NYU Furman Center

WHITE PAPER

Inclusionary Housing Policy in New York City:

Assessing New Opportunities, Constraints, and Trade-offs

Josiah Madar | March 26, 2015

furmancenter.org

Source: Furman Center and New York Department of City Planning

In R10 and similar commercial zoning districts, the city's zoning code ordinarily permits developers to build to a floor area ratio (FAR) of 10,[9] which generally results in high-rise construction. Under the IHP, developers of sites in these zoning districts can earn 3.5 square feet of bonus zoning density for every square foot of newly constructed affordable housing (including associated common areas) built without direct public subsidies[10] and increase the FAR of their building by up to 20 percent to 12. For example, on a site that ordinarily would allow 100 units, a full zoning bonus would allow the developer to build an additional 20 units, for a total of 120. To generate this bonus, the developer would need to set-aside about six of the units as affordable (20 divided by 3.5). Even though the program's affordable housing requirement is not expressed as a percentage set-aside, the 3.5 "multiplier" is the rough equivalent of 30 percent of the additional density (six units out of 20 additional units) or about five percent of the entire building (six units out of 120 total units), if the full bonus is generated.

In the Designated Areas, the base FAR ranges between 2 and 9, depending on the underlying zoning district, and in most cases can be increased by up to 33 percent. In these areas, developers generally earn only 1.25 square feet of bonus density for every square foot of affordable housing they provide, which can be developed using public subsidies. For example, in a typical Designated Area, a developer could increase a 60 unit project to 80 units if using the 33 percent maximum bonus. With a multiplier of 1.25, this 20 units of bonus density would require 16 units of affordable housing, which is equal to 75 percent of the additional density and 20 percent of the total project. In some Designated Areas, developers have the option of providing affordable units that serve moderate- and middle-income households (rather than low-income) but generate a smaller bonus.

Under the IHP, developers can either provide the affordable units on-site or off-site, within a defined distance of the market-rate project using the zoning bonus,[11] and, in each case, the affordable units generate the same amount of bonus. The off-site option effectively allows market-rate developers with projects located in an R10 district or Designated Area to purchase bonus density generated by other developers nearby rather than develop affordable housing themselves. Only the project that is using the zoning bonus needs to be located in either an R10 zone or Designated Area, not the site of the affordable housing.

Additionally, the IHP allows developers to generate bonus density not only by building new affordable housing, but also by substantially rehabilitating existing housing currently in poor condition and contractually agreeing to comply with the occupancy and rent restrictions of the IHP, or agreeing to restrict existing market-rate housing (or housing that is scheduled to exit other affordability restrictions in the near future) in accordance with the program's requirements for affordable housing. However, this

[9] "Floor area ratio" or "FAR" is the primary method the city's zoning code uses to limit density. FAR specifies the maximum building area that can be built per square foot of land area. For example, on a 10,000 square foot site with an FAR of 10, a developer can build a building with 100,000 square feet of floor area.
[10] Affordable units that benefit from direct government subsidies only generate 1.25 square feet of bonus density.
[11] The off-site units must be located in the same community district as the project using the density bonus or no more than half a mile away in an adjacent community district.

Figure 2: Approximate 421-a Geographic Exclusion Area

Source: New York City Department of Housing Preservation and Development and Furman Center

For 35 years after construction, affordable units provided to fulfill 421-a's requirements in the GEA can only be sold or rented to tenants who, at the time of sale or lease, meet the applicable income limits. If the units are developed without other types of government subsidy, the income limit is 60 percent of AMI (in 2014, this equaled $40,320 for a two-person household in New York City). If a project is developed with other types of government subsidy, all the affordable units must be affordable to households earning 120 percent of AMI (in 2014, this equaled $80,640 for a two-person household), and in buildings with 25 or more total units, the average level of affordability for the affordable units cannot exceed 90 percent of AMI (in 2014, this equaled $60,480 for a two-person household). During the 35 year period, rents cannot exceed 30 percent of the applicable income limit. The affordable units must be located on-site, unless the developer purchases certificates that were produced before 2008 under a now-defunct off-site production option.[14]

[14] Before 2008, 421-a included an off-site option that allowed affordable housing developers to generate certificates by building new affordable units anywhere in the city. Market-rate developers could buy these certificates and use them to qualify their projects for property tax exemption within the GEA (which then consisted only of parts of Manhattan). Under current law, no new certificates can be created, but there are still a number of unused certificates available that generate 10 or 15 years of tax exemption, subject to a cap on the exempt value. As a result, some number of new market-rate projects will continue to qualify for tax exemption without providing on-site affordable units until the remaining supply of certificates is exhausted.

The tax exemption itself applies to the net new taxable value resulting from the new construction, meaning that during the duration of the exemption, the building owner pays property taxes only on the fixed, pre-development value of the property. In most cases, this is only a very small portion of a new multifamily building's potential tax liability. Given the relatively high property tax burden facing multifamily residential properties in the city (especially rental buildings), the 421-a exemption offers significant savings to market-rate landlords and condominium unit owners.

