



August 17th, 2008

Honorable Michael Bloomberg  
City Hall  
New York, New York 10007

Dear Mayor Bloomberg,

We write to urge you to substantially reduce the amount off-street parking being planned and built in the five boroughs. We were alarmed to learn that City mandated parking is likely to produce as much as one billion more miles of driving annually by the year 2030. This added driving will create more congestion on city streets and worsen air quality. It will also erase any traffic reduction achieved by your sustainable transportation initiatives.

The accompanying study, *Suburbanizing the City: How New York City Parking Requirements Lead to More Driving*, documents how New York City's off-street parking requirements encourage car ownership and use, and contradict policies aimed at reducing traffic. This study also reveals that City officials do not know how much parking currently exists, how much parking will be built under current zoning or the extent to which new parking will increase driving and traffic in the metropolitan area. This finding is a great concern to our groups; accurate and up-to-date information on parking supply is critical for City agencies to make sound decisions on development and zoning.

We urge you to undertake the following reforms to create a more informed and sustainable off-street parking policy that reduces – not encourages – car use:

1. Fully assess the amount of existing and planned off-street parking.
2. Consider measures to significantly reduce required parking.
3. Revise environmental laws so that parking impacts are fully accounted for.
4. Freeze special permits and stop directly subsidizing new parking.

Attached are more detailed recommendations developed with national experts in land use and transportation. We look forward to working with your administration, especially the Departments of City Planning and Transportation, and your Office of Long Term Planning and Sustainability, to implement these recommendations. Our goal is to help New York City institute an off-street parking policy that strengthens New York City neighborhoods, bolsters the city's economy and improves the global and local environment.

Sincerely,

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## Four Reforms for Sustainable Parking Management in New York City

### 1. Fully assess the amount of existing and planned off-street parking.

- **Inventory existing and planned off-street parking.** The City should create a complete, public inventory of existing, permitted and planned off-street parking. Using this information, the City should fully assess the relationship between residential, retail and commercial parking requirements, driving and travel choice. This information will provide a baseline to assess the impact of additional parking.
- **Measure how much driving is created by new off-street parking.** City agencies do not know the impact of new parking. Neither the Department of City Planning nor the Department of Transportation have computer models, surveys, sampling or studies that reveal the local or cumulative impact of parking requirements.
- **Determine parking demand based on the assumption that off-street parking has a cost.** Currently, the Department of City Planning and environmental documents project demand for parking based on the assumption that it is free. This results in very high demand assumptions. The City should estimate demand for off-street parking based on appropriate price levels.
- **Measure the effect of increases in parking growth on neighborhood and citywide traffic congestion.** Through permits and as-of-right building, the City is increasing the city's off-street parking supply, while the capacity of the street network remains static. New traffic as a result of new cars on the road (facilitated by the availability of parking) must be closely analyzed.

### 2. Consider measures to significantly reduce required parking.

- **“Unbundle” the price of parking from the cost of new residences.** Parking is often included (bundled) in the sale price or rent of new housing, partly because it is accepted practice and partly for the developer's convenience. This forces households without a car to pay for parking they do not need, and encourages other households to purchase a vehicle as there is no additional cost for parking. “Unbundling” parking, in contrast, enables households to choose the amount of parking they are willing to pay for, makes housing more affordable for car-free households, and increases the flexibility of developers to build less parking. Unbundled parking is found in new condo and apartment projects across the U.S., including Miami, Chicago and Washington, DC. It is required by law for new projects in several San Francisco neighborhoods, and for many new developments in Arlington County, Virginia.
- **Eliminate minimum parking requirements.** Many U.S. cities have abolished minimum parking requirements in some or all neighborhoods including San Francisco, Milwaukee, Miami and Seattle. In Britain, parking requirements have been abolished for the entire nation. Minimum parking requirements remove the opportunity for households without a car to choose a new home without a parking space. By artificially inflating the supply of parking, minimum parking requirements also reduce the cost of owning a car –bringing even more traffic to New York City's neighborhoods.

- **Reclassify minimum parking requirements as maximums.** There is little justification for the City to require developers to provide more parking than they would otherwise choose. However, there is a good rationale to restrict parking in many neighborhoods – particularly close to subway stations – through introducing parking maximums. This approach can mitigate traffic from new development, promote housing affordability, and avoid the loss of on-street parking for new curb cuts. Parking maximums can be determined based on detailed, local studies that consider neighborhood character and the traffic capacity of local streets.

An interim strategy is to simply convert existing minimums to maximums. Cities with parking maximums include Portland, Oregon; Cambridge, Massachusetts; and Seattle. San Francisco recently adopted parking maximums in central neighborhoods for both non-residential and residential uses.

- **Peg the maximum parking requirement to the proximity to transit.** In other words, the closer a development is to a subway station or Bus Rapid Transit, the lower the parking requirement should be.
- **Establish impact fees for new parking spaces. New parking imposes considerable costs on New York City taxpayers.** These costs include the loss of on-street parking to curb cuts, increased street maintenance, more enforcement to deal with increased traffic volumes and environmental and public health impacts from more pollution. Impact fees would not only recover some of these costs, but would also provide a financial incentive to build housing with less parking.
- **Prohibit curb cuts on key pedestrian and transit streets.** Curb cuts for parking facilities create conflicts and safety hazards where cars need to cross busy sidewalks. Cars waiting to turn into garages also delay buses and general traffic. Therefore, the City should limit curb cuts to side streets or alleys. In some cases, this may mean that parking may not be provided on a particular parcel. San Francisco recently prohibited curb cuts on Market Street, a central pedestrian and transit corridor.
- **Incentivize car-sharing spaces in new development.** Car sharing services such as Phillycarshare.org provide an alternative to car ownership, by making a neighborhood-based fleet of cars available to members on an hourly basis. Many new condo and other developments in New York already include car sharing for commercial reasons. The City could accelerate this practice through providing incentives in the zoning code, such as reducing any parking minimums or exempting car sharing spaces from parking maximums. Vancouver, British Columbia and Seattle are cities that take this approach.



### **3. Revise environmental laws to fully account for parking impacts.**

- **Revise CEQRA and the special permitting process so that the cumulative impact of new parking on neighborhoods is considered.** Currently, the impacts of new parking garages are considered in isolation from other new parking. The cumulative impact of large amounts of parking is not considered, and the overall impact of additional traffic on neighborhoods is ignored. For example, in Manhattan Community Board 4, thousands of new residential parking units have been added in recent years without any assessment of the cumulative traffic or environmental impact. Each new garage is only assessed on the basis of whether the increase in traffic will affect the Level of Service at the nearest intersection, and whether it generates 50 or more trips per peak hour. The net result is that very large traffic impacts are ignored.

### **4. Stop directly subsidizing new parking and freeze special permits**

- **Place a moratorium on issuing new special parking permits in Manhattan's Clean Air Act Zone (the "Manhattan Core")** until an inventory of existing and planned parking is completed, and a study of the cumulative environmental impact of new parking is conducted.
- **Freeze new city subsidies for building parking** until a complete accounting of the extent and environmental impact of those subsidies is completed.
- **Eliminate minimum parking requirements for affordable housing developments.** Minimum parking requirements are particularly onerous and inappropriate in affordable housing developments. Though the Zoning Resolution allows most affordable housing developments to build a smaller number of parking spaces than it requires in market-rate housing, requiring any parking at all makes little sense in neighborhoods where fewer than 20% of households can afford to own cars. Requiring parking in affordable housing developments is a waste of scarce public subsidy dollars that could otherwise be used to create more affordable units and consumes building area and open space in neighborhoods where such spaces are badly needed for community use.

# Suburbanizing the City: How New York City Parking Requirements Lead to More Driving



*Before Parking Requirements*  
*Douglass Street between 4th and 5th Avenue, construction circa 1908*



*After Parking Requirements*  
*Butler Street between 4th and 5th Avenue, construction circa 1980*

Adjacent Streets in Park Slope, Brooklyn, New York City

Prepared for Transportation Alternatives  
August 2008

Rachel Weinberger  
Mark Seaman  
Carolyn Johnson

# Executive Summary



*The introduction of parking requirements greatly alters the city's pedestrian oriented streets. These photos show adjacent streets in Park Slope, Brooklyn*

This study finds that New York City's residential off-street parking requirements encourage car ownership and use, and contradict City sustainability goals which seek to reduce traffic, air pollution and carbon emissions. The parking requirements also undermine city policies which seek to improve public transit and conditions for cycling and walking. Furthermore, the study reveals that New York City's parking policy is ad-hoc and not consistent with sustainability goals or efforts to reduce everyday traffic congestion on city streets.

Parking is a fundamental part of the street and highway system. It is also a key determinant of individuals' decisions to drive or own a car. Previous research shows that limiting the parking supply in a central business district results in more transit use and less driving. Studies also show that increasing the parking supply in a central business districts results in less transit use and more driving. This report looks at the residential end of the trip, and is the first to examine how the availability of residential parking, especially that required by the zoning code, affects car ownership and driving in New York City.

## Key Findings:

- In many cases, the city's residential off-street parking requirements exceed existing off-street parking. As a result, new residences built under the zoning code will have far more parking than existing residences. This will shift neighborhoods from pedestrian-oriented to more car-oriented places and undermine their pedestrian character.

- New York City zoning regulations mandating parking at new residential developments will increase auto ownership rates and add over 1 billion annual vehicle miles traveled (VMT) by 2030. This is 40% to 50% more than if the City were to maintain its existing rate of car ownership. (A billion VMT is equivalent to 8 months of traffic in Manhattan south of 86th Street.)
- Auto use associated with required parking at new housing will add over 431,000 metric tons of CO<sub>2</sub> per year by 2030. (By comparison, the city's new, high-mileage, "green" taxis and black car initiative will reduce CO<sub>2</sub> emissions by 351 thousand tons a year.)
- Residents of new residential development are at least 40% to 50% more likely to own automobiles than today's New Yorkers.
- The Department of City Planning lacks crucial information for making informed decisions about the amount of off-street parking it requires in the Zoning Resolution. The agency does not know how much parking there is, how much is required, or how much driving new parking will produce.
- There is no evidence to suggest that reducing off-street parking requirements would lead to less development, lower growth or other negative consequences.

<sup>1</sup> Kuzmyak, Weinberger, Pratt and Levinson 2003, Chpt. 18, and Hess, Daniel Baldwin 2001



# Introduction

The research presented in this report examines and critiques the current New York City zoning requirements with respect to residential off-street parking. The first part of the study draws from other research to briefly explain how parking affects travel behavior. After an extensive literature search we were not able to find any prior research that examined the relationship between residential off-street parking and vehicle miles traveled. This phenomenon has not been well understood and the state of research requires that we draw from these other sources.

The second part of the study looks at the current zoning requirements with respect to both land use and off-street parking to understand the baseline condition. Finally, by examining four development scenarios for New York City we estimate the growth in motor vehicle travel that the City will experience if it stays the course on off-street parking policy.

## Infrastructure, Congestion, Vehicle Ownership and Vehicle Miles Traveled

Congestion occurs when the demand for a facility exceeds its capacity. Though intuition suggests reducing congestion is accomplished by adding capacity, research has proven the fallacy of that approach repeatedly. In his books, *Stuck in Traffic* and *Still Stuck in Traffic* Anthony Downs shows how the building of more transportation infrastructure results in greater congestion. Likewise Martin Mogridge, in *The Self Defeating Nature of Urban Road Capacity Policy* describes the history of road capacity policy and how it has not achieved the ends expected and, worse, has brought about results opposite of those intended. This has been documented in numerous studies including quite conclusively by the British Government in the 1995 report *Trunk Roads and the Generation of Traffic* by the Standing Advisory Committee for Trunk Road Assessment<sup>2</sup>.

