figure 15). Manufacturing building area decreases were higher in Manhattan's special districts, especially in all Soho-Tribeca's mixed use districts, which combined lost almost 7 million Sq. Ft. The Garment Center District lost almost 5 million Sq. Ft. of manufacturing building area, and an almost equal amount was gained in commercial building area.
- Auto-related uses experienced a modest increase throughout, except in Long Island City's Hunter's Point District, which gained almost 700,000 Sq. Ft. at 169% rate of increase. Decrease of auto uses occurred at higher rates in all Manhattan's special district, except Garment Center District, which experienced a modest increase.
- Commercial land uses increased throughout except in Sunset Park- Red Hook's M1-2D district, which experienced a slight decrease of about 2,000 Sq. Ft. The highest increases occurred in Soho-Tribeca's loft zoning districts M1-5A (166,000) and M1-5B (438,000), and in the Garment Center district (300,000 Sq. Ft.) at exceedingly high rates. Sunset Park-Red Hook's M1-1D district experienced the highest rate of increase (186%) but a modest gain of close to 20,000 Sq. Ft.
- Residential land use increases were higher in Manhattan, in which all Soho-Tribeca's mixed use districts, especially the Lower Manhattan Special Mixed Use District gained close to 200,000 Sq. Ft. Even the Garment Center District, in which residential uses are not allowed, experienced increases in residential land and building area. Decrease in residential uses occurred only in Long Island City's M1-3D district, which experienced a modest loss at a very low rate.

- Vacant land uses decreased in most special districts. The decrease was highest in Long Island City's Hunter's Point district, which lost 130,000 Sq. Ft. at a very high rate. Chelsea-Garment District's loft district (M1-6M) and the Special Franklin Street District in Greenpoint-Williamsburg depleted their vacant land completely.

The review of land uses by district in each borough highlights the following:

Manhattan – In general, all the mixed use districts in Manhattan have experienced enormous pressures for commercial development and most have experienced a decline of auto-related uses.

- The **Garment Center District** is under tremendous pressures for changes into commercial uses as well as residential uses, even though residential uses are not permitted in this district, and commercial uses are restricted. Thus, market pressures and the absence of zoning enforcement may lead to a radical change in the nature of this district, which remains strongly manufacturing and contains the highest concentration of manufacturing jobs of any zoning district in all the study areas included in this report.
- The **M1-6M** loft zoning district in Chelsea-Garment District study area has also experienced changes to mainly commercial but also to residential and automotive uses to a lesser degree. Although manufacturing land uses have declined in this district, it remains predominantly manufacturing in nature and contains a considerable amount of manufacturing jobs.
- The **M1-5 / R8A** district in Chelsea-Garment District, the smallest of all the special districts in this report, is purely manufacturing, since it contains no residential or commercial uses, and during the last ten years it has experienced growth in manufacturing uses and decline of auto-related use. However, manufacturing uses are likely to be related to warehousing since the district contains no manufacturing firms or jobs.
- The **M1-5 / R9A** district in Chelsea-Garment District has remained predominantly manufacturing, although it has experienced changes to commercial and auto-related uses, and residential uses have remained unchanged during the 10-year period. Like the above district, manufacturing uses are also likely to be related to warehousing, since the district reports only one firm providing 100 jobs.
- The **Special Lower Manhattan Mixed Use District** in Soho-Tribeca study area is currently a mixed manufacturing/residential/commercial district. However, manufacturing uses have declined while commercial, residential and "other" uses have increased in the last ten years. The district nevertheless contains a considerable amount of manufacturing jobs.
- The **M1-5A** and **M1-5B** artists' districts in Soho-Tribeca are predominantly residential and commercial in nature. The district has shed more most of their manufacturing land uses, while commercial land and building uses have increased at very fast rates. These districts, originally conceived to house artists by restricting residential and many commercial uses have not been able to succeed.

Queens – There are no common patterns among the special districts in this borough’s study areas.

- The **Special Hunter’s Point Mixed Use District** in Long Island City maintains a balance of manufacturing, commercial and residential uses. However, it has experienced a decline in manufacturing land and building area as well as vacant land in favor of commercial and auto-related uses. The district contains fewer manufacturing jobs than other special districts comparable in size.
- The **M1-3D** district in Long Island City is a mixed residential-manufacturing district, experiencing a decline in manufacturing and residential land and building area in favor of commercial and auto-related uses. It contains, however a considerable amount of manufacturing jobs.
- The **M1-1D** district in Maspeth is a predominantly residential-manufacturing district, has experienced an increase in auto-related, commercial and to a lesser degree manufacturing uses. Vacant land has decreased at a very rapid rate. The district contains a limited number of manufacturing jobs.

Brooklyn – There are no common patterns among the special districts in this borough’s study areas.

- The **Special Northside Mixed Use District** in Greenpoint-Williamsburg is a mixed residential-manufacturing district, experiencing a decline of manufacturing and industrial uses in favor of mainly residential and to a lesser degree commercial uses. Relative to its size, the district still contains a substantial number of diverse manufacturing jobs.
- The **Special Franklin Street Mixed Use District** in Greenpoint-Williamsburg is a predominantly residential district, which has experienced a substantial decrease of its manufacturing uses in favor of ‘other’ and auto-related and to a lesser degree residential uses. The district contains a limited number of manufacturing jobs.
- The **M1-1D** district in Sunset Park-Red Hook is a mixed residential-manufacturing/industrial district, which has experienced changes from manufacturing and “other” industrial uses in favor of residential, commercial and auto-related uses. The district contains a limited number of manufacturing jobs.
- The **M1-2D** district in Sunset Park-Red Hook is another mixed residential-manufacturing, larger in size, and one of the three special districts reviewed in this report which has experienced growth in manufacturing land and building area during the 10-year period. Commercial, auto, and “other” industrial uses decreased during the same period.

Industrial Parks

The five industrial parks reviewed in this report include Hunts Point IPIP, Long Island City IPIP, East New York IPIP, East Williamsburg Industrial Park and Sunset Park IPIP. The combined industrial parks represent 19% of the total study areas land, and contain 17% of the total manufacturing firms and 23% of the jobs. The review of the five industrial parks reports the following trends:

- Manufacturing and “other” uses, predominantly industrial uses occupy two thirds of the combined industrial parks land and building area. Residential and commercial land uses occupy only 8% of the land, but 21% of the building area (See Figure 16).
- Between 1989 and 2000, “other” and vacant land uses experienced a substantial decrease, albeit at a low rate in favor of auto-related and commercial uses. Residential and manufacturing uses also lost land area, but residential uses experienced a slight increase in building area (See Figure 17).

The review of land uses changes in the five industrial parks highlights the following:

- Between 1989 and 2000, auto-related land uses experienced increases in all parks. These increases were higher and faster in Long Island City, which gained almost 800,000 Sq. Ft. of land and in East New York IPIP, which gained 200,000 Sq. Ft. Hunts Point had a substantial increase of 600,000 Sq. Ft. at a very high rate. Only Sunset Park IPIP experienced a slight increase at a very low rate (See Figure 18).
- Manufacturing land areas uses experienced increases throughout, except in Hunts Point’s, which had a substantial loss of 1.4 million Sq. Ft. of land at twice the City’s rate, and Long Island City’s, which lost more than 800,000 Sq. Ft. Increases in manufacturing use land were modest throughout except in Sunset Park IPIP, which gained 2.1 million Sq. Ft. of land at a fast rate. It lost, however 67,000 Sq. Ft. of building area.
- Commercial land uses increased throughout except in East New York IPIP, which lost 17,000 Sq. Ft. of land and 24,000 Sq. Ft. of building area. Sunset Park experienced the highest and fastest increases of over 500,000 Sq. Ft. of land at a superlative rate of increase. Increases in commercial building area were highest in Long Island City IPIP, which gained 1.2 million Sq. Ft.
- Residential use land decreased in all parks, except Long Island City IPIP, which gained 34,000 Sq. Ft. of land. Decreases were fastest in East New York, which lost 30,000 Sq. Ft. Residential building area, however, increased throughout except in Sunset Park IPIP, which lost 28,000 Sq. Ft. The highest increased occurred in Long Island City, which gained almost 800,000 Sq. Ft. of building area.
- All parks Point experienced decreases in vacant land and building uses except Hunts Point, which gained 1.7 million Sq. Ft. of land and 165,000 Sq. Ft. of vacant building area. Decreases of vacant land were highest and occurred more rapidly in Long Island City, which lost over one million Sq. Ft. of land

Industrial Land Use and Zoning Policy Findings

Model Land Use and Zoning Policies

The review of model industrial land use policies from other municipalities suggests that in order to foster manufacturing development, it is necessary to establish specific manufacturing zones where other types of development such as residential, commercial or other industrial activity are prohibited or very restricted.

Chicago

- The case of Chicago shows that the establishment of PMDs (Planned Manufacturing Districts where non-industrial development is restricted) in combination with industrial development programs and capital infrastructure investments offered by the city have been important factors behind that city's retention and development of its manufacturing sector.
- Even though Chicago's PMDs were established back in the late 1980s, the city has since made modifications to these regulations in order to respond to emerging industries of the "new economy" such as high-technology firms.

Portland

- Portland's Comprehensive Plan is conducive to periodically assessing the connection between economic priorities and land use policies. The major review that the plan undergoes every five years allows the city to respond to economic changes by updating its land use policies.
- Within the five types of industrial development zones that Portland's Comprehensive Plan created, residential development is all but prohibited except in very limited areas and circumstances. In order to become permitted, residential uses must undergo a rigorous review process and comply with established density limits. Also, commercial uses are only allowed in Portland's industrial development zones when they are ancillary to industrial activity.
- Conditional uses and Variances entail quasi-judicial reviews which require a public hearing before an assigned review body. Depending on the use change being proposed within Portland's industrial zones, the proposed use must demonstrate that it: will not have significant adverse effects on nearby industrial firms; will not significantly alter the overall industrial character of the area based on the existing proportion of industrial to non-industrial uses and on the effects of incremental changes; needs to be located in an industrial area or building because industrial firms or their employees constitute the primary market of the proposed use.
- The preservation of industrial and mixed use character of these areas is addressed through restrictive use and development standards regulations that control population density, business location and growth, and provide guidelines for urban appearance and enhancement.

- In addition to zoning mechanisms, the city provides incentives for businesses to locate and stay in target areas, and it encourages target industries to locate and expand within industrial areas.
- Portland's zoning ordinance contains environmental nuisance regulations—including performance standards that relate to noise, vibration, odor, and glare—which are updated periodically. The city's Bureau of Buildings, in consultation with other environmental agencies, enforces performance standards. In addition, these regulations are framed within state and regional codes and agencies.

Seattle

- As in Portland, part of the success of Seattle's land use approach can be attributed to its reliance on a comprehensive plan that is accountable to the community at large and is inclusive in its local participatory approach.
- One of the goals of Seattle's plan is to promote the development of manufacturing/industrial centers to ensure that adequate accessible industrial land remains available to promote a diversified employment base, to promote the use of industrial land for industrial purposes and to encourage economic activity and development in industrial areas.
- Seattle's zoning has four basic types of industrial development industrial zones, which vary according to the land uses permitted as well as density, height, screening, or performance standards requirements applicable to each zone. The use restrictions are meant to protect these industrial zones by curbing the development of non-industrial uses.
- Conditional uses and Variances in Seattle's industrial zones must undergo a discretionary approval process that requires a Master Use Permit application, including a comprehensive evaluation of the proposal and its potential impacts on the area and environment. The reviews are the responsibility of the Director of the Department of Construction and Land Use (DCLU) and are subject to an administrative appeal hearing to Seattle's Hearing Examiner.
- Environmental regulations, established in the ordinance are framed within state codes and are enforced by the City's Department of Construction and Land Use. Location, control and enforcement of noxious and environmentally harmful uses in any of the industrial zones is addressed through the identification and discretionary regulation of High Impact Uses.

Vancouver

- Vancouver utilizes a compatibility matrix in its mixed use districts as an innovative way of providing greater protection to residents against noxious uses while at the same time providing flexibility. The chart establishes the compatibility of uses with residential development and whether these uses are allowed as-of-right, with conditions, or not allowed with mixed use buildings of 25 feet from a residential component.

Manufacturing Land Use and Zoning in New York City

- Despite efforts on the part of New York City to study the issues posed by manufacturing land use and zoning, no major steps have been taken over the past two decades to address those issues. Industrial land use policies today have derived from recommendations included in the Department of City Planning's 1993 land use report, Citywide Industry Study.
- The Citywide Industry Study concluded that the city should implement zoning changes in manufacturing areas to encourage the development of wholesale and retail trade. With few recommendations for manufacturing retention, since the report's publication, the city has presumed that manufacturing is in an inevitable state of decline, and that city land use, zoning and economic development strategies will have a very limited impact on the health of this sector.
- The Department of City Planning has begun to act on the recommendation of the Citywide Industry Study that some areas be rezoned. Over the past three years, it has initiated rezoning actions in several waterfront mixed-use areas, primarily in Brooklyn and the Bronx.
- Even without the sanction of formal rezoning actions, land use changes in manufacturing and mixed use zones have been accomplished on a property-by-property basis through Variances granted by the New York City Board of Standards and Appeals (BSA). In fact, a growing number of conversions from industrial to residential and other purposes has been taking place. This can largely be attributed to the fact that New York City's zoning ordinance provision regarding Variances is relatively vague and open to wide interpretation. Although Variances cannot be granted without a public hearing at the local community board, applications are rarely denied through this process. Such weaknesses in the zoning ordinance's Variances provisions have led to a shrinking pool of available industrial space.
- Certain industrial uses which often by necessity generate heavy truck traffic, such as warehousing and distribution, are only permitted in manufacturing districts. Aside from these uses, there are many other industrial uses that take up large quantities of land in manufacturing areas. They include: public transportation yards, airports, port facilities, water and sewer services, electricity and gas-related uses, solid waste disposal, and vehicle and equipment parking, storage, and repair. As such, many manufacturers still find themselves competing with other uses for appropriate locations in manufacturing zones.
- Other uses that are increasingly found in manufacturing zones are automotive related repair facilities, automobile sales, and accessory parking facilities. Also, private storage facilities are found in many manufacturing areas.
- Community-initiated 197a plans throughout Brooklyn and the Bronx have called for quality of life improvements by increasing public access to waterfront areas as a method for alleviating the severe lack of open space and for the enjoyment of the nearby residents, workers, and New York City residents at large. Currently, many manufacturing areas are along the waterfront and therefore are not publicly accessible.

- A large proportion of New York City's manufacturing-zoned land is vacant, and there are a few reasons for this. First, portions of manufacturing zoned land (particularly in western Staten Island) are wetlands and thus cannot be developed. Second, large sections of the city's waterfront are zoned manufacturing and although many of the original uses have left, properties remain vacant because of fears of contamination. Finally, in gentrifying and waterfront areas, landlords often prefer to hold land vacant hoping that they can get a higher price once the land is rezoned for residential and commercial use.
- In recent years, a number of new, non-industrial uses have developed in manufacturing zones. For example, big box retail operations and adult entertainment businesses have been finding their way into manufacturing zones. In addition, the popularity of locating in older industrial buildings has spurred an increase in conversions to residential (legal and illegal), retail and office use.
- High tech companies like telecommunications and new media have until recently been growing at a tremendous rate in New York City. In search of large floor plate spaces, they have found older industrial buildings appealing. In many industrial areas such as Chelsea and Tribeca in Manhattan, Sunset Park in Brooklyn, and Long Island City in Queens, new high tech facilities have taken over some of the best loft buildings.

Mixed Use Zoning in New York City

- The Special Mixed Use Districts which are intended to strike a balance between manufacturing and residential uses employ a very restrictive use provision and a regulatory process that on paper appear to be very effective in preserving manufacturing uses and the mix between those and non-manufacturing uses. However, their uniqueness and multiplication has undermined the City's capacity to enforce and administer the ordinance. To varying degrees, all of the special mixed use districts analyzed for this study have preserved manufacturing jobs, but have also experienced conversions to non-manufacturing uses, particularly to commercial and auto uses which are allowed as-of-right.
- The original purpose of the Loft Law for Artists was to allow artists certified by the Department of Cultural Affairs to live and work in the same space. Zoning districts designated M1-5A or B and M1-6A or B were created for this purpose in areas of Soho, Noho and Tribeca in Manhattan. However, the costs of bringing converted lofts up to code has been so prohibitive that barely half of the buildings registered under the Loft Law were compliant as of June 1999.
- Loft zoning regulations that apply to permitted residential conversions of non-residential buildings built before 1961 in certain districts of Manhattan, Brooklyn and Queens (designated M1-5M or M1-6M) allow conversions of manufacturing space under the condition that space be set aside for industrial uses, and originally required that the developer contributed to a business relocation fund. However, the "conversion contribution" no longer exists, and commercial development is allowed as-of-right. In addition, unrestricted conversions of loft buildings into high-priced condominiums especially in Soho and Tribeca have increased property values between three to ten times in only five years, and this demand is increasing and expanding into Brooklyn. Therefore, these districts have been prone to gradual gentrification, especially in waterfront areas under great development pressures.

- M1-D district regulations are very restrictive since they allow the same manufacturing uses allowed in standard manufacturing districts on an as-of-right basis but restrict residential development. However, this district can only be applied to particular land use configurations and thus cannot be replicated in different types of mixed use neighborhoods.
- The MX zoning designation was a New York City zoning innovation when it was created in 1997 not only because it allows more flexibility in mixed use development but also because it marked the first time that environmental restrictions and remediation requirements were an explicit component of the development approval process. For the first time, an environmental permit issued by DEP⁴ is required to allow new construction or rehabilitation of mixed use developments in a building. This aspect of the MX designation, however, applies specifically and exclusively to mixed use buildings or adjacent buildings sharing a perimeter wall. However, it makes no mention of development or use restrictions in close proximity (same block or district) to existing environmentally hazardous facilities or restrictions based on other nuisances affecting the quality of life in these communities, including regulations for transfer stations and recycling facilities. In addition, MX does not include mechanisms to preserve manufacturing activity and prevent displacement by residential and commercial uses. Thus, this type of district is likely to transform neighborhoods from mixed residential-manufacturing to mixed residential-commercial areas.

⁴ Department of Environmental Protection

Manufacturing Development Findings

Manufacturing Trends

Manufacturing Benefits

- In June 1999, manufacturing employment constituted 8.4% of the City's job base, providing a quarter million jobs in New York City. It was the City's fourth largest employment sector. In Brooklyn and Queens, manufacturing activity was even more significant since it accounted for 11.1 % and 10.8% of the job mix respectively.
- Job creation in manufacturing is one of its most significant benefits for New York City. Manufacturing has an employment multiplier of 1.77, which means that every 1,000 manufacturing jobs create another 777 jobs in other sectors. This is much greater than employment multipliers for major sectors like health services (1.42), business services (1.41), air transport (1.52) and construction (1.51). The employment multiplier for retail is only 1.2.
- There are many benefits to retaining manufacturing, one of the most important being that it helps ensure a diverse economy. By supporting and encouraging the growth of more than just one or two economic sectors, the city makes itself less vulnerable to fluctuations in the market economy.
- Retaining this sector is also crucial because it leverages more jobs and offers its workers more security than other sectors such as retail and services through higher wages, higher rates of unionization, and greater benefits.
- Manufacturing is an important source of employment for a significant proportion of the city's population, including new immigrants with limited English language skills and people who lack educational credentials, since it offers a chance to enter the job market.
- Manufacturing firms play a crucial role in maintaining the competitive edge of firms in other sectors like creative/cultural and advertising, service and contribute as 'silent partners' in the economy. However, despite these benefits, manufacturing businesses still face many obstacles like unaffordable high rents in a speculative real estate market making it extremely difficult for small manufacturers to maintain viable businesses

Manufacturing Employment Trends

Note: For detailed quantitative breakdowns of manufacturing jobs and firms per SIC code in the study areas and their subareas, please consult appendix D-1. Also, to see this information by zoning district, please consult appendix D-2.

- The study areas are reasonably representative of the manufacturing job base citywide. In 14 of the 20 SIC codes in the Manufacturing sector, the eight study areas combined represent between 42% and 67 % of all the jobs in each of those SIC codes.

- Manufacturing jobs have declined in New York City and in the eight study areas, especially very rapidly in the two study areas in Manhattan, which combined contain 44% of the total study areas jobs. However, some sectors like printing and chemicals reported growth. Apparel suffered the greatest loss overall, except in Maspeth, East New York and Sunset Park-Red Hook study areas, which experienced growth.
- While manufacturing employment has continued to decline nationwide, the rate of decline in New York City has recently fallen below the national rate, suggesting that the industries still located in New York City have strong economic motivation for remaining in this market area.
- In the eight study areas, 70% or more of the manufacturing jobs are located within M zones, as expected, while 30% are located in commercial and residential zones. In Chelsea-Garment District, however, only 41% of the Manufacturing jobs are located in M zones where they have no legal protection at all, beyond their leases. The remaining 59% are technically, nonconforming uses, mainly in commercial zones that have been mapped in the area over the past 30 years. This anomalous trend is particularly important in light of the fact that this area represents one of the largest concentrations of manufacturing jobs (mainly in Apparel and Printing) in the entire city.
- A review of the study areas indicate the following:
 - **Chelsea-Garment District** – Apparel (48%) and then Printing (28%) are by far the dominant industries, but Textiles and Miscellaneous industries combined also account for almost 15% of the total of over 33,000 jobs
 - **Soho-Tribeca** – Conversely, Printing (61%) and then Apparel (13%) dominate with no other industries representing more than 5% of the total 7,041 jobs
 - **Hunts Point** – Fabricated Metal and Food represent over 50% of the 2,415 manufacturing jobs in the area, with Rubber & Plastic and Industrial Machinery (including computers) making up another 27% of the total
 - **Long Island City** – A diverse mix of Apparel, Printing, Measuring Instruments, Paper, Fabricated Metal and Miscellaneous manufacturing characterize the area, with no industry having more than 15% of the total 17,083 jobs
 - **Maspeth** – Another diverse mix of industries, led by Paper, Fabricated Metal, Textiles, Apparel, Food and other Miscellaneous industries, none of which represent more than 10-15% of the area's 6,559 manufacturing jobs.
 - **East New York** – Food (with almost 30% of the jobs) leads a fairly diverse manufacturing sector here, with Furniture & Fixtures, Fabricated Metal and Miscellaneous industries each representing no more than 12-15% of the 4,820 jobs in the area
 - **Greenpoint-Williamsburg** - Again, Food (with almost 18% of the jobs) leads a diverse group of industries including Apparel, Fabricated Metal, Chemicals and Miscellaneous industries, each representing 10-15% of the area's 13,685 jobs

- **Sunset Park** – This is perhaps the most diverse of all the study areas with Apparel and Food leading a group that includes Chemicals, Printing, Paper, Fabricated Metal and Non-computer Electronics, with no industry representing more than 7-15% of the nearly 8,000 jobs in the area

Further detail on the peculiar concentrations of specialized “Miscellaneous” manufacturing industries in the study areas is provided by our analysis of the 4-digit SIC codes. Some of these industries give a special character to the local manufacturing district and may represent important linkages with other related industries both locally and citywide. For example:

- Some 2,650 Jewelry and Precious Metal jobs are concentrated mainly in Chelsea-Garment District (1,155 jobs) and Long Island City (1,500 jobs) study areas. A preponderance of the Costume Jewelry jobs (586 out of 608) are also concentrated in the Chelsea-Garment District subarea,
- The 2,433 jobs in Signs and Advertising Specialties are distributed in seven of our study areas, with a majority of the concentrations being in East New York, Chelsea-Garment District, Long Island City and Maspeth
- Virtually all (400 out of 435) the Dolls & Stuffed Toy jobs are located in Greenpoint-Williamsburg.
- Not surprisingly, the lion’s share of the Fasteners and Buttons employment (345 out of 431 jobs) is in the Chelsea (garment district) area.
- What remains of the Carbon Paper and Inked Ribbons industry (150 jobs) can be found in Greenpoint-Williamsburg.

In the Chelsea-Garment District study area, printing firms are located mainly between 5th and 8th Avenues, surrounding apparel firms and close to commercial activities. In Long City Island, these firms locate near the access to major roads and bridges.

Apparel firms, the second biggest sector in New York City are mainly found near commercial, residential or mixed use districts. Almost 45% of the total manufacturing jobs in the City are located in the Chelsea Garment District study area between 33rd and 41st streets and 5th and 8th Avenue, close to commercial activities. There are two big clusters of Apparel and Textile along the Bushwick-Glendale border (between study areas 5 and 7) close to residential zones. One is along Flushing Avenue, and the other is in the triangle surrounded by Myrtle Avenue, Wyckoff Avenue and Decatur Street. Both of these locations have convenient access to public transportation and major roads connecting to expressways and bridges leading to Manhattan.

In the Chelsea-Garment District study area, jewelry firms concentrate around 5th Avenue between 40th and 35th street close to apparel firms and retail shops. These firms also concentrate around Broadway and 6th Avenue between 27th and 31st streets. In Long Island City they are in close proximity to fabricated metal firms.

Generally, furniture firms in our 8 study areas are near residential districts. In East New York all the firms are located in Industrial Parks and some in residential zones.

The fabricated metals sector has a large percentage of jobs in our 8 study areas, especially in the outer boroughs where they locate mostly in manufacturing zones. In Sunset Park- Red Hook these firms are close to public subway lines and major roads leading to the Gowanus expressway.

Financing and Real Estate

- A significant proportion of manufacturers cite the lack of affordable real estate as the number one problem they face. The lack of affordable space can be attributed to various factors including a general rise in real estate values for all types of uses and competition from other uses such as residential and commercial, which are able to pay higher rents per square foot than manufacturers. The little space that is still available for industrial uses is often financially problematic as many of these vacant industrial buildings are in need of major rehabilitation at costs that are financially prohibitive to small manufacturing firms. They also tend to be located in areas far away from Manhattan, and this is a cause for concern for many manufacturers who fear losing their client and labor bases.
- Even though there are city and state financing programs available to manufacturers, most of them are only eligible to businesses that are seeking to buy property or large equity investments in a facility. Hence, they are inappropriate for the majority of New York City manufacturers, which are small firms who must devote all their energy and capital for machinery, production, and marketing.
- Despite this major obstacle in financing availability, there are a few success stories regarding the development of manufacturing space in New York City whose models should be replicated through new and revised policies:
 - The city, through its Economic Development Corporation (EDC), committed itself to the financing and operation of a few buildings in the Brooklyn Army Terminal in Sunset Park. EDC's predecessor agency⁵ rehabilitated Building **B** and provided relocation assistance to firms choosing to locate there.
 - Another success story involving the development of affordable real estate is Brooklyn's Greenpoint Manufacturing and Design Center (GMDC), a nonprofit organization which purchased a deteriorated industrial building from the city for one dollar and then rehabilitated and rented out space to small manufactures.
 - Some private developers have been able to successfully develop space for manufacturers by incrementally rehabilitating buildings and by acquiring the properties at a relatively low cost.

⁵ The agency was called the Public Development Corporation.

Manufacturing Development Programs

New York City's In-Place Industrial Parks (IPIP)

- IPIPs were originally intended to serve as state-of-the-art industrial parks that address the problems that were causing manufacturers to leave New York, and they provide liaison services for firms located within their boundaries. However, they are somewhat limited in their ability to assist manufacturers in overcoming the wide range of obstacles that make it hard for them to remain in New York City. While many IPIPs are almost fully occupied, others have buildings and lots that remain vacant. In addition, some IPIPs have started to market to firms other than manufacturers. Revamping the existing IPIP program in order to increase their capacity would enable them to play a stronger role than they currently do with regard to providing manufacturing firms with technical assistance, help in accessing financing, and enforcing land use and zoning regulations.

Real Estate Assistance Programs

- Current city and state programs that provide real estate financing target owner-occupants and thus do not address the vast majority of manufacturing firms which are building tenants, not owners. Even for the limited number of manufacturing firms which own rather than lease their property, the high capital investment thresholds required for financing eligibility prohibit many firms from taking advantage of them. Finally, many of these financing programs have lengthy, cumbersome application processes which impede many smaller firms from applying as most of them are already overburdened by administering and monitoring daily operations.

Energy Assistance Programs

- The well known Energy Costs Savings Program is biased against manufacturing tenants in the same way ICIP is because in order to qualify for the former, a firm must qualify for the latter. Thus, only owner-occupant manufacturing firms which make substantial investments to their property can be eligible for these energy cost savings. In addition, the New York State programs, which offer credits and exemptions against electricity sales taxes, are also biased against manufacturing tenants who often do not have sub-metered electrical accounts of their own. This is because only energy used "directly and exclusively in the manufacturing, processing, or assembling of tangible personal property for sale is eligible for sales tax savings.

Equipment Purchase Assistance Programs

- The NYC Industrial Development Authority Financing of Equipment Purchases is the same IDA program which provides financing for building purchases and renovations as well so it is limited by the same restrictions i.e. only owner-occupant manufacturing firms may be eligible to apply.