Inside the GEA, and for properties outside the GEA that are at least 20 percent affordable, the exemption lasts between 20 and 25 years (including a phase-out period), depending on the location, and there is no cap to the exemption's value (see Table 1). Outside of the GEA, for properties that are less than 20 percent affordable, the exemption lasts for 15 years (including a phase-out period), and the value of the exemption is capped.[15]

Table 1: Summary of 421-a Benefits and Requirements

	Inside the GEA: Manhattan south of 110th St.*	**Inside the GEA: except Manhattan south of 110th St.***	**Outside the GEA****
Required affordable set-aside	20% of units	20% of units	None
Duration of exemption	12 years full, plus 8-year phase-out	21 years full, plus 4-year phase-out	11 years full, plus 4-year phase-out
Cap on exemption value	None	None	Yes
Duration of affordability requirements	35 years	35 years	N/A
Income limits for affordable units	60% of AMI (at tenant's initial lease date), if no other government subsidy is used	60% of AMI (at tenant's initial lease date), if no other government subsidy is used	N/A
Rent regulation for affordable units	Rent capped at 30% of income limit	Rent capped at 30% of income limit	N/A

*For properties that do not purchase certificates.

**Properties outside the GEA can also elect to meet the 20 percent affordable requirement and receive the 25-year exemption that is available inside the GEA.

The interaction of 421-a and the Inclusionary Housing Program

[15] Similarly, an exemption obtained through the purchase of certificates lasts for between 10 and 15 years, depending on the location within the GEA, and in most cases the value is capped.

A single building can participate in both 421-a and the IHP if it is eligible and meets both programs' requirements (see Table 2). In fact, a single affordable unit can count towards the required 421-a set-aside in the GEA while also generating a zoning bonus if it meets all of the location, design, and affordability requirements of both programs.

This ability to count affordable units towards both programs has important implications for the way they are used. Because the 421-a benefit is so valuable, virtually every new rental building in the GEA participates, and a vast majority of those do so by providing on-site affordable units rather than purchasing grandfathered certificates.[16] As long as 421-a is available in its current form, it effectively establishes a baseline 20 percent affordability set-aside in the city's highest-cost neighborhoods for rental buildings, regardless of the requirements of the current IHP. Additionally, these affordable units must be affordable at 60 percent of AMI, even though the IHP only requires affordability at 80 percent of AMI.

To return to our earlier examples, if a developer with a site inside the GEA can build a 100-unit rental building in an R10 district without a zoning bonus, 20 of those units would need to be affordable to qualify for 421-a. If the developer participates in the IHP, earning the 20 percent zoning density bonus, the building can then build 120 units. Of these, 24 would need to be affordable to qualify for 421-a. The IHP requirement to generate the bonus, which would be 6 units in this instance, is met and exceeded by the 24 units needed to comply with 421-a. While building a larger project requires more affordable units to remain in compliance with 421-a (the equivalent of 20 percent of the additional density), the only burden imposed by the IHP itself is the additional costs of making some or all of the affordable units comply with the special requirements of the IHP (e.g., the administrative process,[17] stricter unit design requirements, and rent-restricting the affordable units permanently instead of for 35 years). [18] If the programs did not permit double counting, the developer in this case would have to provide a total of 30 affordable units (24 under 421-a plus six under the IHP), 25 percent more than would be required under the current rules.

[16] Based on an analysis of certificates of occupancy and data from the New York City Departments of Building, City Planning, and Finance, we identified about 3,300 rental units in primarily market-rate buildings (with a minimum 10 units) that (1) were located within the GEA and eligible for 421-a, (2) obtained building permits after the current 421-a eligibility rules went into effect (July 1, 2008), and (3) were completed between 2011 and 2013. Of these, 94 percent are in buildings that participate in 421-a by providing on-site affordable units. A vast majority of market-rate condominium buildings completed over this period in the GEA either qualified for 421-a using certificates or did not participate at all. These counts exclude units located in buildings receiving other types of exemptions available only to affordable housing.

[17] Historically, developers have reported that the administrative process required to participate in the IHP is extremely cumbersome. In past years, this process has involved reviews of building and unit designs, condominium plans, and building finances, and has reportedly taken several months. Recent changes to the administrative process have reportedly shortened this timeframe.

[18] In fact, because the five percent set-aside effectively required to maximize the IHP bonus in R10 districts is so much smaller than the 421-a requirement, certifying the full 20 percent of affordable units under the IHP generates far more bonus than can be used on-site. This allows developers to maximize their own bonus and also potentially sell additional bonus zoning density to other projects located in an R10 district or Designated Area that do not include on-site affordable units.

The interaction is similar in the Designated Areas, where the effective set-asides required by 421-a and the IHP are both 20 percent. A 60-unit building expanded to 80 units with bonus density would require an increase in affordable units from 12 to 16 to remain in compliance with 421-a. Those same units could also fully meet the IHP's affordable housing requirement. If not permitted to double-count, the developer would need to provide 16 affordable units under each program for a total of 32, a much higher burden that would dramatically change the economics of the development.

Table 2: Summary of 421-a and Inclusionary Housing Program

	421-a	**Inclusionary Housing Program**
Benefit provided	Property tax exemption	Additional zoning density
Required Set-Aside	20%	20% (Designated Area) or 4.8% (R10)*
Affordability Level	60% of AMI (if no other government subsidy is used)	80% AMI
Duration of Affordability	35 years	Permanent
Off-site Option	No**	Yes

*Assumes generation of maximum zoning bonus.
**Other than the remaining certificates generated before 2008.