The principal reasons for this phenomenon are explained by the economic concepts of latent and induced demand<sup>3</sup>. When the monetary cost of a commodity is hidden, as in the case of most of our roads, people enjoy it for “free” until so many people use it that it becomes congested and no longer “free.” It still has no direct monetary cost but users begin to pay for it with their time. In this way the time cost and the system capacity become the limiting factors. When infrastructure is added it has two important effects, the direct effect of adding more capacity, which serves the latent demand and the secondary effect of reducing the time cost – hence making use cheaper – and attracting more users, thus inducing demand<sup>4</sup>.

Adding parking infrastructure has the same effect as adding road infrastructure. The supply increase serves latent demand, the effect of reducing time cost induces demand. Previous studies on the relationship between off-street parking and vehicle usage have focused on the provision and pricing of downtown parking. That research has found that where parking is relatively scarce, and therefore costly, cities enjoy higher transit mode share for downtown oriented trips<sup>5</sup>. We have found almost no research on the relationship between residential parking requirements and vehicle usage. For this study we extrapolate from the research on transportation supply and the research on downtown parking.

Parking complicates transportation planning because demand for parking and demand for road use are complementary, yet off-street parking is typically privately owned and roads are publicly provided common goods. Ideally, policies regarding road capacity and parking provision should be aligned. However, as New York City increasingly recognizes the importance of integrating land use and transportation, nowhere is the lack of integration more apparent than at the interface of the public street system and publicly regulated but privately owned off-street parking.

The urban street system is comprised of three components, the streets, the vehicles and terminals (parking). Each of these components has its own supply and demand functions but they are not independent of each other. To work effectively the system has to be balanced. As the City makes car ownership easier by requiring off-street parking, more vehicles compete for limited street space, contributing to more traffic. The converse is true as well: with an effective policy to reduce car ownership, fewer vehicles will be owned and fewer used, resulting in fewer demands on the road system and a freer flow of traffic. Congestion is a “common pool resource problem” frequently referred to as a tragedy of the commons<sup>6</sup>. By removing a potentially important barrier to ownership, off-street parking in New York City favors car ownership thus contributing disproportionately to traffic throughout the city.

<sup>2</sup> Standing Advisory Committee for Trunk Road Assessment 1995

<sup>3</sup> Both concepts are well explored in economics literature, they were first introduced in transportation by J.J. Leeming in 1969.

<sup>4</sup> Latent demand is existing demand for a good at a given price but when there is no more capacity. Induced demand is new demand that is generated by a decrease in price.

<sup>5</sup> Arnott, Richard, Tilman Rave, and Ronnie Schob 2005  
Kuzmyak, Weinberger, Pratt and Levinson 2003  
Hess, Daniel Baldwin 2001  
Shoup, Donald C. 2005

<sup>6</sup> Hardin, Garrett 1968

Zoning regulations that require accessory parking as part of new residential development increase transportation supply; they make car use cheaper by eliminating the time-cost associated with searching for a spot and retrieving a vehicle when it is not parked in one's own driveway. This action induces additional car ownership. When deciding off-street parking regulation it appears that no analysis is done with respect to the traffic impacts.

One of the most attractive aspects of dense cities like New York is the easy access to amenities and destinations. This accessibility has made New York City increasingly attractive to more affluent households, which outside of New York City have high levels of car ownership and use, but who own vehicles at a much lower rate in Manhattan and other dense parts of the city. The more the city tries to accommodate car ownership through residential parking requirements, the more spread out the city becomes, the less accessible its amenities are and the more congested its streets become. This decreases the attractiveness of the city. In sum, at some level of density, higher levels of car use and ownership become impractical and unproductive. Despite the mobility offered by automobiles, the fact that car ownership in Manhattan is restricted to only 20% of households and it is also home to many of the region's wealthiest residents, suggests that many households are willing to forgo having a car in return for easy walking and transit access to amenities.

### *Bundling accessory parking with housing makes housing more expensive by shifting part of the car ownership costs to the home.*

Finally, the bundling of accessory parking with housing increases the price of housing and decreases the cost of car ownership by shifting part of the car cost to the apartment, house, condo or co-op. The additional cost to housing of required parking is well documented<sup>7</sup>. A much less considered effect of the shift is that it reduces the marginal cost of car ownership. Anyone who purchases or rents a home that includes an off-street parking space is de facto making a prepayment toward car ownership. The payment is not toward the car directly but toward the expense of owning and operating a car, which includes the cost of storage. Thus both markets are distorted and likely result in both lower rates of homeownership and higher rates of car ownership than would be seen if the uses and costs were unbundled.

*Both markets are distorted and likely result in both lower rates of homeownership and higher rates of car ownership than would be seen if the uses and costs were unbundled.*

## Current Zoning

New York City is currently zoned in nearly 150 different land use categories each with its own set of requirements. To understand the future impact of the zoning code on car ownership and vehicle miles traveled (VMT) we developed a schematic set of zoning maps using 16 zones<sup>8</sup>. These maps, based on the City's Primary Land Use Tax lot Output (PLUTO) data, show a simplified scheme with an emphasis on residential areas as these are the focus of this study. These maps, one for each borough, are shown on the following pages. While each district has unique requirements, many have the same parking requirements. Following each zoning map we include two additional maps for each borough. The first shows areas aggregated according to their parking requirements, showing the variation in parking requirements per dwelling unit across the city. The third map in each set shows the impact of these requirements by mapping parking density. Densities are based on per-unit parking requirement and the average residential density of each zoning district.

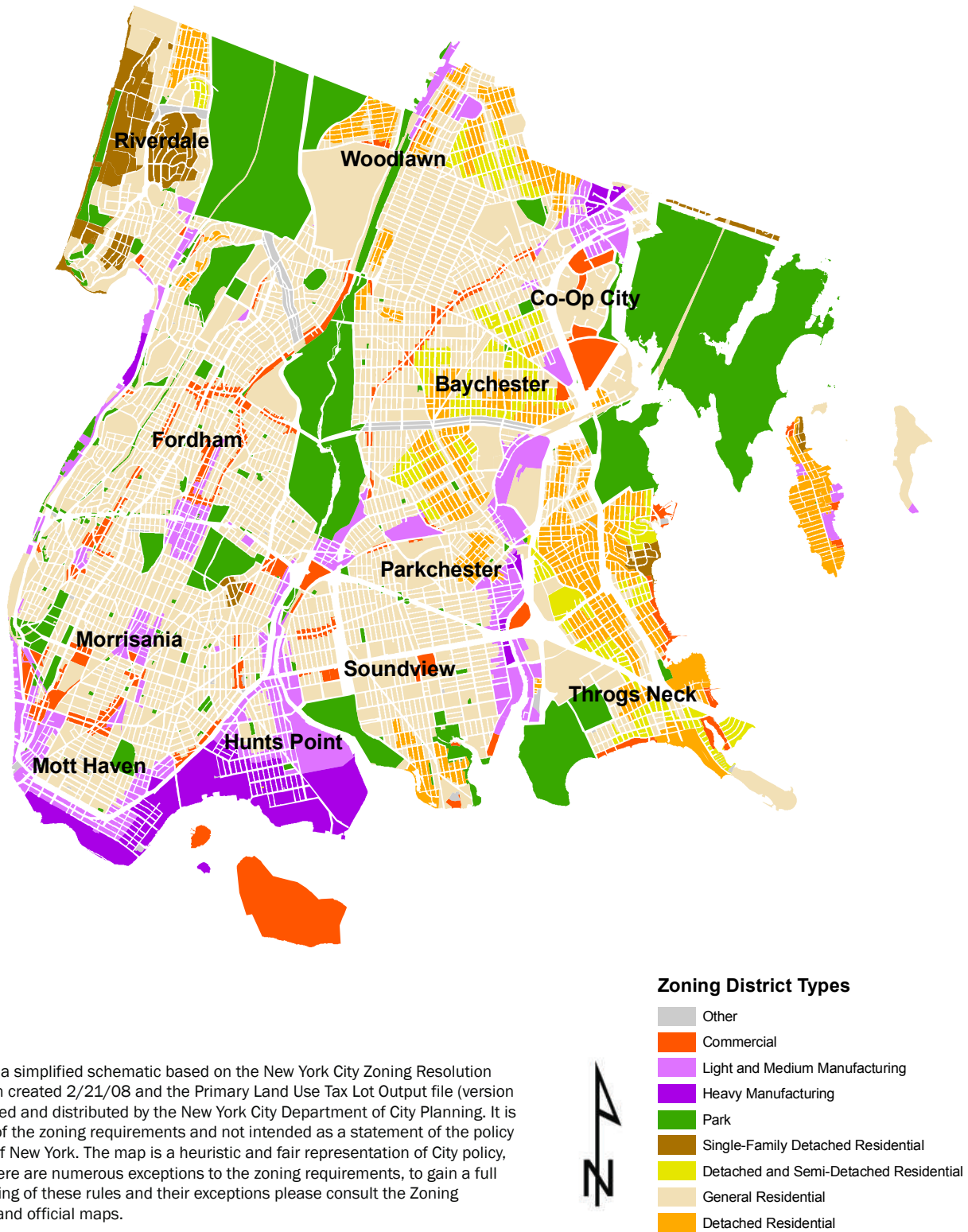
### Points of Interest:

- Residential areas in the Bronx are slatted for a range of parking requirements, from 0.4 to 1 space per unit. However only a small amount of residential area is scheduled for the lowest requirements, 0.4 and 0.5 spaces per unit.
- Manhattan is unique because parking requirements are based on geographic location (north or south of 60th Street) not zoning district.
- Under current zoning, Brooklyn would have the highest residential parking densities outside of Manhattan.
- Staten Island is almost entirely zoned for one parking space per dwelling unit.
- Queens and Staten Island are very similar in parking requirements and parking density.

<sup>7</sup> Shoup, Donald C. 2005  
Millard-Ball, Adam 2002  
Jia, Wenyu and Martin Wachs 1999  
Baker, Linda 2006

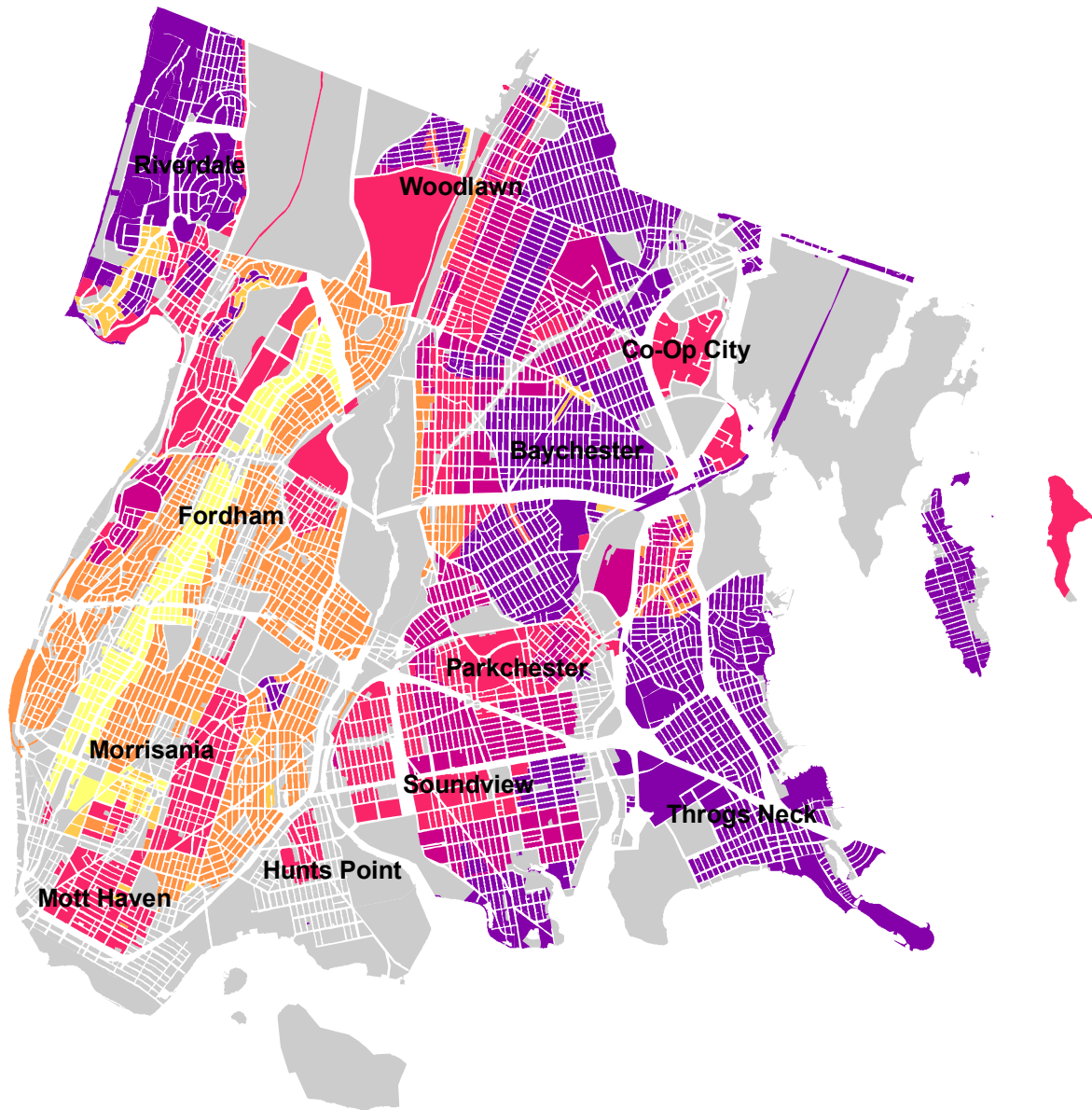
<sup>8</sup> The 16 zones are based on section 11-12 of the NYC zoning code