Other Assistance Programs

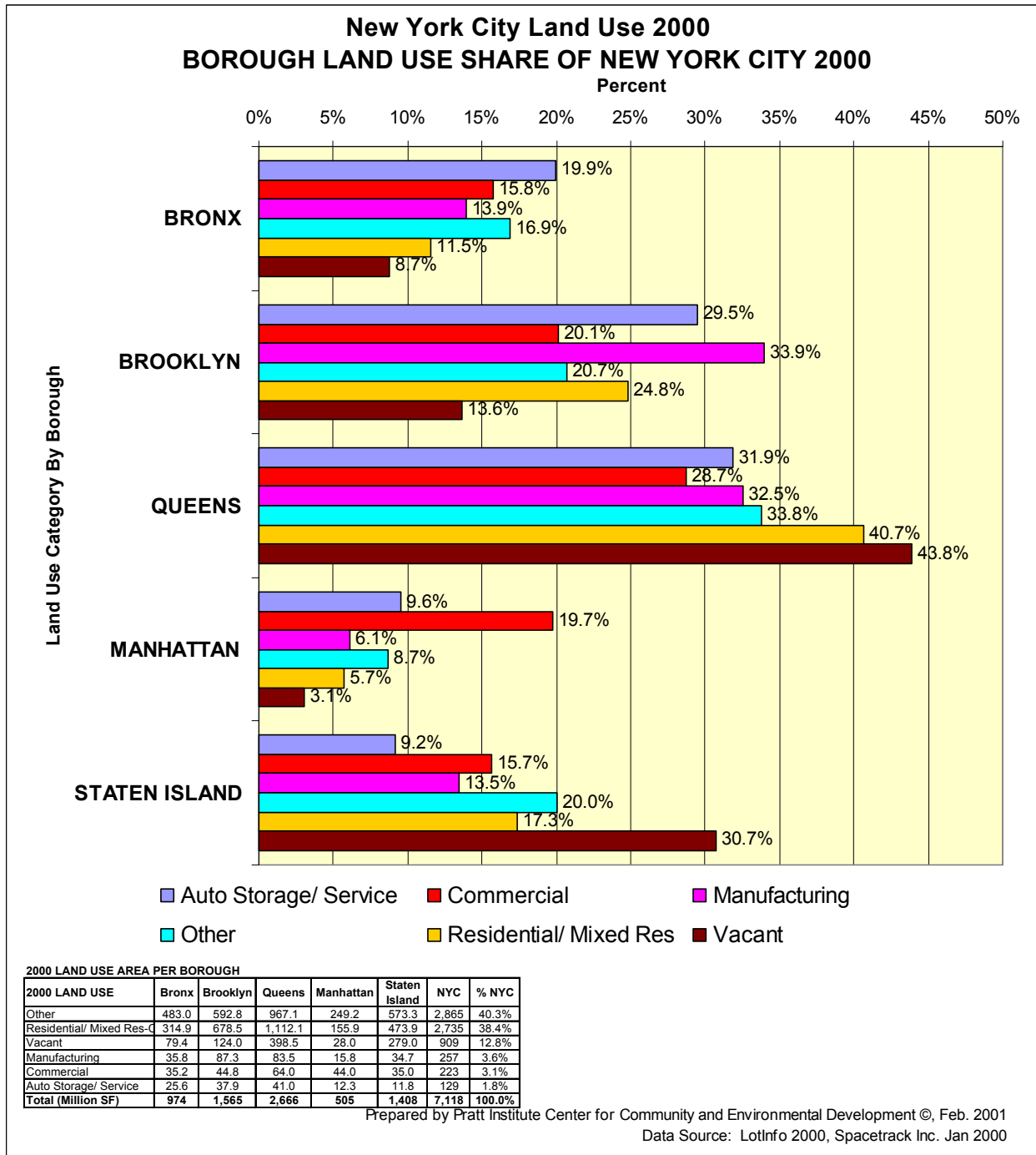
- One of the very few programs with the potential to assist manufacturing tenants (as opposed to those who own their space) is the NYC Rate Abatements for Commercial and Industrial Tenants for firms which relocate in M zones in the outer boroughs or north of 96th Street in Manhattan. A landlord applies for an abatement on real estate taxes on a building and is then required to pass the savings on to the tenant by reducing the rent by the same amount. As such, it assumes that landlords will see the benefit of such a program, which requires the passing along of all benefits to the tenants.

Manufacturing Sustainability Findings

- In general, manufacturing has a difficult time garnering public and political support because of its common association with air and water pollution as well as the dumping of waste and a general decline in the quality of many urban neighborhoods.
- In New York City, manufacturing zones are increasingly perceived as a threat to the quality of life in neighboring residential areas because of their high concentration of undesirable uses such as waste transfer stations and adult entertainment establishments. In addition, they have a strong tendency to generate other problems such as truck traffic as well as negatively impact nearby manufacturing establishments.
- New York City's M-zones tend to be in poor physical condition as exemplified by numerous potholes, lack of proper lighting, and illegal dumping. Such conditions further fuel the negative perceptions of M-zones that many people already have. City infrastructure improvements as well as green infrastructure techniques have the potential to greatly improve the image and physical condition of these areas.
- The current system of determining which uses are compatible in manufacturing and mixed use zoning districts is outdated due to the changes in technology and industrial processes that have taken place during the forty years since the zoning resolution was originally written. For example, printing falls under a single use category even though there are several different types of printing processes that have different levels of environmental performance. Depending on the type of process, some of them can appropriately be sited near residential uses, but the zoning resolution's antiquated system of use groups prohibits this. In other words, as currently written, the resolution only takes into consideration an industry's classification rather than its actual performance.
- Performance-based standards are an alternative to traditional zoning because they can be adapted to ever-evolving manufacturing processes, new enterprises, new technologies, and changing market forces. At the same time, they also protect the public objectives of land use controls and promoting environmental quality.
- Vancouver takes an innovative approach to compatibility and performance issues by utilizing a compatibility matrix in its mixed use districts as an innovative way of providing greater protection to residents against noxious uses while at the same time providing flexibility. The chart establishes the compatibility of uses with residential development and whether these uses are allowed as-of-right, with conditions, or not allowed with mixed use buildings of 25 feet from a residential component. Through this tool, performance standards determine whether the impacts of a particular activity in a particular location conform to standards of acceptability.
- There is a growing body of evidence that shows that achieving higher environmental performance does not come at a cost to manufactures but rather can result in financial payoffs for them as well. In other words, contrary to conventional wisdom, environmentally friendly production processes and economic returns are *not* mutually exclusive.

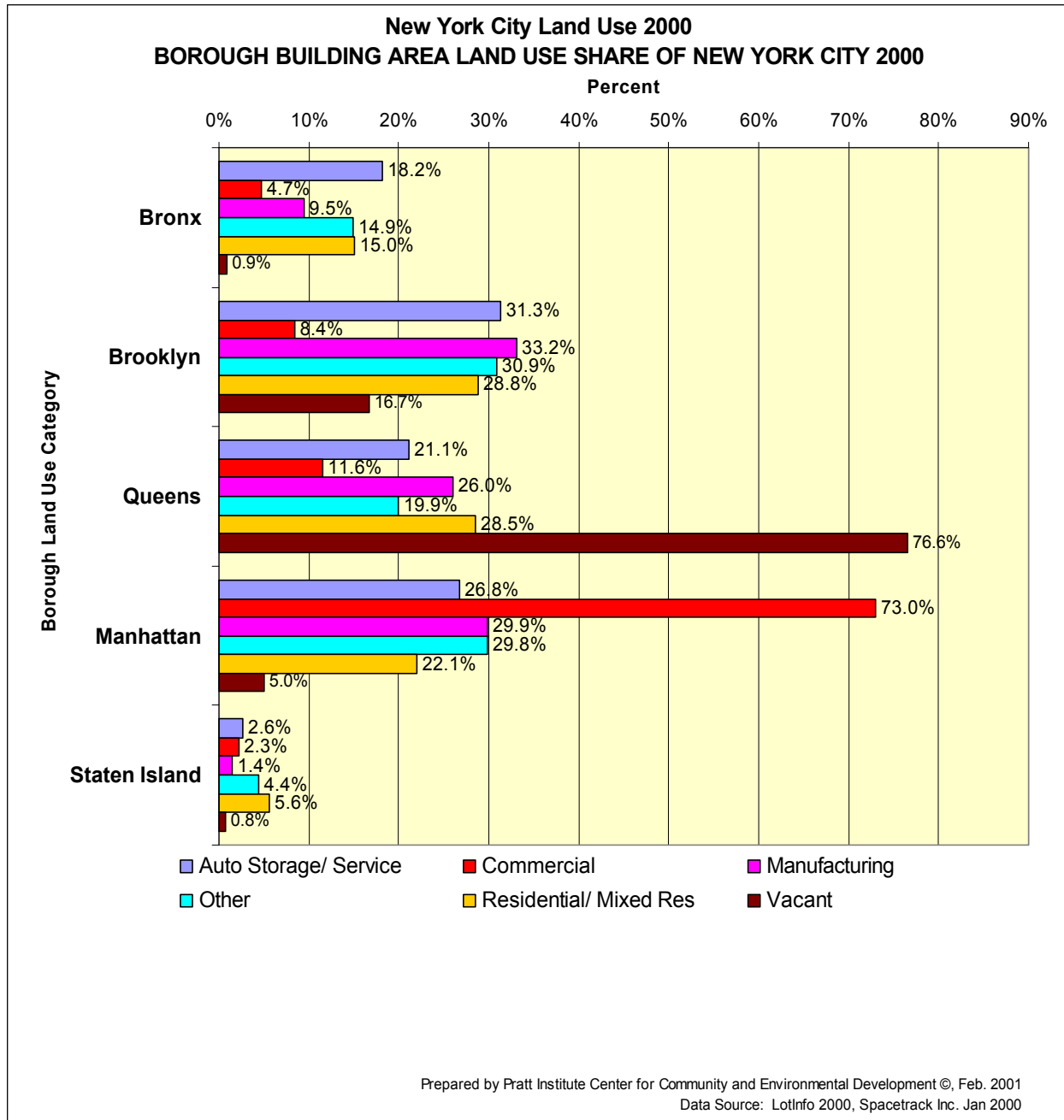
- Various manufacturing firms throughout the country have adopted principles of industrial ecology and therefore have been able to reduce the by-product wastes from production processes while simultaneously saving significant amounts of financial resources.
- Eco-industrial parks are emerging as an important venue for applying the principles of industrial ecology and thus offer much potential for urban areas to retain manufacturing while preventing future pollution and other types of environmental deterioration.

Figure 1: BOROUGH LAND USE SHARE OF NEW YORK CITY 2000



- Queens, the largest borough in extension, contains the highest share of New York City’s auto-related, commercial, “other” and vacant land uses. It also contains the second highest share of manufacturing land.
- Brooklyn, the second largest borough, contains the highest share of manufacturing land, and the second highest share of auto-related land uses.
- Manhattan, the smallest borough, contains a high share (20%) of New York City’s commercial land, and the lowest amount of vacant land.
- Staten Island, which ranks third in size, is the least developed borough with 31% of New York City’s vacant land.

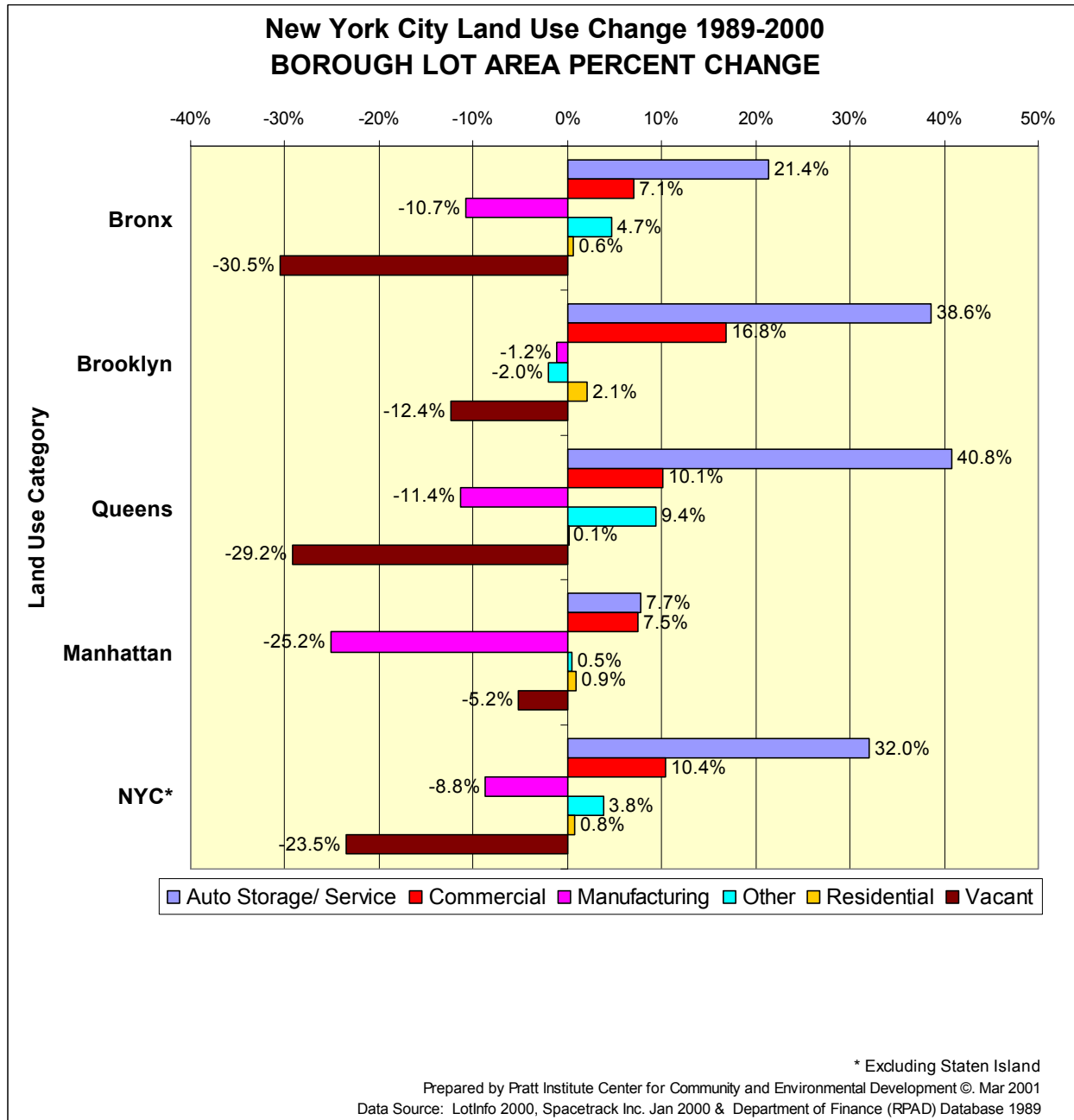
Figure 2: BOROUGH BUILDING AREA LAND USE SHARE OF NEW YORK CITY



The difference between the borough profiles in terms of building area versus land area reflect the relative densities of the respective boroughs.

- Manhattan, the most built-up borough, contains the highest share of New York City’s commercial building area, and (although it has been decreasing rapidly) the second largest share of manufacturing building area.
- Brooklyn, the second densest borough, contains the highest share of New York City’s manufacturing, auto-related, “other”, and residential building area.
- Queens, the third densest borough, contain the highest share (20%) of New York City’s vacant building area.

Figure 3: NYC & BOROUGHS LOT AREA PERCENT CHANGE



- Bronx, Manhattan and Queens experienced substantial increases in auto-related uses, especially Queens, which had the fastest rate of growth.
- The four boroughs experienced increases in commercial land uses.
- All four boroughs experienced a decline of manufacturing land, with Manhattan having the highest rate of decline.
- New York City* as a whole experienced a substantial decrease of vacant land.

Figure 4: STUDY AREAS LAND USE 2000

STUDY AREAS LAND USE 2000	Sq. Ft.	Auto Storage/ Service	Commercial	Manufacturing	Other	Residential/ Mixed Res-Comm	Vacant	TOTAL (Sq. Ft.)
CHELSEA - GARMENT DISTRICT	BLDG SF	5,474,779	58,703,316	44,071,462	13,753,768	35,227,297	8,413	157,239,035
	LOT SF	2,591,461	5,757,790	5,206,679	7,795,761	7,221,221	1,033,098	29,606,010
SOHO - TRIBECA	BLDG SF	826,808	24,786,185	16,873,807	6,496,726	23,093,867	2,000	72,079,393
	LOT SF	584,925	4,051,919	2,968,488	4,398,264	4,733,238	772,855	17,509,688
HUNTS POINT	BLDG SF	944,899	176,359	5,141,115	2,718,221	3,729,219	0	12,709,813
	LOT SF	1,837,307	279,356	6,855,146	20,051,238	1,478,063	8,908,947	39,410,057
LONG ISLAND CITY	BLDG SF	2,744,878	8,836,114	32,159,312	5,176,263	22,246,106	16,675	71,179,348
	LOT SF	5,889,445	5,126,759	22,757,780	22,163,160	14,020,237	2,365,644	72,323,025
MASPETH	BLDG SF	1,015,691	1,958,417	17,034,645	3,560,304	52,243,612	130,777	75,943,446
	LOT SF	4,032,300	2,460,847	21,616,663	56,319,418	48,225,426	3,436,065	136,090,719
EAST NEW YORK	BLDG SF	1,364,372	2,182,808	7,288,711	9,205,802	53,844,352	111,610	73,997,655
	LOT SF	5,524,887	2,672,927	7,155,892	28,599,993	47,151,250	11,087,665	102,192,614
GREENPOINT-WILLIAMSBURG	BLDG SF	2,269,515	4,032,780	37,954,586	18,102,923	79,273,065	397,670	142,030,539
	LOT SF	5,611,186	2,973,589	34,554,834	37,994,102	42,440,737	7,544,387	131,118,834
SUNSET PARK-RED HOOK	BLDG SF	2,823,591	3,394,172	26,307,560	24,944,967	80,915,380	156,990	138,542,660
	LOT SF	4,508,742	3,034,868	20,306,074	48,855,139	48,744,203	3,160,802	128,609,827
TOTAL SF BUILDING	17,464,533	104,070,151	186,831,198	83,958,974	350,572,898	824,135	743,721,889	
TOTAL SF LAND	30,580,253	26,358,056	121,421,556	226,177,075	214,014,373	38,309,462	656,860,774	
BLDG AREA % OF NYC	26.8%	16.2%	57.7%	14.8%	10.6%	8.2%	15.2%	
LAND AREA % OF NYC	23.8%	11.8%	47.2%	7.9%	7.8%	4.2%	9.2%	

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 Data Source: LotInfo 2000, Spacetrack Inc. Jan 2000

Figure 5: COMBINED STUDY AREAS LAND USE CHANGE 1989-2000

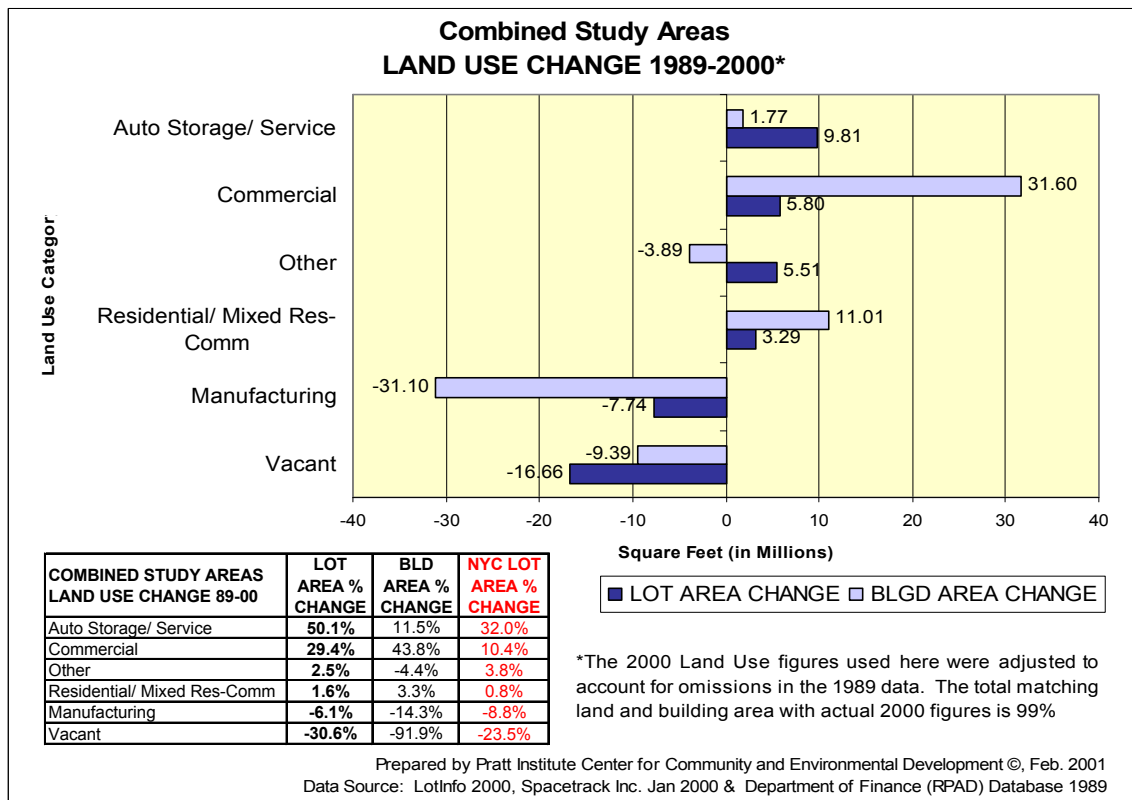


Figure 6: STUDY AREAS & NEW YORK CITY LAND USE CHANGES 1989-2000

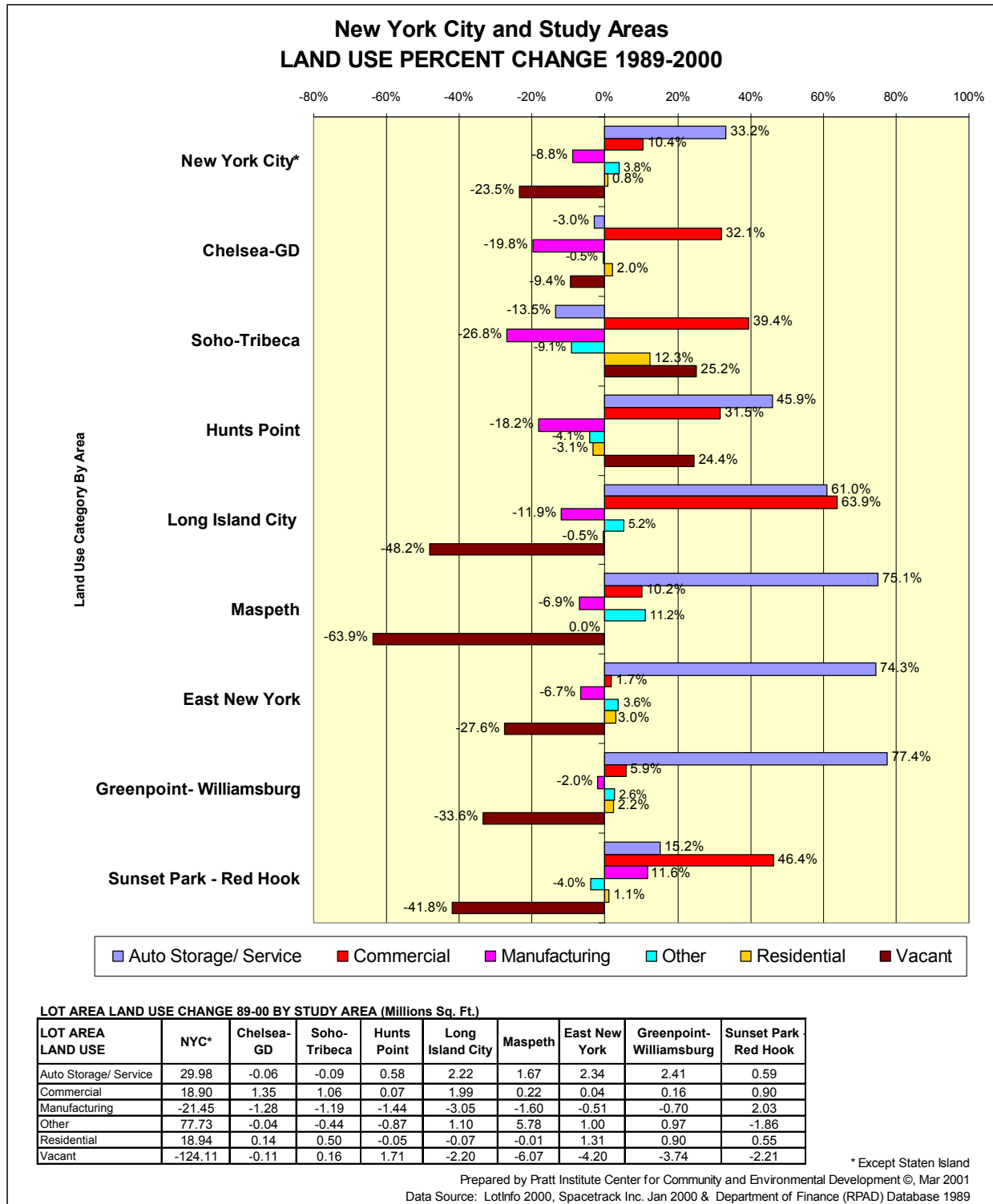


Figure 7: 1989-2000 STUDY AREAS LAND USE CHANGE TO RESIDENTIAL & COMMERCIAL IN M DISTRICTS

1989-2000 Study Areas Land Use Change to Residential in M and M.U. Districts

Study Area	2000 Mftg Jobs in M & MU Districts	2000 Mftg Uses Lot Area Sq.Ft. in Comm. & Res Districts	Total M & MU Districts	Res 1989 M & MU Districts	Res 2000 M & MU Districts	Res Change 89-00	M & MU Districts Res % Change	SA Res % Change
Chelsea-GD	11,043	1,018,422	14	449,871	493,604	43,733	9.7%	2.0%
Soho-Tribeca	6,009	818,386	7	988,031	1,217,440	229,410	23.2%	12.3%
Hunts Pt	2,365	50,254	5	140,942	115,631	-25,311	-18.0%	-3.1%
LIC	16,228	1,869,913	18	2,383,402	2,346,122	-37,280	-1.6%	-0.5%
Maspeth	4,181	1,047,197	11	1,715,646	1,662,979	-52,667	-3.07%	0.0%
ENY	3,709	825,844	16	1,002,486	918,179	-84,306	-8.4%	3.0%
Gpt-Will	11,830	2,211,712	28	3,998,705	4,191,077	192,372	4.8%	2.2%
SP-RH	6,856	1,190,270	29	3,286,100	3,183,818	-102,282	-3.1%	1.1%
TOTAL	62,221	9,031,998	128	13,965,183	14,128,852	163,669	1.2%	1.6%

1989-2000 Study Areas Land Use Change to Residential in M Districts

Study Area	2000 Mftg Jobs in M District	Total M Districts	Res 1989 M Districts	Res 2000 M Districts	Res Change 89-00	M Districts Res % Change	M Dist. w/o Res Use	% M Dist. w/ Res Use
Chelsea-GD	10,071	11	406,081	443,633	37,552	9.2%	3	72.7%
Soho-Tribeca	2,966	4	206,804	275,559	68,754	33.2%	1	75.0%
Hunts Pt	2,365	5	140,942	115,631	-25,311	-18.0%	1	80.0%
LIC	15,186	17	1,600,413	1,585,039	-15,373	-1.0%	6	64.7%
Maspeth	3,931	10	1,275,765	1,238,803	-36,962	-2.9%	2	80.0%
ENY	3,709	16	1,002,486	918,179	-84,306	-8.41%	1	93.8%
Gpt-Will	11,015	21	2,308,707	2,442,302	133,595	5.8%	1	95.2%
SP-RH	5,647	26	1,919,606	1,796,710	-122,897	-6.4%	8	69.2%
TOTAL	54,890	110	8,860,804	8,815,856	-44,948	-0.5%	23	79.1%

1989-2000 Study Areas Land Use Change to Commercial in M and M.U. Districts

Study Area	2000 Mftg Jobs in M & MU Districts	Total M & MU Districts	Comm 1989 M Districts	Comm 2000 M Districts	Comm Change 89-00	M Districts Comm % Change
Chelsea	11,043	14	4,217,106	5,570,996	1,353,890	32.1%
Soho-Tribeca	6,009	7	2,689,577	3,749,184	1,059,606	39.4%
Hunts Pt	2,365	5	212,493	279,496	67,003	31.5%
LIC	16,228	18	3,121,422	5,115,661	1,994,239	63.9%
Maspeth	4,181	11	2,172,531	2,394,990	222,459	10.2%
ENY	3,709	15	2,590,671	2,634,432	43,761	1.7%
Gpt-Will	11,830	28	2,766,205	2,928,101	161,896	5.9%
SP-RH	6,856	29	1,941,357	2,842,703	901,345	46.4%
TOTAL	62,221	127	19,711,363	25,515,563	5,804,199	29.4%

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Data Source: LotInfo 2000, Spacetrack Inc. Jan 2000; Harris Infosource 2000; & New York City Zoning Resolution Maps as of Nov. 2000