D. Financial and Data Analysis

To better understand the potential for new inclusionary housing programs to produce affordable housing in New York City, we built financial models similar to what a private developer might use to evaluate potential development opportunities. By analyzing these models, we are able to estimate the effects of varying set-aside and affordability requirements on the financial performance of various types of rental development in different parts of the city and some of the resulting constraints on policy design. In the remainder of the report, we describe our broad findings from our financial modeling (and from analysis of other related data) and identify key issues policymakers must consider when developing new programs.

Our Financial Models

Our models focus on mid-rise and high-rise rental buildings. Residential real estate development in New York City takes many forms, ranging from super-tall luxury towers to modest, detached single-family houses. But, in recent years, projects with at least ten units have made up about three quarters of all new housing production, and of those, about 80 percent were in elevator buildings.[19]

[19] For buildings with certificates of occupancy issued between 2011 and 2013. Based on a Furman Center analysis of data collected from the New York City Department of Buildings, Department of City Planning, and Department of Finance. The share of new units in elevator buildings is even higher in the high-priced neighborhoods that offer the most potential for cross-subsidy of affordable units.

We do not model condominium development, which, due to differential property tax treatment[20] and the apparent reluctance of condominium developers to provide affordable units on-site, in addition to different development costs and revenue potential, requires separate analysis. Although condominium projects currently make up a significant share of development in prime neighborhoods, and may be an important part of any new inclusionary housing program, a vast majority of high- and mid-rise residential buildings in the city currently under development are rental projects.[21] Because the economics of condominium development are different in a number of ways from those of rental development, it is impossible to extrapolate from the models described here the ability of condominium developments to cross subsidize affordable units.

Specifically, we model three types of rental construction:

- High-rise (generally 16 stories or higher), with no parking, which can be built only in the Manhattan core and parts of Long Island City, due to the minimum parking requirements that apply in the rest of the city;
- High-rise with parking for 20 percent of all units, which the city's zoning currently permits in Downtown Brooklyn; and
- Mid-rise (generally between six and 12 stories, with an elevator), with parking for half of all units, which the city's zoning currently permits in many neighborhoods.

For most of our analysis, we match these construction types to neighborhood market types to define six different project types, which are summarized in Table 3. The neighborhood market types are based on actual neighborhoods in New York City and our estimates of current rents are drawn from interviews with developers and recent leasing data provided by Jonathan Miller of Miller Samuel. These neighborhoods are not intended to be representative of every part of the city, but provide a sample of city submarkets in which market-rate development currently occurs and in which rents are high enough to support at least some cross-subsidy of affordable units. We do not model the city's weaker housing markets in which mid- and high-rise market-rate housing does not appear to be financially feasible without direct subsidy (as discussed in the first subsection of our findings).

The first five market types we model are located inside the 421-a GEA, so require a 20 percent affordable set-aside to qualify for property tax exemption. Only the sixth, our mid-rise/moderate-weak

[20] For an overview of New York City's property tax system and its treatment of condominium units, see Furman Center. (2013). *Shifting the Burden: Examining the Undertaxation of Some of the Most Valuable Properties in New York City*. New York City. Available at: http://furmancenter.org/files/FurmanCenter_ShiftingtheBurden.pdf.

[21] According to data provided by Reis, of all units in multifamily buildings currently planned, proposed, or under construction, almost 90 percent are in rental projects. The Upper East Side is the only neighborhood submarket tracked by Reis in which condominium development makes up a majority of the development pipeline. However, real estate professionals we consulted reported that condominium developers have generally out-bid rental developers for development sites in prime neighborhoods over the past several months, suggesting that the composition of the pipeline may shift in the future, particularly where the economic potential of inclusionary zoning is greatest.

market project type, is located outside the GEA, meaning the property tax exemption is available without the developer providing any affordable housing.

Table 3: Analyzed Project Types

Construction Type	Market Type	Annual Gross Rent	Example Neighborhood(s)
High-rise (no parking)	Very Strong, inside the GEA	$80 per rentable sf (1BR: $4,800/mo)*	Manhattan Core
High-rise (20% parking ratio)	Strong, inside the GEA	$60 per rentable sf (1BR: $3,500/mo)*	Downtown Brooklyn
Mid-rise (50% parking ratio)	Strong, inside the GEA	$60 per rentable sf (1BR: $3,600/mo)*	Williamsburg Upland
Mid-rise (50% parking ratio)	Moderate, inside the GEA	$44 per rentable sf (1BR: $2,600/mo)*	Astoria
Mid-rise (50% parking ratio)	Moderate-low, inside the GEA	$37 per rentable sf (1BR: $2,200/mo)*	Bedford-Stuyvesant (inside the GEA)
Mid-rise (50% parking ratio)	Moderate-low, outside the GEA	$37 per rentable sf (1BR: $2,200/mo)*	Bedford-Stuyvesant, Flushing, other relatively strong markets outside the GEA

*Approximate monthly rent for one-bedroom apartment of 720 square feet.

Key Assumptions

Our models rely on a set of assumptions about construction costs, operating costs, mechanical and common area "loss factors,"[22] and other factors, which we compiled based on interviews with residential developers and other industry experts active in New York City. In many cases, the experts we interviewed identified a range of values, from which we selected a specific number to use in our models. A full list of our assumptions is included in Appendix A.