# BRONX - ZONING DISTRICT TYPES





# BRONX - RESIDENTIAL PARKING REQUIREMENTS



## Residential Parking Requirements

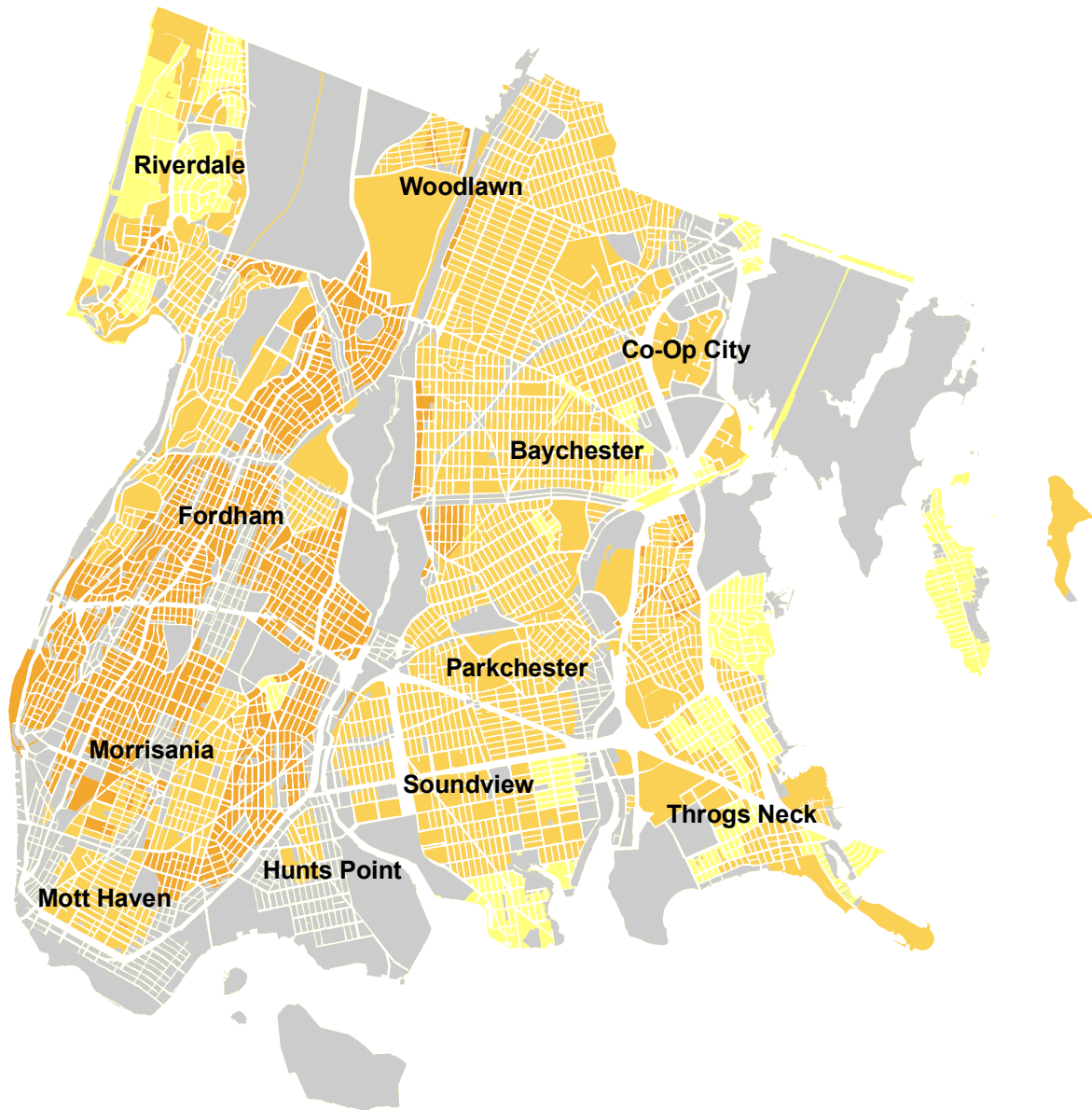
Grey	Commercial/Industrial/Other
Yellow	0.4 space/unit
Orange	0.5 space/unit
Red-Orange	0.6 space/unit
Red	0.66 space/unit
Magenta	0.7 space/unit
Dark Magenta	0.85 space/unit
Purple	1 space/unit

This map is a simplified schematic based on the New York City Zoning Resolution Web Version created 2/21/08 and the Primary Land Use Tax Lot Output file (version 07c) prepared and distributed by the New York City Department of City Planning. It is illustrative of the zoning requirements and not intended as a statement of the policy of the City of New York. The map is a heuristic and fair representation of City policy, however, there are numerous exceptions to the zoning requirements, to gain a full understanding of these rules and their exceptions please consult the Zoning Resolution and official maps.





# BRONX - RESIDENTIAL PARKING DENSITIES



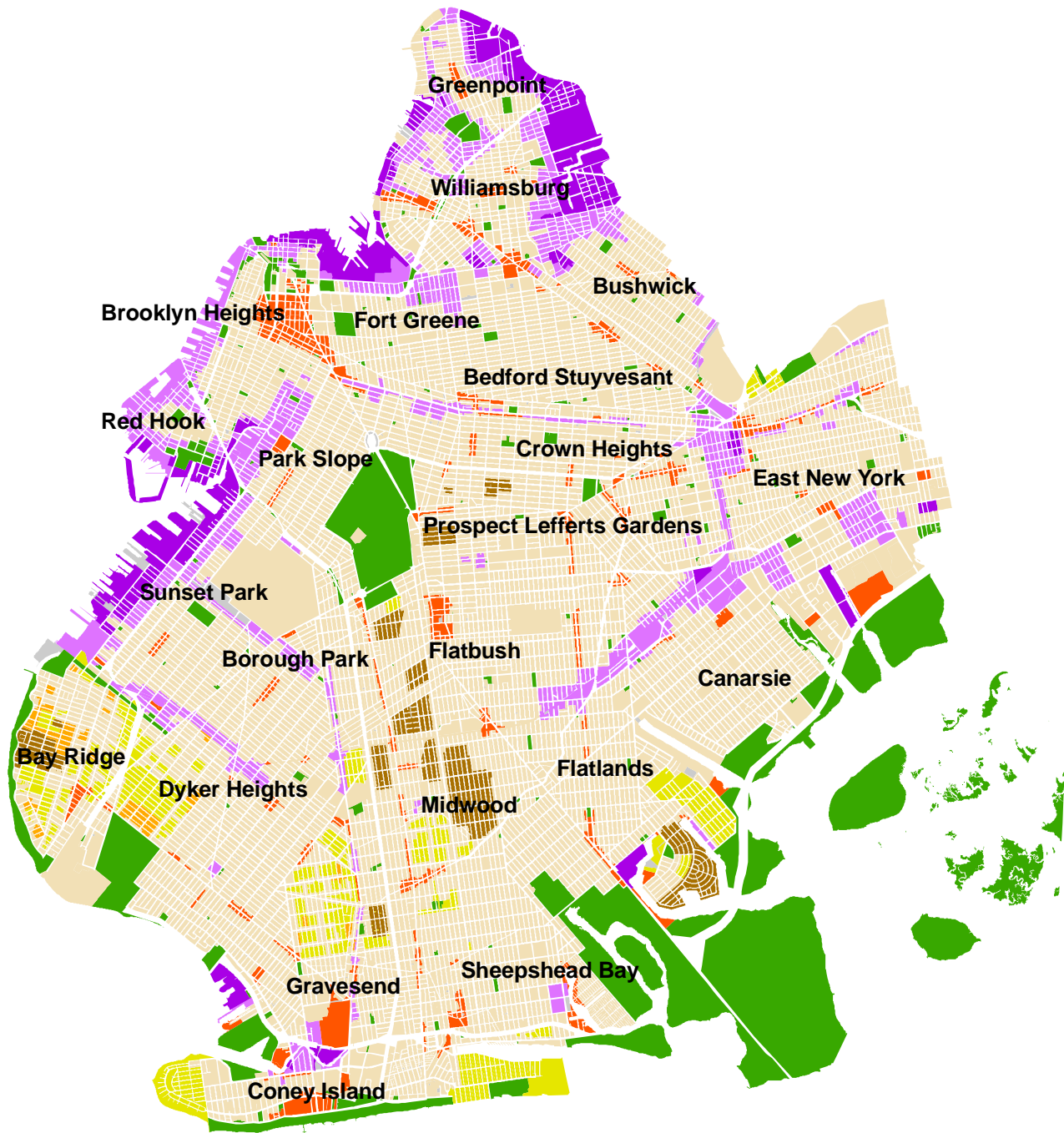
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## Parking Densities

Commercial/Industrial/Other
0 - 20 spaces/acre
21 - 40 spaces/acre
41 - 60 spaces/acre
61 - 80 spaces/acre
81 or more spaces/acre