Figure 8: STUDY AREAS MANUFACTURING FIRMS & JOBS 2000 BY ZONING DISTRICT

Zoning	General Residence District R3-2, R4, R4B ~R10H	Local Retail District C1-1 ~ C2-8A		General Commercial District C4-1 ~ C6-9CR		General Service District C8-1 ~ C8-4		Commercial Zoning Subtotal		Mixed Use Districts M(R), R(M), M1-D, M1-SM M1-6M, M1-5A/B, M1-6A/B		Light Manufacturing District M1-1~ M1-6		Medium Manufacturing District M2-1~ M2-4		Heavy Manufacturing District M3-1, M3-2		Manufacturing Zoning Subtotal			
		Firms	Jobs	Firms	Jobs	Firms	Jobs	Firms	Jobs	Firms	Jobs	Firms	Jobs	Firms	Jobs	Firms	Jobs	Firms	Jobs	Firms	Jobs
Study Area	Study Subarea																				
Chelsea-Garment District	Chelsea District(10011)	9	317	2	35	78	2,053	0	0	80	2,088	11	872	13	552	0	0	0	0	13	552
	Garment District (10018)	0	0	0	0	214	8,804	0	0	214	8,804	0	0	270	8,424	0	0	0	0	270	8,424
	Fur Flower District (10001)	9	144	6	124	207	8,144	0	0	213	8,268	0	0	190	3,883	0	0	0	0	190	3,883
	Subtotal	18	461	8	159	499	19,001	0	0	507	19,160	11	872	473	12,859	0	0	0	0	473	12,859
	Percent of Study Area	1.8%	1.4%	0.8%	0.5%	49.5%	57.0%	0.0%	0.0%	50.2%	57.4%	1.1%	2.6%	46.9%	38.6%	0.0%	0.0%	0.0%	0.0%	46.9%	38.6%
Soho-Tribeca	Soho (10012)	6	256	0	0	17	221	0	0	17	221	58	1,692	0	0	0	0	0	0	0	0
	Tribeca(10013)	2	12	0	0	31	543	0	0	31	543	31	1,351	167	2,917	3	49	0	0	170	2,966
	Subtotal	8	268	0	0	48	764	0	0	48	764	89	3,043	167	2,917	3	49	0	0	170	2,966
	Percent of Study Area	2.5%	3.8%	0.0%	0.0%	15.2%	10.9%	0.0%	0.0%	15.2%	10.9%	28.3%	43.2%	53.0%	41.4%	1.0%	0.7%	0.0%	0.0%	54.0%	42.1%
Hunt's Point	Hunt's Point (10474)	1	50	0	0	0	0	0	0	0	0	0	0	22	674	10	484	19	1,207	51	2,365
	Subtotal	1	50	0	0	0	0	0	0	0	0	0	0	22	674	10	484	19	1,207	51	2,365
	Percent of Study Area	1.9%	2.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	42.3%	27.9%	19.2%	20.0%	36.5%	50.0%	98.1%	97.9%
Long Island City	Hunters Point (11101)	15	372	0	0	2	8	1	5	3	13	15	771	202	10,639	9	453	46	3,126	257	14,218
	Astoria (11106)	19	479	0	0	0	0	0	0	0	0	11	271	18	877	0	0	3	82	21	959
	Subtotal	34	851	0	0	2	8	1	5	3	13	26	1,042	220	11,516	9	453	49	3,208	278	15,177
	Percent of Study Area	10.0%	5.0%	0.0%	0.0%	0.6%	0.0%	0.3%	0.0%	0.9%	0.1%	7.6%	6.1%	64.5%	67.4%	2.6%	2.7%	14.4%	18.8%	81.5%	88.8%
Maspeth	Glendale (11385)	45	1,534	0	0	3	19	0	0	3	19	0	0	39	1,444	0	0	5	115	44	1,559
	Maspeth(11378)	12	409	0	0	0	0	0	0	0	0	7	250	24	1,140	8	532	17	1,116	49	2,788
	Subtotal	57	1,943	0	0	3	19	0	0	3	19	7	250	63	2,584	8	532	22	1,231	93	4,347
	Percent of Study Area	35.6%	29.6%	0.0%	0.0%	1.9%	0.3%	0.0%	0.0%	1.9%	0.3%	4.4%	3.8%	39.4%	39.4%	5.0%	8.1%	13.8%	18.8%	58.1%	66.3%
East New York	Broadway Junction (11207)	16	394	0	0	1	7	8	101	9	108	0	0	30	1,589	0	0	2	17	32	1,606
	Cypress Hills (11208)	23	489	0	0	0	0	2	120	2	120	0	0	26	2,103	0	0	0	0	26	2,103
	Subtotal	39	883	0	0	1	7	10	221	11	228	0	0	56	3,692	0	0	2	17	58	3,709
	Percent of Study Area	36.1%	18.3%	0.0%	0.0%	0.9%	0.1%	9.3%	4.6%	10.2%	4.7%	0.0%	0.0%	51.9%	76.6%	0.0%	0.0%	1.9%	0.4%	53.7%	77.0%
Greenpoint-Williamsburg	Greenpoint (11222)	22	372	0	0	1	3	1	7	2	10	9	166	69	2,205	0	0	24	1,229	93	3,434
	Northside-Southside Wbg (11211)	42	761	0	0	12	283	4	37	16	320	26	572	43	853	0	0	21	1,156	64	2,009
	Williamsburg-BedStuy (11206)	13	235	0	0	2	9	3	31	5	40	0	0	54	2,161	0	0	8	1,374	62	3,535
	Bushwick - East Wilbg (11237)	14	289	0	0	0	0	0	0	0	0	0	0	37	1,064	0	0	16	878	53	1,942
Subtotal	91	1,657	0	0	15	295	8	75	23	370	35	738	203	6,283	0	0	69	4,637	272	10,920	
	Percent of Study Area	21.6%	12.1%	0.0%	0.0%	3.6%	2.2%	1.9%	0.5%	5.5%	2.7%	8.3%	5.4%	48.2%	45.9%	0.0%	0.0%	16.4%	33.9%	64.6%	79.8%
Sunset Park-Red Hook	Red Hook-Gowanus (11231)	10	425	0	0	0	0	0	0	0	0	0	0	20	263	8	105	2	79	30	447
	Park Slope (11215)	15	151	0	0	0	0	0	0	0	0	4	76	16	311	29	857	0	0	45	1,168
	Sunset Park (11232)	7	262	0	0	0	0	0	0	0	0	20	694	21	829	0	0	54	2,409	75	3,238
	South Sunset Park(11220)	9	101	0	0	0	0	0	0	0	0	6	104	11	231	10	389	11	509	32	1,129
Subtotal	41	939	0	0	0	0	0	0	0	0	30	874	68	1,634	47	1,351	67	2,997	182	5,982	
	Percent of Study Area	16.2%	12.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	11.9%	11.2%	26.9%	21.0%	18.6%	17.3%	26.5%	38.4%	71.9%	76.7%
Total		289	7,052	8	159	568	20,094	19	301	595	20,554	198	6,819	1,272	42,159	77	2,869	228	13,297	1,577	58,325
	Percent of Study Area	10.9%	7.6%	0.3%	0.2%	21.4%	21.7%	0.7%	0.3%	22.4%	22.2%	7.4%	7.4%	47.8%	45.5%	2.9%	3.1%	8.6%	14.3%	59.3%	62.9%

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 Data Source:Hams InfoSource, Jan 2000 & New York City Zoning Resolution Maps as of Nov. 2000

Figure 9: STUDY AREAS LOT AREA 2000 BY "M" DISTRICT

Study Area Name	Special / Mixed Use District Name	Special / Mixed Use Districts	Light Manufacturing District	Medium Manufacturing District	Heavy Manufacturing District	M Districts Subtotal SF Land Area	M & M.U. Districts Subtotal SF Land Area	Study Area Total SF Land Area
		SF LAND AREA	SF LAND AREA M1	SF LAND AREA M2	SF LAND AREA M3			
Chelsea-Garment District	Subtotal	2,548,292	9,757,742	5,039,188	0	14,796,930	17,345,221	29,606,019
	% Tot. M & MU Dist.	14.7%	56.3%	29.1%	0.0%	85.3%	100.0%	
	% Tot. M		65.9%	34.1%	0.0%	100.0%		
	Garment Center	1,803,547						
	M1-6M District	476,313						
Soho- Tribeca	Subtotal	6,248,449	2,533,009	2,588,314	0	5,121,324	11,369,772	17,509,688
	% Tot. M & MU Dist.	55.0%	22.3%	22.8%	0.0%	45.0%	100.0%	
	% Tot. M		49.5%	50.5%	0.0%	100.0%		
	Lower Manhattan Mixed Use District	2,746,434						
	M1-5A District	995,572						
Hunt's Point	Subtotal	0	9,209,143	952,433	26,517,445	36,679,021	36,679,021	39,410,057
	% Tot. M & MU Dist.	0.0%					100.0%	
	% Tot. M		25.1%	2.6%	72.3%	100.0%		
	HuntersPoint Special District	2,909,792						
	M1-3D District	2,734,494						
Long Island City	Subtotal	5,644,286	38,017,826	1,351,073	13,511,693	52,880,591	58,524,877	72,323,025
	% Tot. M & MU Dist.	9.6%	65.0%	2.3%	23.1%	90.4%	100.0%	
	% Tot. M		71.9%	2.6%	25.6%	100.0%		
	HuntersPoint Special District	2,909,792						
	M1-3D District	2,734,494						
Maspeeth	Subtotal	1,185,817	17,837,388	2,548,799	12,181,580	32,567,766	33,753,584	136,090,719
	% Tot. M & MU Dist.	3.5%	52.8%	7.6%	36.1%	96.5%	100.0%	
	% Tot. M		54.8%	7.8%	37.4%	100.0%		
	M1-1D District	1,185,817						
East New York	Subtotal	0	14,759,831	0	1,088,788	15,848,619	15,848,619	102,192,614
	% Tot. M & MU Dist.	0.0%					100.0%	
	% Tot. M		93.1%	0.0%	6.9%	100.0%		
Greenpoint-Williamsburg	Subtotal	3,849,109	23,591,606	0	47,672,895	71,264,501	75,113,609	131,118,834
	% Tot. M & MU Dist.	5.1%	31.4%	0.0%	63.5%	94.9%	100.0%	
	% Tot. M		33.1%	0.0%	66.9%	100.0%		
	Special Northside Mixed Use District	3,657,904						
	Special Franklin St. Mixed Use District	191,204						
Sunset Park- Red Hook	Subtotal	4,258,499	11,601,447	17,474,395	32,983,591	62,059,433	66,317,932	128,609,827
	% Tot. M & MU Dist.	6.4%	17.5%	26.3%	49.7%	93.6%	100.0%	
	% Tot. M		18.7%	28.2%	53.1%	100.0%		
	M1-1D District	622,569						
	M1-2D District	3,635,930						
TOTAL SF		23,734,451	127,307,992	29,954,202	133,955,990	291,218,184	314,952,636	656,860,783
% Tot. M & MU Dist.		7.5%	40.4%	9.5%	42.5%	92.5%	100.0%	
% Tot. M			43.7%	10.3%	46.0%	100.0%		

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 Data Source: LotInfo 2000, Spacetrack Inc. Jan 2000& New York City Zoning Resolution Maps as of Nov. 2000

Figure 10: STUDY AREAS "OTHER" USES 2000

Study Areas "Other" Uses Lot Area 2000

"Other" Land Uses Categories	Chelsea-GD	Soho-Tribeca	Hunts Point	Long Island City	Maspeth	East New York	Gpt-Wilbg	Sunset Park-Red Hook	LOT AREA SF	% Lot Area
Asylums & Homes	89,661	3,114	184,579	80,409	8,797	352,795	288,685	112,704	1,120,744	0.5%
% of Study Area's "Other" Uses	1.2%	0.1%	0.9%	0.4%	0.0%	1.2%	0.8%	0.2%	0.5%	
Educational Facilities	948,650	707,144	196,735	1,321,897	1,297,386	3,124,412	3,780,682	1,935,636	13,312,542	5.9%
% of Study Area's "Other" Uses	12.2%	16.1%	1.0%	6.0%	2.3%	10.9%	10.0%	4.0%	5.9%	
Government Facilities	114,396	81,946	354,502	742,242	5,147,401	348,841	2,565,419	791,834	10,146,582	4.5%
% of Study Area's "Other" Uses	1.5%	1.9%	1.8%	3.3%	9.1%	1.2%	6.8%	1.6%	4.5%	
Health Facilities	271,602	17,291	0	150,953	116,287	942,401	881,270	755,914	3,135,718	1.4%
% of Study Area's "Other" Uses	3.5%	0.4%	0.0%	0.7%	0.2%	3.3%	2.3%	2.3%	1.4%	
Indoor Public Assembly	1,518,850	50,219	20,005	223,290	310,394	163,192	261,795	250,988	2,798,734	1.2%
% of Study Area's "Other" Uses	19.5%	1.1%	0.1%	1.0%	0.6%	0.6%	0.7%	0.5%	1.2%	
Other Misc.	331,365	535,282	7,283,472	1,769,902	31,230,367	13,091,884	4,179,741	4,084,791	62,506,805	27.6%
% of Study Area's "Other" Uses	4.3%	12.2%	36.3%	8.0%	55.5%	45.8%	11.0%	8.4%	27.6%	
Outdoor Recreation	357,342	424,476	140,767	1,156,697	12,523,560	5,598,826	4,263,273	6,874,876	31,339,817	13.9%
% of Study Area's "Other" Uses	4.6%	9.7%	0.7%	5.2%	22.2%	19.6%	11.2%	14.1%	13.9%	
Religious Facilities	411,474	206,009	268,159	665,666	736,062	1,595,024	1,610,768	1,619,562	7,112,724	3.1%
% of Study Area's "Other" Uses	5.3%	4.7%	1.3%	3.0%	1.3%	5.6%	4.2%	3.3%	3.1%	
Transportation Facilities	533,732	2,077,299	31,534	2,920	157,555	0	12,534,986	27,043,907	42,381,933	18.7%
% of Study Area's "Other" Uses	6.8%	47.2%	0.2%	0.0%	0.3%	0.0%	33.0%	55.4%	18.7%	
Utilities	3,218,687	295,485	11,571,485	16,049,184	4,791,608	3,382,617	7,627,483	5,384,926	52,321,475	23.1%
% of Study Area's "Other" Uses	41.3%	6.7%	57.7%	72.4%	8.5%	11.8%	20.1%	11.0%	23.1%	
TOTAL LOT AREA	7,795,759	4,398,264	20,051,238	22,163,160	56,319,418	28,599,993	37,994,102	48,855,139	226,177,073	100.0%
% of Total "Other" Uses	3.4%	1.9%	8.9%	9.8%	24.9%	12.6%	16.8%	21.6%	100.0%	

Study Areas "Other" Uses Building Area 2000

"Other" Land Uses Categories	Chelsea-GD	Soho-Tribeca	Hunts Point	Long Island City	Maspeth	East New York	Gpt-Wilbg	Sunset Park-Red Hook	BLDG AREA SF	% Bldg Area
Asylums & Homes	511,417	14,925	933,670	64,917	12,221	361,244	301,633	345,615	2,545,642	3.0%
% of Study Area's "Other" Uses	3.7%	0.2%	34.3%	1.3%	0.3%	3.9%	1.7%	1.4%	3.0%	
Educational Facilities	3,927,039	2,843,737	251,500	2,562,686	2,003,637	4,602,663	6,006,852	3,115,229	25,313,343	30.1%
% of Study Area's "Other" Uses	28.6%	43.8%	9.3%	49.5%	56.3%	50.0%	33.2%	12.5%	30.1%	
Government Facilities	289,374	447,716	65,983	868,211	57,289	500,176	855,446	1,349,448	4,433,643	5.3%
% of Study Area's "Other" Uses	2.1%	6.9%	2.4%	16.8%	1.6%	5.4%	4.7%	5.4%	5.3%	
Health Facilities	1,426,314	48,082	0	356,813	124,518	1,294,366	1,808,269	1,911,069	6,969,431	8.3%
% of Study Area's "Other" Uses	10.4%	0.7%	0.0%	6.9%	3.5%	14.1%	10.0%	7.7%	8.3%	
Indoor Public Assembly	4,645,754	105,226	14,700	397,269	246,557	325,922	320,324	337,188	6,392,940	7.6%
% of Study Area's "Other" Uses	33.8%	1.6%	0.5%	7.7%	6.9%	3.5%	1.8%	1.4%	7.6%	
Other Misc.	1,707,858	2,372,685	1,375,677	289,567	379,055	683,918	417,463	1,117,576	8,343,799	9.9%
% of Study Area's "Other" Uses	12.4%	36.5%	50.6%	5.6%	10.6%	7.4%	2.3%	4.5%	9.9%	
Outdoor Recreation	112,069	23,254	800	2,330	96,034	100,592	199,837	528,015	1,062,931	1.3%
% of Study Area's "Other" Uses	0.8%	0.4%	0.0%	0.0%	2.7%	1.1%	1.1%	2.1%	1.3%	
Religious Facilities	1,082,943	374,271	75,091	633,280	504,493	1,336,921	2,286,859	2,145,046	8,438,904	10.1%
% of Study Area's "Other" Uses	7.9%	5.8%	2.8%	12.2%	14.2%	14.5%	12.6%	8.6%	10.1%	
Transportation Facilities	51,000	266,830	800	1,190	136,500	0	5,906,240	14,095,781	20,458,341	24.4%
% of Study Area's "Other" Uses	0.4%	4.1%	0.0%	0.0%	3.8%	0.0%	32.6%	56.5%	24.4%	
Utilities	0	0	0	0	0	0	0	0	0	0.0%
% of Study Area's "Other" Uses	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
TOTAL BLDG AREA	13,753,768	6,496,726	2,718,221	5,176,263	3,560,304	9,205,802	18,102,923	24,944,967	83,958,974	100.0%
% of Total "Other" uses	16.4%	7.7%	3.2%	6.2%	4.2%	11.0%	21.6%	29.7%	100.0%	

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 Data Source: LotInfo 2000, Spacetrack Inc. Jan 2000

Figure 11: STUDY AREAS AUTO USES 2000

Study Areas Auto Land Uses Lot Area 2000

STUDY AREA	TOTAL AUTO USES LOT AREA SF	PARKING LOT AREA SF	AUTO SVC LOT AREA SF	PKG % of AUTO LOT AREA	AUTO SVC % of AUTO LOT AREA
Chelsea-Garment District	2,591,461	1,451,222	1,140,239	56.0%	44.0%
Soho-Tribeca	584,925	279,625	305,300	47.8%	52.2%
Hunts Point	1,837,307	207,111	1,630,196	11.3%	88.7%
Long Island City	5,889,445	1,501,596	4,387,848	25.5%	74.5%
Maspeth	4,032,300	1,743,202	2,289,098	43.2%	56.8%
East New York	5,524,887	2,238,319	3,286,567	40.5%	59.5%
Greenpoint-Williamsburg	5,611,186	2,262,767	3,348,419	40.3%	59.7%
Sunset Park- Red Hook	4,508,742	893,948	3,614,794	19.8%	80.2%
TOTAL	30,580,252	10,577,791	20,002,461	34.6%	65.4%

Study Areas Auto Land Uses Building Area 2000

STUDY AREA	TOTAL AUTO USES BLDG AREA SF	PARKING BLDG AREA SF	AUTO SVC BLDG AREA SF	PKG % of AUTO BLDG AREA	AUTO SVC % of AUTO BLDG AREA
Chelsea-Garment District	5,474,779	2,748,874	2,725,905	50.2%	49.8%
Soho-Tribeca	826,808	460,043	366,765	55.6%	44.4%
Hunts Point	944,899	34,002	910,897	3.6%	96.4%
Long Island City	2,744,878	309,488	2,435,390	11.3%	88.7%
Maspeth	1,015,691	46,034	969,657	4.5%	95.5%
East New York	1,364,372	37,533	1,326,839	2.8%	97.2%
Greenpoint-Williamsburg	2,269,515	179,920	2,089,595	7.9%	92.1%
Sunset Park- Red Hook	2,823,591	240,658	2,582,933	8.5%	91.5%
TOTAL	17,464,533	4,056,552	13,407,981	23.2%	76.8%

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 Data Source: LotInfo 2000, Spacetrack Inc. Jan 2000

Figure 12: STUDY AREAS AUTO USES LAND USE ACTIVITY 1989-2000

STUDY AREA	2000* AUTO USES LOT AREA CHANGED & UNCHANGED USES SQ.FT. & PERCENT									2000* TOTAL AUTO USES SF
	1989 AUTO USES (UNCHANGED)		2000* AUTO USES PREVIOUS USE (CHANGED)						Subtotal Changed	
	Auto Uses & Parking	Subtotal Unchanged	Commercial	Manufacturing	Other	Residential	Vacant			
Chelsea-GD	Auto Uses (G1-G9, Z2)	1,955,926	5,982	102,617	109,507	0	417,439	635,545	2,591,471	
	Parking (G1, G6, G7, Z2)	70.5%	0.2%	4.0%	4.2%	0.0%	16.1%	24.5%	100.0%	
Soho-Tribeca	Auto Uses (G1-G9, Z2)	1,023,020	2,536	48,465	77,956	0	299,246	428,203	1,451,223	
	Parking (G1, G6, G7, Z2)	70.5%	0.2%	3.3%	5.4%	0.0%	20.2%	29.5%	100.0%	
Hunts Point	Auto Uses (G1-G9, Z2)	532,180	13,662	20,638	0	0	18,445	52,745	584,925	
	Parking (G1, G6, G7, Z2)	91.0%	2.3%	3.5%	0.0%	0.0%	3.2%	9.0%	100.0%	
Long Island City	Auto Uses (G1-G9, Z2)	257,017	0	0	0	0	0	0	257,017	
	Parking (G1, G6, G7, Z2)	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	
Maspeth	Auto Uses (G1-G9, Z2)	1,050,313	4,571	580,095	91,480	0	118,132	794,258	1,844,571	
	Parking (G1, G6, G7, Z2)	56.9%	0.2%	31.4%	5.0%	0.0%	6.4%	43.1%	100.0%	
East New York	Auto Uses (G1, G6, G7, Z2)	59,447	0	0	0	0	147,801	147,801	207,248	
	Parking (G1, G6, G7, Z2)	28.7%	0.0%	0.0%	0.0%	0.0%	71.3%	71.3%	100.0%	
Greenpoint-Williamsburg	Auto Uses (G1-G9, Z2)	2,375,102	121,694	1,566,151	558,373	32,741	1,189,642	3,468,601	5,843,703	
	Parking (G1, G6, G7, Z2)	40.6%	2.1%	26.8%	9.6%	0.6%	20.4%	59.4%	100.0%	
Sunset Park-Red Hook	Auto Uses (G1, G6, G7, Z2)	141,452	18,549	262,240	105,781	25,606	836,564	1,248,740	1,390,192	
	Parking (G1, G6, G7, Z2)	10.2%	1.3%	18.9%	7.6%	1.8%	60.2%	89.8%	100.0%	
TOTAL S.A. AUTO USE	Auto Uses (G1-G9, Z2)	1,824,937	75,340	405,703	328,516	22,560	1,231,605	2,063,724	3,888,661	
	Parking (G1, G6, G7, Z2)	46.9%	1.9%	10.4%	8.4%	0.6%	31.7%	53.1%	100.0%	
TOTAL S.A. AUTO USE	Auto Uses (G1-G9, Z2)	31,204	26,829	185,105	193,210	20,323	1,208,562	1,634,029	1,665,234	
	Parking (G1, G6, G7, Z2)	1.9%	1.6%	11.1%	11.6%	1.2%	72.6%	98.1%	100.0%	
TOTAL S.A. AUTO USE	Auto Uses (G1-G9, Z2)	2,405,933	85,888	421,827	122,189	52,404	2,173,864	2,856,171	5,262,105	
	Parking (G1, G6, G7, Z2)	45.7%	1.6%	8.0%	2.3%	1.0%	41.3%	54.3%	100.0%	
TOTAL S.A. AUTO USE	Auto Uses (G1-G9, Z2)	364,656	14,672	11,488	17,573	29,275	1,790,947	1,863,955	2,228,611	
	Parking (G1, G6, G7, Z2)	16.4%	0.7%	0.8%	0.8%	1.3%	80.4%	83.6%	100.0%	
TOTAL S.A. AUTO USE	Auto Uses (G1-G9, Z2)	2,084,412	45,434	951,410	410,639	27,065	2,001,806	3,436,354	5,520,766	
	Parking (G1, G6, G7, Z2)	37.8%	0.8%	17.2%	7.4%	0.5%	36.3%	62.2%	100.0%	
TOTAL S.A. AUTO USE	Auto Uses (G1-G9, Z2)	233,730	6,579	82,866	106,378	15,453	1,812,815	2,024,091	2,257,820	
	Parking (G1, G6, G7, Z2)	10.4%	0.3%	3.7%	4.7%	0.7%	80.3%	89.6%	100.0%	
TOTAL S.A. AUTO USE	Auto Uses (G1-G9, Z2)	2,735,597	79,257	568,785	347,722	35,248	736,026	1,767,039	4,502,635	
	Parking (G6, G7, Z2)	60.8%	1.8%	12.6%	7.7%	0.8%	16.3%	39.2%	100.0%	
TOTAL S.A. AUTO USE	Auto Uses (G1-G9, Z2)	100,594	2,100	27,598	93,432	13,339	656,885	793,354	893,948	
	Parking (G6, G7, Z2)	11.3%	0.2%	3.1%	10.5%	1.5%	73.5%	88.7%	100.0%	
TOTAL S.A. AUTO USE	Auto Uses (G1-G9, Z2)	14,964,400	431,827	4,617,226	1,968,406	170,018	7,886,960	15,074,437	30,038,837	
	Parking (G1, G6, G7, Z2)	49.8%	1.4%	15.4%	6.6%	0.6%	26.3%	50.2%	100.0%	
TOTAL S.A. AUTO USE	Auto Svc (G2-G5, G8-G9)	12,753,280	360,561	3,999,464	1,374,077	66,023	1,134,141	6,934,265	19,687,545	
	Parking (G1, G6, G7, Z2)	64.8%	1.8%	20.3%	7.0%	0.3%	5.8%	35.2%	100.0%	
TOTAL S.A. AUTO USE	Auto Svc (G2-G5, G8-G9)	2,211,120	71,266	617,763	594,330	103,995	6,752,819	8,140,172	10,351,292	
	Parking (G1, G6, G7, Z2)	21.4%	0.7%	6.0%	5.7%	1.0%	65.2%	78.6%	100.0%	

*The Auto Land Use 2000 figures used here were adjusted to account for omissions in the 1989 data. The total matching land area with actual 2000 figures is 98%.