Our analysis also relies on assumptions about the minimum financial performance each of our project types would need to achieve for a developer to be willing to build. Developers and real estate investors measure the financial performance of real estate development in many ways, but for simplicity, our models focus on one common metric: the stabilized net operating income yield (the "NOI yield"). This measure is equal to the net income the building is projected to generate (rent and other income, less operating expenses) in the first year it has been fully leased to tenants, divided by the total amount spent to acquire the site and design and construct the building.[23]

[22] The "loss factor" is the share of the total building gross square footage (other than parking) that is not rented to tenants.

[23] The NOI yield is "free and clear," meaning it does not take into account any debt on the project. As a further check on the economic feasibility of development, we also calculated the projected internal rate of return assuming a sale of the new building 12 years after the project commenced, both with and without financing (see Appendix A).

The NOI yield a developer will seek is tied to the current resale value of similar types of buildings in a similar neighborhood. Generally speaking, a developer will require a lower projected NOI yield for project types and submarkets with less perceived risk, where properties tend to sell at relatively high multiples of their net income. Our models assume developers would need to generate an NOI yield of 5.25 percent for the two high-rise project types we analyze, 5.50 percent for the mid-rise/strong market projects, and 5.75 percent for the mid-rise projects in moderate and moderate-low markets. For purposes of this analysis, we treat these minimum yields as fixed thresholds, assuming that developers would not accept a lower yield if policy changes made development less profitable.

To be clear, our models provide only rough approximations of financial performance under different development scenarios. Even for a single developer, the inputs in our models can vary widely among actual projects. For example, construction costs per square foot of building area depend not only on the building type (high-rise versus low-rise, which we distinguish in our models), but also on the overall size of the project, the building configuration, the level of finishes, location, site conditions (e.g., subsurface conditions, like environmental contamination, poor soil conditions, and interaction with subway tunnels and other infrastructure), and whether the developer is also the builder. Costs can also shift rapidly over time due to global demand for materials and local competition for skilled workers.

Also, although our goal is to model developer incentives, developers are a heterogeneous group with different capital sources and business models that create different threshold return requirements. They use different measures of financial performance from one another, have different minimum thresholds of performance, and may have very different expectations of market-rent trends, which will greatly affect their projections of a potential project's viability. Although we describe development that would not generate the minimum NOI yield we assume as "infeasible," we cannot be sure some developers would not still pursue such a project. Even with these caveats, our overall findings are fairly robust to variation in the assumptions we use, but the numbers we report should not be treated as point estimates.

E. Findings

1. Without additional subsidy, inclusionary housing applied to high-density development is financially feasible only in neighborhoods with relatively high rents.

High- and mid-rise development in New York and other high-cost cities is extremely expensive due to the materials, labor, and mechanical systems required for mid-rise and high-rise construction. As a result, even without taking into account land costs, relatively high market rents are needed to generate the NOI yields we estimate are necessary to make development feasible. In markets where rents are too low to generate this yield on construction costs, developers would be unlikely to build, even if land were free. Furthermore, additional zoning density offered through a zoning bonus or upzoning in these areas would have no material value in the near-term, because a developer would be unable to generate an acceptable NOI yield by building out the additional floor area. For these reasons, in much of New York City, inclusionary housing on its own will be unable to produce any affordable housing.

High hurdle for building high-density housing

In neighborhoods without a strong track record of recent market-rate development and higher perceived risk, we assume developers need to generate at least a 5.75 percent NOI yield on development costs. Table 4 shows the current rent per square foot of apartment floor area that, net of operating expenses, would be needed to generate this yield on the hard and soft construction costs incurred by building that square foot of apartment floor area (and associated common and mechanical areas). This is the approximate "break even" point at which building *additional* floor area would become financially feasible. However, to be clear, this rent is only a lower bound for the feasibility of a full development project, because it would not leave any room to pay for site acquisition.[24]

The table shows the minimum rent for the two construction types we model that would be permitted outside of the Manhattan core,[25] with and without property tax exemption, and with and without a 20 percent affordable set-aside requirement applied against the floor area.

Table 4: Current market rent (per rentable square foot per year)* required to generate 5.75% NOI yield on construction costs, by building type, affordable set-aside, and property tax status

	100% Market-rate Building		20% Affordable Building (at 60% AMI)	
	A	**B**	**C**	**D**
	Full Property Tax	**No Property Tax**	**Full Property Tax**	**No Property Tax**
High-rise with 20% parking requirement	$61 ($3,600 for a 1BR unit**)	$39 ($2,400 for a 1BR unit**)	$72 ($4,300 for a 1BR unit**)	$45 ($2,700 for a 1BR unit **)
Mid-rise with 50% parking requirement	$54 ($3,200 for a 1BR unit**)	$33 ($2,000 for a 1BR unit**)	$63 (3,800 for a 1BR unit**)	$38 ($2,300 for a 1BR unit**)

*Assumes 3% annual increases between now and first stabilized year.
**Approximate rent for one bedroom unit.