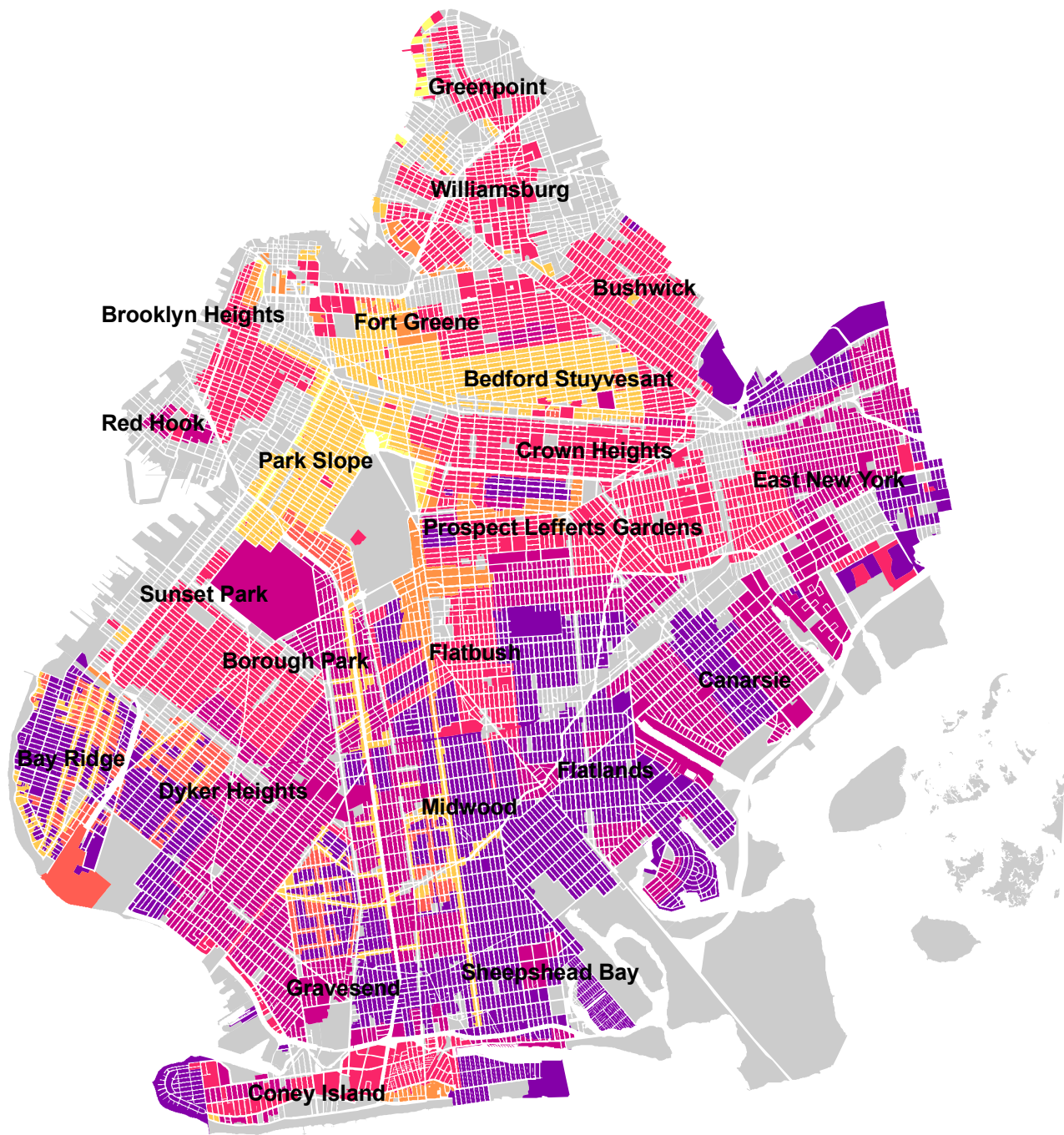
# BROOKLYN - ZONING DISTRICT TYPES



## Zoning District Types

- Other
- Commercial
- Light and Medium Manufacturing
- Heavy Manufacturing
- Park
- Single-Family Detached Residential
- Detached and Semi-Detached Residential
- General Residential
- Detached Residential

# BROOKLYN - RESIDENTIAL PARKING REQUIREMENTS



## Residential Parking Requirements

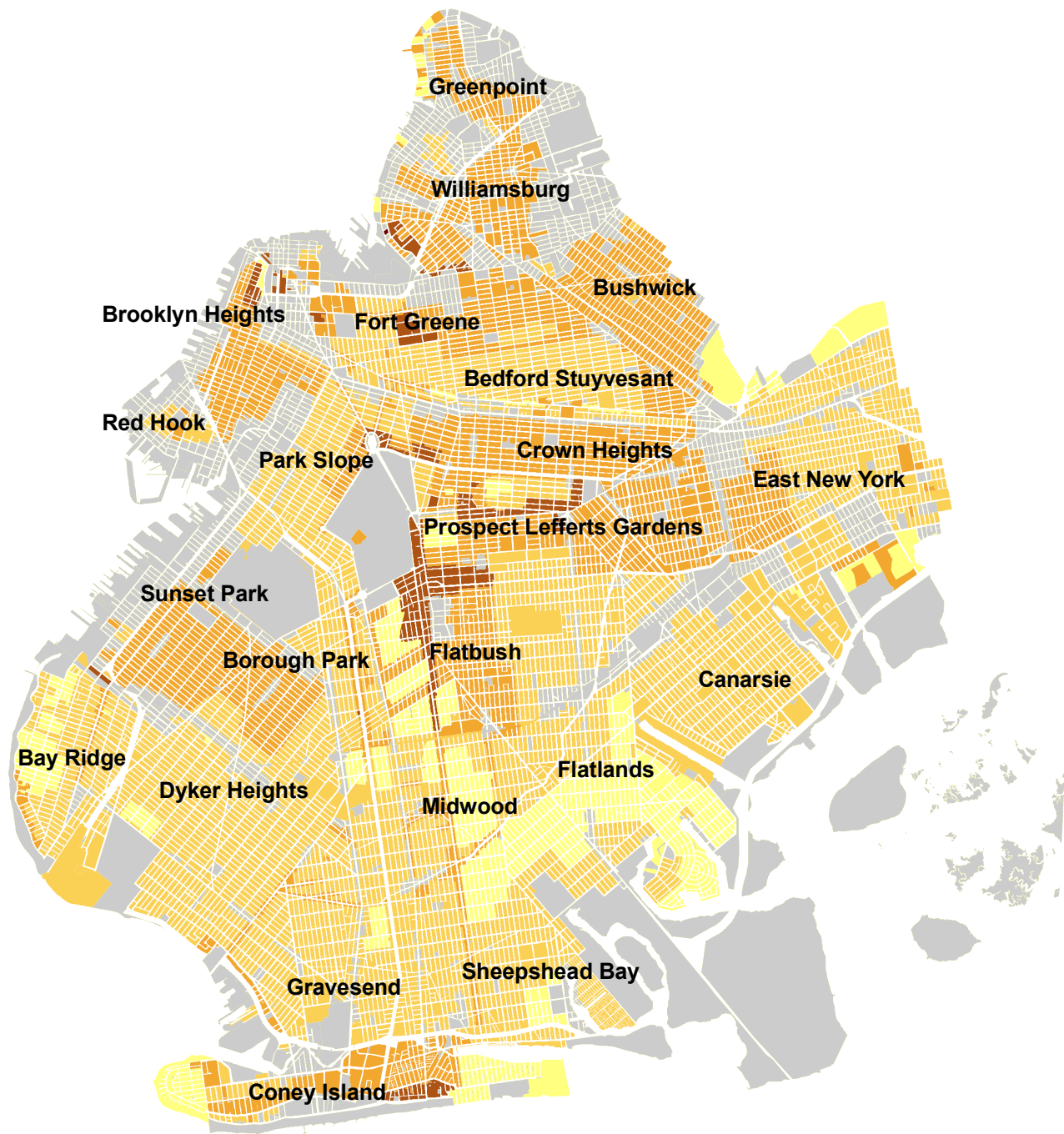
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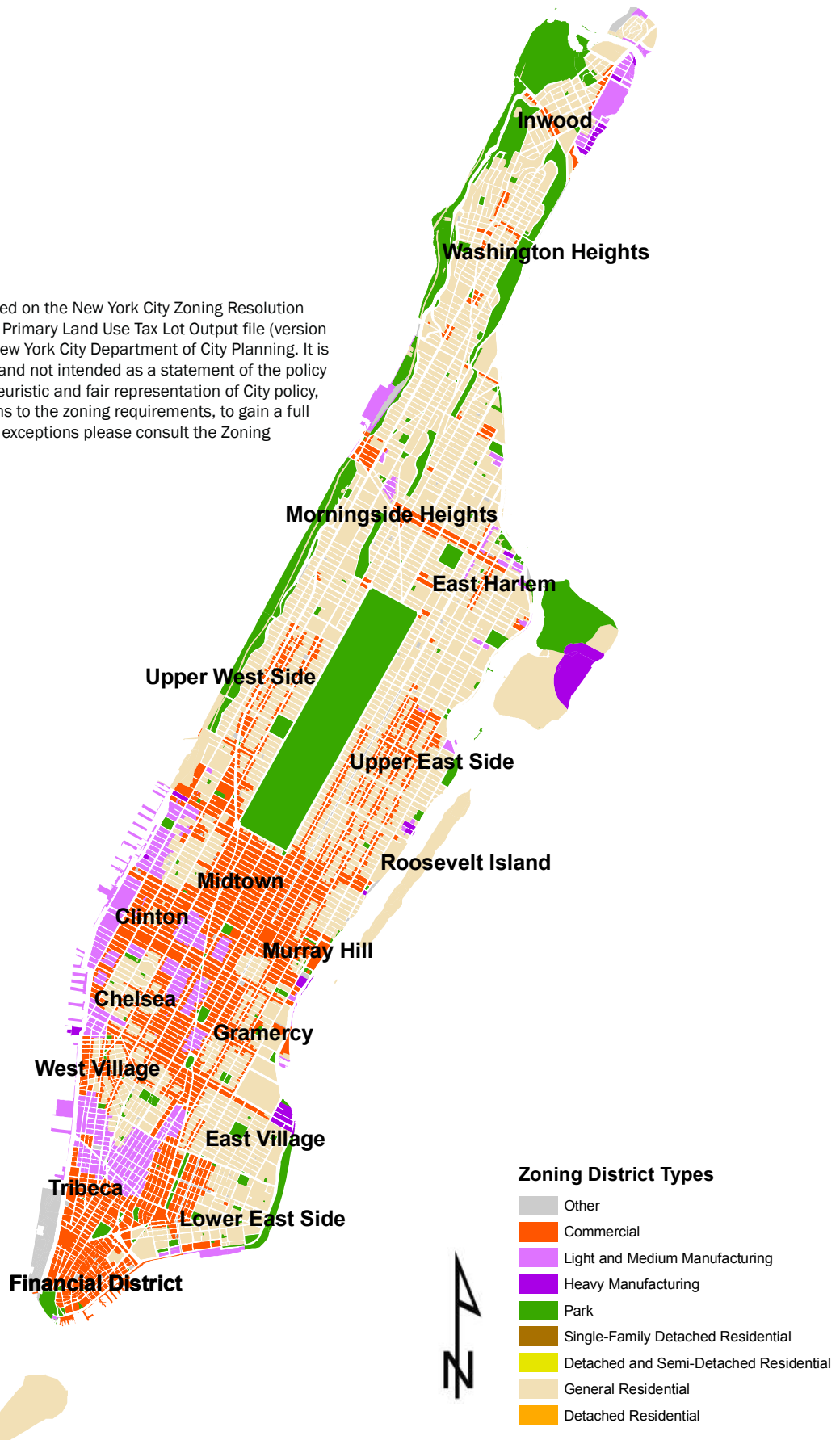