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 Data Source: LotInfo 2000, Spacetrack Inc. Jan 2000 & Department of Finance (RPAD) Database 1989

Figure 13: COMBINED MIXED USE DISTRICTS LAND USE 2000

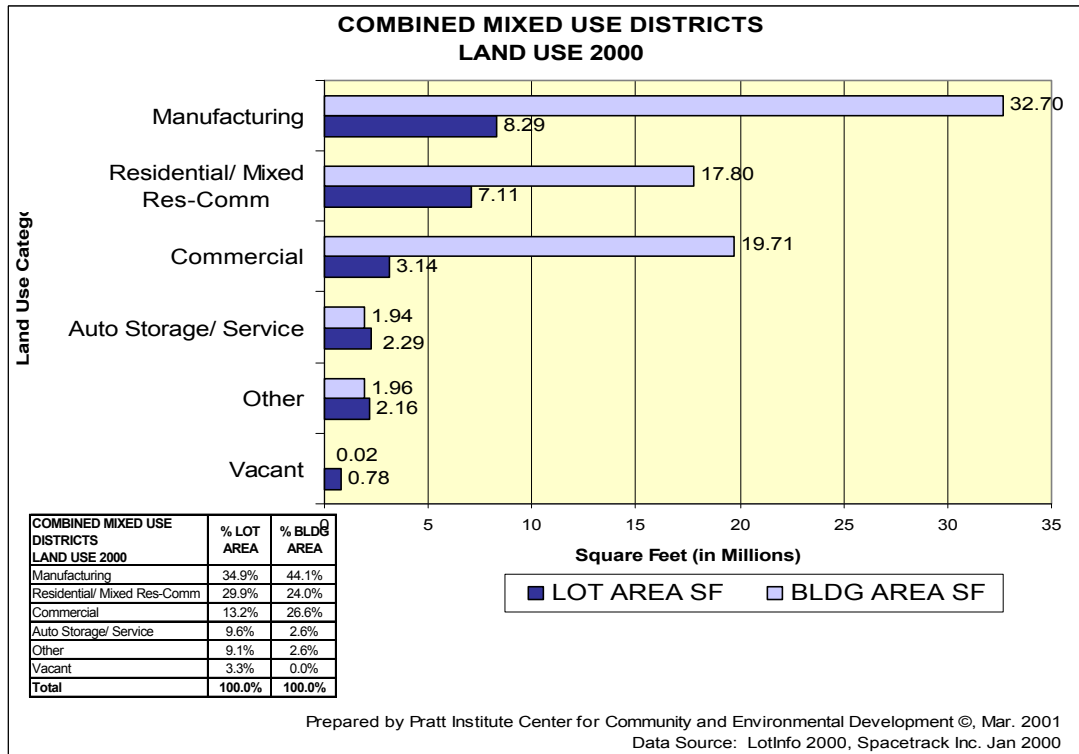


Figure 14: COMBINED MIXED USE DISTRICTS LAND USE CHANGE 1989-2000

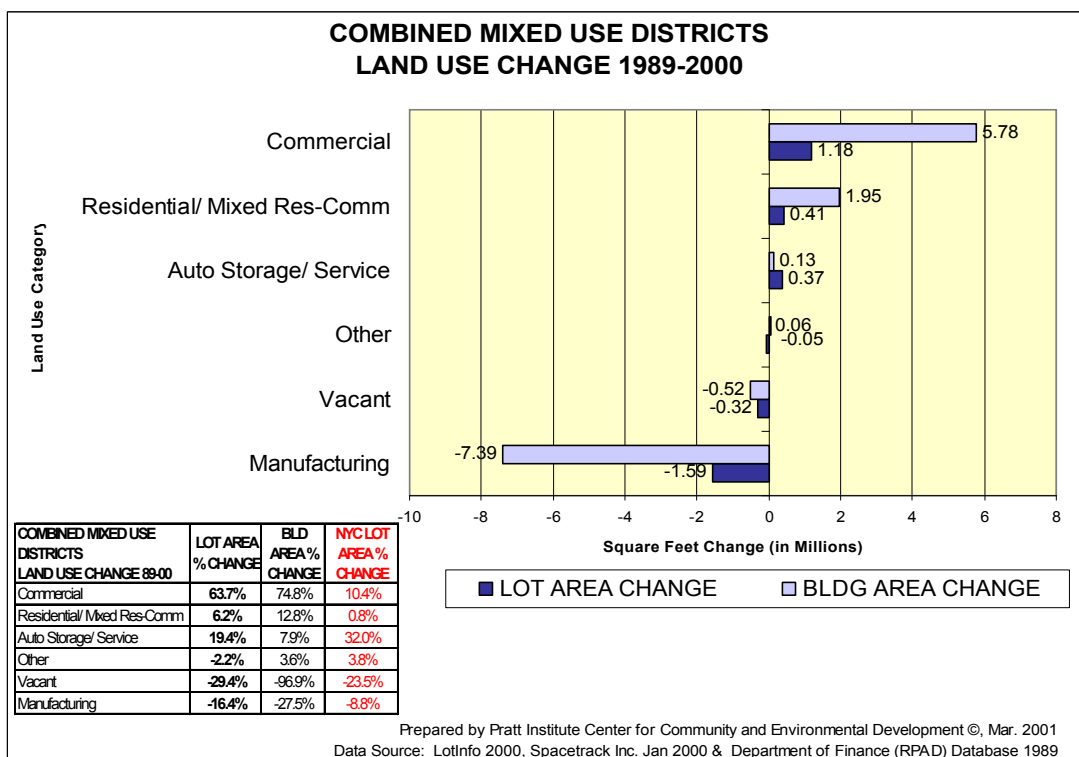


Figure 15: MIXED USE DISTRICTS LOT AREA PERCENT CHANGE 1989-2000

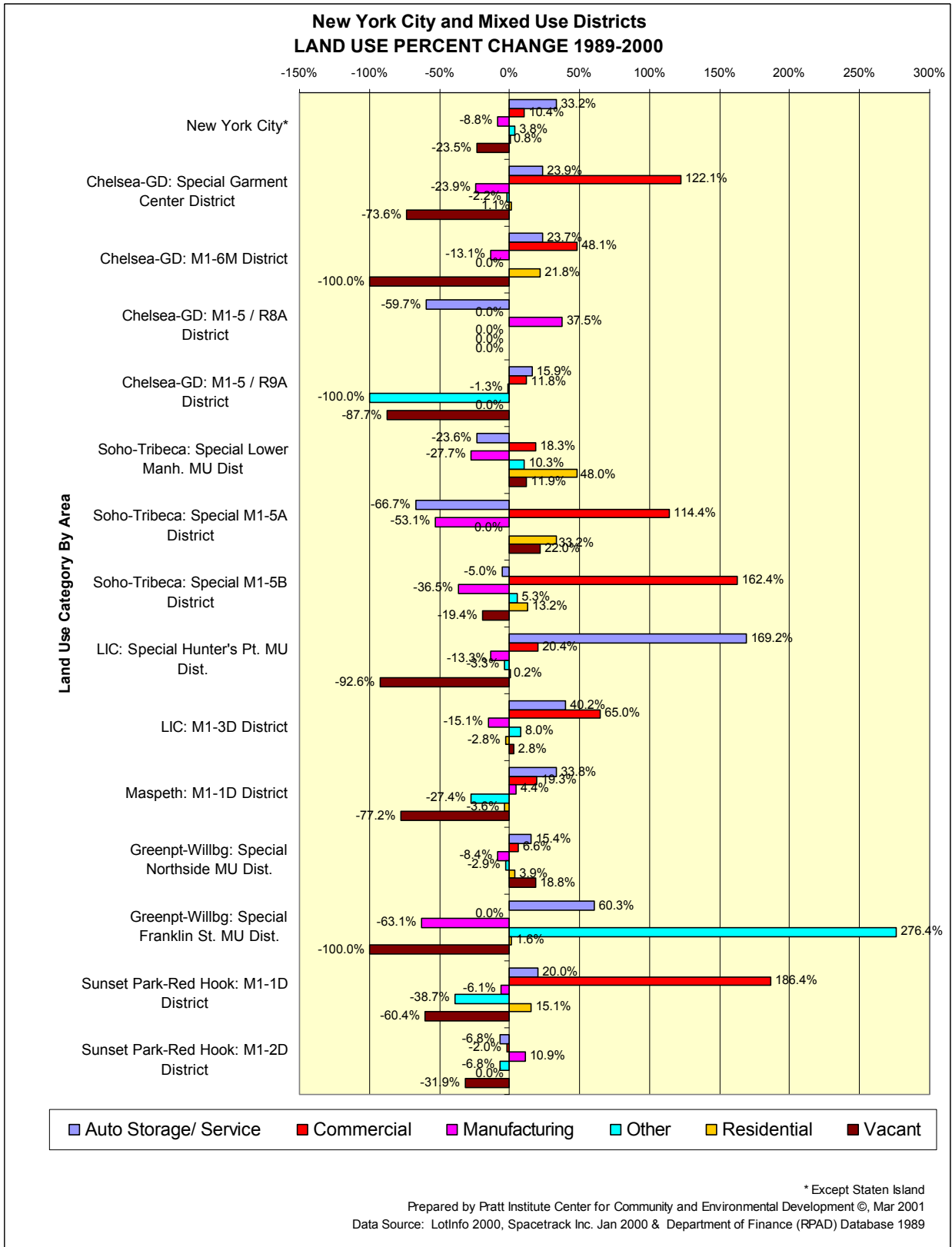


Figure 16: COMBINED INDUSTRIAL PARKS LAND USE 2000

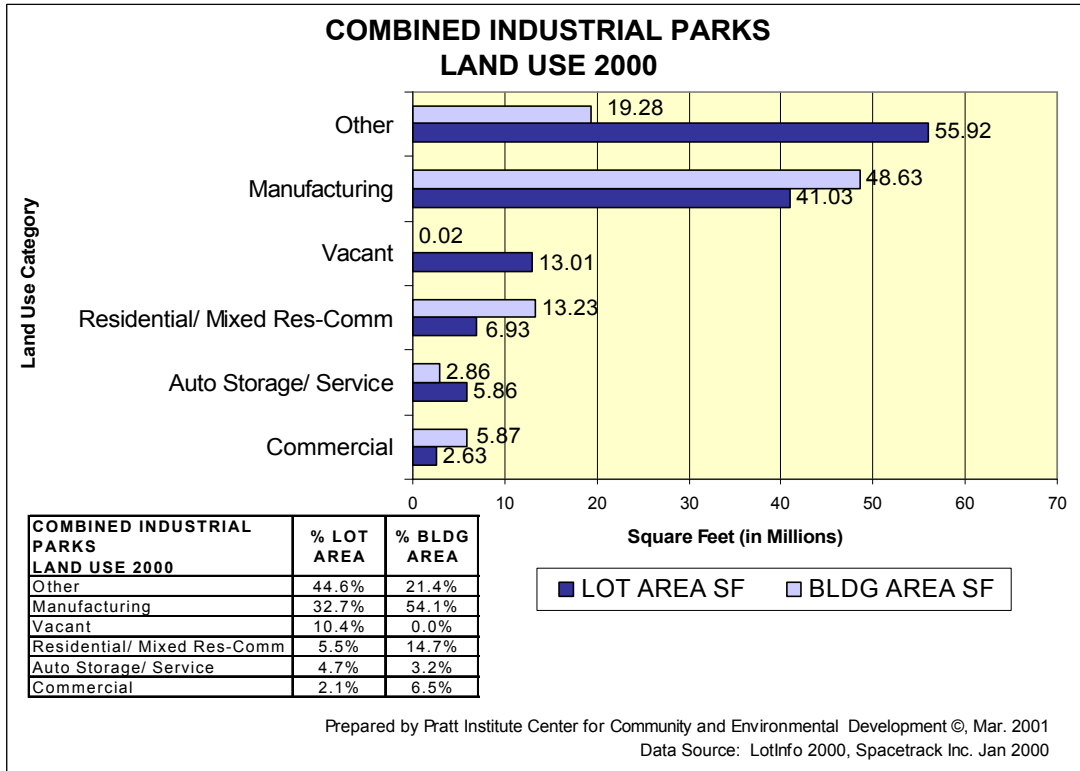


Figure 17: COMBINED INDUSTRIAL PARKS LAND USE CHANGE 1989-2000

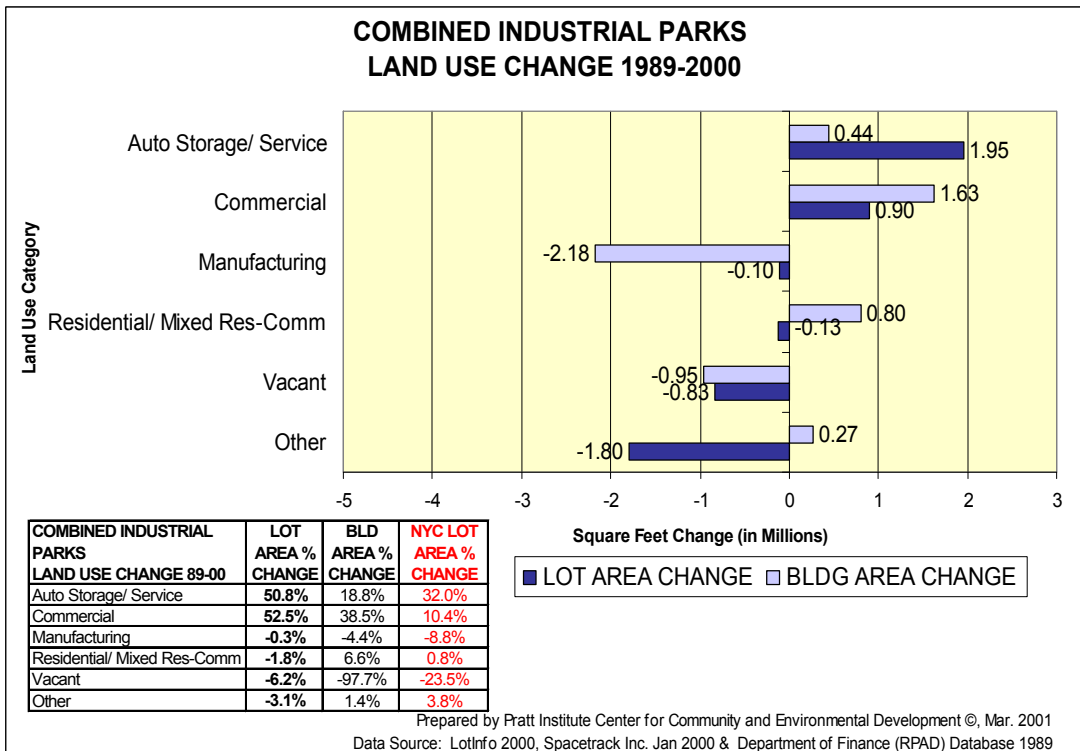
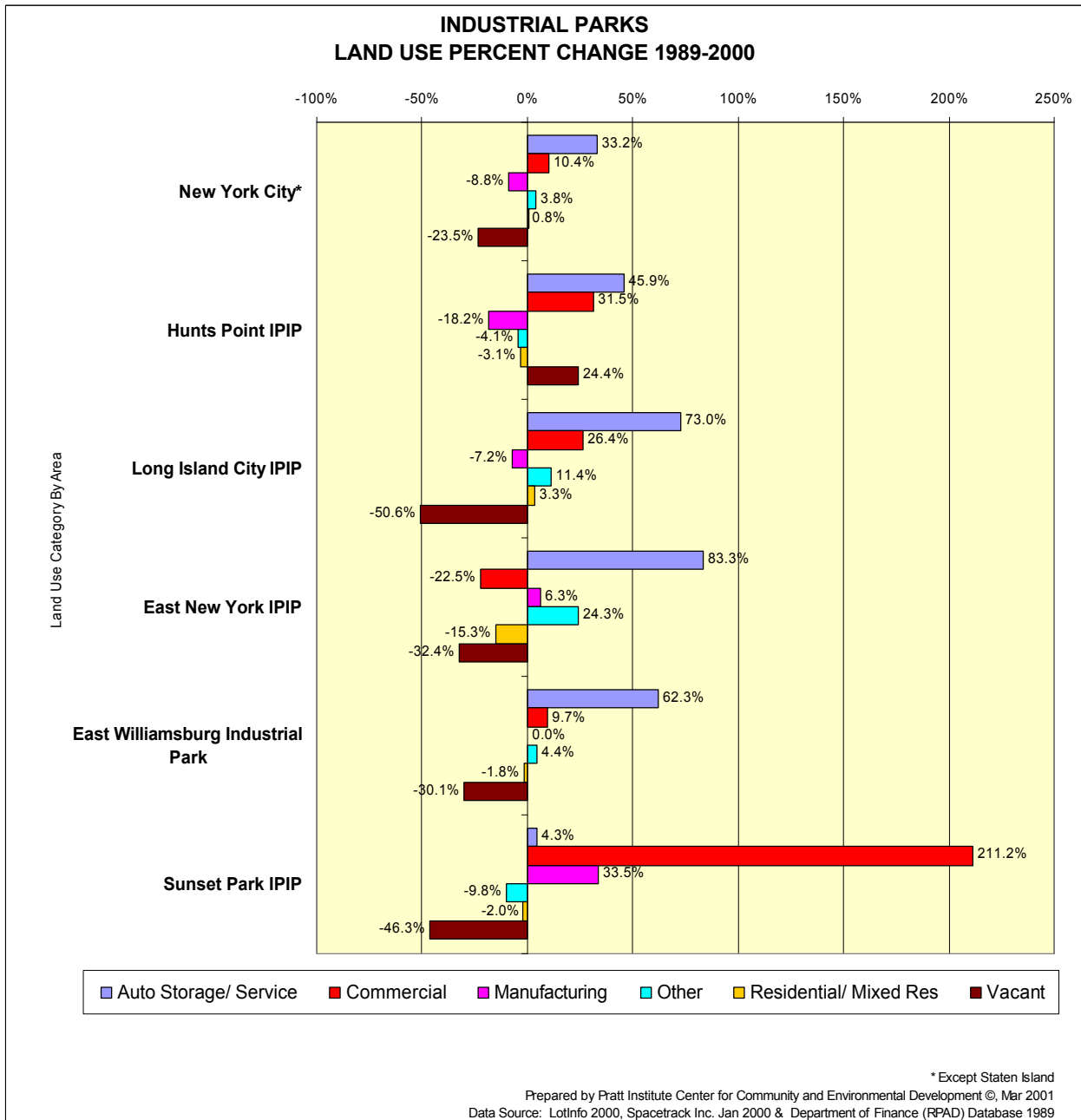


Figure 18: INDUSTRIAL PARKS LOT AREA PERCENT CHANGE 1989-2000



SPECIFIC FINDINGS

Study Areas

STUDY AREA 1: CHELSEA-GARMENT DISTRICT

Note: For detailed information on the Chelsea-Garment District study area's background, current land use and zoning, land use changes, and manufacturing trends, please see Appendix E-1.

Manufacturing Activity

Despite the loss of manufacturing jobs in this area, the Chelsea-Garment District study area contains the largest concentration of manufacturing jobs of all the study areas included in this report, with 33,352 jobs in 1,009 firms⁶. Also, according to Dun & Bradstreet, the study area contains approximately 120,567 industrial jobs, with manufacturing, the largest industrial employment sector containing 48.8% of the total.

Manufacturing in the Chelsea-Garment District study area is a mix of many diverse sectors. The largest among these are Apparel, Printing, Miscellaneous Manufacturing Industries and Textiles. Within Apparel, the dominant activities are in making clothing for men and women, which are further classified into different SIC codes based on their specific activity. Clothing for women (misses, girls etc) makes up 48.5% (7,776 jobs) and clothing for men (boys), 28% (4,423 jobs) of the total employment in Apparel.

For the entire study area, job losses were at a higher rate than at the City.

- Job losses were highest in Apparel and Miscellaneous Manufacturing Industries especially the latter which had a higher rate of decline than the City
- Printing and Publishing and Electronic and Electrical Equipment experienced significant increases though citywide the Electronics sector decreased by 8%.
- Other sectors that showed increases in this period were: Rubber and Misc. Products and Lumber & Wood Products.
- In this study area 59% of the total manufacturing jobs are located outside of the M districts. These businesses and jobs are centered around the Apparel, Printing and Miscellaneous sectors.

Land Use Issues

The Chelsea- Garment district is evenly occupied by 'Other'⁷, Residential, Commercial and Manufacturing uses. Manufacturing districts in this study area contain a mix of predominantly manufacturing and 'other' uses. Nearly 20% (1,018,422 Sq. Ft.) of manufacturing uses are located in residential and commercial districts. Offices occupy a majority of the commercial use land and building area.

⁶ Harris Infosource, Jan. 2000

⁷ Other uses in this analysis include transportation; utilities, parks, schools, community facilities, institutional uses, or any other use not included in the remaining land use categories.

In general, the loss of Vacant and Manufacturing land area was absorbed by Commercial and Residential uses. Residential and Commercial uses together cover nearly 16% of the M-districts, with commercial uses occupying the larger share. These numbers are of concern for the future character of these districts especially since changes to commercial uses have been at a particularly high rate in Manufacturing Districts with rates at more than ten times the city rate. In contrast, manufacturing lot area decreased by one fifth of its total at a higher rate of decline than New York City. Manufacturing uses in M-districts too have suffered losses at nearly one and half times the rate at the borough level between the years 1989 and 2000.

The M-districts in the Chelsea-Garment District are formed by M1 and M2 districts and by the mixed use M1-6M, M1-5 / R8A and M1-5 / R9A districts. M1-zoned land in Chelsea Garment District greatly exceeds the amount of M2-zoned land by a 2:1 ratio. (There are no M3 districts.) Also, with regard to building square footage, M1-zoned manufacturing uses greatly exceed the amount of M2-zoned land by a 9:1 ratio.

The land area of Chelsea Garment District's 'M' districts is dominated by 'Other' and Manufacturing uses.

- Manufacturing lot area decreased by one fifth of its total at a lower rate of decline than Manhattan but higher than the City. Manufacturing building area also decreased rapidly.
- Commercial uses increased at a higher rate of change than Manhattan and New York City.

Special Garment Center District

The land and building area in this district is predominantly occupied by manufacturing uses. Commercial uses are the second largest use with offices having a significant presence. In general,

- Manufacturing land area decreased by one sixth of its total area at a much higher rate than New York City.
- Pressure is high for changes into commercial uses. The decrease in manufacturing building area approximately equaled the increase in commercial building area.
- Changes to residential and 'other' uses, especially their building areas, have occurred at a quicker pace than the borough or the City.
- Apparel is the largest employment sector in this district with 73% of the jobs.

Chelsea Rezoning Area

The Rezoning area is in the central and southern section of the study area mostly dominated by residential uses. Residential building area is four times the manufacturing building area.

- Pressure is high for changes into commercial and auto uses, and vacant land has disappeared at a higher rate than the study area.
- Changes to residential uses too have occurred at a rapid rate though they have been limited in number.
- The Chelsea Rezoning Area contains nearly 2,700 jobs. These are predominantly in Printing and also a significant number in Apparel and Misc. Manufacturing Industries. Most of the firms with one exception are in non-M districts.

M1-5/R8A District Land Use and Zoning

The M1-5/R8A district experienced land use changes wherein the decrease of auto uses led to the conversion of land to manufacturing uses. This district contains only two uses: Manufacturing and Auto, with manufacturing being the dominant use. In the 11 yr period 1989-2000, manufacturing uses increased proportionate to the decrease in auto uses.

M1-5/R9A District Land Use and Zoning

The M1-5/R9A District contains Manufacturing as the largest land use. However, it still experienced losses in Manufacturing though these were at a lower rate than the City. The loss of Manufacturing, Vacant and 'Other' land area was absorbed by Auto and Commercial uses. Miscellaneous Manufacturing Industries with 100 jobs is the only employment sector in this district.

STUDY AREA 2: SOHO-TRIBECA

Note: For detailed information on the Soho-Tribeca study area's background, current land use and zoning, land use changes, and manufacturing trends, please see Appendix E-2.

Manufacturing Activity

This study area contains more than 7,000 jobs. The largest concentrations of jobs is in the Printing sector. . Within Printing, 44% of the jobs are in Commercial Lithographic Printing. According to Dun & Bradstreet, the study area is home to approximately 21,000 industrial jobs, with manufacturing, the largest industrial employment sector containing 52% of the total

- This study area experienced a decline in manufacturing jobs at a higher rate than the City especially Tribeca (Subarea 2).
- There were significant losses in the largest sectors, namely Apparel and Printing which both lost jobs at a higher rate than the City. Apparel, especially had a higher rate of decline among the two sectors. These losses were experienced at a similar rate in both subareas.
- A few sectors gained jobs though small in number, their growth occurred at a higher rate than the City. They were sectors like Industrial. Machinery and Equipment, Stone, Clay and Glass products, Chemicals and Textiles.
- Between the two subareas, Tribeca (Subarea 2) is the largest employer with 69% of the employment in the study area. The bulk of these jobs are in Printing and some in Apparel.
- In this study area 15% of the total manufacturing jobs are located outside the M districts. These are mostly in the sectors of Food, Printing and Industrial and Commercial Machinery.

Land Use Issues

In terms of land uses, the pressure is higher for changes into commercial and residential uses. Changes to commercial and residential uses have been limited in Manufacturing District, but have occurred more rapidly within the Mixed-Use districts. In general;

- Soho-Tribeca remains a predominantly industrial area with established mixed-use districts. Although, the decline in manufacturing land uses experienced in the area during the last ten years is at a lower rate than Manhattan, this area has experienced enormous pressures for changes into residential and commercial uses. The land area of Soho-Tribeca is evenly occupied by Residential, 'Other' and Commercial uses. Although Manufacturing uses are only 17% of the study area, a high percentage of Manhattan's manufacturing land use is located here. Nearly 28% (818,386 Sq. Ft.) of these manufacturing uses are located in residential and commercial districts.
- In Soho-Tribeca 15% of the total manufacturing jobs are located outside of the M districts. Most of these jobs are in Food, Industrial and Commercial Machinery, Printing and Fabricated Metals.

Special Lower Manhattan Mixed Use District

The Special Lower Manhattan Mixed Use District was enacted in 1976 in an attempt to meet the needs of a neighborhood where housing and industry co-exist. It is located on the western side of Canal Street near the Hudson River waterfront and is the only special purpose district in Manhattan. The district was to allow for loft dwellings and joint living-work quarters for artists. Some highlights of the area are:

- It contains a fairly even distribution of Manufacturing, Commercial and Residential uses.
- The rapid loss of Manufacturing uses and the high rate of conversion to Residential and Commercial uses undermine the objectives of this district and also call attention to the future of this area.
- However, this area also experienced decreases in auto uses and vacant land contrary to the increases in the borough and City.
- This district contains 16% of the jobs in the study area with the highest job concentrations being in Printing.

M1-5A District

In the 11-year period 1989-2000, the M1-5A district experienced significant losses in Manufacturing land uses leading to the conversion of land to Commercial and Residential uses. Residential and Commercial uses combined now make up nearly 60% of the building area and more than half of the study area land.

- Manufacturing uses decreased at an alarming rate considering that 20% of the manufacturing use losses in the Soho-Tribeca study area occurred in this district. These losses were at double the rate of decline of the study area or the borough.
- Commercial uses increased rapidly and had the highest rate of increase among all the other uses in this district between '89 and '00. Vacant land too increased in this district.
- Auto Storage land area experienced the highest rate of decrease at 67%.
- This district contains 99 jobs in five firms in the sectors of Printing, Fabricated Metals and Misc. Mfg Industries representing a very small percentage of the jobs in the study area.

M1-5B District

- In the M1-5B district, pressure has been high for conversion of manufacturing use predominantly to Commercial uses. Residential changes though significant in sq. footage have been modest in comparison to the rate of increase of commercial uses. Commercial building area increased rapidly and had the highest rate of increase among all the mixed-use districts in NYC.
- Manufacturing land decreased at a higher rate of decline than Manhattan. Manufacturing building area also experienced high decreases. These decreases approximately equaled the skyrocketing increases in Commercial lot and building area. This district contains 42% of the jobs in the study area mostly in the sectors of Printing and Apparel.

STUDY AREA 3: HUNTS POINT

Note: For detailed information on the Hunts Point study area's background, current land use and zoning, land use changes, and manufacturing trends, please see Appendix E-3.

Manufacturing Activity

The Hunts Point Study Area contains 2,415 jobs in 52 firms as of January 2000. Most of these jobs are in sectors like Fabricated Metals, Food, Rubber products, Lumber products and Industrial and Commercial machinery. According to Dun & Bradstreet, the study area contains approximately 9,357 industrial jobs, with manufacturing, the second largest industrial employment sector containing 35.4% of the total.

- The largest sectors like Fabricated Metal Products and Food make up more than 50% of the jobs.
- Between 1992 and 1999, the Hunts Point Study Area experienced a decline in manufacturing jobs but at a lower rate than the City as a whole. For the entire study Area, Food lost the most number of jobs at more than double the rate of the City. Other sectors that lost jobs include Apparel at a rate of 49% and Leather, which lost all of its jobs.
- However, a few sectors showed growth in the number of jobs and these include Printing, Paper and Chemicals. Among these, Printing showed the highest growth of 78 jobs at a rate of 142%, much higher than the city's rate of increase of 3%.

Land Use Issues

Since M zones cover a large percentage of the study area, the land use patterns in these zones and the study area at large are the same. Manufacturing zones in this study area appear to be overly characterized by 'other', vacant land and auto uses than manufacturing itself. In addition to manufacturing districts, residential and commercial districts also contain manufacturing uses. In this study area, 50,254 Sq. Ft. (0.7%) of manufacturing uses are located outside manufacturing districts. In terms of land use, the loss of Manufacturing, and to a lesser degree residential and 'other' uses was absorbed primarily by vacant land and a small percentage of commercial and auto uses. Changes to commercial and auto uses though limited are of concern as they have occurred at a rapid rate, especially in terms of their building area.

- Most of the manufacturing uses in Hunts Point are located in M zones. These zones cover 93% of the land. However, manufacturing land uses occupy only 19% of their area while more than one half is occupied by 'Other' uses.
- Of the total 20.1 million sq. ft. of 'Other' uses land area, 58% is occupied by Utilities. Miscellaneous land uses, which include the Food Terminal Market too occupy a significant area.
- 'Other' uses tend to be land-intensive uses as illustrated by the fact that although Transportation and Utilities cover nearly 30% of the study area, they create only 5 jobs / acre. In comparison, Manufacturing uses create 21 jobs / acre⁸.
- Manufacturing use decreased by one sixth of its total at a higher rate of decline than the borough or the City.

⁸ Calculations based on Dun and Bradstreet, Market place Analysis, Jan 2000 data.

- Auto Storage uses increased substantially at a rapid rate more than double the borough or the City.
- Vacant land occupies a substantial 24% of the land. Between the years 1989-2000, vacant land increased at a rate of 5%(about 1.2 million sq. ft.) though it decreased in the borough.
- In Hunts Point 2% of the total manufacturing jobs are located outside of the M districts. These are mainly jobs in the Lumber and Wood sector.

STUDY AREA 4: LONG ISLAND CITY

Note: For detailed information on the Long Island City study area's background, current land use and zoning, land use changes, and manufacturing trends, please see Appendix E-4.

Manufacturing Activity

Despite the decline in manufacturing activity, Long Island City still has a large and diverse concentration of manufacturing jobs. Most of these jobs are in sector related to the Design and Fashion and Finance industries, such as Women's clothing, Jewelry and Printing. The review of the area highlights the following:

- A diverse mix of Apparel, Miscellaneous, Printing, Measuring Instruments, Paper, Fabricated Metal and Miscellaneous manufacturing characterize the area, with no industry having more than 16% of the total 17,083 jobs.
- Long Island City Study Area experienced a decline in manufacturing jobs (with the exception of Printing) but a lower rate than the City as a whole, except Astoria (Subarea 2), which lost jobs at a much higher rate.
 - Food and Electronic experienced a decline in the area at higher rates than New York City; Apparel also declined but a lower rate.
 - Printing increased its job base at a higher rate than the City.
 - The area increased the Miscellaneous and Chemicals sector's job base, which declined in New York City as a whole.

Land Use Issues

In terms of land uses, the pressure is higher for changes into commercial and auto uses, and vacant land is rapidly disappearing. Changes to Residential uses have been limited, but have occurred more rapidly within the M-zoned districts close to the waterfront. Since the jobs in these districts are linked to other important sectors of the economy, the retention of these areas as manufacturing should be seriously considered. In general:

- Long Island City remains a predominantly industrial area with established mixed use districts, experiencing enormous pressures for changes into residential and commercial uses. The decline in manufacturing land uses experienced in the area during the last ten years cannot be overlooked, since the area contains a high percentage of Queens' manufacturing land uses (27%). Many manufacturing uses (1,869,913 Sq. Ft.) are also located in residential and commercial districts though they are a small percentage of the total (8.2%) manufacturing uses.
- The rapid decrease of the already scarce vacant land and buildings and their scattered availability represent an issue of concern in the stability and growth of manufacturing and mixed use activity in this study area.
- In Long Island City 5% of the total manufacturing jobs are located outside of the M districts. These businesses and jobs, centered around the Apparel, Industrial Machinery and Miscellaneous sectors are currently grandfathered, but new development or expansion of these businesses is not allowed by the current regulations.

Special Hunter's Point Mixed Use District

The Special Hunter's Point district has been extensively developed during the 11-year period 1989-2000, but it has maintained its mixed use character and diverse manufacturing activity. The review of the area highlights the following:

- Auto-related activity grew exponentially.
- Commercial land and building area also had substantial increases.
- Manufacturing land area declined more rapidly than in Long Island City and the City as a whole.
- Vacant land and building area all but disappeared during the 11-year period.
- Miscellaneous represents the largest manufacturing employment sector in the district with 226 of the total 545 jobs.