Column A of Table 4 shows the minimum rent needed assuming the project would be fully market-rate, but subject to New York City's full property tax. As explained above, a vast majority of newly built rental buildings in New York participate in the 421-a exemption program that is currently available, but we include column A to illustrate the significance of the exemption to development feasibility and because the program is scheduled to expire later this year, so may no longer be available. For fully taxed high-rise construction, we estimate current rent would need to be about $61 per square foot to generate the minimum NOI yield, even with no land cost. For a one-bedroom apartment, this rent level translates to about $3,600 per month in current rent, which would be affordable to tenants earning about 220

[24] Land prices vary widely, depending on the market rents in a neighborhood, the speculative value of possible future rents, and the profitability of any permitted non-residential uses.
[25] As discussed below, all of the Manhattan core (Manhattan below 96th Street) has a sufficiently strong housing market to justify high-density development, so our focus is on more marginal submarkets.

even with a required affordable unit set-aside. In these neighborhoods, how we evaluate the potential for cross-subsidy depends on the approach an inclusionary housing policy takes.

Mandatory policies without offsetting benefits

As discussed above, a mandatory policy that imposes an affordable set-aside requirement without an accompanying upzoning or new tax benefit may depress land prices, because developers will bid less for development sites than they would have without the requirement. Assuming that land is priced to allow developers to fully develop a site and earn a reasonable return before the policy was enacted, the effective amount of cross-subsidy available to cover affordable units depends on how far downward land prices adjust and whether developers would accept lower returns.

To illustrate the relationship between a mandatory policy, land values, and NOI yield, we can model a policy change that adds an additional on-site affordable set-aside requirement to a hypothetical rental project inside the GEA, based on our high-rise/strong market project type described on page 14. We can call this project "Furman Tower." Before the policy change, Furman Tower would need to have a 20 percent set-aside at 60 percent of AMI to comply with 421-a. If the project could have 236 total units under current zoning,[31] this would mean 47 would need to be affordable. To generate a NOI yield of 5.25 percent, we estimate the developer of Furman Tower could afford to pay about $44.4 million for the development site. If the landowner is willing to sell at this price (net of any required demolition and environmental remediation costs), acquisition of the site and development of the project would be financially attractive to the developer.

If a new policy increased the affordable set-side by an additional 25 units without providing any offsetting benefits, the total rental revenue Furman Tower generates each year would be significantly lower. If the full cost of this reduced revenue is born by the developer (i.e., the land price remains $44.4. million), we estimate that the NOI yield for Furman Tower would drop to 4.62 percent. If the full cost is born by the land seller (i.e., the developer maintains its 5.25 percent yield), the value of the land would need to drop to about $28.9 million, a 35 percent decrease. If the willingness of the land owner and developer to sell at a lower price or accept a lower yield, respectively, do not match up in a way that absorbs the value of the lost rent revenue, the site will remain undeveloped and the city will see neither market-rate nor affordable units for the time being.

How the parties respond to such a policy change would depend on many factors, including alternative development opportunities available to developers (and their investors), alternative uses of the land, and the land owner's willingness to sell the land for less than previously expected. Just how much land prices or developer returns could fall to provide a cross-subsidy for affordable units is difficult to estimate and likely varies from site to site.

Cross-subsidizing affordability with additional density

[31] This hypothetical building is based on the "full building" assumptions in Appendix A.

Alternatively, policymakers can adopt a voluntary program that offers valuable benefits to developers in exchange for reserving affordable housing, or a mandatory inclusionary housing program that coincides with other policy changes providing new benefits to developers.

Under a voluntary program, the offsetting benefits must offer more value than the cost to the developer of participating in the program in order to attract participation. For a mandatory policy, the relative values of the simultaneously adopted benefit and the cost of providing affordable units determines the point at which the set-aside requirement would need to depress land prices or reduce developer returns in order for development to occur (assuming it was feasible before the policy change).

If we return to our hypothetical Furman Tower project, we estimate that setting aside 25 additional units as affordable would reduce the net operating income in the first stabilized year of operations by about $830,000. However, if we simultaneously add zoning density allowing the project to include 47 more units (all of which could charge market-rent[32]), the resulting net income from those units is enough to offset the $830,000 loss and still generate a 5.25 percent yield on the additional construction costs needed to develop the larger building. The result, summarized in Table 5, is a larger project that can bear the original land acquisition price and generate the original NOI yield. The additional 47 units of density completely cross-subsidize the 25 additional affordable units.

Table 5: Hypothetical "Furman Tower" Project

	Total Units	Affordable Units	Available for Land Acquisition	NOI Yield
Current zoning and 20 percent set aside as affordable to qualify for 421-a	236	47	$44.4M	5.25%
Current zoning and 10 additional units set aside as affordable, cost born by developer	236	72	$44.4M	5.04%
Current zoning and 10 additional units set aside as affordable, cost born by landowner	236	72	$37.3M	5.25%
10 additional units set aside as affordable *and additional zoning density permitting 19 more units*	283	72	$44.4M	5.25%

In the Furman Tower example, we refer to the ratio of 25 affordable units to 47 units of additional density (52 percent) as the "**cross-subsidy potential**" for this construction type in this market. This is the percentage of *additional* floor area that can be affordable while still generating the minimum NOI yield we assume that a developer would need for a given project or, in other words, at which the market rate portion of additional density fully cross-subsidizes the construction and operation of the affordable portion. The cross-subsidy ratio for a given development site depends on the market rents in the area, the construction and operating costs, and the required level of affordability for the affordable units.