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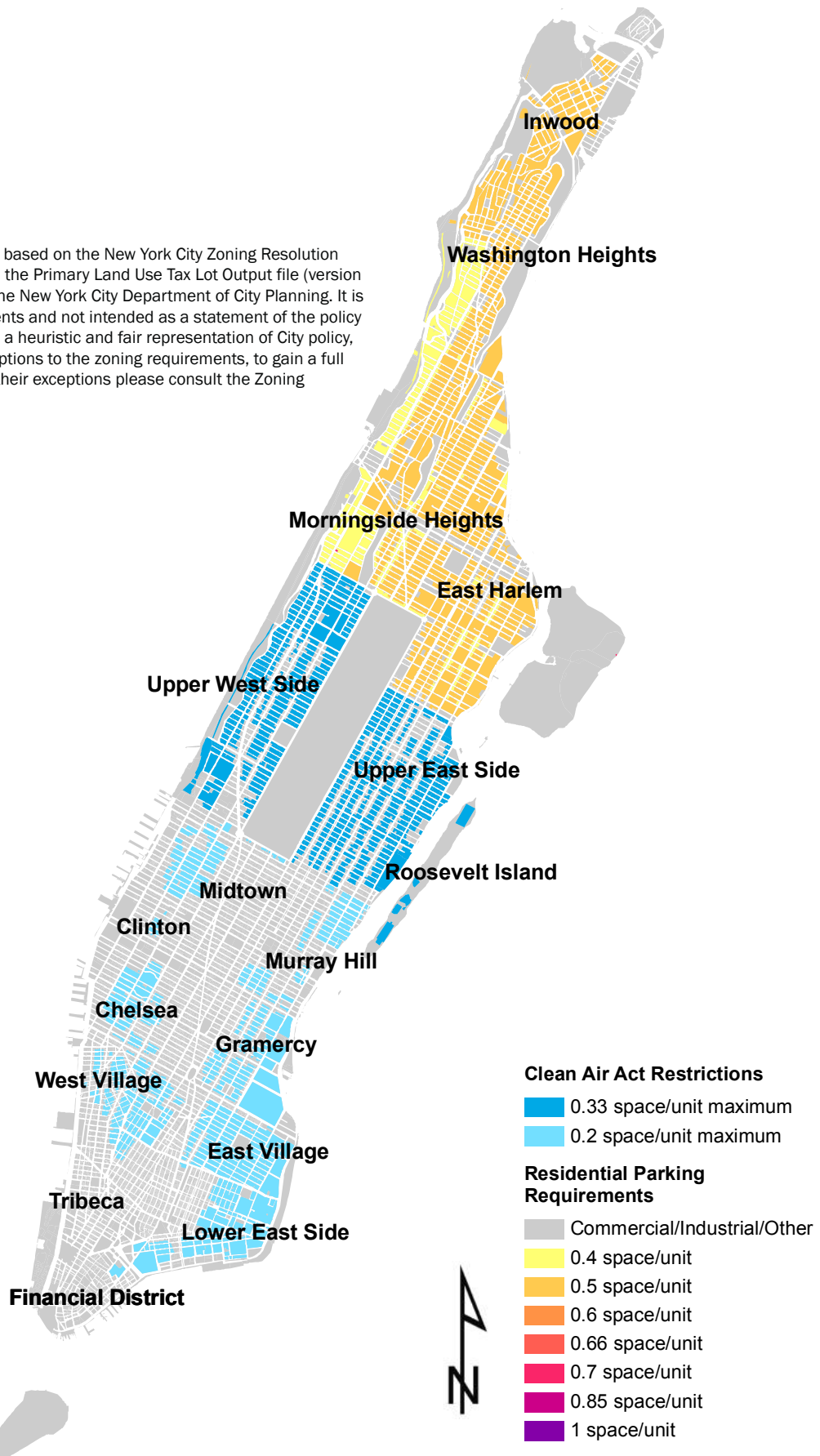
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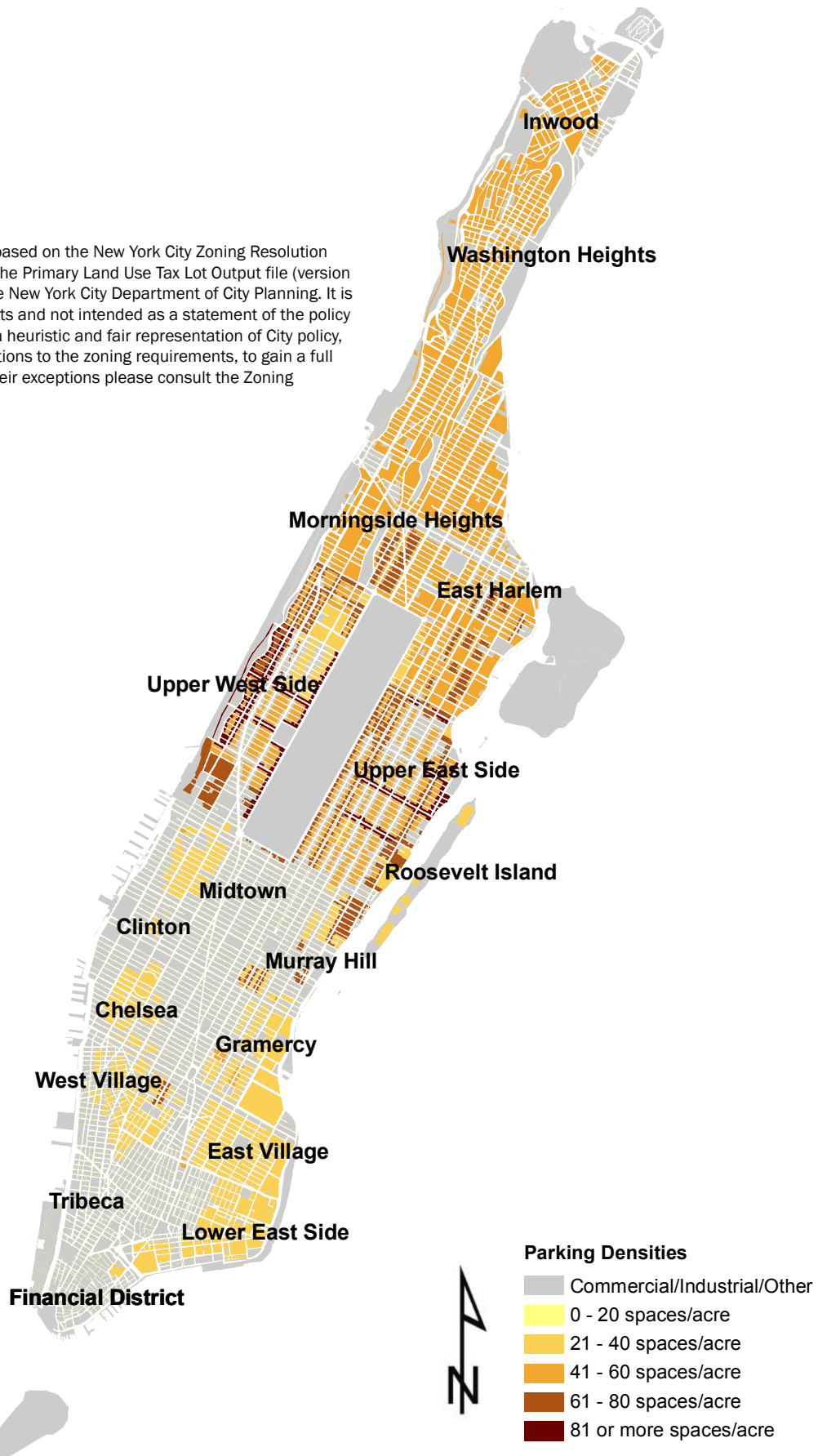
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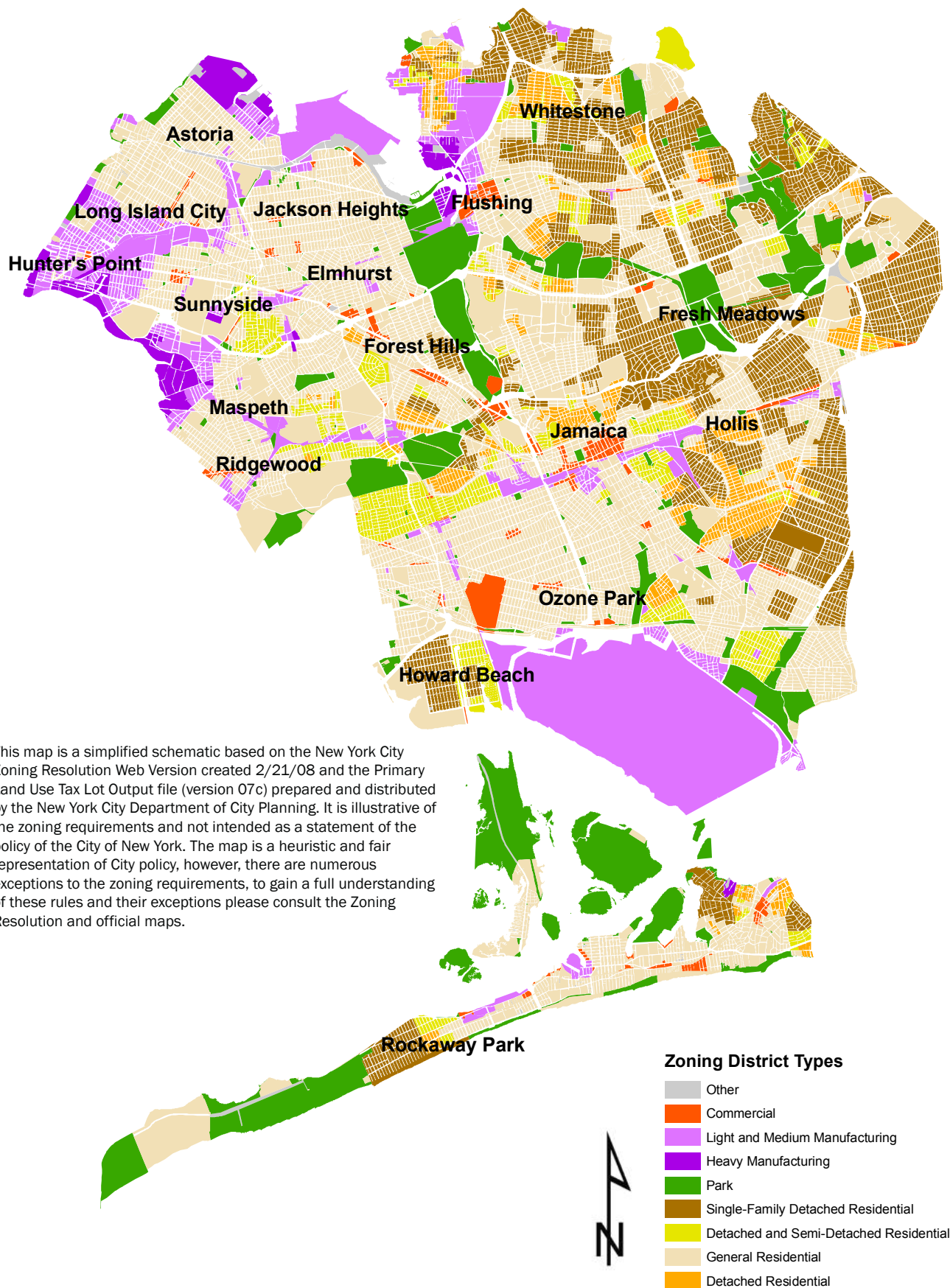
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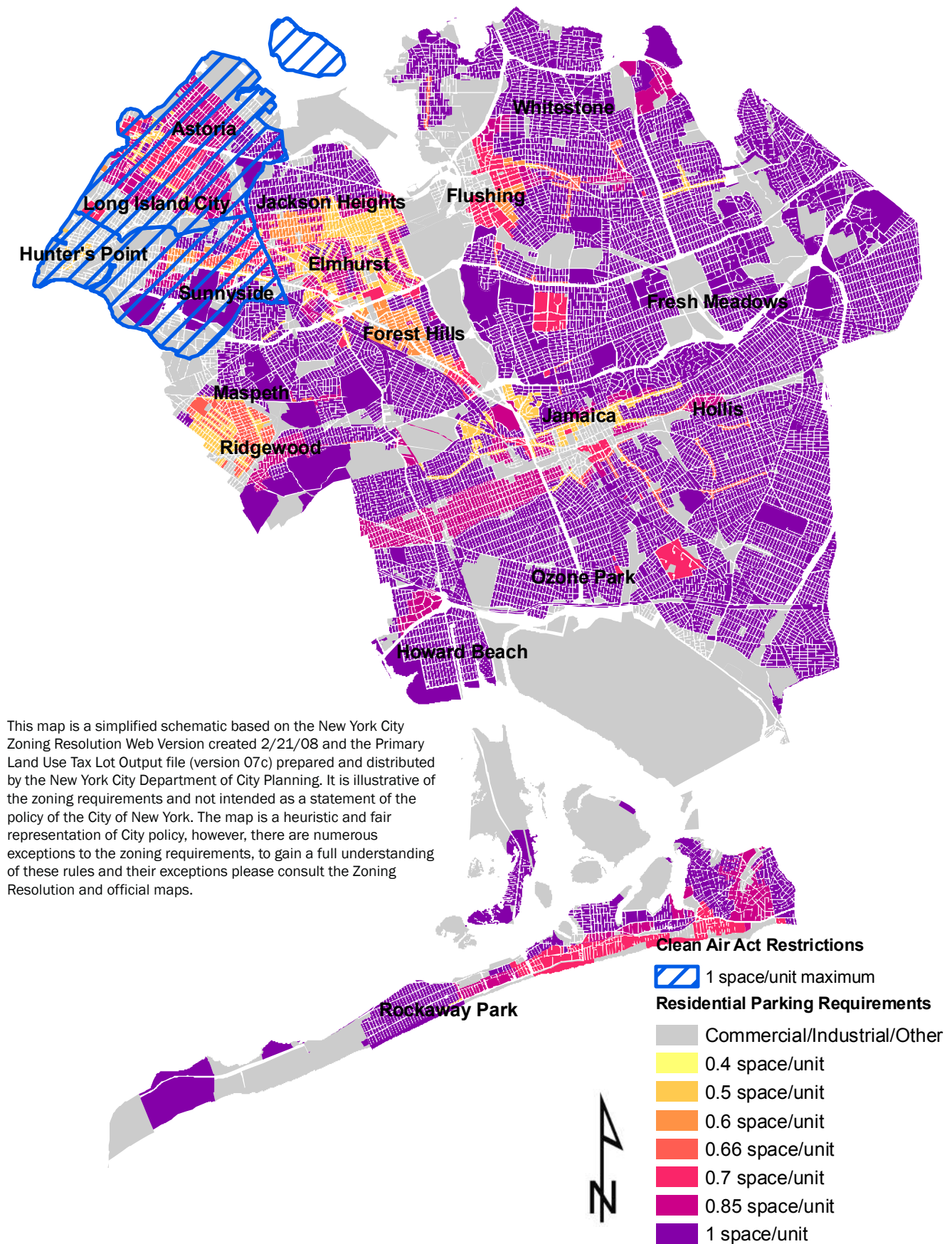