M1-3D District

The M1-3D district experienced extensive land use changes during the 11-year period, but still maintains its mixed use character and diverse manufacturing activity. The review of the area highlights the following:

- Residential uses have remained stable albeit a slight decrease at negligible rates.
- Manufacturing lost substantial land (and building) area at a rate higher than the City as a whole during the same period. This loss was rapidly absorbed by Commercial and Auto-related uses, which are allowed as-of-right in M1 districts.
- The districts contain over 1,000 diverse manufacturing jobs, with the highest concentration in Instruments and Apparel.

Long Island City In Place Industrial Park

- Long Island City In Place Industrial Park remains a predominantly industrial area, where Transportation, Utilities and Auto-related uses have grown at a much faster pace than the city as a whole. Manufacturing land, however, have declined, albeit a rate lower rate than the borough and City as a whole
- The rapid decrease of vacant land and it's scattered availability represent a constraint in the growth of manufacturing activity in the Park, even though many of the existing "M" districts allow mid to high density developments. In addition, the large waterfront M3-1 district at the southwest corner is slated for a large housing development (Queens West), which also represents an issue of concern in the stability of manufacturing activity in area.
- A diverse mix of manufacturing activity characterize this park, with Miscellaneous manufacturing, Printing and Apparel providing close to one half of the total 9,264 jobs.

STUDY AREA 5: MASPETH

Note: For detailed information on the Maspeth study area's background, current land use and zoning, land use changes, and manufacturing trends, please see Appendix E-5.

Manufacturing Activity

This study area contains more than 6,000 jobs. The largest concentrations of jobs are in sectors like Paper, Fabricated Metal, Textile, Apparel and Miscellaneous Manufacturing sectors. According to Dun & Bradstreet, the study area contains approximately 30,997 industrial jobs, with manufacturing, the second largest industrial employment sector containing 31% of the total.

- The Maspeth study area experienced job losses but at a lower rate than at the city level though Maspeth (Subarea 1) lost jobs at a higher rate.
 - Job increases were experienced in Apparel and Fabricated Metals though citywide these sectors lost jobs. Apparel increased at a higher rate in Glendale (Subarea 2) than in Subarea 1 while Fabricated Metals increased at a higher rate in Maspeth (Subarea 1).
 - Paper experienced a decline at a higher rate than the City. About 70% of the jobs in Paper are in Maspeth (Subarea 1). Textiles decreased too though at a lower rate.

Land Issues

- The land area in Maspeth is dominated by 'Other' and Residential uses. Land area for 'Other' uses is mostly occupied by Miscellaneous uses (cemeteries, post offices, easements etc), 31 million sq. ft. (55%) while Outdoor Recreational uses (parks, playgrounds etc.) occupy 12.5 million sq. ft. (22%). However, building area for 'Other' uses is predominantly occupied by Educational facilities covering 2 million sq. ft. (56%).
- Pressure has been high for changes into Auto and 'Other' uses. Auto uses at the study area level have grown at a quick pace (75%). 'Other' uses had substantial increases at a higher rate than in Queens' though citywide 'other' uses decreased. There have been significant changes in M zoned land to Auto and 'Other' uses, however these changes have generally occurred at a lower rate than at the city level.
- The decrease of vacant land and buildings at a high rate (64%) and its subsequent conversion to Auto and 'Other' uses is a source of concern
- This area experienced decreases in manufacturing land uses during the last ten years at a rate of 7%. Although this rate is lower than the city rate of 16% and Queens' rate of 11%, it is still cause for concern as this study area covers 25% of Queens' manufacturing land and employs over 6,000 jobs. Also, 4.8% (1,047,197 Sq. Ft.) of manufacturing uses are located in residential and commercial districts.
- About 30% of the manufacturing jobs are located in non-manufacturing districts.

M1-1D District

The M1-D district contains a mix of Manufacturing, Residential and Auto uses. Between 1989 and 2000, this district experienced land use changes wherein the decline in Vacant, 'Other' and Residential uses led to the conversion of land to Manufacturing, Commercial and Auto uses.

- Manufacturing uses experienced growth at a rate of 4.4% though there have been losses at the city level. This growth though encouraging is offset by the high rates of increase in auto and commercial uses and rapid decreases in available vacant land that has occurred in this district.
- Commercial uses had a limited increase in area, however their rate of change was much higher than the borough or the city level.
- Vacant land had the highest decrease losing 35.8 thousand sq. ft at a rate of 77%.
- This district contains 4% of the jobs and 0.2% of the firms in Maspeth. The highest job concentration being in Transportation Equipment (SIC 37) with 80 jobs in one firm making aircraft equipment.

STUDY AREA 6: EAST NEW YORK

Note: For detailed information on the East New York study area's background, current land use and zoning, land use changes, and manufacturing trends, please see Appendix E-6.

Manufacturing Activity

This study area contains nearly 5,000 jobs. The largest concentration of jobs is in the Food sector with a majority of them being in Cypress Hills (Subarea 2). Other sectors that include significant employment include Miscellaneous Manufacturing Industries and Furniture and Fixtures. According to Dun & Bradstreet, the study area is home to approximately 10,945 industrial jobs, with manufacturing, the largest industrial employment sector containing nearly 39% of the total

This study area experienced a decline in manufacturing jobs at a higher rate than the City.

- Some of the highest employing sectors like Food and Misc. Manufacturing Industries experienced a decline in the number of their jobs at higher rates than the City. Misc. Manufacturing Industries especially had a higher rate of decline among the two.
- A few sectors gained jobs though small in number, their growth occurred at a higher rate than the City. They were sectors like Apparel and Paper.
- Between the two subareas, Cypress Hills (Subarea 2) is the largest employer with 56% of the employment in the study area. The bulk of these jobs are in Food and Fabricated Metals.

Land Use Issues

Manufacturing districts in East New York contain a mix of predominantly Manufacturing, 'Other' and Auto uses. Auto and 'other' uses combined occupy about 40% of the land in these districts, equal to that occupied by manufacturing uses. Residential and Commercial uses cover nearly 11% of the 'M' districts. These numbers are of concern for the future character of these districts especially since changes to commercial, 'other' and auto uses have been at a particularly high rate in Manufacturing Districts with auto uses increasing the most at more than three times the city rate. Also, in sharp contrast, manufacturing uses in 'M' districts have suffered losses at more than double the rate at the borough level between the years 1989 and 2000.

- There are 15 manufacturing districts in this study area among which 14 districts contain residential uses. Similarly 9 manufacturing districts contain commercial uses with four of these districts experiencing commercial use change at a higher rate than the study area. These uses along with the high rate of change of auto and 'other' uses and the rapid loss of vacant land lead to a strain on manufacturing uses and thus need to be looked into closely. In addition, 11.5% (825,844 Sq. Ft.) of manufacturing uses are also located in residential and commercial districts.
- In East New York 23% (more than 1,000 jobs) of the total manufacturing jobs are located outside of the M districts. A majority of these jobs are in the sectors of Food, Fabricated Metals, Apparel and Furniture and Fixtures.

Land Use in Industrial Parks

East New York- In Place Industrial Park

The East New York Industrial Park B.I.D. contains a mix of manufacturing, 'other' and vacant uses.

- Between 1989 and 2000, manufacturing uses experienced a small increase though there were decreases at the city level. However, 'other' uses grew rapidly at eight times the rate at the city level. Similarly, auto uses too grew at more than two and a half times the city rate.
- The rapid decrease of vacant land coupled with the high rates of increase in 'other' and auto uses represent hurdles in the continued growth of manufacturing activity in this Park.
- This area contains 322 jobs with more than 60% employed in Primary Metal Industries and Furniture and Fixtures.

Karfield Industrial Park

The Karfield Industrial Park on the southern section of the study area contains a mix of manufacturing and auto uses.

- Although Manufacturing occupies the largest area, it has experienced losses between the years 1989 and 2000. These losses though at a lower rate than the city are of concern when considered in the context of high rates of increase in auto and 'other' uses and rapid decreases in available vacant land that have occurred in this park.
- This park contains 1,503 jobs created in twelve manufacturing sectors. Some of the sectors with more than 200 jobs include Food, Furniture and Fixtures, Printing and Misc. Manufacturing Industries.

Twin Pines Industrial Park Land Use and Zoning

The Twin Pines Industrial Park on the southern section of the study area contains a mix of manufacturing, auto and commercial uses.

- Between 1989 and 2000, Manufacturing land area decreased at a negligible rate though building area experienced some increases. However, this area experienced rapid increases in auto, other and commercial uses especially in auto uses which increased at four times the city rate. These increases and the rapid decrease in vacant land are constraints in the expansion of manufacturing uses. Another issue affecting the future of manufacturing uses in this park the significant area (nearly 22%) occupied by residential and commercial uses, among which the latter experienced increases at higher rates than the city.

This park contains 589 jobs created in 5 manufacturing sectors. The sectors with significant numbers of jobs include Food, Rubber and Miscellaneous products.

STUDY AREA 7: GREENPOINT-WILLIAMSBURG

Note: For detailed information on the Greenpoint-Williamsburg study area's background, current land use and zoning, land use changes, and manufacturing trends, please see Appendix E-7.

Manufacturing Activity

Despite the decline in manufacturing activity, Greenpoint-Williamsburg still has a large and diverse concentration of manufacturing jobs. Most of these jobs are in sector related to the Design and Fashion, Entertainment and Finance industries, such as clothing, food, metal fabrication and printing.

Greenpoint-Williamsburg Study Area experienced a decline in manufacturing jobs at a higher rate than the City as a whole, except Bushwick (Subarea 4), which also lost jobs but at a much lower rate.

Food (with almost 18% of the jobs) leads a diverse group of industries including Apparel, Fabricated Metal, Printing and Miscellaneous each representing 10-15% of the area's 13,685 jobs. Food and Apparel experienced a decline in the area albeit at much lower rates than New York City. Fabricated Metals and Printing, however, increased their manufacturing job base especially Printing, which increased at a rate more than ten times higher than the City as a whole.

Land Use Issues

Greenpoint-Williamsburg remains a predominantly industrial and mixed use area experiencing enormous pressures for changes into residential and other industrial uses. 2.2 million Sq. Ft. (6.4%) of manufacturing uses are located in residential and commercial districts. The slight decline in manufacturing land uses experienced in the area during the last ten years cannot be overlooked, since the area contains a high percentage of Brooklyn's manufacturing land uses.

The rapid decrease of the already scarce vacant land and its scattered availability represent an issue of concern in the stability and growth of manufacturing and mixed use activity in this study area.

In addition, in Greenpoint-Williamsburg 15% of the total manufacturing jobs are located outside of the M districts. These businesses and jobs are, centered around the Apparel, Food and Printing sectors are currently grandfathered, but new development or expansion of these businesses is not allowed by the current regulations.

Special Northside Mixed Use District

The Special Northside Mixed Use District has been extensively developed during the 11-year period 1989-2000, in which manufacturing lost substantial land and building area at rates higher than Brooklyn as a whole, while residential activity grew at higher rates than Brooklyn and the City.

Even though the district has maintained its mixed use character and diverse manufacturing activity, it has also evolved into a predominantly residential and mixed residential/commercial district.

Special Franklin Street Mixed Use District

The Special Franklin Street Mixed Use District has also been extensively developed during the 11-year period 1989-2000, in which manufacturing land and building area all but disappeared. Other types of uses increased during this period, maintaining the area's a mixed use character. However, the district has also evolved into a predominantly residential district.

East Williamsburg In Place Industrial Park

East Williamsburg In Place Industrial Park remains a predominantly industrial area, where Transportation, Utilities and Auto-related uses have grown at a much faster pace than the city as a whole, and even manufacturing has experienced a modest growth.

The rapid decrease of vacant land and its scattered availability, as well as the largely low-bulk zoning regulations for the existing "M" districts represent constraints in the growth of manufacturing or other industrial activity in the Park.

Rethinking manufacturing in Greenpoint-Williamsburg is essential, since there are limited viable areas in New York City where manufacturing businesses can be relocated. Despite the overall decline in manufacturing jobs, the area has witness growth in some sectors vital to New York City's economy.

STUDY AREA 8: SUNSET PARK-RED HOOK

Note: For detailed information on the Sunset Park-Red Hook study area's background, current land use and zoning, land use changes, and manufacturing trends, please see Appendix E-8.

Manufacturing Activity

This study area employs 7,795 jobs. The largest concentrations of jobs are in the Apparel and Food sectors. Chemicals and Printing make up 10% each of the jobs in this area.

- This study area experienced a decline in manufacturing jobs at a lower rate than the City except Red Hook- Gowanus (Subarea 3), which lost jobs at a much higher rate. There were significant losses in Miscellaneous Manufacturing Industries, Transportation Equipment and Textiles, with all of them occurring at much higher rates than the City.
- Apparel experienced a growth though citywide this sector lost jobs. Electronic and Electrical Equipments too had a higher rate of increase than the City.
- Between all the subareas, Sunset Park (Subarea 4) is the largest employer with 54% of the employment in the study area. The bulk of these jobs are in Food and Chemicals.

According to Dun & Bradstreet, the study area is home to approximately 27,037 industrial jobs, with manufacturing, the largest industrial employment sector containing nearly 41% of the total

Land Use Issues

Land uses in Sunset Park- Red Hook are predominantly 'Other' and Residential uses with Manufacturing uses covering roughly 1/6th of the area. This is the only study area in this report that has registered increases in Manufacturing uses overall in the study area and also specifically in M districts. In general, the decline in Vacant and 'Other' land area led to increases in Manufacturing, Commercial, Auto and Residential land area. However, a majority of the increases in building area were cornered by Residential and Commercial uses with Manufacturing uses losing in building area.

- There are 29 manufacturing zoning districts in this area with more than 70% of them containing residential uses among which three districts have experienced residential changes at higher rates than the study area. Although residential uses exist in such a large number of M districts, these M districts have been strong havens for manufacturing uses as illustrated by the fact that Manufacturing uses have grown in these districts. There are more than 6,000 manufacturing jobs in these districts. However, most of the districts which have increases in residential uses at higher rates are the ones in which they have been allowed as-of-right, highlighting the need to focus attention on strengthening existing manufacturing uses in these districts. Also, a significant number of manufacturing uses, nearly 6% (1,190,270 Sq. Ft.) are located in residential and commercial districts.
- In Sunset Park-Red Hook 12% of the total manufacturing jobs are located outside of the M districts. Printing, Food and Rubber and Miscellaneous Plastic Products make up 61% of the jobs in non-M districts.

M1-1D District

The M1-1D district is a mix of primarily Manufacturing, Residential and Automotive uses. This district contains a limited number of manufacturing jobs and firms with a majority of the jobs being in the Food sector. 'Other', vacant and manufacturing uses experienced a decline in this district leading to increases in Commercial, Residential and Auto uses. These uses had comparable increases in terms of sq. footage, however changes to commercial uses were particularly significant that between 1989 and 2000 they grew at more than 10 times the borough rate. Although commercial uses occupy a small share of the district, combined with Residential uses they have the potential to strain manufacturing activity, especially the small manufacturers which predominantly characterize this district.

M1-2D District

The M1-2D district, the second largest special district among the districts reviewed is a mix of Manufacturing and Residential uses. About 65% of the jobs in this district are in the Food and Apparel sectors. Between the years 1989 and 2000, all land uses in this district except manufacturing uses showed decreases in their total lot areas. However, Commercial and Residential did have a very limited increase in their building areas. The decline in vacant land was absorbed mainly by manufacturing uses. In conclusion, it is the only other special district in this report that has experienced growth in manufacturing activity, both in lot area and building area.

Sunset Park In Place Industrial Park

Sunset Park In Place Industrial Park is a mix of predominantly 'other' and manufacturing uses and also some Residential uses.

It contains nearly 22% of the jobs in IPIP's reviewed in this report. Some of the major sectors include Food, Chemicals, Apparel and Electronics.

The rapid decrease of available vacant land and also 'other' land has led to increases in manufacturing and commercial uses. However, the high increases in commercial lot and building area at more than 10 times the study area or the borough rate are of concern and represent a constraint in the future for the secure growth of manufacturing activity in this Park.

CONCLUSION

General Land Use Findings

In New York City, manufacturing land uses not only occupy a very small percent of the total land but considering that during the last 10 years these manufacturing uses and vacant land have declined in favor of primarily automotive and commercial uses, that those auto and commercial uses have occurred rapidly and can and do locate in M zones, and that already a significant percent of manufacturing uses are located in residential and commercial zones and conversely, residential uses are present in most manufacturing zones, we can conclude that the future of manufacturing activity in New York City and the improvement of New York City's environment is predicated on the implementation of appropriate changes in land use and zoning policies.

Manufacturing uses are the predominant land use in special purpose districts in our report. These districts were originally created to facilitate coexistence between residential and industrial uses and to strike a balance between both uses, however they are now experiencing rapid increases in residential and commercial uses and decreases in manufacturing uses, highlighting the necessity to address these issues so that a balanced mix of manufacturing and other uses be maintained in these districts.

Most of the manufacturing zoning districts (M1-M3) in the study areas contain residential uses, which indicate that this condition might be found throughout New York City. Thus, as residents become more actively involved in the environmental health of their communities, the City is likely to face pressures to address their concerns. Therefore, it is critical to establish standards based on the cumulative impacts of industrial activity on these manufacturing and mixed use zones in order to protect their residents and the residents of adjoining neighborhoods.

Industrial Land Use and Zoning Policy Findings

The review of model industrial land use policies in other urban areas has shown that in order to preserve existing manufacturing and foster new development, it is necessary to establish specific manufacturing zones where other types of development such as residential, commercial or other industrial activity are prohibited or very restricted. These zones provide industrial development programs to encourage manufacturing businesses and address environmental issues through regulations designed to curtail noxious uses. Also, periodic reviews to reflect new trends in the economy and to reassess economic and land use priorities are essential for the success of these zones. However, New York City's land use and zoning policies in the past two decades have not reflected any major mechanisms to encourage manufacturing retention and development. In fact the 1993 land use report conducted by the City, *Citywide Industry Study*, seemed to accept the inevitability of the demise of Manufacturing in New York. Issues like the presence of competing uses not related to production based manufacturing and new uses like "Big-Box" retail in manufacturing zones, high rents, rezoning actions by the City and ad hoc land use changes through variances granted by the New York City Board of Standard and Appeals have all adversely impacted manufacturing activity in New York. Also, existing mixed use zoning policies which were created, as stated earlier, to balance manufacturing and other uses have not in all cases made it easy for manufacturing uses to remain and grow in these zones. They are difficult to evaluate since they lack mechanisms to review the regulations and also use outdated performance standards to regulate noxious activity for specific manufacturing activity.

Manufacturing Development Findings

Despite the decline in manufacturing activity in the last 10 years, manufacturing sectors still provide a quarter million jobs in New York City. There are many benefits to retaining manufacturing, one of the most important being that it helps ensure a diverse economy. These sectors are also crucial because they leverage more jobs than any other sector and tend to be traditionally more stable than service jobs. Moreover, manufacturing sectors also offer low-income residents and new immigrants with limited educational credentials and language skills, a chance to enter the job market. Manufacturing firms play a crucial role in maintaining the competitive edge of firms in other sectors like creative/cultural and advertising, service and contribute as 'silent partners' in the economy. However, despite these benefits, manufacturing businesses still face many obstacles like unaffordable high rents in a speculative real estate market making it extremely difficult for small manufacturers to maintain viable businesses.

The City's range of financing, technical assistance and development programs which include IPIP's and other assistance programs are inadequate and limited in power and scope as they offer financial assistance mostly to owners. These programs have to be modified and further refined so that they may benefit the many small manufacturing businesses in New York who are tenants.

Manufacturing Sustainability Findings

New York City's manufacturing zones—and therefore manufacturing itself—are often perceived as threatening to the quality of life due to issues such as truck traffic and the presence of undesirable establishments such as adult entertainment venues and waste transfer stations. In addition, the poor physical condition of manufacturing areas (poor lighting, potholes, illegal dumping) fuels their negative perception. However, green infrastructure techniques hold great promise for improving these areas. In addition, updating the current zoning resolution by implementing performance-based zoning strategies would be an innovative and important way to determine the compatibility of different uses while also providing greater flexibility for developers and ensuring the public health of mixed use neighborhoods. Finally, industrial ecology represents a shift in the conventional ways of thinking about waste and natural resources and firms which have applied some of its principles have been able to save large amounts of money, cut down on waste production, and save natural resources. Eco-industrial parks are emerging as important venues for these practices.

RECOMMENDATIONS

INTENT AND TIMING OF RECOMMENDATIONS

This section of our report outlines a set of recommendations to inform the City's present review of its planning, zoning and land use related development policies in manufacturing and mixed use zones. Our aim is to assist the City to balance competing interests within this valuable but limited supply of land while at the same time helping to retain and expand as much of the City's manufacturing base as is economically and environmentally feasible. The data that we have analyzed and the insights that we have gained from a wide range of industry experts indicates that productive manufacturing and related activity remains a vital part of New York City's economy. In fact, manufacturing in New York City serves as a "silent partner" in our economy by contributing to other sectors such as FIRE, creative/cultural and advertising, and by helping to maintain New York City's competitive edge. The study recommends how and where land use and zoning policy can, by utilizing financial incentives and environmental standards, make it possible to both accommodate dynamic growth in the FIRE, creative/cultural, health care and high technology industries and retain viable manufacturing in the City. We urge New York City to move towards a new industrial and economic development paradigm that integrates 21st century land use, zoning, environmental and financing strategies.

The recommendations that follow are intended to:

- Identify criteria for determining which areas presently zoned for manufacturing are suitable for rezoning to other uses, which should be retained and which should be considered for Mixed Use (non-transitional) and Mixed Use (transitional) Zones. Included is a proposal to create Manufacturing Development Zones in which manufacturing uses would be given extra protections and supports.
- Assist New York City-based industries, over a discrete period of time, to improve their local, regional and global market position by investing in the improvement of their planning, design, management and production capabilities and helping them become more environmentally accountable and economically competitive. And,
- Integrate land use, zoning, environment, tax and program finance policies into a proactive industrial retention policy.

TOWARD A NEW INDUSTRIAL AND ECONOMIC DEVELOPMENT PARADIGM

Over the past three decades, land use needs and issues in manufacturing and mixed use zones have changed dramatically. The nature of manufacturing in the City has evolved significantly from its previous profile of a mix of small, mid-sized and large-scale production businesses to smaller-scale "niche" firms that are integrally related to the City's economic drivers such as the FIRE, creative/cultural and health care industries. These new kind of manufacturers play a key role in New York's economy, yet their existence is threatened to a great extent by real estate pressures.

Today, manufacturers are in competition for space with an array of other equally important uses such as residential and commercial development and municipal services. Unfortunately, the City's manufacturing land use and zoning policies have not kept pace with these changes and have not been able to effectively balance these competing needs. Manufacturers have been at a great disadvantage in the market because other uses are able to pay much higher rents, and because much space in the most desirable manufacturing and mixed use zones is land banked by private owners in anticipation of zoning changes. In recent years, the increasing concentration of noxious uses such as waste transfer facilities in manufacturing zones has added to the instability of these areas because nearby residents have experienced a deterioration in their quality of life and have begun to rally for the rezoning of manufacturing areas.

It is not our assertion that manufacturing uses are of higher value than housing or office development. In fact, we recognize that the City is facing a mounting shortage of housing, particularly among low and middle income residents, and that it must find ways of expanding the supply outside of Manhattan. Moreover, the City needs to provide commercial space for emerging technology related industries, particularly biotechnology, telecommunications and new media, if it is to remain competitive in the "New Economy." However, in a city of the size and economic and demographic diversity of New York, economic development need not be seen as a zero sum game where the ability to take advantage of growth opportunities in one sector is inevitably tied to the demise of other viable sectors. New York need not have to choose between new technologies such as telecommunications, media, and biotechnology and more traditional production-based manufacturing. Nor should meeting the demand for additional office and residential space in New York City be seen as incompatible with retaining manufacturing businesses. On the contrary, the city's remaining manufacturers are silent but crucial partners to other sectors of our economy. They also provide stable, well paying jobs for city residents with limited skills who would otherwise have difficulty in entering and remaining in the job market.

Adequate resources, including land, venture capital, infrastructure and program and regulatory systems, are needed to enable New York City to fully capitalize on the promise of existing and emerging manufacturing related industries. This report urges the City to craft a more comprehensive planning and land use strategy in manufacturing zones that takes into consideration the housing, economic development and environmental needs of New York City -- now and in the future. Moreover, the City, in partnership with existing manufacturing technical assistance organizations such as the Industrial Technology Assistance Corporation and the New York Industrial Retention Network, the various borough-based economic development assistance organizations, labor unions and trade associations, should design a system of incentive-based voluntary improvements to the operations of small and medium-sized manufacturing enterprises to elevate the level of their environmental performance. Our recommendations entail resource and infrastructure investments on the part of the public and private sectors in New York City which will reap future rewards in terms of the City's increased economic competitiveness and environmental accountability.

GENERAL RECOMMENDATION**Overall Findings:**

- 1.a** The land use area for manufacturing purposes has decreased during the last ten years.
- 1.b** Manufacturing has an important role as the “silent partner” in New York City’s economy.
- 1.c** Manufacturing provides stable, well paying jobs for an important sector of the City’s population -- new immigrants and those with less educational opportunities.
- 1.d** There is a growing awareness of the future role that manufacturing will play to improve the quality of the environment

The result of the review and findings on the eight study areas as well as policy findings in New York City and other urban areas suggest the need for a new industrial / manufacturing and economic development paradigm linked to a sustainable development strategy.

1

Establish a system that would coordinate and integrate the place-based delivery of program, financial, technical assistance, environmental, and land use and zoning policies. The system should address development in manufacturing districts in a manner that contributes to the retention and expansion of manufacturing activity and simultaneously the improvement of New York City’s environment.

This financial and technical assistance support system would allow development in manufacturing and mixed use zones in a manner consistent with sound industrial and mixed use zoning policies. This system would enhance the opportunity for the retention and development of manufacturing while improving the quality of the environment. It would be applicable on existing Manufacturing and Mixed Use Districts, and would vary according to their particular characteristics and potential for manufacturing and other types of development.

The system would coordinate and integrate the place-based delivery of policy, program and finance initiatives, technical assistance services, environmental incentives, land use and zoning actions, and its services would be available citywide.

Details about the components and application of this support system are woven throughout the remaining recommendations.

LAND USE AND ZONING RECOMMENDATIONS

Today, manufacturing land uses occupy less than 4% of the City's total land area and less than 7% of its building area. This is a relatively small percentage share of the total, especially considering that many of the City's manufacturing land uses are actually located outside of manufacturing-zoned land where expansion and growth of new manufacturing activity is not feasible.¹ Thus, a continuous decline of land available for manufacturing could jeopardize the future of manufacturing activity in New York City.

Finding #2: In New York City, manufacturing land uses not only occupy a very small percent of the total land but considering:

- that during the last 10 years these manufacturing uses and vacant land have declined in favor of primarily automotive and commercial uses;
- that those auto and commercial uses have occurred rapidly and can and do locate in M zones;
- that a significant percent of manufacturing uses are located in residential and commercial zones and
- that residential uses are present in most manufacturing zones,
- we conclude that the future of manufacturing activity in New York City and the improvement of New York City's environment is predicated on the implementation of appropriate changes in land use and zoning policies.

2

Establish new manufacturing development zones and strengthen existing Manufacturing zones throughout New York City as follows:

2a

Designate existing Manufacturing Zones that have strong concentrations of manufacturing and other industrial uses as “ Manufacturing Development Zones.”

In order to provide special protections to manufacturers who are threatened by competing uses such as auto-related and commercial land uses, M-zoned areas where there is evidence of a large concentration of manufacturing uses and a substantial number of manufacturing jobs should not only be retained, but strengthened through the creation of Manufacturing Development Zones.

¹ This assessment could not be verified by this report at a citywide level, but it is assumed based on the findings for the eight study areas that a large number of manufacturing land uses are located outside of manufacturing-zoned land.

REGULATORY OR ZONING-RELATED CHARACTERISTICS

- Manufacturing Development Zones, or “MD” zones, should overlay the existing M1, M2 and M3 zones and should, to varying degrees, restrict the location of non-industrial uses in order to provide special protections to manufacturing uses.
- MD zones should greatly restrict, or outright prohibit residential development. Zoning and land use policies in other U.S. cities such as Chicago and Portland have demonstrated that this is necessary to retain manufacturing in urban areas.
- MD zones should require fencing, greening and access restrictions on non-production related industrial uses (SIC Codes 40-51) and should limit allowable parking facilities for wholesale uses (SIC Codes 15-17) to discourage Super stores and large scale retailers from locating within them. Retail / Wholesale uses should only be permitted by special permit after very stringent findings are met.
- Zoning regulations within these MD zones should be amended so that commercial, auto-related and selected other non-manufacturing industrial uses currently permitted as-of-right which have the potential to create negative impacts would need a special permit. Such uses should include utilities, solid waste facilities, and parking as a principal use (which has the potential to increase reliance on automobile transport). The applicant seeking to locate such uses in an MD zone should have to meet a set of City Planning Department promulgated findings that nearby manufacturing functions and adjoining residential and mixed use areas would not be adversely affected by the proposed use and that mitigation measures and compensatory beneficial improvements have been adopted.
- The Board of Standards and Appeals (BSA) variance application process should be modified for applicants within MD zones. Before being considered by the BSA, the applicant should have to show that their application for a special permit had been turned down by the Department of City Planning or the City Planning Commission. The City Planning Commission, acting on the advice of the City Planning Department, the Community Board and the MD zone’s managing entity, should be empowered (after meeting a set of threshold review findings) to grant a special permit for other uses. Since a special permit would trigger a ULURP action, applications would therefore first be brought to the zone’s managing entity and the community board for their information, comment and review and then to the Department of City Planning for threshold review. Only after the applicant has gone through this process and been turned down for a special permit should he/she be permitted to present his/her case to the BSA.
- Any property or business owner who has successfully obtained a special permit and has demonstrated his/her willingness to meet the MD zone’s special environmental protections (such as fencing, greening, parking facilities restrictions and other required mitigation measures) should be eligible to apply for special financial incentives (see the Financial and Technical Assistance Recommendations section).