[32] If we assume the new set-aside requirement allows affordable units to be double-counted, the 25 additional affordable units are more than enough to keep the full project in compliance with the 20 percent set-aside required by 421-a inside the GEA.

To be clear, the cross-subsidy potential is not the affordable percentage of the entire project to which that density is added. As discussed below, how the cross-subsidy potential translates into an affordable set-aside for an entire project depends on the base level of zoning density and how much additional density is added through an upzoning or bonus.

As Table 6 shows, the cross-subsidy potential of additional density varies widely across the project types we describe on page 14 because of their different market rent levels and construction and operating costs. Our estimates are based on maintaining the target NOI yield for each project type specified on page 15 (between 5.25 and 5.75 percent) and assume the affordable units are for households earning 60 percent of AMI.

For additional high-rise floor area in our very strong market type, if it were fully taxed, the cross-subsidy potential would be 28 percent, meaning net revenue from additional market-rate density is high enough to generate a 5.25 percent NOI yield on the additional construction costs, even if the equivalent of 28 percent of the additional density is set aside as affordable. For fully taxed high-rise and mid-rise development in our strong market type, the cross-subsidy potential is only eight percent and 19 percent, respectively. For mid-rise construction in our moderate and moderate-weak market types, fully taxed additional density has no capacity for cross-subsidy at all. Without property tax exemption, the capacity for added density to cross-subsidize affordable units is nonexistent or extremely limited, even in fairly high-rent neighborhoods.

Table 6: On-site cross-subsidy potential* of additional density, by project type**

	Full Property Taxes	With Property Tax Exemption
High-rise, very strong market (inside the GEA)	28%	61%
High-rise, strong market (inside the GEA)	8%	52%
Mid-rise, strong market (inside the GEA)	19%	62%
Mid-rise, moderate market (inside the GEA)	0%	36%
Mid-rise, moderate-low market (inside the GEA)	0%	15%
Mid-rise, moderate-low market (outside GEA)	0%	15%

*For units affordable at 60 percent of AMI

** Refer to Table 3 for project type definitions

For projects with property tax exemption, the situation is very different. For the projects types in our very strong, strong, and even moderate markets, affordable units can make up more than 50 percent of incremental new density added to a development project without affecting land values or the NOI yield. For the high rise/very strong market and midrise/strong market project types, the cross-subsidy potential is more than 60 percent. Even in the moderate-low market types, additional density has some capacity to cross-subsidize affordable units if added to a project with property tax exemption. Of course, even this last market-type has relatively high rents for New York City. As discussed in the previous section, our models suggest that weaker markets with rents below those shown in columns A and B of Table 4, which comprise much of the city, have no potential for cross-subsidy.

New requirements versus the 421-a requirement

When interpreting Table 6, it is important to keep in mind that of the cross-subsidy potential we estimate for additional density added to our project types inside the GEA, 20 of the percentage points would generally be required by 421-a in order for the enlarged project to qualify for the property tax exemption. This means that only the amount above 20 percent could be required by a new inclusionary housing policy that did not permit affordable units to count towards both programs.

For example in Furman Tower (which is located inside the GEA), additional zoning density will permit 47 more units. Of these, the 52 percent cross-subsidy potential means about 25 can made affordable without affecting the feasibility of the project. As Table 7 shows, however, about 9 of the 47 additional units would need to be affordable under 421-a, meaning only 16 of the 25 new affordable units could be newly required by a separate inclusionary housing program that does not permit double-counting.

Table 7: Affordable units in hypothetical "Furman Tower" project

	Total Units	Affordable Units*	20% required to qualify for 421-a
Base Density	236	47	47
Additional Density	47	25**	9
Total	283	72	56

*Affordable at 60% of AMI
**Maximum permitted by cross-subsidy potential of additional density

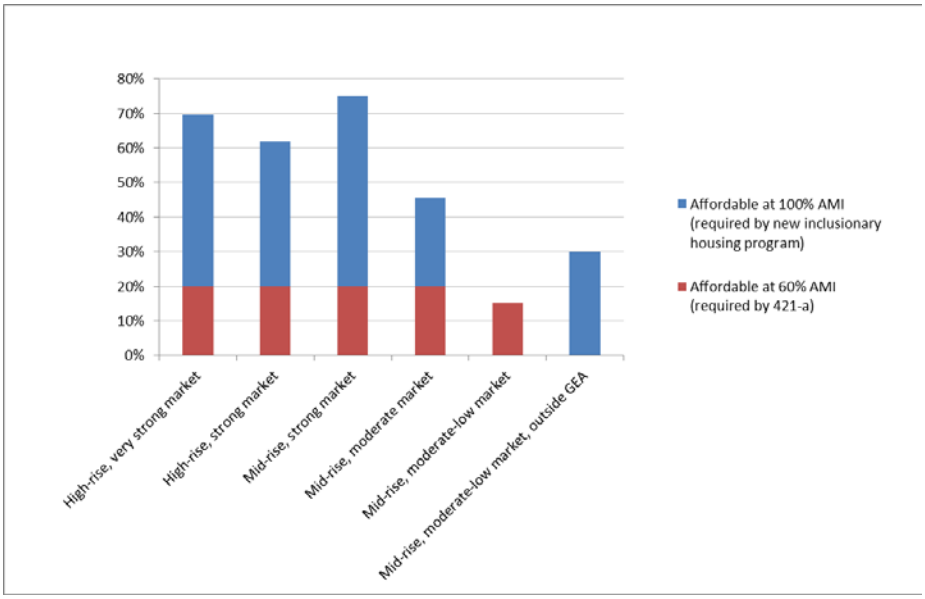
For additional density added to a tax exempt project that has a cross-subsidy potential below 20 percent, such as for our mid-rise/moderate-low market project type, that cross-subsidy can only be exploited if located outside the GEA, or if reduced developer returns make development feasible with a higher set-aside. If inside the GEA, the additional floor area would be financially infeasible to develop,