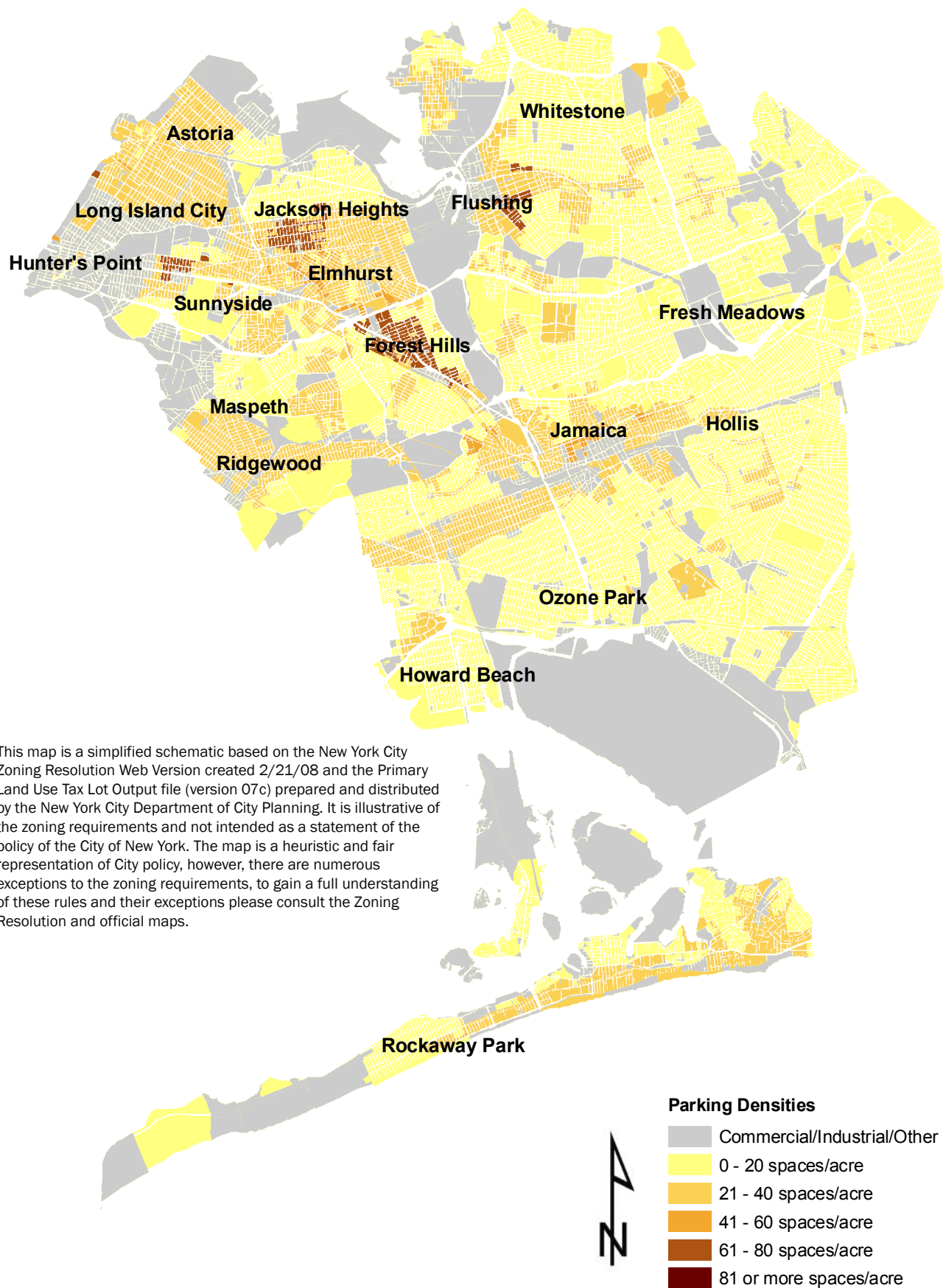
# QUEENS - ZONING DISTRICT TYPES



# QUEENS - RESIDENTIAL PARKING REQUIREMENTS

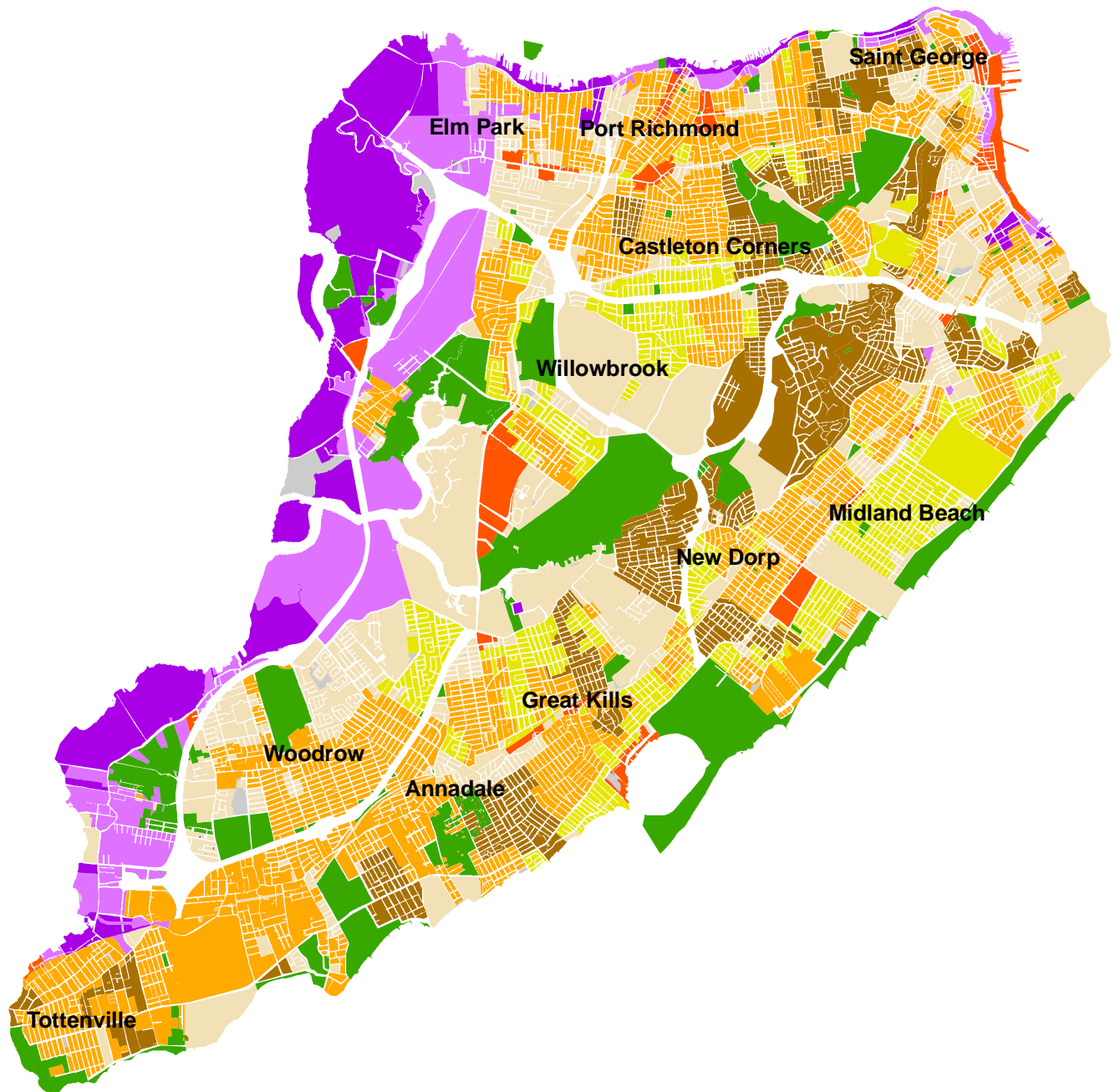


# QUEENS - RESIDENTIAL PARKING DENSITIES





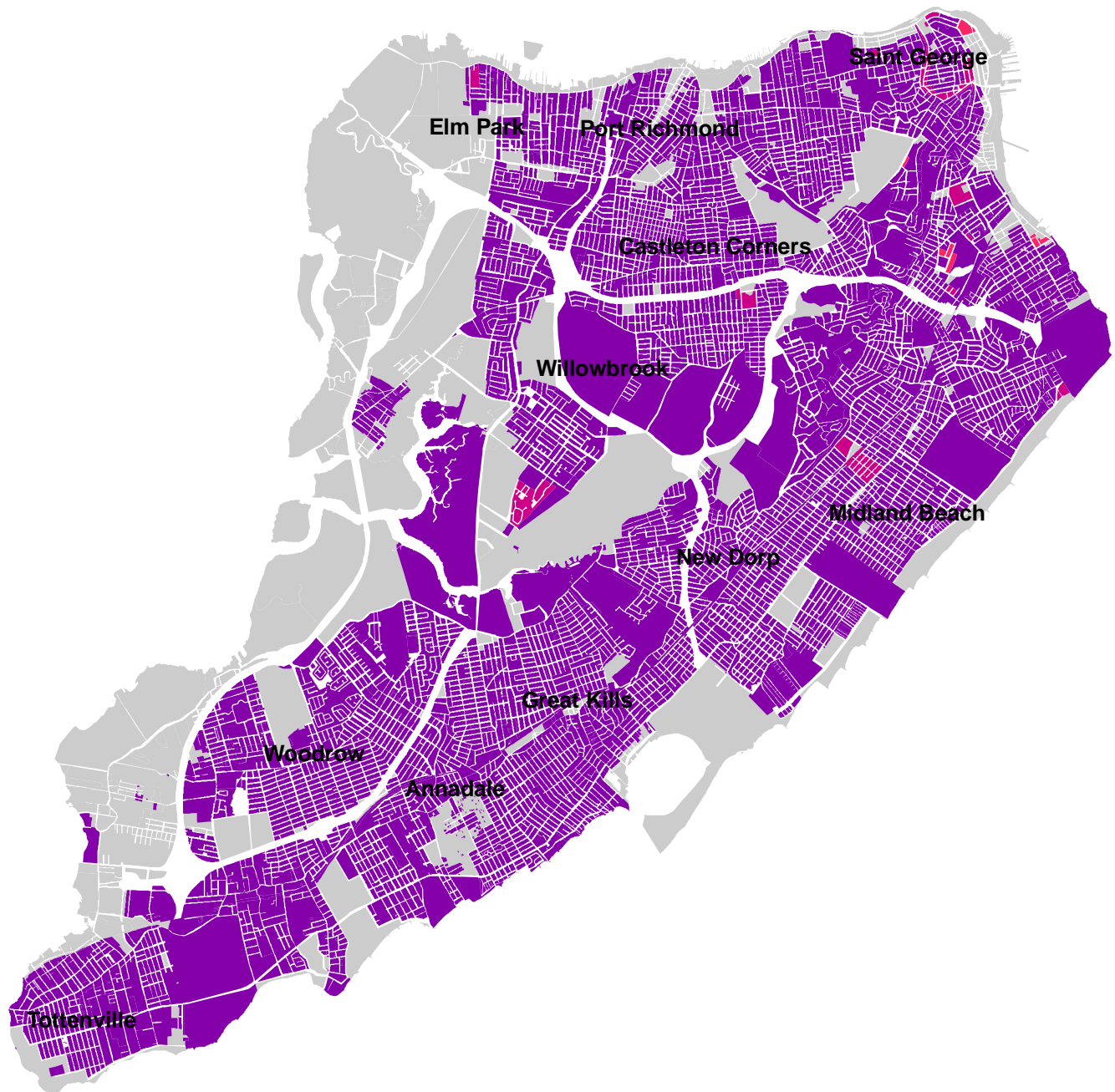
# STATEN ISLAND - ZONING DISTRICT TYPES



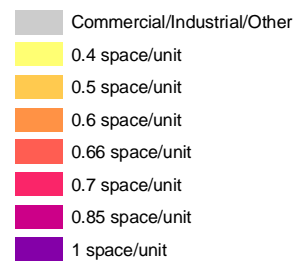
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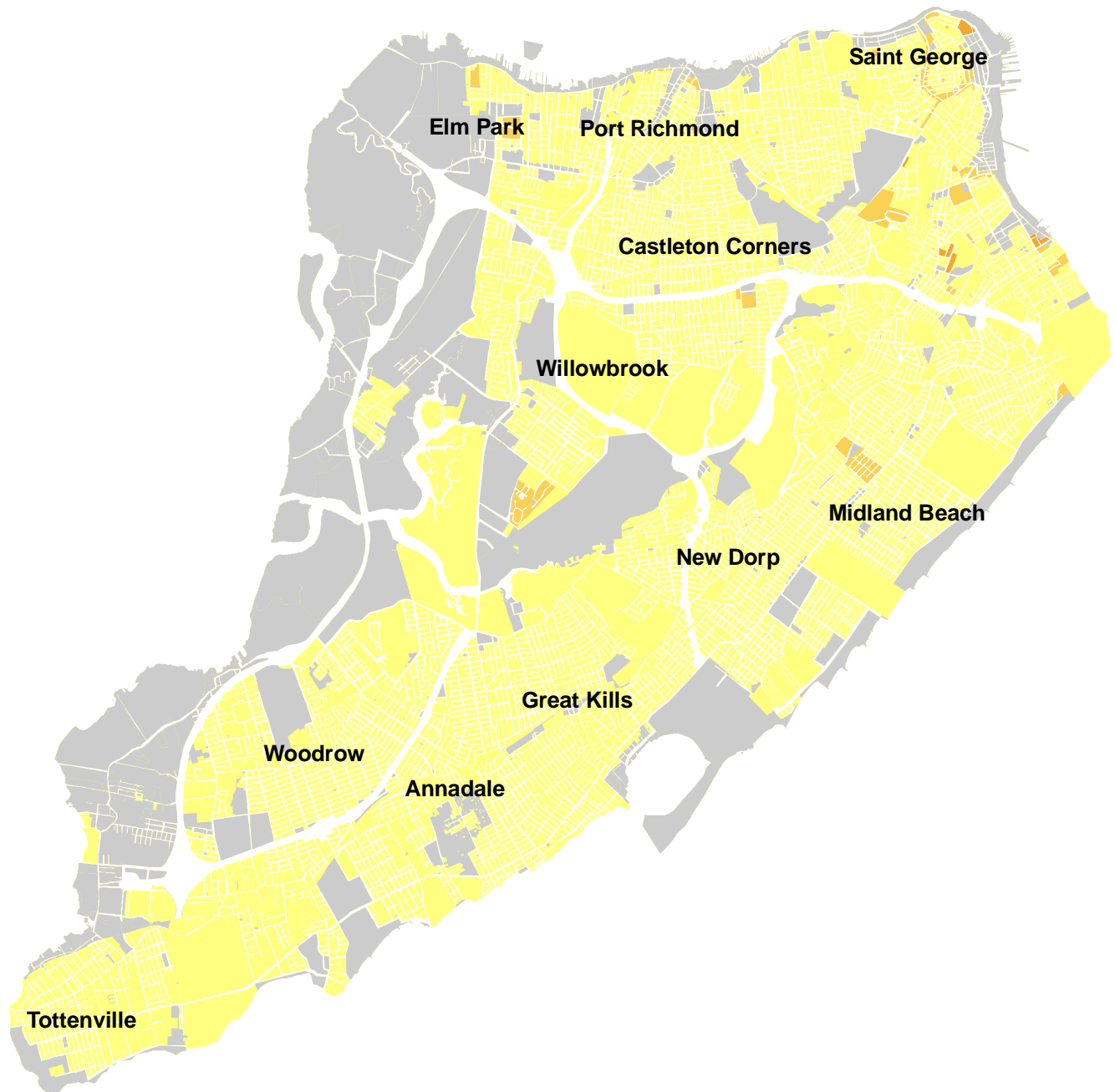
# STATEN ISLAND - RESIDENTIAL PARKING REQUIREMENTS



## Residential Parking Requirements

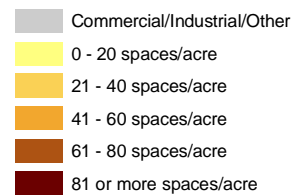


# STATEN ISLAND - RESIDENTIAL PARKING DENSITIES



1

## Parking Densities



## Future Car Ownership and Vehicle Miles Traveled

New York City residents have the lowest rate of auto ownership in the United States. In part this is due to the fact that the inconvenience of car ownership outweighs the benefits. And the benefits of density outweigh the inconvenience of carelessness. In part it is due to the fact that some people prefer a car-free lifestyle, for them there is no inconvenience, and New York is one of the few cities in the country where the density of land use and the robustness of the transit system make living car-free a feasible option.

*The expected carbon reductions from the transportation elements of PlaNYC will be erased if new development adheres to the off-street parking requirements set forth in the zoning code.*

Because they own fewer cars,<sup>9</sup> New Yorkers have a much lower per capita carbon footprint than other cities<sup>10</sup>. In spite of the low footprint PlaNYC has set an important goal to reduce carbon even further. Here we show that the expected carbon reductions from the transportation elements of PlaNYC, including what would have been accomplished with the Mayor's congestion pricing plan, will be erased if new development adheres to the off-street parking requirements set forth in the zoning code.

The City is projecting a need for 265,000 additional dwelling units by 2030 to accommodate the projected 1 million new residents<sup>11</sup>. To estimate future auto ownership, we test four development scenarios for the 265,000 new dwelling units. The scenarios range from ultra high density in which 100% of the development will be in high density projects such as the Atlantic Yards and large scale projects such as the Jamaica rezoning to medium density in which 15% of development is in Atlantic Yards style development, 45% in medium density housing with parking requirements of 0.5 per dwelling unit and 40% in 1 to 3 family density which has a parking requirement of 1 spot per dwelling unit.

To estimate the VMT impact we use the New York Metropolitan Transportation Council's (NYMTC) Regional Travel Household Interview Survey (RT-HIS) and the National Household Travel Survey – New York Supplement (NHTS-NYS). The RT-HIS is the most comprehensive information the city currently has on individual and household travel behavior. Two shortcomings of the interview lead to a conservative estimate of travel impacts. The first problem is that no interviews were done with New York City residents on weekend days. To estimate weekend travel we used the