ADMINISTRATIVE OR LEGISLATIVE CHARACTERISTICS

- Local and state government in New York should work in partnership with existing technical assistance organizations such as the New York Industrial Retention Network and the Greenpoint Manufacturing and Design Center and a newly created Trust for Industrial Space to retain existing manufacturing and promote new manufacturing development in these MD zones. Special efforts should be made to target existing financial program resources to manufacturers in these zones. New financial incentives should also be created to help manufacturers to meet enhanced environmental performance and compatibility standards (see the financial and program recommendations section).
- A publicly accountable managing entity, such as an expanded form of the Local Development Corporations (LDCs) that currently are responsible for the management of In Place Industrial Parks, should be established in each Manufacturing Development Zone. These entities should work in partnership with existing technical assistance providers and should coordinate service and program delivery in these zones.
- The Manufacturing Development Zone designation should be evaluated periodically as part of a cyclical review of New York City's zoning ordinance (perhaps every 10-12 years to allow sufficient time to analyze long-term impacts). Any modifications to the extra protections afforded in the MD zones should take into consideration how well these protections have met their objectives. Any changes should be considered a "major action" and be subject to ULURP.
- New York City, through its relevant government agencies, including the City Planning Department, should employ a policy directive of applying for and targeting state and federal funding resources to Manufacturing zones. To the extent possible, the City should make Manufacturing Development Zones programmatically coterminous with existing city, state and federal designations to take maximum advantage of existing resources. It should target financial incentives to manufacturing tenants relocating to these districts and to landlords agreeing to preserve affordable rents for traditional manufacturing uses. For example, the City should automatically designate newly created MD zones as In Place Industrial Parks as well. Furthermore, where possible, the City should make Manufacturing Development Zones coterminous with existing federal Empowerment Zones and New York State Empire Zones.

2b

Preserve certain existing M-zones that have manufacturing uses and some non-manufacturing industrial uses as Manufacturing zones.

If New York City is to retain small and mid-size manufacturers, provide areas for relocating businesses and position itself to capitalize on emerging industries such as biotechnology, telecommunications and eco-industrial enterprises, adequate space in Manufacturing zones must be developed and preserved. Preserving selected existing manufacturing zones will enable the City to retain needed manufacturing and allow the development of new uses and the construction of new facilities as needs arise. These zones chosen for preservation should have some present manufacturing uses and should not currently be experiencing major new commercial or residential development.

- As with “MD” zones, zoning regulations within M-zones should be amended so that commercial uses currently permitted as-of-right would need a special permit:
 - ✓ Applicants seeking to locate commercial, auto-related and other industrial uses which have the potential to create negative impacts, such as power plants, solid waste facilities, bus depots and parking as a principal use (which has the potential to increase reliance on automobile transport), should have to meet a set of City Planning Department promulgated findings that nearby manufacturing functions and adjoining residential and mixed-use areas would not be adversely affected by the proposed use. These uses should have to meet fencing and greening requirements and should only be permitted if they fulfill “fair share” siting rules that ensure that they are not overly concentrated in certain locations. They should also adhere to limits on off-street parking.
 - ✓ Commercial uses which serve manufacturers (for example, hardware stores which serve the business community and restaurants which serve manufacturing workers) should be encouraged because they help retain manufacturers but they should not exceed 20,000 square feet.
 - ✓ Commercial uses which serve a retail function on a large scale, such as big box stores, should be discouraged, although not altogether prohibited. The City Planning Commission should establish a set a threshold criteria for these businesses, including size (in no case should they exceed 75,000 square feet) and there should be extensive restrictions on parking to discourage increased auto use.
- As-of-right development in M-zones should be limited to manufacturing uses, warehousing, distribution and certain new essentially production-based uses. Construction and parking facilities should be permitted, however, fencing and greening requirements and on-street parking restrictions should be imposed on these uses.

- Manufacturing zones should greatly restrict, or outright prohibit residential development. Zoning and land use policies in other U.S. cities such as Chicago and Portland have demonstrated that this is necessary to retain manufacturing in urban areas.
- Enhanced environmental performance and compatibility standards similar to the Seattle and Vancouver models should be developed by the City Planning Commission and the City's environmental agencies for all districts, including the MD and M zones. Achieving higher performance standards than are currently required by environmental laws and regulations would be voluntary but would be encouraged through as-of-right financial incentives such as tax credits, forgivable loans, and other grant and loan mechanisms. The repayment of loans would be made possible by savings resulting from the improvements undertaken by businesses. The public cost for these programs would be more than offset by reductions in the need for public investment in infrastructure and outlays for mandated remediation measures (see the Environmental Recommendations section).

Finding #3: A significant percentage (78%) of manufacturing zoning districts in New York City already contain residential land uses. This overall trend is not likely to be reversed, especially in light of the tremendous pressure for more housing in New York City. During the last 10 years, residential land uses increased in the combined study areas at a rate twice as fast as the rest of New York City. Within individual M-districts, however, there was a very wide variance in the percentage change of residential land uses. For example, in Soho-Tribeca, residential land use increased by 33%, and in Greenpoint-Williamsburg it increased by almost 6%. In Hunts Point, residential land use decreased by 18% and in East New York, it decreased by almost 9%. Commercial uses also increased in manufacturing zoning districts at rates higher than the City. For instance, in Long Island City's M districts, which contain the largest number of manufacturing jobs commercial land uses increased by 64%.

3

Rezone certain existing M-zones to Residential or Commercial zones where the number of conversions or the amount of new development for commercial or residential use has increased significantly, and they have lost almost all their manufacturing uses.

In certain M-zoned districts, the amount of new development for residential use (and commercial use) is already significantly increased, and there are few existing manufacturing facilities. These districts should be considered for rezoning, although there should be an effort on the part of the city to protect existing manufacturers. Furthermore, increased tax revenues resulting from rezoning actions should be recaptured and allocated to manufacturing retention activities citywide.

- Existing manufacturing uses in these rezoned areas should be allowed to remain by being grand fathered as legal pre-existing nonconforming uses or, for those meeting higher environmental performance and compatibility standards, being reclassified as a permitted use in C zones.
- As this rezoning would result in a decrease of available manufacturing space, a portion of the increased tax revenues resulting from the increased FAR (a zoning measurement for the allowable developable area) should be used to establish a Tax Increment Financing (TIF) system for funding financial incentives to encourage the replacement and retention of traditional manufacturing space.

Finding #4: As a result of new advances in technology, many industrial processes in industries such as printing, apparel, food processing, and selected artisan work are no longer noxious and need not be restricted to manufacturing districts. For example, with the move to electronic printing, problems resulting from fumes, odors, vibrations and noise can now be minimized or eliminated in that industry. Most apparel facilities, except those that involve dyeing or tanning, have few adverse environmental impacts and the noise that results from sewing operations can easily be controlled if the space is air conditioned or other noise baffling measures are taken. Even food processing can be relatively inoffensive, especially when compared to uses already permitted in these commercial zones, uses such as restaurants or bakeries. In addition, 22% of the total study areas jobs [and firms] is located in commercial districts, and 8% in residential districts where they are considered non-conforming uses. This is significant considering that manufacturing activity cannot expand in these districts, and businesses that lease rather than own their land are likely to be more rapidly displaced from areas under intense market pressures.

4

Allow certain manufacturing activities that are currently listed in Use Groups restricted to M-zones to locate, as-of-right, in C-zones if they meet higher environmental performance and compatibility standards.

One strategy for easing the real estate issues facing manufacturers is to allow manufacturing activities which are no longer noxious (due to new advances in technology) to locate in C-zones if they meet certain environmental performance and compatibility standards.

- Financial incentives for manufacturing uses should be available to tenants and landlords who have located in or have been grandfathered in C-zones.
- In addition, technical and financial assistance should be available for businesses to upgrade to the higher performance and compatibility standards required to locate in C-zones.
- However, there should be restrictions on the number of truck movements associated with these manufacturing uses in C-zones and there should be requirements relating to the location of loading bays.

Finding #5: The study areas comprise 109 manufacturing zoning districts M1 through M3. However, 86 of those districts (78%) contain residential land uses. Furthermore, between 1989 and 2000, residential land uses, which increased in the combined study areas at a rate twice as fast as in the rest of New York City, decreased within the M districts, albeit at only half a percentage point. This is significant, considering that 50% of the study areas manufacturing jobs are located in these M districts, and that most of those districts are de facto mixed use areas. All of the above suggests that zoning and land use decisions affecting these manufacturing zoning districts must be carefully considered in order to balance the preservation of manufacturing jobs against residential development pressures.

5

Strengthen and expand mixed use zoning regulations by establishing two types of mixed use zones: Transitional and Non-Transitional according to the following:

5a

Preserve and strengthen existing Mixed Use Districts which have maintained a balanced mix of manufacturing and other uses, have not experienced significant changes to residential uses, and contain a significant number of manufacturing jobs. These districts should be considered Non-Transitional mixed use districts

In order to retain manufacturers in New York City, it is important to preserve and strengthen existing Mixed Use Districts that contain a significant number of manufacturing jobs. Manufacturers in these districts should be provided with incentives to improve their environmental performance, however, in order to mitigate the tensions that are sometimes created when they are located near commercial and residential uses.

- Special financial support and protections for manufacturers (primarily, but not exclusively, for those who are tenants) should be provided so that they are not displaced because of real estate pressures and can continue to operate in these districts.
- Zoning regulations for Mixed Use Districts should be altered to include quality of life environmental and compatibility standards. Financial incentives for manufacturers (both those who are property owners and those who are tenants) to meet these environmental and compatibility standards should be provided. Financing instruments should include the transfer of development rights, industrial easements, cross subsidies, tax incentives, and the proceeds of Tax Increment Financing.
- Enforcement of existing environmental standards should be strengthened. In addition, laws against illegal conversions should be strictly enforced.
- Establish density limits (lower FAR) for residential and commercial development and consider increasing density for manufacturing development.

5b

Create new Non-Transitional Mixed Use Districts in manufacturing areas abutting existing successful Mixed Use Districts with a significant presence of both residential and manufacturing uses.

- These new Mixed Use districts should determine permitted uses and activities through an environmental and compatibility standard rather than through the specification of permitted uses.
- As with the other districts, financing for meeting these standards, for retaining manufacturers and for improved enforcement should be provided.
- Establish density limits (lower FAR) for residential and commercial development and consider increasing density for manufacturing development.

5c

Create new Transitional Mixed Use Districts in Manufacturing zones where residential and commercial uses have already increased significantly and where there are few remaining manufacturing facilities.

- These new mixed use districts would be similar to those that exist today.
- In these rezoned districts, every attempt should be made to preserve remaining manufacturing uses. Financial incentives should be made available to both tenants and landlords. Manufacturing uses that are grandfathered should receive incentives to improve their environmental and compatibility standards. Increased real estate tax revenues should be used to fund the TIF System described in the Financial Incentives section.

5d

The Non-Transitional mixed use district is a new type of Mixed Use Zone which will employ financial and programmatic tools to maintain a predetermined mix of uses.

- These tools should include easements, internal cross-subsidy programs, land trusts, reversionary interests, modifications in the loft law to protect artists and artisans occupying live-work environments, transfer of development rights, and sale of air rights.
- Establish density limits (lower FAR) for residential and commercial development and consider increasing density for manufacturing development.

Finding #6: *New York City's Zoning Resolution has not been modified to incorporate uses that have emerged as part of the New Economy, and most new technology, media, biotechnology and e-commerce businesses have not yet been categorized. Yet, in many ways these high technology uses are similar in function to production and distribution uses, and therefore should have a legitimate place in manufacturing and mixed use zones.*

6

Define and list new economic activities such as telecommunications, media production and biotechnology in the NYC Zoning Resolution and provide for periodic updating of the zoning resolution to list new manufacturing activities, technologies and processes.

- Many of these essentially production-based activities are currently competing with traditional manufacturing uses for space in Manufacturing districts. While similar to many manufacturing production businesses, they generally are compatible with and can afford the higher real estate costs of Commercial zones. As they are currently unlisted uses, their zoning status is unclear.
- These uses should be permitted in Commercial zones (based on predetermined environmental performance and compatibility standards) as well as Manufacturing zones.

Finding #7: · Community-initiated 197a plans throughout Brooklyn and the Bronx have called for quality of life improvements by increasing public access to waterfront areas as a method for alleviating the severe lack of open space and for the enjoyment of the nearby residents, workers, and New York City residents at large. Currently, many manufacturing areas are along the waterfront and therefore are not publicly accessible.

7

Create and implement Waterfront Access plans in Manufacturing and Mixed Use Zones.

- In Manufacturing Zones along the waterfront, a Public Access Waterfront plan, created by a representative coalition of industrial and residential stakeholders as well as the relevant government agencies, should be encouraged and assisted in the development of waterfront access plans, and upon agreement the plan should be adopted into the zoning maps for the area.
- Developers (both profit and nonprofit) should be allowed to implement these plans even when the manufacturing zoning itself is not being changed. Adjoining public street ends should be made available for inclusion in the Waterfront Access area, where appropriate. Tools should be developed to address issues of liability and maintenance of these access areas.

Finding #8: *Even without the sanction of formal rezoning actions, land use changes in manufacturing and mixed use zones have been accomplished on a property-by-property basis through variances granted by the New York City Board of Standards and Appeals (BSA). Unlike other U.S. cities such as Portland, New York City's zoning ordinance provision regarding variances is relatively weak and open to wide interpretation, and has made it possible for a growing number of conversions from industrial to residential and other purposes to take place. The widespread granting of variances has not only short-term effects but long-term ones. Even when property owners merely expect that they may be granted a variance in the future, they tend to keep industrial spaces off the market.*

8

Curtail illegal and legal ad hoc conversion of manufacturing properties.

- The zoning resolution should be amended to strengthen the City's ability to prevent illegal conversions in existing M and mixed use zone. The Mayor's Office and the City Council should provide the Buildings Department with adequate specially assigned staff resources to enforce existing zoning laws.
- The enforcement unit within the City's Department of Buildings, financed by penalties and judgments, should be empowered to investigate and stop the illegal conversion or rental of manufacturing space. This enforcement unit should be empowered to investigate charges of rent gouging and other forms of tenant harassment and should have the ability to levy treble damages.
- The zoning resolution should be amended to require that applicants seeking permission from the Board of Standards and Appeals to convert manufacturing land and/or buildings to another use must first fulfill their obligation to go before the City Planning Commission. Only if their application is denied and after certain findings have been made should they be permitted to appeal. The Board of Standards and Appeals should solely serve as a venue for redress and appeal of unique hardships that prevent the property from being developed to its full potential under the existing applicable zoning.

Finding #9: *In many older industrial areas, especially those in Manhattan or those located near residential or mixed use neighborhoods, loft buildings have increasingly been converted to commercial and residential uses. Conversion to residential uses, while illegal in many cases, has occurred at a rapid pace partially because of the enormous shortage of housing in New York City across the spectrum of incomes. In places such as Greenpoint/ Williamsburg and DUMBO in Brooklyn, conversion trends have been in part sparked by artists and artisans seeking live/work spaces. As the pace and scale of conversion and gentrification of these older industrial areas has increased, many of these artists and artisans have begun to feel the same pressures to move as manufacturers. In some cases, illegal use of manufacturing space by artists and artisans is causing friction with other uses. Today, land use and zoning policies in manufacturing zones must address the space issues facing artists and artisans as well as manufacturers in order to mitigate these conflicts.*

9

In M1 zones, with the exception of Manufacturing Development Zones, allow working artists and artisans to occupy space in manufacturing buildings with accessory living areas as long as they are certified as artists by the Department of Cultural Affairs, or as long as they can demonstrate that they produce some tangible product or service and can prove that they need the type of space that can only be found in an M or loft district.

- Working artist and artisans, meeting the conditions outlined above, should be eligible for some of the financial assistance available to manufacturers, provided that they qualify as working artists or artisans, do not displace manufacturing jobs and can demonstrate a need for the assistance. This type of financial support should also be available to qualified artists living in mixed-use zones.
- In addition, some new regulatory mechanisms which allocate uses, including artist space, in mixed-use buildings should be explored. For instance, 80% of a buildings square footage might be allocated to manufacturing, with the remaining 20% set aside for work space with accessory residential use as long as the residential area (a) is accessory to what is principally work and production space that needs to be located in an M zone or in a loft type structure and (b) is located above the M activities. In addition, the building should be required to meet the compatibility standards established for that area.

FINANCIAL AND TECHNICAL ASSISTANCE RECOMMENDATIONS

Finding #10: While there are a number of financing programs available to manufacturers, many are difficult for small and medium sized businesses to access. One of the major obstacles facing New York City manufacturers is that those who are renters rather than owners of their space (the majority of today's industries) are ineligible to apply for several of the real estate assistance programs.

10

Develop, modify and refine financial assistance programs to help not only manufacturers who own their own facilities, but also those who rent space.

Our specific recommendations are to:

- **Re-establish the Business Relocation Assistance Corporation (BRAC)** and modify it to require contributions from all owners displacing manufacturing space and to enable manufacturers who are forced out of any area to relocate in the M zoned area of their choice. Although the Industrial Relocation Grant (IRG) program provided relatively modest grants (up to \$30,000), it did have some success in retaining manufacturers that would otherwise be driven out of New York City due to its high real estate costs. The reinstatement of this program (including increasing the relocation grant and removing some of its geographic constraints) and the related Relocation and Productivity Program (RPP) would help preserve the City's existing manufacturing jobs base.
- **Expand and simplify the Industrial and Commercial Incentive Program (ICIP)** to enable industrial tenants, not just building owners, to take advantage of its real estate tax abatement and exemptions. The ICIP is currently designed primarily to encourage building owners to invest in capital improvements to their property (in excess of 25% of the building value). Since tenants do not own the entire building or pay the real estate taxes directly, it is difficult even for those who are willing to make capital improvements to meet the 25% threshold or to effectively reap the benefits of real estate tax reduction that must be passed through from their landlord. Allowing pro rated and more modest investments by tenants to qualify for the ICIP and allowing a credit against any business tax owed to the city (not just real estate tax) would make this a much more useful program for many small manufacturers.
- **Revamp the Energy Cost Savings Program (ECSP)** to enable manufacturing tenants to realize its benefits. Again, like the ICIP, because the program is designed primarily to benefit building owners, many manufacturing businesses that rent their spaces (and do not have sub-metered electrical accounts of their own) cannot take advantage of the potential savings that this program represents. Furthermore, since eligibility for this program is tied to participation in ICIP, tenants are even less likely to be able to utilize it.

Finding #11: *Because existing financial programs are disjointed and each require a separate (and sometimes lengthy) application process, many small businesses simply do not have the capacity to apply. The city does not have a coherent, integrated system of incentives and benefits for manufacturing retention, and the numerous government agencies which administer these programs cannot provide one-on-one technical assistance to each applicant. We recommend that the City move to streamline these various benefit programs into a more coherent system, and that it provide increased funding to the not-for-profit agencies who provide technical assistance to manufacturers wishing to access these programs.*

11

Establish a new manufacturing / industrial technical assistance, finance and management support system to work with manufacturers. We propose that city, state and federal economic development agencies, working in partnership with manufacturing retention organizations such as ITAC, NYIRN, MANYC and the various borough-based economic development assistance organizations, labor unions and trade associations should come together to assist existing and emerging manufacturing enterprises to meet the goals outlined in this report. A special commission/panel should be convened to help design and oversee the implementation of the delivery system. The support system should service each of the designated Manufacturing Development Zones.

- All of the potential participants in the this support system, including the Mayor’s Office, all relevant city agencies, NYIRN, ITAC, MANYC manufacturing organizations, manufacturing technical assistance organizations, representatives of labor, the IPIPs, environmental justice organizations, community development corporations, and Local Development Corporations should work to develop this system. In addition, representatives of relevant state and federal agencies should be invited to participate.
- The system should function on a city-wide basis and should work directly with each of the “enhanced” IPIPs that should be established in each of the City’s Manufacturing Development Zones.
- The new manufacturing / industrial technical assistance, finance and management support system should have the following functions:
 - ✓ Serve as a coordinator of the various programs and financial tools that exist and are proposed as part of this report, including the Trust for Industrial Space (described below);

- ✓ Pool and market financing for manufacturing real estate development ventures carried out by IPIPs, CDCs, LDCs, and CDFIs;
 - ✓ Serve as a liaison to the Trust for Industrial Space;
 - ✓ Provide back-up technical assistance to all IPIPs;
 - ✓ Undertake infrastructure improvements;
 - ✓ Assist in implementing area wide ISO 14001 improvements based on incentives and voluntary compliance in meeting and exceeding environmental and sustainable development goals;
 - ✓ Provide research and development assistance to enable small and mid-sized enterprises to develop eco-industrial processes such as zero waste and closed loop manufacturing, demanufacturing and remanufacturing, to reduce waste and consumption of natural resources and to generally integrate environmental performance and financial profitability; and
 - ✓ Foster partnerships
- Since ITAC already provides many of these services, the system should be built around the existing program delivery system. It should have a policy setting body, council or other coordinating entity that could coordinate activities and subcontract with existing organizations to provide additional and enhanced services. ITAC already has the capacity to do ISO type assistance, research eco-industrial process. NYIRN has the capacity to market and provide case management for companies.

11a

Provide existing local development corporations (LDCs) with the funding, technical assistance and training necessary to enable them to evolve into “enhanced” In Place Industrial Park entities.

- There should be one enhanced IPIP for each Manufacturing Development Zone. If the zone does not already have one, a new LDC should be created.
- The enhanced IPIP should have direct management responsibility in its zone and assist adjoining M and mixed-use zones as well as manufacturers located in non-m zoned areas.
- Enhanced IPIPs should have all the powers of existing IPIPs, plus access to the resources of the “system”, more staff, increased training and back-up assistance provided by the system. These IPIPs should:
 - ✓ Manage the In Place Industrial Park
 - ✓ Provide technical assistance to all the manufacturers in their area
 - ✓ Enforce the zoning and land use provisions for their area
 - ✓ Assist in financing
 - ✓ Provide research and development assistance
 - ✓ Comment on all land use, zoning and special permit applications
 - ✓ Foster local partnerships
- In addition, the enhanced IPIP should work with ITAC to assist manufacturers to identify new markets, market their products, develop closed-end productions cycles, and achieve greater levels of eco-industrial efficiency. They should have research and development capacities and be linked to other technical assistance providers. Local manufacturers should have access to technical assistance regarding the following areas: process improvement; quality management systems; business management systems; human resource development; market development; materials engineering; plant layout; product development; energy audits; environmental studies; financial planning; Computer Aided Design/Computer Aided Manufacturing /Computer Aided Engineering; electronic commerce b2b activities; and succession planning.

11b

Provide technical assistance and financial assistance to manufacturing enterprises to encourage them to undertake audits and plans for sustainable manufacturing.

- The owners of these manufacturing establishments will realize direct savings through increased sales, competitiveness and productivity and savings on greater resource efficiencies, reduced costs for raw materials, energy savings and reduction in handling waste. The City will realize indirect savings through the lower costs of handling waste, the reduction in traffic and air pollution, less wear and tear on the infrastructure, reduction in asthma rates, etc.

Finding #12: *The major problem facing manufacturers is not the lack of land zoned for their use, but the affordability of the real estate that is available. One of the reasons that manufacturers today are particularly vulnerable to the pressures of the market is that many of them are small to mid-sized businesses who lease rather than own their space. While ownership is an appropriate strategy for insulating some manufacturing companies from the vagaries of the market, it is neither feasible nor desirable for the majority. Many of New York's manufacturers are small, and therefore do not have the management staff capacity to develop new space. Engaging in real estate development has the potential to siphon management's attention away from core business functions such as marketing. From a public policy perspective, it makes sense to encourage small and mid-sized firms to make investments in equipment or training to improve their competitiveness, rather than to lead them to engage in new activities such as real estate that require new areas of expertise. Finally, renting space rather than owning gives manufacturers the flexibility they need to grow and contract as their businesses change.*

12 **Establish new mechanisms to promote the retention and expansion of manufacturing space. The City should expand economic incentives for the private and not-for-profit sectors to create additional space for rent to the small manufacturers in New York City.**

Our specific recommendations are to:

- Create a **Trust for Industrial Space** to provide institutional support for industrial retention and development. The TIS would be a new entity established to either directly, or in partnership with other entities and private and or public developers, acquire and renovate space suitable for use by manufacturers. The Trust could own, renovate and manage the space itself, or it could encourage the development of manufacturing space by providing financial incentives and technical assistance to private developers or not-for-profit organizations committed to the development of manufacturing space.

The Trust could be funded through a variety of mechanisms. For example, like the successful examples such as GMDC, it might be initially funded by government and foundation grants and contracts, but over time be funded by revenue generated by projects in which the Trust retains equity. As a not-for-profit entity, the Trust could also receive and hold the development rights to industrial properties. A property owner might be induced to make such a gift or “bargain sale” to obtain a tax benefit (equivalent to the amount by which the appraised value exceeds the sales price to the Trust) which could offset capital gains liability on the property or other income tax liabilities. The Trust could also benefit from a transfer of development rights as described in the following section as well as from some types of internal cross-subsidy programs described in the financial recommendations section of this report.

The Trust would manage and operate two new finance programs. These are:

- ✓ **An Industrial Real Estate Investment Trust (IREIT)** to attract private equity investments in the acquisition and preservation of active manufacturing uses in areas threatened by conversion pressures. The use of a IREIT operated by the Trust for Industrial Space gives the Trust the ability to offer a tax-advantaged return on equity for long-term investors while preserving manufacturing space. Such a structure would enable the Trust for Industrial Space to serve and attract financing from an upper tier of investors.
- ✓ **A Transfer of Development Rights (TDR) program** to facilitate the preservation of industrial space by enabling the owners of Industrial property to sell or donate the rights to develop their property for financially more remunerative uses and or uses other than manufacturing. The intent would be to maintain the existing manufacturing building stock in M zones and in mixed-use areas, especially in areas in which market pressures are encouraging speculative conversion of manufacturing space and where the economics of production do not permit manufacturers to compete against more profitable competing land uses. The acquisition of these development rights either through outright purchase, or through the receipt of donated property, could help permanently protect viable manufacturing uses though the subsequent transfer of those rights to the Trust for Industrial Space or another similar entity. Making this a preferred tax investment and/or utilizing the bargain sale provisions of the IRS code could enhance the economic attractiveness of purchasing such development rights.
- **Establish Tax Increment Finance (TIF) districts** in areas slated for rezoning. When land is rezoned from manufacturing to residential or commercial uses, there is potential for land values to increase significantly, by governmental fiat, as it were. The TIF approach can provide an equitable mechanism for the city to recapture and reinvest some part of the increase in property value created by the proposed upzoning actions. A portion of the increased real estate tax revenues generated within the TIF district would be used to back bonds which, in turn, would provide below market interest loans and grants to finance retention and expansion of the area's manufacturing base. These financial mechanisms can be used to maintain the mix in the proposed mixed-use zones and to protect adjoining areas from unintended dislocation consequences due to an overheated real estate market. These loans and grants would also be available to assist manufacturers in these and adjoining areas to remain competitive in the global market by enabling them to meet ISO 14000 environmental standards

A geographic and programmatic nexus between the Tax Increment Finance District and the location of the funds to be generated should be created. The purpose would be to remediate the negative impacts of any rezoning action by providing replacement space for a comparable use.

- Expand the availability of **Industrial Development Agency (IDA) bonds** to developers of rental projects. These tax-exempt bonds offer attractive below-market-interest rates to developers of manufacturing space. Related to this the federally chartered and state chartered banks should be encouraged to develop new financial products that would enable potential owners and developers of speculative multi-tenanted manufacturing space to obtain favorable finance rates and terms.

12b

In certain Manufacturing Retention Zones and/or for certain “endangered” manufacturing industries, offer real estate tax abatements and/or City income tax credits to landlords who agree to retain manufacturers as tenants at below market rental rates.

- Functioning in a manner similar to the negative income tax, the amount of the abatement/credit could be equivalent to the percentage of space occupied by the tenant or to the difference in rental revenue between the tenant and the average market price.
- These benefits should be available to all manufacturing businesses that are economically viable and competitive within their sectors except that they have difficulty in overheated and speculative real estate markets. Specifically manufacturers whose location in the city is important because of the role they play as “silent partners,” are environmentally beneficial, enhance New York City’s competitiveness, reduce traffic and transit volumes, provide efficient and reliable access to vital products, and if they provide needed employment opportunities for area residents, they should be eligible for this kind of assistance.

12c

Expand city and state economic development funding to allow organizations such as NYIRN, MANYC and ITAC to provide the technical assistance and upfront capital needed by small manufacturing businesses.

- Undertake long-term financial planning
- Design and carry out market development strategies
- Comply with performance-based zoning and ISO standards
- Conduct energy and waste stream audits

ENVIRONMENTAL RECOMMENDATIONS

Finding #13: *In light of changes in industrial and commercial practices resulting from improved technology and pollution prevention, our present means of determining compatible uses in manufacturing and mixed used districts is outdated because there are numerous land uses whose operations are designed to function with minimal environmental impacts, but whose “use category” does not permit their location in areas near or adjoining residential areas.*

13

Consider establishing new performance standards as follows:

13a

Prepare an index of compatible uses and activities that would reference environmental performance standards for inclusion in the New York City Zoning Resolution.