because setting aside enough affordable units to qualify for 421-a would generate too low an NOI yield.[33]

Even if a new inclusionary housing policy allows affordable units to serve higher income bands, a building must still comply with the requirements of 421-a; 20 percent of the units must still be affordable at 60 percent of AMI if inside the GEA and not using other forms of government subsidy. Figure 4 shows the cross-subsidy potential of additional density under an inclusionary housing program that allows affordable units to serve households earning 100 percent of AMI. For the project types in our very strong, strong, and moderate markets, all of which are inside the GEA, the higher affordability level results in a larger cross-subsidy potential than in Table 6. For high-rise development in our very strong market, for example, 20 percent of additional density could be affordable at 60 percent AMI (fulfilling the 421-a requirement) and another 50 percent could be affordable at 100 percent of AMI.

However, the increase in the cross-subsidy potential permitted by a higher affordability level is partially muted because the cross-subsidy must still provide the deeper affordability required by 421-a for 20 percent of the additional floor area. For the mid-rise/moderate-low market project type inside the GEA, the higher income target has no effect on the cross-subsidy potential because the cross-subsidy is insufficient to fulfill the requirements even of 421-a. Outside the GEA, in contrast, developers need not set-aside any affordable units to qualify for the exemption. Accordingly, all of the affordable housing that the additional density cross-subsidizes can be affordable at 100 percent of AMI, and the change in affordability level makes the cross-subsidy potential for this project type double, from 15 to 30 percent.

Figure 4: On-site cross-subsidy potential of additional density with property tax exemption (affordability at 60% and 100% AMI), by project type

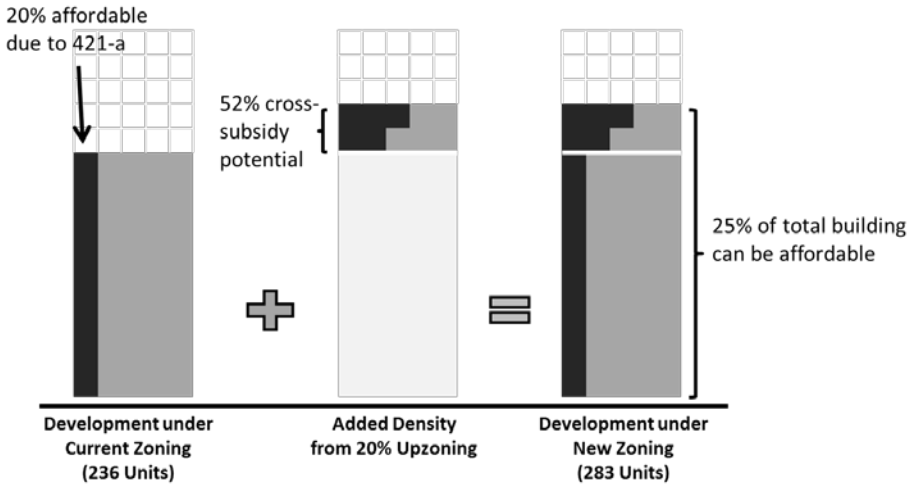


[33] This is consistent with the minimum rents shown in Table 4. The market rent for our moderate-low market type is only $37 per rentable square foot, less than the $39 that Table 4 shows is needed to provide the minimum NOI yield for mid-rise building area that is 20 percent affordable to households earning 60 percent of AMI.

The Affordable Set-Aside for the Entire Building

The cross-subsidy potential described in Table 6 and Figure 4 applies only to the additional density added to a development site. The share of an entire building that could be affordable given the cross-subsidy potential we estimate depends on how much additional density is added by a bonus or upzoning. For example, turning back to our Furman Tower project, the additional density increased the building size from 236 units to 283 units, a 20 percent density increase (see Figure 5). That additional density cross-subsidizes 25 additional affordable units, reflecting the 52 percent cross-subsidy potential for that project type. But those 25 units make up only about nine percent of the entire building. Between the 47 affordable units required of the initial density to qualify for 421-a and the 25 additional affordable units, the total affordable set-aside for Furman Tower would be about 25 percent.