NHTS-NYS. The second short-coming of the RT-HIS is that it is a one day diary which decreases the likelihood of representing households who may be on longer, multi-day car trips.

## EIS Analysis

Almost 25,000, or 9%, of the city's 265,000 new units will come from, or be accommodated in projects shown in Table 1. Because very high density projects are negotiated not built "as of right" there is nothing in the zoning code that would indicate their parking requirements. To estimate the parking requirements we looked at scoping documents and environmental impact statements of these five projects. They are in different stages of development with different levels of detail available. Greenpoint-Williamsburg, Jamaica and Willets Point are rezoning actions; Atlantic Yards and Flushing Commons require rezoning but they are principally development projects. The table below summarizes the expected increase in dwelling units, commercial/retail/other non-residential and non-open space uses and the planned off-street residential and commercial parking. The average parking per dwelling unit requirement of these projects (0.32/DU) is used as the basis for the high density development portions of the scenarios described in Table 2.

*NY region per capita carbon emissions grew 3.5 to 7 times faster than per capita emissions in major metro areas throughout the country*

<sup>9</sup> New Yorkers own 3 million fewer cars than average Americans (City of New York, 2007). The square footage those vehicles would take up in parking alone is equivalent to between 60 and 100 times the rental square footage of the former World Trade center.

<sup>10</sup> New York Metro area residents emitted 0.66 tons of carbon per person from cars compared with 1 full ton per person from cars in major metro areas throughout the country. However, NY region per capita carbon emissions grew 3.5 to 7 times faster than per capita emissions in major metro areas throughout the country. Brookings Institution. "Shrinking the Carbon Footprint of Metropolitan America." 2008

<sup>11</sup> City of New York. "PlaNYC." 2006



**Table 1 Summary of Five Major Development Projects**

	<i>Dwelling Units (increase)</i>	<i>Commercial, Retail, Other (1,000 sq ft)</i>	<i>Residential Parking Spaces increase</i>	<i>Public and Commercial Parking Spaces</i>	<i>Parking per Dwelling Unit</i>
<b>Greenpoint-Williamsburg</b>	8,257 (7,391)	337	3,245	250	0.39
<b>Jamaica</b>	5,380 (3,565)	3,100	1210*	6,490	0.22
<b>Atlantic Yards</b> (Average of residential and commercial variations)	5878	2,150	880	3,670	0.15
<b>Willeys Point</b>	5,500	3,440	2,500	4,200	0.45
<b>Flushing Commons**</b>	517	566	708	1,295	1.37
<b>Total</b>	22,851	9,593	7,333	15,905	0.32

\* The Jamaica rezoning will result in a 19 space increase over the existing accessory count. However these spaces are being reassigned from the Jamaica downtown core to several residential zones. The 1210 spaces counted here represent increases in residential off-street accessory parking based on the new zoning requirements.