One land use tool that could assist New York City to bring manufacturing into the 21st century is the creation of a performance standard-based compatibility index, much like the one successfully developed and implemented in Vancouver. Through this tool, performance standards would be used to determine whether the impacts of a particular activity in a particular location conform to standards of compatibility. Industrial facilities would be permitted in different zoning districts based on the degree to which hazards and nuisances are brought under control, not according to whether the use is included in a list of permitted uses in that zone.

- This index should be prepared by the City Planning Department and the Department of Environmental Protection in consultation with businesses, local environmental agencies, community boards, environmental justice organizations, industrial retention organizations, and citywide and neighborhood civic organizations. It should be similar to the compatibility index used in Vancouver.
- The compatibility index should apply to all Zoning Districts, not just Manufacturing and Mixed Use. Coupled with existing New York City environmental laws, the compatibility index should update and replace the current zoning performance standards. It should be designed to provide greater protection while at the same time providing more flexibility than presently exists.

- Environmental performance standards would address the degree of hazard, air pollution, smoke, dust, noise, glare, odor, erosion and sediment, runoff, liquid, solid or airborne wastes, fumes, traffic, and vibration generated by a particular use. Compatibility Standards and criteria might consider pollution prevention or control, amount of hazardous substances used or stored, engineering design, enclosure, size, scale, hours of operation, trucks and other traffic and landscaping of the facility being reviewed.
- Performance-based zoning would not be predicated on existing use categories but rather on an ongoing assessment of measurable impacts associated with how those firms actually perform. In order to assist them with meeting environmental compliance, firms would be provided with technical assistance in conducting periodic environmental self-audits.
- Manufacturers should be offered financial incentives and technical support to achieve voluntarily developed performance-based goals.
- In order to qualify for this financial and technical assistance, an environmental management plan would be mandatory for all **new** enterprises locating in these areas, however the higher performance-based goals within those plans would only initially be developed and met by each business on a voluntary basis. Over a 10-year period, requirements that all **existing** small and mid-sized enterprises develop environmental management plans would be phased in.
- Existing New York City enterprises forced to relocate for any reason would be exempt from this management plan requirement. However, financial incentives should be provided for them to be able to undertake this kind of an assessment, particularly prior to their move. This would enable them, to the extent feasible, to adopt both new more competitive and environmentally accountable production processes and to utilize "green building technologies," both of which will increase their competitiveness over time but which they may be unable to afford at the time of relocation.

13b

Enforcement of performance standards should be conducted in a manner that is consistent and predictable and that focuses on problem solving

- The Department of Environmental (DEP) protection rather than the Buildings Department would be principally responsible for enforcement as well as training enforcement personnel. Enforcement should encourage remediation and compliance rather than simply enforcement of penalties.
- After receiving training, an oversight committee of manufacturers and community residents should work with DEP to enforce environmental regulations.

13c

Create a “notice to cure” policy for environmental and compatibility violations.

- In order to assist small business in paying for environmental improvements, a “notice to cure” policy should be instituted by all environmental agencies whereby businesses can use up to 90% of the penalty monies from their first violations to invest in environmental improvements to their operations, including investments in alternative fuel vehicles for mobile source violations.
- Repeat violators should pay double or triple the current amount in fines for chronic violations. Rather than going into the City’s general fund, penalties from these subsequent violations would go into a “performance enhancement trust” fund available to all manufacturers for environmental audits and improvements. This fund would also be financed through other mechanisms (see the Financial Assistance section).

Finding #14 : *While there are compelling economic reasons for manufacturing companies to achieve higher environmental performance, there are also some practical reasons. In recent years, residents of communities adjacent to industry have increased their opposition to the negative impacts associated with M-zoned areas. In some cases, the negative environmental impacts have been caused by non-manufacturing noxious uses permitted in M-zones, such as waste transfer stations, sludge facilities, and power plants, and in other cases they have been caused by manufacturers who are not good neighbors to nearby residential areas. However, the cumulative effect of the concentration of burdensome uses and environmentally detrimental facilities in M-zones has prompted some community residents to call for the rezoning of manufacturing districts in order to protect their health and welfare. Thus, environmental issues are threatening the future of manufacturing in New York City. The time has come for government, industry and communities to work towards heretofore mutually exclusive goals – a healthy environment and the retention of New York City’s productive labor-intensive manufacturing base. As a result of recent technological advances that emerged from the field of environmental sustainability, however, these inter-related goals can and should be achieved and are mutually attainable.*

14

Provide incentives for owners and developers in M-zones to undertake sustainable development.

14a

Provide incentives for developers who are undertaking new construction and substantial rehabilitation in M-zones to employ state-of-the-art “green building” technologies.

Green building technologies are designed to ensure that the impact of a building on the environment will be minimal over its lifetime. Green buildings incorporate principles of energy and resource efficiency, practical applications of waste reduction and pollution prevention, good indoor air quality and natural light to promote occupant health and productivity, and transportation efficiency in design and construction, during use and reuse. The Mayor’s Office of Green Building Technology should work with the private sector to identify opportunities for innovation and help create markets for both products and design concepts.

- The additional cost, if any, of these approaches should be underwritten by below market loans and/or forgivable loans and grants to be repaid through future energy savings and increased productivity. These financial instruments should be administered by local banks or by utilities.
- Manufacturing zoning should require site planning that utilizes resources naturally occurring on the site, such as solar and wind energy, natural shading, native plant materials, topography and drainage. Where there is no natural shading, trees, vines and rooftop greening should be strategically located to reduce energy costs, lower ambient temperatures and provide shade, while at the same time reducing air pollution through natural photo-remediation processes.
- Any new development in manufacturing zones should optimize the use of existing infrastructure and mass transportation systems.
- Recycled content and environmentally preferable construction materials and furnishings, consistent with the U.S. Environmental Protection Agency guidelines, should be encouraged.
- Incentives should be provided to private builders to develop buildings that can be deconstructed (where all the component parts can be reused). Land and facilities in manufacturing zones should be set aside to store these materials (as presently proposed by the Long Island City LDC). Energy and materials waste would thus be minimized throughout the building’s life cycle, from design through demolition or reuse.
- New buildings should be designed so that their envelope maximizes energy efficiency.
- The utilization of materials and design strategies to achieve optimal indoor environmental quality (particularly including light and air) should be required.

- Require operation systems and practices which support an integrated waste management system.
- Encourage, wherever possible, the rehabilitation of buildings rather than their demolition.
- When buildings warrant demolition, require the recycling of building materials at demolition and management of water as a limited resource in site design, building construction and building operations.

14b

Where rezoning from Manufacturing to other uses is being proposed, city zoning, land use and related program and financial policies should be employed to promote sustainable development. Ultimately, sustainable development policies should be applied in all zoning districts.

- A policy that encourages building reuse and discourages demolition should be developed.
- Environmental Impact Statement (EIS) guidelines should be revised to require that an EIS being developed for a proposed rezoning action:
 - ✓ include an evaluation of potential demolition and identify opportunities for the recycling of materials and the retrofitting existing buildings;
 - ✓ discuss, where possible, the impact of a proposed rezoning on increased demand for infrastructure investments (i.e., electrical, steam, water, sewage systems, solid waste) and identify remediation actions to offset any increased demand;
 - ✓ include a detailed description of how any additional demand would be avoided through the application of “green building” technologies and other alternative energy strategies; and
 - ✓ identify waste reduction and greater resource and energy efficiency strategies.

14c

Promote, through enhanced Zoning Bulk regulations, additions to the Building Code, and new financial incentives, a green infrastructure policy in M-zones that would direct the City and encourage owners and developers, where and when appropriate, to provide trees, permeable surfaces, vines, shrubs, and roof top greening in order to provide “photo remediation” functions and to act as environmental sinks serving the area.

- To the extent possible, green space and tree planting strategies should be vigorously pursued by the City. Included should be the development of parks, expansion of the City’s “Green Streets” program, and the greening and creation of street end parks, particularly along canals, creeks and other waterways.
- The City should plant in small places and interstitial spaces, shrubs, vines and other vegetation.
- Incentives and technical assistance should be provided for building owners to plant grass and wild flowers on rooftops and in vacant lots and spaces adjoining their buildings. Such green roofing techniques can even include painting roof tops white or silver to minimize the urban heat island effect.
- The City should carry out the greening of all its traffic triangles and create “neck downs,” where feasible, to narrow the openings to residential streets adjoining M zones to discourage trucks from entering and to provide additional space for the planting of trees and shrubs.
- For all new construction, it should be required that developers replace any trees destroyed on the site. If this is not feasible, require the owner or developer to plant offsite or to contribute to a “plant fund.” The city’s rezoning proposal for Long Island City includes a comparable requirement. This strategy should be expanded to all areas of the city, but and especially in M-zones.
- The city should promulgate fencing, screening and planting requirements for all parking lots, open yards and other visually burdensome uses.
- Urban design guidelines should be established to enhance the visual quality of Manufacturing zones and adjoining neighborhoods.

14d

The city should undertake an extensive traffic calming study covering all the M zones, focused particularly on the border areas of M zones in order to:

- ✓ Separate and divert trucks away from residential enclaves and R-zones;
- ✓ Reduce speed of trucks near and in residential areas;
- ✓ Separate residential from M-areas;
- ✓ Reduce the impact of truck incursions into residential areas; and
- ✓ Reduce adverse impacts through planting of trees and shrubs, and where feasible, use appropriate screening, including silent Macadam and other sound absorbing materials, to reduce sound transmission.

A traffic calming strategy should include incentives for:

- The installation of Geographic Positioning Devices on trucks serving the designated areas.
- The conversion to natural gas and / or other energy efficient and non-polluting fuels.

14e

Through financial incentives and code requirements, encourage the private sector to create a new energy infrastructure in Manufacturing zones utilizing solar and other renewable technologies, thereby reducing energy consumption in M-zones.

- Incentives should be provided by the City to encourage private generating or public power generating/distributing utilities to develop on flat rooftops in Manufacturing zones. A solar-based energy infrastructure that would supply primary power to the host building should be developed. Surplus energy would be sold back to the utility for distribution throughout the grid. Utilities should be required to pay the cost of setting up the system on the host building (who in turn provides the easement) in an access arrangement comparable to that presently provided to cable companies in New York City. Such a program, if implemented on a city-wide scale, could satisfy the need for new power generation. It could reduce the cost of electricity for manufacturing, reduce the need for new infrastructure investment and provide for a healthier and cleaner environment and a lower cost.

14f

By passing Brownfields reclamation legislation, New York State should facilitate the redevelopment of abandoned, idled, or under-utilized industrial and commercial facilities where expansion or redevelopment is complicated by real or perceived environmental contamination.

DATA RECOMMENDATION

Finding #15: *The current restrictions on available data make it extremely difficult to document an accurate picture of the health and strength of the manufacturing sector. Although it is clear from interviews and from business directories that the data sets this study had to utilize represent an undercount of businesses, no fully inclusive citywide database is presently available to researchers and the public.*

15

Collect and make available better data for research on manufacturing in New York City. A census of manufacturers that details their location, type of business (NAIC or SIC) and number of employees should be conducted and regularly updated.

- This database should be made available on the Internet. It should enable the private sector, the city and technical assistance organizations to undertake place-based and sector analysis, community-based planning, infrastructure investment and program development in a rational and informed manner.

METHODOLOGY

It is important to advise the reader that the data sets analyzed in the course of this study have certain limitations. One of the major problems encountered in conducting the research for this report was the inconsistency and inadequate quality of much of the existing data on the City's manufacturing employment. Although our information is drawn from the best databases available, in many cases it clearly represents an undercount of the actual universe of manufacturing jobs in New York City. The constraints of time and funding made it impossible for us to remedy this shortcoming through in depth citywide field surveys. Compounding the problem is the fact that many producers, manufacturers and other businesses tend to define what they do in ways that are not always consistent with the terms and definitions used by those who gather and maintain data about this sector of the economy.

For instance, in Red Hook and Greenpoint in Brooklyn, we have good reason to believe that there are more jobs and enterprises than are reported in the widely used Harris InfoSource data. However, because we are looking for current trends and large-scale changes in employment patterns over time, we are compelled to utilize the most current available data sets that allow for temporal analysis, despite their flaws. While the absolute numbers contained in this report may reflect an undercount, we are confident that our analysis accurately describes the trends in the City's manufacturing employment changes over time.

In addition, while the land use data utilized in this study provides the basis for an analysis of patterns in land use, it cannot be considered a comprehensive census of manufacturing activity in any specific area. The land use data in this study are based on Department of Finance building classifications. However, they may not be entirely accurate because Department of Finance personnel in the field are required to assign each tax lot with only one use, and this can obscure multiple uses that are taking place on one tax lot.

Based on our assessment of the imperfections in the currently available data, one of the recommendations of our study is that better and more accurate data be collected and maintained in accessible electronic repositories and that consistent definitions of manufacturing activity be collectively adopted by members of the industry as well as economic analysts and policy makers.

SELECTION OF STUDY AREAS

In order to gain a better understanding of New York City's land use and zoning policies as they relate to manufacturing conditions and trends, eight study areas were chosen to serve as case studies for these issues. The study areas comprise a diverse and statistically significant representation of manufacturing firms and jobs within New York City; together, these areas account for 46% of all of the city's manufacturing firms and almost 37% of its manufacturing-based employment.¹

In addition, most of the areas contain some type of mixed use zoning such as Special Purpose Districts, Loft Zoning (such as M1-5A/B, M1-6M) and M1-D districts. These districts were originally created to retain manufacturing activity and/or strike a balance between manufacturing, commercial, and residential development. In order to evaluate the effectiveness of these districts in achieving their goals, we undertook a temporal analysis of changes in land use, both within and outside these areas, between 1989 and 2000.

¹ Harris InfoSource, January 2000

Five of the eight areas also contain an In-Place Industrial Park, a geographic-based program for industrial development administered by the city's Economic Development Corporation. The study includes a temporal analysis of land uses within these parks.

The eight study areas, located in four boroughs, are defined by zip codes as follows:

No.	STUDY AREA NAME	STUDY SUBAREA NAME ²	ZIP CODES	COUNTY
1	CHELSEA-GARMENT DISTRICT	Fur/Flower District	10001	Manhattan
		Chelsea District	10011	
		Garment District	10018	
2	SOHO-TRIBECA	Soho	10012	Manhattan
		Tribeca	10013	
3	HUNT'S POINT	Hunts Point	10474	Bronx
4	LONG ISLAND CITY	Hunters Point	11101	Queens
		Astoria	11106	
5	MASPETH	Maspeth	11378	Queens
		Glendale	11385	
6	EAST NEW YORK	Broadway Junction	11207	Brooklyn
		Cypress Hills	11208	
7	GREENPOINT-WILLIAMSBURG	Northside-Southside Williamsburg	11211	Brooklyn
		Williamsburg-Bedford-Stuyvesant	11206	
		Greenpoint	11222	
		East Williamsburg-Bushwick	11237	
8	SUNSET PARK-RED HOOK	Park Slope	11215	Brooklyn
		South Sunset Park	11220	
		Red Hook-Gowanus	11231	
		Sunset Park	11232	

For each of these study areas, we assessed their current land use characteristics and manufacturing job activity by sector and reviewed changes in these factors over time.

SIC CODES

Because standard industrial classification (SIC) is one of the most widely used systems of classifying economic activity, its codes -- which divide and subdivide industries into sub-sectors -- are included in various business databases. The SIC is a somewhat limited system because, while it labels a business with a specific classification by type, it does not give an indication of the different types of employment *within* that business. For instance, the printing and publishing industries (which are among New York City's largest manufacturing employers) today provide more white-collar occupations, such as writing, editing and advertising, than blue-collar production jobs.³ On the other hand, much of the food processing industry is included under SIC distribution codes and thus, is not classified as manufacturing at all. Similarly, printing facilities that are embedded in New York City's banking operations are not classified as manufacturing jobs, per se. For these reasons, it is extremely difficult to ascertain how many employees in a business are involved in production of tangible goods (the traditional hallmark of manufacturing activity) and how many work in non-production related positions, such as management.

² The subarea names are based on post office denominations.

³ Citizens Housing and Planning Council, "Factory Floor," *The Urban Prospect* July 1999 [journal on-line]; available from <http://www.chpcny.org>; Internet; accessed June 2000.

Despite this shortcoming, the SIC system was employed in this analysis because it is the only classification method through which longitudinal analyses can be conducted for more than one year, allowing for a temporal comparison of business types and sizes. The North American Industry Classification System (NAICS), another business classification system, was not used because it was only available for 2000.⁴

ZIP CODES

There are two main reasons why the study's basic geographic level of analysis is the zip code. Business firm data available from the New York State Department of Labor (DOL) is aggregated packaged by the firms' zip code, not by individual firm addresses. Therefore, zip codes are the smallest practical areas for conducting geographic analyses of DOL data. In addition, zip codes are a useful way of identifying New York City's neighborhoods. Individually or in groups of two or three, zip codes often (but not always) coincide with popularly recognized neighborhood names. For example, Williamsburg, Brooklyn falls into the 11211 zip code quite neatly. The zip codes 11101 and 11106 comprise the area that is traditionally known as Long Island City.

DATA SOURCES

New York State Department of Labor (DOL)

DOL is one of the most direct sources for data on changes in employment over time. However, there are important shortcomings in the DOL database. In the interest of protecting privacy, its database omits information on the number of employees when there are less than three firms for a particular SIC code operating within a particular zip code. However, the *total* number of jobs for all manufacturing-related SIC codes within a particular zip code is provided. As long as a firm's primary two-digit SIC code falls between 21 and 39, or "manufacturing," it is included in the DOL data that we utilized. As noted above, however, this excludes certain important production activities that fall into other SIC codes such as wholesale trade (SIC codes 50 – 51) and motor freight transportation and warehousing (SIC code 42).

New York City Department of Finance RPAD (Real Property Assessment Database)

We used the NYC 1989 RPAD from the Department of Finance to analyze land use. (Since it was in an IBM mainframe nine-track tape format, we commissioned Chaiken Systems to translate it into a ready-to-use GIS format for MapInfo.⁵) 1989 was the base year that was chosen in order to provide a temporal comparison of land use for an approximate ten-year period (1989-2000).

This database has inherent limitations, which are described in the section on 1989-2000 land use changes. For example, about 6% of the tax lots are missing in Queens, 4.6% are missing in the Bronx, and 4.9% in Manhattan, while Brooklyn had an approximate 2% surplus of tax lots. Staten Island included only 10% of its tax lots, which was insufficient to provide a meaningful analysis. In addition to missing lots, the field containing building square footage information for each entry was often blank. Lastly, the database initially contained many duplicates which had to be eliminated. We caution any potential users of this data source as to these limitations.

LotInfo 2000

LotInfo 2000, a product of Spacetrack, Inc., is a comprehensive GIS-based property and address database for New York City. Its data comes directly from the New York City Department of Finance

⁴ Along with SIC, NAICS codes are included in the Harris InfoSource database of industrial firms in 2000.

⁷ MapInfo is the computer application PICCED uses to do GIS map-making and analysis.

RPAD (property tax assessment) file, which is updated annually. This data is joined to the NYC Department of City Planning base map, and it includes tax lots in the five boroughs. It contains a wide array of fields which contain information for each tax lot, including: ownership, building lot and size, land use, and real estate billing. For the purposes of this study, the database's field for building classification code was utilized as an indicator of land use in 2000.

Since both the 1989 and 2000 land use databases were produced and maintained by the same entity (the New York City Department of Finance) we tried to minimize the discrepancies that often undermine the reliability of longitudinal analyses that rely on data derived from different sources for different points in time.

Harris InfoSource

Harris InfoSource is the only niche provider of in-depth profiles of U.S. manufacturers. This company compiled the first complete national database of manufacturers in 1996. Surveying for their most recent data on New York City was done in 1999 and released in January 2000. This source was used for assessing the current state of industrial firms and employment. Harris defines manufacturing by SIC codes; therefore, they limit their data collection to those firms that are classified by codes 20 through 39.

Harris InfoSource provides the location of manufacturing firms by latitude/longitude and not by street address, allowing for instantaneous geocoding⁶ and spatial analysis using a small level of geography. For example, geocoding was used to tabulate manufacturing jobs within specific areas such as zoning districts and In Place Industrial Parks. However, it should be noted that the absence of business addresses prevented this study from ascertaining the exact location of specific firms, and thus, providing a more accurate analysis of jobs within a block, lot or building.

Dun & Bradstreet

Dun & Bradstreet is a prominent provider of business-to-business credit, marketing, purchasing, and receivables management information for all types of businesses. It is generally more comprehensive than Harris InfoSource and hence, its job counts are higher, even within the same business sector and geographic area. However, the Dun & Bradstreet data we utilized was packaged by zip codes, not by individual street address. Therefore, in order to analyze manufacturing jobs within zoning districts, Harris InfoSource data was used because of its ability to be geocoded at a much more finer scale. In the study, we have provided Dun & Bradstreet manufacturing job counts (for the study areas) from October 2000 in order to complement the Harris InfoSource data, which as noted above, tends to undercount manufacturing jobs and firms. In addition, Dun & Bradstreet data was used to identify *industrial* jobs in their various broad SIC categories (i.e., construction, manufacturing, transportation, and wholesale trade) for each study area and thus place manufacturing in the broader context of all industrial activity.

New York City Zoning 2000

In order to analyze the location of jobs within different zoning districts, we digitized current zoning boundaries for each of the eight study areas using the official zoning maps that accompany New York City's Zoning Resolution as the source. This was a time-consuming effort that was necessary because there is no publicly available source of digitized zoning in New York City. Because we only have digitized zoning for the eight study areas in the year 2000, we were unable to analyze zoning changes over time. Also, due to this constraint, we were unable to compare zoning districts in the eight study areas to the city as a whole.

⁶ Geocoding is the process by which a geographic locale is assigned to a particular database record. This can be done via latitude/longitude, block and lot numbers, or street address.

DATA ANALYSIS

Land Use 2000

In order to study current land use patterns, building classification codes from the LotInfo 2000 database were utilized. Building classification codes are a relatively specific indicator of what a building's use is; therefore, these codes also conventionally serve as an indicator of land use. There are 200 land use categories, so any meaningful analysis requires that these categories be collapsed into a more manageable number of land use types. Specifically, for the purposes of geographically illustrating existing land uses for each study area, the 200 categories were collapsed into 27 as follows (See the General and Specific Land Use Code breakdown at the end of this section):

RESIDENTIAL (1-2 FAMILY)	COMMERCIAL
RESIDENTIAL (WALK UP)	INSTITUTIONS - MEDICAL / ASYLUMS
RESIDENTIAL (WALK UP) -CONVERTED LOFT	INDUST.LOFT / OFFICES
MIXED RESIDENTIAL (WALK UP) / COMMERCIAL	MIXED INDUST.LOFT / COMMERCIAL
RESIDENTIAL (ELEV.) -CONVERTED LOFT	INSTITUTIONS - PRIVATE
RESIDENTIAL (ELEVATOR)	COMMERCIAL OFFICES
MIXED RESIDENTIAL (ELEV.) / INDUSTRIAL -A.I.R.	COMMUNITY / PUBLIC FACILITY / SCHOOLS
MIXED RESIDENTIAL (ELEV.) / COMMERCIAL	PARK / PLAYGROUND / OPEN ACTIVITY
WAREHOUSE & STORAGE	TRANSPORTATION / TRANSIT
HEAVY MANUFACTURING	UTILITIES
LIGHT MANUFACTURING	VACANT
AUTO STORAGE / SERVICE	INSTITUTIONS - GOVERNMENT
LICENSED / PUBLIC PARKING	MISCELLANEOUS
MIXED AUTO STORAGE / COMMERCIAL	

However, for the purposes of analyzing the large quantities of data in each study area, a much more compact system of six land use categories was utilized. These categories are the broadest way of classifying land use for the sake of comparison:

- *Commercial*
All types of commercial uses, from offices to shopping centers to movie theaters to bodegas, were consolidated into one unified category.
- *Residential and Mixed Residential-Commercial*
All residential uses—even when combined with a commercial use in the same building were grouped together under this category.
- *Auto Storage and Service*
This is an individual category because these types of industrial uses have a strong tendency to compete with manufacturing uses, particularly in manufacturing-zoned land. Auto Service establishments include gas stations and garages, while Parking includes lots or multi-story structures.
- *Manufacturing*
This category includes all manufacturing uses, including factories, warehouses, and industrial lofts.
- *Vacant*
All vacant lots were lumped together into a single category regardless of the use to which it is related. Thus, vacant-related manufacturing and vacant-related residential land fall within this single category.

- *Other*

This represents an eclectic mix of uses such as hospitals and other health care facilities, group homes, religious institutions, libraries, museums, community centers, outdoor recreational facilities, transportation facilities, public utility uses, schools, and government installations. Transfer stations are sometimes included in this category, however an undetermined number of these facilities are also included under Auto Storage/Service. Only when this category constituted a significant proportion of all uses within a particular geographic area was it examined in further detail.

Land Use Changes 1989-2000

Due to the omissions in the 1989 land use database, only the lots in common with ones in the 2000 database were compared. 1989 lot data from Staten Island was not compared to its respective 2000 data because only 10% of the former exists in the database. The total lot match of the 1989 data with the 2000 data for the four boroughs combined is 96.5%.

As previously mentioned in the description of the 1989 land use database, the fields containing building square footage information for each lot were often left blank. This hindered our ability to analyze building area growth over time. However, the 1989 database for building area *did* contain land uses for each of the tax lots measured by the square feet of a lot's land area. Thus, by assuming that the total amount of building area in 1989 was the same as that in 2000, we were able to track quantitative changes in building area uses based on the difference in the square feet of land uses for each tax lot between the two years. This method of tracking and cleaning involved a great deal of time and effort; time constraints limited our capability to obtain land use changes with respect to building area at a citywide level. As such, land use changes based on building area were omitted at the citywide and borough level, but were analyzed within the eight study areas.

Manufacturing Jobs and Firms 2000

The Harris InfoSource database on manufacturing firms was the basis for a quantitative assessment of current manufacturing firms by SIC code and number of employees. Using latitude/longitude points that the database provided as a geographical reference, each firm was geocoded to its specific location. Since Harris InfoSource did not provide firms' zip codes, GIS geocoding was used to tabulate data according to specific location. This in turn allowed for analyzing firm type and size based on zip code level geography. Finally, even though Harris InfoSource includes primary, secondary, and tertiary SIC codes, this reports uses the primary SIC code in its analyses.

Changes in Manufacturing Jobs and Firms 1992-1999

NYS Department of Labor data served as the source for analyzing changes in industrial firms and employment over time. Data from 1992 is the earliest available data in digitized form while 1999 data was the most recent available when this study was initiated. Therefore, we compared figures from 1992 to those from 1999.

As previously mentioned (see the section on New York State Department of Labor), DOL's approach to protecting firms' privacy required us to provide an estimate when necessary. Wherever there are less than three firms for a particular two-digit SIC code, DOL leaves the number of total jobs for that SIC code blank. However, these jobs are included in the *total* number of manufacturing jobs by zip code. Therefore, in order to conduct the analysis, we took the discrepancy between the total number of manufacturing jobs reported by DOL and the sum of the jobs in SIC subtotals in the same zip code and evenly distributed the total reported by DOL differential among the SIC categories left blank by DOL. While this methodology does not produce an exact absolute number of jobs for those specific SIC codes in either the beginning or end year of the analysis, it does provide an estimate that is meaningful for analytic purposes.

Two-digit SIC codes were used for this temporal comparison. The four-digit codes were beyond the scope of this analysis; only when a particular two-digit code was broad (i.e. subsumed firm types that were distinct and in which a significant number of jobs were involved) was it examined in further detail. Finally, as previously mentioned, the zip code was the geographic basis for comparison as DOL data is tallied by zip code, rather than address. It is also important to reiterate that, due to the limitations of SIC classification, this temporal analysis of changes in firms and jobs does not differentiate between employees performing in a firm's creative, management and administrative areas versus those in labor (manufacturing production) positions.

GENERAL LAND USE CODE⁷

AUTO STORAGE / SERVICE

AUTO SERVICE

G. GARAGE AND GASOLINE STATIONS:

2. Garage-One Story (Semi-fireproof or fireproof)
3. Garage and Gas Station Combined
4. Gas Station-With Enclosed Lubrication Plant or Workshop
5. Gas Station-Without Enclosed Lubrication Plant or Workshop
8. Garage with Showroom
9. Miscellaneous

PARKING

G. GARAGE AND GASOLINE STATIONS:

1. Garage-Two or More Stories
6. Licensed Parking Lot
7. One or Two Car Garage

Z. MISCELLANEOUS:

2. Public Parking Areas

COMMERCIAL

H. HOTELS

1. Luxury Type-Built prior to 1960
2. Luxury Type-Built after 1960
3. Transient Occupancy-Midtown Man. Area
4. Motels
5. Private Club, Luxury Type
6. Apartment Hotels
7. Apartment Hotels-Cooperatively Owned
8. Dormitories
9. Miscellaneous

J. THEATERS:

1. Art Type (Seating capacity under 400 seats)
2. Art Type (Seating capacity over 400 seats)
3. Motion Picture Theater With Balcony
4. Legitimate Theaters (Theater sole use of building)
5. Theater as Part of Building or Other Use
6. T.V. Studios
7. Off-Broadway Type
8. Multi-Motion Picture Theater
9. Miscellaneous

K. STORE BUILDINGS (TAX-PAYERS INCLUDED):

1. One Story Store Building
2. Two Story or Store and Office
3. Department Stores, Multi-story
4. Stores, Apartments Above
5. Diners, Franchised Type Stand

⁷ Based on RPAD 1989/LotInfo 2000 Land Use Classification Codes

6. Shopping Centers with Parking Facilities
7. Funeral Home
9. Miscellaneous

O. OFFICE BUILDINGS

1. Fireproof-Up to Nine Stories
2. Ten Stories and Over (Side Street Type)
3. Ten Stories and Over (Main Avenue Type)
4. Tower Type
5. Semi-Fireproof
6. Bank Building (Designed exclusively for banking)
7. Professional Buildings
8. With Residential Apartments
9. Miscellaneous

MANUFACTURING

E. WAREHOUSES:

1. Fireproof
3. Semi-fireproof
4. Frame, Metal
6. Governmental Warehouses
9. Miscellaneous

F. FACTORY AND INDUSTRIAL BUILDINGS:

1. Heavy Manufacturing (Fireproof)
2. Special Construction (Printing Plant, etc. Fireproof)
4. Semi-fireproof
5. Light Manufacturing
8. Tank Farms
9. Miscellaneous

L. LOFT BUILDINGS:

1. Over Eight Stories (Mid-Manhattan type with or without stores)
2. Fireproof-Loft and Storage type (without retail stores)
3. Semi-Fireproof
8. With Retail Stores (Other than Type 1)
9. Miscellaneous

RESIDENTIAL / MIXED RES-COMMERCIAL

A. ONE FAMILY DWELLINGS:

0. Cape Cod
1. Two Stories Detached (Small or moderate size, with or without attic)
2. One Story (Permanent living quarters)
3. Large Suburban Residence
4. City Residence
5. Attached or Semi-detached
6. Summer Cottages
7. Mansion Type or Town House
8. Mobile Home/trailer
9. Miscellaneous (Old buildings, attached and semi-detached farm houses, etc.)

B. TWO-FAMILY DWELLINGS:

1. Brick
2. Frame
3. Converted (From one family)
9. Miscellaneous (City type, old, etc.)

C. WALK-UP APARTMENTS:

0. Three Families
1. Over Six Families Without Stores
2. Five to Six Families
3. Four Families
4. Old Law Tenements
5. Converted Dwelling or Rooming House
6. Cooperatives (Other than condominiums)
7. Over Six Families With Stores
8. Co-op Conversion from Loft/Warehouse
9. Garden Apartments/Mobile Home Park/Trailer Park

D. ELEVATOR APARTMENTS

0. Co-op Conversion from Loft/Warehouse
1. Semi-fireproof (Without Stores)
2. Artists in Residence
3. Fireproof (Standard construction without stores)
4. Cooperatives (Other than condominiums)
5. Converted
6. Fireproof-With Stores
7. Semi-fireproof-With Stores
8. Luxury Type
9. Miscellaneous

R. CONDOMINIUMS:

1. One Family (Attached)
2. Walk-up Apartments
4. Apartment Buildings (Elevator)
5. Commercial Buildings
9. Miscellaneous

S. RESIDENCE-MULTI-USE:

1. Primarily One Family with Store or Office
2. Primarily Two Family with Store or Office
3. Primarily Three Family with Store or Office
4. Primarily Four Family with Store or Office
5. Primarily Five to Six Family with Store or Office

OTHER

I. HOSPITALS AND HEALTH:

1. Hospitals, Sanitariums, Mental Institutions
2. Infirmary
3. Dispensary
4. Staff Facilities
5. Health Center, Child Center, Clinic

- 6. Nursing Home
- 7. Adult Care Facility
- 9. Miscellaneous

M. CHURCHES, SYNAGOGUES, ETC.:

- 1. Church, Synagogue, Chapel
- 2. Mission House (Non-Residential)
- 3. Parsonage, Rectory
- 4. Convents
- 9. Miscellaneous

N. ASYLUMS AND HOMES

- 1. Asylums
- 2. Homes for Indigent Children, Aged, Homeless
- 3. Orphanages
- 4. Detention Houses for Wayward Girls
- 9. Miscellaneous

P. PLACES OF PUBLIC ASSEMBLY (INDOOR AND CULTURAL):

- 1. Concert Halls
- 2. Lodge Rooms
- 3. YWCA, YMCA, YWHA, PAL
- 4. Beach Club
- 5. Community Center
- 6. Amusement Places, Bathhouses, Boat Houses
- 7. Museum
- 8. Library
- 9. Miscellaneous Including Riding Academies and Stables

Q. OUTDOOR RECREATION FACILITIES:

- 1. Parks
- 2. Playgrounds
- 3. Outdoor Pools
- 4. Beaches
- 5. Golf Courses
- 6. Stadium, Race Tracks, Baseball Fields
- 7. Tennis Courts
- 8. Marinas/Yacht Clubs
- 9. Miscellaneous

T. TRANSPORTATION FACILITIES (ASSESSED IN ORE):

- 1. Airports, Air Fields, Terminals
- 2. Piers, Docks, Bulkheads
- 9. Miscellaneous

U. UTILITY BUREAU PROPERTIES:

- 1. Bridges, Tunnels, Highways
- 2. Electric Utilities
- 3. Gas Utilities
- 4. Telephone Utilities
- 5. Communications Facilities (Other than telephone)
- 6. Railroads, private ownership
- 7. Transportation, public ownership

8. Revocable consents
9. Miscellaneous (Including private improvements in city land and in public places)

W. EDUCATIONAL STRUCTURES:

1. Public Elementary, Junior, and Senior High Schools
2. Parochial Schools, Yeshivas
3. Schools or Academics
4. Training Schools
5. City University
6. Other Colleges and Universities
7. Theological Seminaries
8. Other Private Schools
9. Miscellaneous

Y. SELECTED GOVERNMENT INSTALLATIONS:

(Excluding Office Buildings, Training Schools, Academic, Garages, Warehouses, Piers, Air Fields, Vacant Land, Vacant Sites, and Land Under Water and Easements)

1. Fire Department
2. Police Department
3. Prisons, Jails, etc.
4. Military and Naval
5. Department of Real Estate
6. Department of Sanitation
7. Department of Ports and Terminals
8. Department of Public Works
9. Department of Environmental Protection

Z. MISCELLANEOUS:

1. Court House
3. Post Office
4. Foreign Governments
5. United Nations
6. Land Under Water
7. Easements
8. Cemeteries
9. Other

X. FULLY EXEMPT PROPERTIES:

1. City of New York
2. State Owned
3. Federally Owned
4. Public Authorities
5. Churches, Synagogues, Monasteries, Convents, Parish/Houses, including Parochial Schools, Theological Seminaries and Cemeteries
6. Charitable Institutions, Fire Associations, Nurseries, Settlements and Lodging Houses and Salvation Army Properties, and Religious (Other than X5)
7. Colleges, Schools, Academies, and Training Schools, Hospitals, Asylums, and Homes
8. Private Housing
9. Foreign Governments and UN Headquarters
10. Private Railroads

VACANT

V. VACANT LAND

0. Vacant Land Zoned for One, Two, or Three Family Homes
1. Privately Owned
2. Police Department
3. Hospital
4. Fire Department
5. School Site or Yard
6. Library or Museums
7. Port of New York Authority
8. State & U.S.
9. Miscellaneous (Department of Real Estate and other Public places)

SPECIFIC LAND USE CODE⁸ (USED FOR MAPS)

RESIDENTIAL (1-2 FAMILY)

A. ONE FAMILY DWELLINGS:

0. Cape Cod
1. Two Stories Detached (Small or moderate size, with or without attic)
2. One Story (Permanent living quarters)
3. Large Suburban Residence
4. City Residence
5. Attached or Semi-detached
6. Summer Cottages
7. Mansion Type or Town House
8. Mobile Home/trailer
9. Miscellaneous (Old buildings, attached and semi-detached farm houses, etc.)

B. TWO-FAMILY DWELLINGS:

1. Brick
2. Frame
3. Converted (From one family)
9. Miscellaneous (City type, old, etc.)

RESIDENTIAL (WALK UP)

C. WALK-UP APARTMENTS:

0. Three Families
1. Over Six Families Without Stores
2. Five to Six Families
3. Four Families
4. Old Law Tenements
5. Converted Dwelling or Rooming House
6. Cooperatives (Other than condominiums)
9. Garden Apartments/Mobile Home Park/Trailer Park

R. CONDOMINIUMS:

1. One Family (Attached)
2. Walk-up Apartments
9. Miscellaneous

RESIDENTIAL (WALK UP) -CONVERTED LOFT

C. WALK-UP APARTMENTS:

8. Co-op Conversion from Loft/Warehouse

MIXED RESIDENTIAL (WALK UP) / COMMERCIAL

C. WALK-UP APARTMENTS:

7. Over Six Families With Stores

R. CONDOMINIUMS:

9. Miscellaneous

⁸ Based on RPAD 1989/LotInfo 2000 Land Use Classification Codes

S. RESIDENCE-MULTI-USE:

1. Primarily One Family with Store or Office
2. Primarily Two Family with Store or Office
3. Primarily Three Family with Store or Office
4. Primarily Four Family with Store or Office
5. Primarily Five to Six Family with Store or Office
9. Primarily One to Six Family with Store or Office

RESIDENTIAL (ELEV.) -CONVERTED LOFT

D. ELEVATOR APARTMENTS

0. Co-op Conversion from Loft/Warehouse

RESIDENTIAL (ELEVATOR)

D. ELEVATOR APARTMENTS

1. Semi-fireproof (Without Stores)
3. Fireproof (Standard construction without stores)
4. Cooperatives (Other than condominiums)
5. Converted
8. Luxury Type
9. Miscellaneous

R. CONDOMINIUMS:

4. Apartment Buildings (Elevator)

MIXED RESIDENTIAL (ELEV.) / INDUSTRIAL -A.I.R.

D. ELEVATOR APARTMENTS

2. Artists in Residence

MIXED RESIDENTIAL (ELEV.) / COMMERCIAL

D. ELEVATOR APARTMENTS

6. Fireproof-With Stores
7. Semi-fireproof-With Stores

K. STORE BUILDINGS (TAX-PAYERS INCLUDED):

4. Stores, Apartments Above

O. OFFICE BUILDINGS

8. With Residential Apartments

WAREHOUSE & STORAGE

E. WAREHOUSES:

1. Fireproof
3. Semi-fireproof
4. Frame, Metal
6. Governmental Warehouses
9. Miscellaneous

HEAVY MANUFACTURING

F. FACTORY AND INDUSTRIAL BUILDINGS:

1. Heavy Manufacturing (Fireproof)
2. Special Construction (Printing Plant, etc. Fireproof)
4. Semi-fireproof

LIGHT MANUFACTURING

F. FACTORY AND INDUSTRIAL BUILDINGS:

5. Light Manufacturing
8. Tank Farms
9. Miscellaneous

AUTO STORAGE / SERVICE

G. GARAGE AND GASOLINE STATIONS:

1. Garage-Two or More Stories
2. Garage-One Story (Semi-fireproof or fireproof)
3. Garage and Gas Station Combined
4. Gas Station-With Enclosed Lubrication Plant or Workshop
5. Gas Station-Without Enclosed Lubrication Plant or Workshop
7. One or Two Car Garage
9. Miscellaneous

LICENSED / PUBLIC PARKING

G. GARAGE AND GASOLINE STATIONS:

6. Licensed Parking Lot

Z. MISCELLANEOUS:

2. Public Parking Areas

MIXED AUTO STORAGE / COMMERCIAL

G. GARAGE AND GASOLINE STATIONS:

8. Garage with Showroom

COMMERCIAL

H. HOTELS

1. Luxury Type-Built prior to 1960
2. Luxury Type-Built after 1960
3. Transient Occupancy-Midtown Man. Area
4. Motels
5. Private Club, Luxury Type
6. Apartment Hotels
7. Apartment Hotels-Cooperatively Owned
8. Dormitories
9. Miscellaneous

J. THEATERS:

1. Art Type (Seating capacity under 400 seats)
2. Art Type (Seating capacity over 400 seats)
3. Motion Picture Theater With Balcony
4. Legitimate Theaters (Theater sole use of building)
5. Theater as Part of Building or Other Use
6. T.V. Studios
7. Off-Broadway Type
8. Multi-Motion Picture Theater
9. Miscellaneous

K. STORE BUILDINGS (TAX-PAYERS INCLUDED):

1. One Story Store Building
2. Two Story or Store and Office
3. Department Stores, Multi-story
5. Diners, Franchised Type Stand
6. Shopping Centers with Parking Facilities
7. Funeral Home
9. Miscellaneous

R. CONDOMINIUMS:

5. Commercial Buildings

INSTITUTIONS - MEDICAL / ASYLUMS

I. HOSPITALS AND HEALTH:

1. Hospitals, Sanitariums, Mental Institutions
2. Infirmary
3. Dispensary
4. Staff Facilities
5. Health Center, Child Center, Clinic
6. Nursing Home
7. Adult Care Facility
9. Miscellaneous

N. ASYLUMS AND HOMES

1. Asylums
2. Homes for Indigent Children, Aged, Homeless
3. Orphanages
4. Detention Houses for Wayward Girls
9. Miscellaneous

INDUST.LOFT / OFFICES

L. LOFT BUILDINGS:

1. Over Eight Stories (Mid-Manhattan type with or without stores)
2. Fireproof-Loft and Storage type (without retail stores)
3. Semi-Fireproof
9. Miscellaneous

MIXED INDUST. LOFT / COMMERCIAL

L. LOFT BUILDINGS:

8. With Retail Stores (Other than Type 1)

INSTITUTIONS – PRIVATE

M. CHURCHES, SYNAGOGUES, ETC.:

1. Church, Synagogue, Chapel
2. Mission House (Non-Residential)
3. Parsonage, Rectory
4. Convents
9. Miscellaneous

X. FULLY EXEMPT PROPERTIES:

5. Churches, Synagogues, Monasteries, Convents, Parish/Houses, including Parochial Schools, Theological Seminaries and Cemeteries
6. Charitable Institutions, Fire Associations, Nurseries, Settlements and Lodging Houses and Salvation Army Properties, and Religious (Other than X5)
7. Colleges, Schools, Academies, and Training Schools, Hospitals, Asylums, and Homes
8. Private Housing

COMMERCIAL OFFICES

O. OFFICE BUILDINGS

1. Fireproof-Up to Nine Stories
2. Ten Stories and Over (Side Street Type)
3. Ten Stories and Over (Main Avenue Type)
4. Tower Type
5. Semi-Fireproof
6. Bank Building (Designed exclusively for banking)
7. Professional Buildings
9. Miscellaneous

COMMUNITY / PUBLIC FACILITY / SCHOOLS

P. PLACES OF PUBLIC ASSEMBLY (INDOOR AND CULTURAL):

1. Concert Halls
2. Lodge Rooms
3. YWCA, YMCA, YWHA, PAL
4. Beach Club
5. Community Center
6. Amusement Places, Bathhouses, Boat Houses
7. Museum
8. Library
9. Miscellaneous Including Riding Academies and Stables

W. EDUCATIONAL STRUCTURES:

1. Public Elementary, Junior, and Senior High Schools
2. Parochial Schools, Yeshivas
3. Schools or Academics
4. Training Schools
5. City University

6. Other Colleges and Universities
7. Theological Seminaries
8. Other Private Schools
9. Miscellaneous

PARK / PLAYGROUND / OPEN ACTIVITY

Q. OUTDOOR RECREATION FACILITIES:

1. Parks
2. Playgrounds
3. Outdoor Pools
4. Beaches
5. Golf Courses
6. Stadium, Race Tracks, Baseball Fields
7. Tennis Courts
8. Marinas/Yacht Clubs
9. Miscellaneous

TRANSPORTATION / TRANSIT

T. TRANSPORTATION FACILITIES (ASSESSED IN ORE):

1. Airports, Air Fields, Terminals
2. Piers, Docks, Bulkheads
9. Miscellaneous

U. UTILITY BUREAU PROPERTIES:

6. Railroads, private ownership
7. Transportation, public ownership

UTILITIES

U. UTILITY BUREAU PROPERTIES:

1. Bridges, Tunnels, Highways
2. Electric Utilities
3. Gas Utilities
4. Telephone Utilities
5. Communications Facilities (Other than telephone)
8. Revocable consents
9. Miscellaneous (Including private improvements in city land and in public places)

VACANT

V. VACANT LAND

0. Vacant Land Zoned for One, Two, or Three Family Homes
1. Privately Owned
2. Police Department
3. Hospital
4. Fire Department
5. School Site or Yard
6. Library or Museums
7. Port of New York Authority
8. State & U.S.
9. Miscellaneous (Department of Real Estate and other Public places)

INSTITUTIONS - GOVERNMENT

X. FULLY EXEMPT PROPERTIES:

1. City of New York
2. State Owned
3. Federally Owned
4. Public Authorities
9. Foreign Governments and UN Headquarters

Y. SELECTED GOVERNMENT INSTALLATIONS:

(Excluding Office Buildings, Training Schools, Academic, Garages, Warehouses, Piers, Air Fields, Vacant Land, Vacant Sites, and Land Under Water and Easements)

1. Fire Department
2. Police Department
3. Prisons, Jails, etc.
4. Military and Naval
5. Department of Real Estate
6. Department of Sanitation
7. Department of Ports and Terminals
8. Department of Public Works
9. Department of Environmental Protection

Z. MISCELLANEOUS:

1. Court House
3. Post Office
4. Foreign Governments
5. United Nations

MISCELLANEOUS

Z. MISCELLANEOUS:

6. Land Under Water
7. Easements
8. Cemeteries
9. Other

GLOSSARY: Acronyms and Terms

ACRONYMS

Note: Those acronyms with an asterisk also are defined in the glossary

BRAC	Business Relocation Assistance Corporation
BSA	Board of Standards and Appeals
CDC	Community Development Corporation
CPC	City Planning Commission
DEP	Department of Environmental Protection (New York City)
DOB	Department of Buildings
DPC	Department of City Planning
ECSP	Energy Cost Savings Program
EDC	Economic Development Corporation
EIS	Environmental Impact Statement
EMS	Environmental Management System
ESDC	Empire State Development Corporation
EDZ	Economic Development Zone
EPA	Environmental Protection Agency (U.S.)
FAR	Floor Area Ratio *
FIRE	Finance, Insurance, and Real Estate
GIS	Geographic Information System
ICIP	Industrial and Commercial Incentive Program
IDA	Industrial Development Authority
IPIP	In-Place Industrial Park
IREIT	Industrial Real Estate Investment Trust
IRG	Industrial Relocation Grant
ITAC	Industrial Technology Assistance Corporation
JDA	Job Development Authority
LDC	Local Development Corporation

MANYC	Manufacturers Association of New York City
MAS	Municipal Art Society
MRE	Minimum Required Expenditure
MRZ	Manufacturing Retention Zone
NIMBY	Not In My Backyard
NIET	New Industrial Environmental Paradigm
NYIRN	New York Industrial Retention Network
PICCED	Pratt Institute Center for Community and Environmental Development
PMD	Planned Manufacturing District
QMS	Quality Management System
RPP	Relocation and Productivity Program
SIC	Standard Industrial Classification *
TIF	Tax Increment Financing *
ULURP	Uniform Land Use Review Procedure *

TERMS

197a plan---197a plans are blueprints or programs for action. The term “197a” comes from a section of New York City’s Charter which offers a framework that communities can use to develop plans for their “growth, improvement and future development.” In the charter, “community” is defined as a geographic area covered by a community board or a section of it. Plans may be proposed and approved by a community board or local community groups, but before they can be implemented, they must be given final approval by the City Planning Commission and City Council. Once approved, an adopted 197-a plan “serves as a policy to guide subsequent actions by city agencies.”

Adaptive reuse---When a building’s original use changes from one to another through a conversion process that often includes rehabilitations and/or renovations.

As-of-right uses---Where a zoning ordinance specifically permits a proposed use of land without the imposition of special conditions, the proposed activity is denominated an "as-of-right use."

Biotechnology---An example of an emerging technology whose processes define any technique that uses living organisms, parts of organisms, or substances from these organisms to make or modify products, to improve plants and animals, or to develop microorganisms for specific uses.

Brownfield---Simply stated, "brownfields" are used lands where expansion or redevelopment is complicated by real or perceived environmental contamination. The term “brownfields” was created to illustrate an unintended side-effect of federal and state cleanup laws: liability and severe costs of cleanups imposed by these laws cause these properties to be abandoned in favor of developing unused land or “greenfields.” A brownfield site can be as small as the vacant corner gas station with abandoned

underground storage tanks or as large as a several hundred acre manufacturing plant that may have had releases of hazardous substances into the soil or groundwater.

Big box retail---A singular retail or wholesale user who typically occupies over 75,000 square feet of gross floor area, requires high parking to building area ratios and has a regional sales market.

Demanufacturing---The process of demanufacturing occurs through disassembling a product so that its parts can be recycled or re-used in other processes. It is a marriage of economic development and environmental technology that solves two problems at once. From an urban economic development perspective, demanufacturing provides jobs and the use of underutilized infrastructures. From an environmental perspective, demanufacturing can provide for the reuse, rather than the disposal, of resources because consumer products are disassembled and their component parts are recycled.

Dematerialization---Industrial ecology is based on the goal of dematerialization, which lowers the amount of inputs (raw materials and energy) that are necessary to produce the same amount of outputs. For example, metal industries, especially steel, have used scrap materials for decades. In the 1970s the oil industry prompted manufacturers to redesign cars to weigh 20% less in order to conserve energy. Dematerialization not only generates environmental benefits but also serves as a cost-effective business strategy.

Dot-com---Term that is frequently used for business enterprises that operate through the internet. Examples include firms that design web sites for clients and firms that have retail mail-order shopping on their web sites.

E-commerce---Term used to describe sales conducted via an internet web site.

Floor plate---Refers to the size of the floor of a building. Industrial uses often prefer buildings with large floor plates because they are convenient for large machinery which require wide, unobstructed spaces in which to operate.

Gentrification---At its most basic level, gentrification is simply the revitalization of a poor, urban neighborhood. Typically, a new group of residents, usually white and middle class, replaces the former inhabitants of the neighborhood. However, it is a very complex, multifaceted process with physical, social, political, ethnic, racial, and economic ramifications.

Grandfathered---This describes the status accorded certain properties, uses, and activities that are legally existing prior to the date of adoption of the zoning ordinance or provisions of the zoning ordinance.

Green roofing---A variety of measures that can be taken to reduce the heat-island effect that occurs when sunlight is absorbed by a building's roof. They include painting roof tops white or silver, using more reflective surfaces, or actually landscaping a roof by planting vegetation.

Industrial activity---In this study, industrial activities are comprised of a broad range of functions that may not necessarily be limited to production-based activity. Examples of industrial activity include manufacturing, distribution and warehousing, public transportation yards, water and sewer services, and solid waste disposal.

Industrial ecology---Term first coined by two General Motors engineers, Robert Frosch and Nicholas Gallopoulos, in their 1989 *Scientific American* article "Strategies for Manufacturing." They called for a fundamental change in production that would seek to improve and protect the natural environment while simultaneously increasing business profitability by closing the gap between inputs and outputs. In this new paradigm, one business's waste would become another's resources, ultimately alleviating pressures associated with natural resource depletion and pollution.

ISO 14001 Standards---A series of voluntary and self-regulatory international standards for incorporating environmental criteria into manufacturing processes and products. It requires firms to develop and implement Environmental Management Systems, and it specifies requirements for: determining

environmental aspects and impacts of services, activities, and products; planning environmental objectives and measurable targets; implementation and operation of programs to meet these objectives and targets; checking and corrective actions; and management review. Some of the benefits of implementing these standards include: materials savings from more complete processing, substitution, re-use, or recycling of inputs; less downtime through more careful monitoring and maintenance; conversion of waste into commercially valuable forms; reduced energy consumption; and savings from safer workplace conditions. For many companies, compliance with ISO 14001 standards may become a contractual requirement of customers in both the U.S. and the European Community. In addition, the U.S. EPA is currently considering regulatory incentives through its Common Sense Initiative to benefits companies that are certified under ISO 14001 standards.

Land use---The occupation or use of land for any human activity or purpose.

Live-work---A live-work space is one in which its dwellers both live and work. In New York City, such spaces are typically occupied by artists and artisans.

Manufacturing job---For the purposes of this report, manufacturing jobs are defined by how the firms that contain them are classified. As such, any firm that falls under SIC codes 20 through 39 is considered to have manufacturing jobs. In other words, manufacturing jobs are considered to be a subset of broader industrial jobs.

Manufacturing activity---This occurs when a business produces articles by hand or machinery, from raw or prepared materials, by giving them new forms, qualities, properties, or combinations.

Manufacturing land use---When a parcel of land hosts a manufacturing activity (as defined above), it is considered to have a manufacturing land use. In this study, however, warehouses and industrial lofts are also included in this definition. A manufacturing land use does not necessarily occur on land that is zoned for manufacturing because many manufacturing firms are pre-existing, non-conforming legal uses located in residential and/or commercial zones.

Manufacturing zone or Manufacturing zoning district---A manufacturing zone is a delimited geographical area that is officially sanctioned by New York City's Zoning Resolution for industrial uses. Industrial activities are grouped into three districts—M1, M2, and M3, according to the level of nuisance a use creates. In general, the more noxious uses are restricted to M3 districts but they may be permitted in M1 and M2 districts if they comply with the performance standards of those districts. These zones may contain other uses besides manufacturing and production-based uses. Commercial, retail, and industrial uses such as warehousing, truck storage, and waste disposal can all be sited in manufacturing zones.

Miscellaneous land use---In this study, a land use classified as "Miscellaneous" is based on the building classification system used by property tax assessors in New York City. In essence, this measures how Miscellaneous land is actually used, not how it is zoned. These uses include: court houses, post offices, foreign governments, United Nations, land underwater, easements, cemeteries, and Other.

Mixed use area vs. mixed use zoning---After World War II, many planners encouraged the separation of residential and commercial uses from industrial uses and used zoning to accomplish this. However, older and more historic neighborhoods, such as Greenpoint, Brooklyn, developed with these uses side by side, or mixed. As such, they are de facto *mixed use areas*. Today, municipalities prescribe mixed use areas by creating *mixed use zoning districts* to achieve a balance between residential and industrial uses where such uses can coexist without conflict.

Natural capital---Term used by economists for land and its resources.

New economy---Term used to describe the current emerging economic activities; it includes high tech industries such as biotechnology, telecommunications and internet-based economic activity as well as ecologically friendly businesses which have emerged out of a greater understanding of the need to reduce waste.

New media---Emerging new communication technologies such as telecommunications and dot-com industries.

Non-conforming uses---Where the actual use of the property predates the imposition of zoning restrictions and those restrictions do not permit that use, it is called a "non-conforming use."

Remanufacturing---Process of disassembling products during which time parts are cleaned, repaired or replaced and then reassembled to sound working condition.

Rezoning---Where a proposed use is not otherwise permitted under local law, the property owner may request that the local government rezone the property, making the proposed activity an "as-of-right" use under that zoning amendment.

SIC (Standard Industrial Classification)---One of the most widely used systems of classifying economic activity, its codes -- which divide and subdivide industries into sub-sectors -- are included in various business databases.

Special permit---When other proposed uses are authorized by the zoning ordinance but are subject to the imposition of special conditions that protect the public interest, such uses are allowed by "special permit."

Speculative blight---The result of building owners who intentionally keep their properties off the market (in anticipation of future changes in zoning or other regulations that they believe will allow them to yield a higher return than if they were to lease the building under current conditions). The vacancies of such buildings can affect a neighborhood's appearance and fuel the perception that the area is in decline.

Supply chain---Through supply chains, manufacturers play a critical role not only to each other, but to other economic sectors due to the web of relationships through which they can supply goods quickly upon demand.

Sustainable development---Refers to development that maintains or enhances economic opportunity and community well-being while protecting and restoring the resource base and the life support systems upon which people and economies depend. Sustainable development "ensures that the utilization of resources and the environment today does not damage prospects for their use by future generations." Sustainability includes:

- integration of conservation and development efforts
- satisfaction of basic human needs
- achievement of equity and social justice
- provision for social self-determination and cultural diversity
- maintenance of ecological integrity

Tax Increment Financing---In general, tax increment financing allows a community to recapture the increase in property taxes that result from a redevelopment project in a residential, commercial, or industrial area. The tax revenues obtained from the project which exceed the level of tax revenues generated by the area prior to redevelopment is called the "tax increment."

Transfer of development rights---The conveyance of development rights by deed, easement, or other legal instrument authorized by local law to another parcel of land and the recording of that conveyance.

ULURP (Uniform Land Use Review Procedure)---A standardized procedure in New York City whereby applications affecting the city's land use are publicly reviewed. Key participants in the ULURP process

are the Department of City Planning and the City Planning Commission, Community Boards, Borough Presidents, Borough Boards, the City Council and the Mayor.

Use group---In the New York City zoning resolution, uses that have similar functional characteristics and/or nuisance impacts are listed in one or more of 18 use groups that are ranked from residential to industrial uses.

Variance---Even without the sanction of formal rezoning actions, land use changes in New York City can be accomplished on a property-by-property basis through variances granted by the Board of Standards and Appeals. A variance is a mechanism which grants the owner an exception to the ordinance when a literal enforcement of its provisions will result in unnecessary hardship. The exception allows a change in use or bulk of the property.

Waste transfer station---A location where garbage is temporarily held en route to other locales after commercial and/or residential pick-up.

Zoning---The division of a city (or county) by legislative regulations into areas, or zones, which specify allowable uses for real property and size restrictions for buildings within these areas.

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DATA SOURCES

Note: For an explanation of how these data sources were used, please see the methodology section.

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