\*\*We were unable to locate the environmental impact statement associated with the Flushing Commons project but a description of the project was laid out in a Draft Scope of Analysis for an Environmental Impact Statement. The draft was available from the NYC.gov website and accessed on June 29, 2008.<sup>1</sup> The project description notes nearly 1,300 public parking spaces at just under 250sq. ft. per space—this is a remarkably low number as most garage construction requires 300 to 350sq. ft. per space to accommodate access and egress lanes-- and 708 accessory spaces at 370sq. ft. per space. The accessory parking is set at a rate of 1.36, far in excess of other requirements in the city. Among the five specific goals for the site is the “maintenance of below market rate parking for the site.”

At a ratio of 0.32 parking spaces to dwelling unit (DU) the parking rate for these projects is quite low by national standards. It is lower than even the New York City zoning standard, which requires between 0.4 and 1 parking space per new unit,<sup>13</sup> but it is not low for many New York City neighborhoods. For example, Park Slope, Brooklyn, which has recently been named one of “the ten great neighborhoods in America,”<sup>14</sup> has approximately 0.06 off street spaces per DU, Jackson Heights, Queens has 0.14<sup>15</sup>. While not the focus of this study, a comprehensive assessment of contextual, or existing, off-street parking accommodation is an essential step if proper planning is to be done to protect the value and character of existing New York neighborhoods.

Table 2 illustrates development scenarios and the estimated increases in off-street parking and car ownership. The first two scenarios are very unlikely given the time frame for large scale project development, they are included here for comparison. There will be some very high density development mixed in with smaller scale and in-fill projects, as illustrated in the *High and Moderate Density* scenarios. With a few exceptions each new parking space will host an additional car, adding to the number of vehicles already owned by residents of the city. The estimated car ownership is only that due to the off-street parking requirement; we do not estimate car ownership increases associated with growth alone.

**Table 2 Possible Development Scenarios and Their Off-street Parking Impacts**

	<i>Spaces Per DU</i>	<i>Ultra High Density</i>	<i>Extreme High Density</i>	<i>High Density</i>	<i>Moderate Density</i>
Highest density <sup>1</sup>	0.32	75%	50%	20%	15%
Medium density <sup>2</sup>	0.5	12.5%	25%	45%	45%
Low density <sup>3</sup>	1	12.5%	25%	35%	40%
Increase in off-street parking and related car ownership <sup>4</sup>		113,288	141,775	169,335	178,345
Spaces per DU		0.43	0.54	0.64	0.67

<sup>1</sup> As estimated from the EIS analysis

<sup>2</sup> examples of zones at this level of parking requirement include R6QH-R7X

<sup>3</sup> examples of zones at this level of parking requirement include R1-R4B

<sup>4</sup> These estimates only include induced car ownership due to the off-street parking requirements.

<sup>12</sup> City of New York Office of Environmental Coordination. “Flushing Commons Draft Scope of Analysis.” (undated)

<sup>13</sup> City of New York Department of City Planning. “Zoning Data Tables.” 2006

<sup>14</sup> American Planning Association. “Great Places in America: Neighborhoods.” 2007

<sup>15</sup> Weinberger, Seaman and Johnson forthcoming

Focusing on the *High and Moderate Density* scenarios we calculate, based on off-street parking alone, residents of the new development are 42% to 49%<sup>16</sup> more likely to own cars than today's New Yorkers. While we cannot estimate the likely increase in overall auto ownership, we note that at most 6% of Park Slope households use off-street parking in their neighborhood<sup>17</sup>. The new developments would include off-street parking for 64% to 67% of dwelling units. If, for example, only 20% of the residents of these units were to park on street, these households would be 86% to 94% more likely to own cars than today's New Yorkers.

## Vehicle Miles Traveled

To develop an estimate of auto usage the Regional Transportation Household Interview Survey (RT-HIS) data were used. The survey's Public Use Distribution disk consists of multiple files: household, person, trip and vehicle files. For

this estimate, the trip and household files were used. From each file only those household and trip records that pertained to people living within the borders of New York City were selected.

Table 3 shows auto trip rates and trip lengths for households that own cars and those who do not own cars. Non-car owning households make, on average 0.04 auto trips per day most likely these trips are made in borrowed vehicles or include rides from friends or family members. Carless households are not further considered in the analysis. Car owning households in New York City make approximately 2.44 auto trips per day. The average trip length is 6.71 miles resulting in average weekday VMT of 16.38. From the NHTS we calculated that New York City households log approximately 130% of their average weekday mileage on weekend days. The total weekly mileage is thus approximately 125 miles per car owning household.

**Table 3 Daily Trip Rates and Average Trip Lengths for New York Households Surveyed in RT-HIS**

<i>Household auto ownership</i>	<i>Daily trips</i>	<i>Households in Survey</i>	<i>Trips per HH</i>	<i>Average trip length</i>	<i>Average weekday VMT/HH*</i>	<i>Average weekly VMT/HH**</i>
0 cars	71	2024	0.04	6.07	0.21	
1 or more cars	5407	2213	2.44	6.71	16.38	124.6

\*RT-HIS;

\*\*RT-HIS weekday estimate modified by NHTS weekend/weekday ratio

**Table 4 VMT Effects Due to Off-street Parking Requirements in Alternate Development Scenarios**

	<i>Ultra High Density</i>	<i>Extreme High Density</i>	<i>High Density</i>	<i>Moderate Density</i>
Increase in off-street parking	113,288	141,775	169,335	178,345
Annual VMT <sup>1</sup> (000)	734,103	918,702	1,097,291	1,155,676
CO2 Metric Tons per year <sup>2</sup>	288,338	360,844	430,990	453,922

<sup>1</sup>Based on current average annual driving of 6,480 miles per year source: RT-HIS and NHTS New York Supplement.

<sup>2</sup>Assumes 22.4 miles/gallon source <http://www.eia.doe.gov/aer/txt/ptb0208.html> United States Department of Energy Annual Energy Review accessed 7/20/2008 and 19.4lbs of carbon/gallon <http://www.epa.gov/otaq/climate/420f05001.htm> United States Environmental Protection Agency Emission Facts 2005 accessed 7/15/2008.

<sup>16</sup> Approximately 45% of New York City households own cars. If new residents own cars at the rate of 64% to 67% as implied by the zoning code and development scenario, they will be 42% to 49% more likely to own cars than today's New Yorkers.

<sup>17</sup> Because only 49% of Park Slope households own cars about 12% of car owning households use off-street parking facilities, 88% park on street.

Assuming that residents of developments with off-street parking accommodations drive at the same rate as current New Yorkers,<sup>18</sup> we combined the estimate of VMT per new household and the number of new households with off-street parking. We estimate 2 million average daily VMT in the most conservative scenario<sup>19</sup>. This is double the mileage savings estimated from the recently proposed congestion charge. Thus the City's policy of carbon reduction is undermined and reversed by the City's policy on off-street parking requirements for residential development.

Table 4 uses the development scenarios illustrated in Table 2 for the 265,000 new housing units and their expected VMT impacts due to the off-street requirement.

The most likely development scenarios, high and moderate density will produce an additional 1 to 1.55 billion annual VMT and 430,000 to 454,000 annual metric tons of carbon.

## Off-Street Parking and Cruising

It is frequently asserted that free residential off-street parking helps to reduce overall or local traffic, particularly cruising for parking. Surprisingly there is no empirical evidence to support this assertion. As we show in this report, off-street residential parking will increase traffic and it will very likely increase cruising for parking.

Additional car ownership will be generated by off-street parking because off-street parking reduces the search costs associated with parking. More New Yorkers would own cars if they had an affordable place to park them<sup>20</sup>. It is also true that the high demand for parking and the high density of many city neighborhoods results in frequent parking shortages and cruising for parking. Unless the City implements policies to better manage the curb and to reduce auto ownership, these shortages will persist. These shortages are exacerbated by the competition between motorists seeking residential parking and those commuting by car or driving to non-work destinations. The shortages will not be abated by marginal increases in off-street parking. In fact, as car ownership increases with new residential off-street parking supply it is quite likely that parking shortages in destination neighborhoods could be made even more severe.

In New York City, as elsewhere, there is demand for guaranteed, residential parking. This demand is met in suburban locations and the lowest density parts of the city. As long as there is curb saturation, however, additional off-street parking will provide space for additional cars –it is unlikely to provide relief at the curb.

## What the City Doesn't Know

In developing the research reported in this study and the forthcoming companion report that looks at travel behavior in two New York City Neighborhoods, every possible data source on residential off-street parking was consulted. These include the Primary Land Use Tax lot Output file, the Department of Consumer Affairs commercial parking database, and the City Zoning Resolution, all of which are produced and maintained by the City and presumably relied upon for analysis and policy making.

Unfortunately, we found these data woefully inadequate for the task of developing citywide policy on parking.

The primary shortcomings of these data include grave inaccuracies and omissions. In limited explorations we found several instances of addresses or longitude and latitude coordinates for garages listed by the DCA that were neither consistent with PLUTO files nor verified by field inspections. In field verifications we found garage space in residential buildings (in one instance between 4,500 and 5,000 square feet) that was not accounted for in the PLUTO data. And perhaps most profoundly affecting the city there is no record of driveways, alley parking and or garages for small residential buildings of up to three families. This data omission policy nearly cripples the City in its ability to quantify off-street parking.

We also were unable to uncover any analysis or methodology that would lead to parking policy decisions.

Specifically we have come to understand the City:

- Has no tangible count of on or off-street parking.
- Employs no methodology to understand the relationship between parking provision and
  - traffic;
  - air pollution;
  - greenhouse gas emissions;
  - auto related health impacts such as asthma and collisions; or
  - quality of street life.

<sup>18</sup> As is shown in Weinberger, Seaman and Johnson (forthcoming) this is likely an underestimate. Households with on site off-street parking are likely to use their vehicles more intensely than other car owning households.

<sup>19</sup> new residential off-street parking spots \* average weekly VMT/HH /7= 113,288\*124.67/7 =2 million

<sup>20</sup> It is deeply ironic that the City's policy on affordable parking should undermine its policy on affordable housing.

## Conclusion

Parking is a key element of the street and highway system. Parking supply affects driving demand by changing the underlying cost structure associated with mode choice decisions. It also affects levels of auto ownership by changing the cost of auto ownership. These two facts combine to make parking management an important powerful tool for both traffic and air quality management.

Absent any other evidence we are inclined to conclude that, like many cities in the United States, New York City has developed a residential off-street parking policy based largely on what is perceived as convenient for car owners at their home locations.

It may seem to be a sensible policy for the City to try and accommodate the desires of some households to own cars but this is a poor approach from the perspective of public stewardship of the city. First, the policy erodes sidewalk integrity and therefore the public realm. Second, adding to the cost of housing development further burdens households who prefer to live car-free. Finally, adding automobile infrastructure in the form of off-street parking will inevitably lead to additional demand for auto travel throughout the city and region.

Adding more terminal space without reference to the right-of-way capacity will bring the system out of balance. Adding capacity in a codified but apparently ad-hoc way undermines the rational planning process. It is at odds with the carbon reduction strategies set forth by City Hall and the guiding principles of sustainable development set forth by the Department of City Planning itself<sup>21</sup>. By increasing the cost of housing construction it also undermines the department's mission of facilitating housing development.

We have discussed principles of transportation planning as they relate to parking and our research has shown that the City's residential off-street parking regulations will undermine its own vision for a sustainable future. Population growth will very likely lead to increased auto ownership, the City, rather than striving to accommodate more auto ownership should focus on strategies that accommodate population growth without embracing auto growth; indeed, to support rather than undermine several worthwhile objectives the City claims to pursue, the City should strive to reduce growth in auto ownership.

<sup>21</sup> City of New York Department of City Planning. "Agency Strategic Plan." (undated)



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