Figure 5: **Affordable set-aside for hypothetical "Furman Tower" after 20 percent zoning density increase**

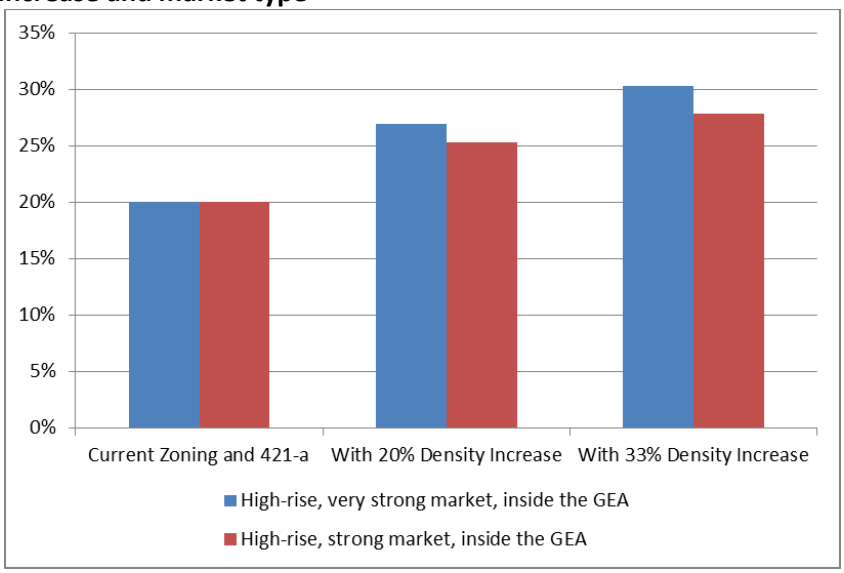


Figures 6 and 7 translate the cross-subsidy potential of additional density added to our different project types into total affordable set-aside percentages for whole tax-exempt buildings under different zoning density increase scenarios. In each case, the set-aside reflects the affordable units cross-subsidized by the additional density as well as the affordable units that would have been required in the base density to qualify for 421-a, if located inside the GEA. For example, if an upzoning increases the permitted density of a high-rise project with property tax exemption in our very strong market type by 20 percent, the cross-subsidy potential (61 percent) would apply to only one sixth of the resulting total zoning density. As Figure 6 shows, the full extent of this cross-subsidy potential, on top of the affordable units that the current 421-a rules would have required in a project built under the old zoning, would make up 27 percent of the whole building. This is seven percentage points more than 421-a alone would require for the larger building.

If upzoned by 33 percent, high-rise projects in very strong market neighborhoods inside the GEA that are currently feasible could have their set-asides increased from 20 percent (required by 421-a) to 30

percent. High-rise projects in our strong market type, which has a lower cross-subsidy potential, could have affordable set-aside requirement increased to 25 percent, if upzoned by 20 percent (like Furman Tower) or to 28 percent, if the upzoning increased the zoning density by 33 percent.[34]

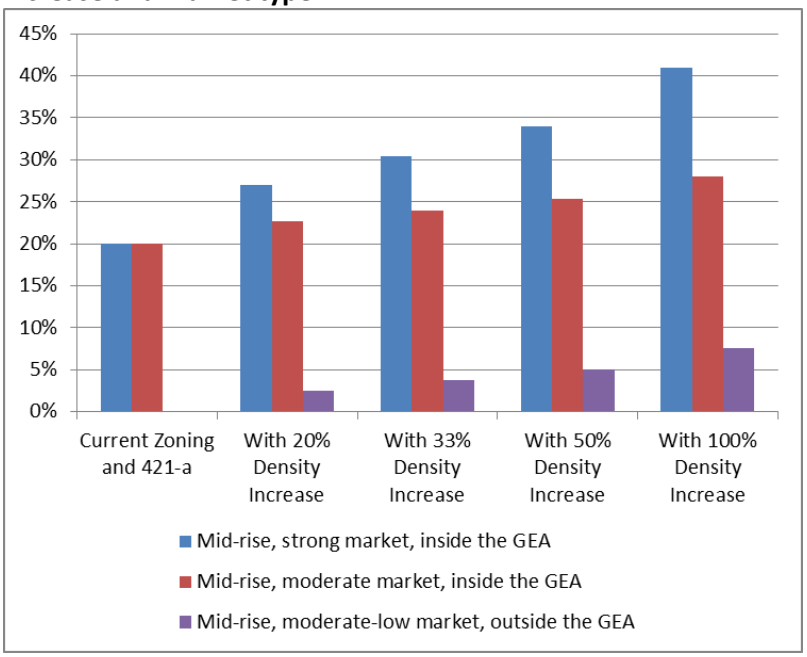
Figure 6: Potential affordable set-aside* for high-rise building with property tax exemption, by density increase and market type



*Affordable at 60 percent of AMI

[34] Because high-rise development is possibly only in zoning districts that already permit very high density, upzonings are unlikely to increase the size of a potential high-rise by more than 33 percent. In fact, state law currently prohibits residential development from exceeding a "floor area ratio" (FAR) of 12, and most high-rise projects are built in zoning districts with a maximum residential FAR of 10.

Figure 7: Potential affordable set-aside* for mid-rise building with property tax exemption, by density increase and market type



*Affordable at 60 percent of AMI

Land in zoning districts that currently permit mid-rise projects can generally be upzoned more than land where high-rise development is already permitted, so the upzoning scenarios shown in Figure 7 cover a wider range of density increases, from 20 percent to 100 percent (a doubling of density). For a mid-rise development site, the cross-subsidy potential in our strong market would allow the affordable set-side to be increased from 20 percent (required by 421-a) to 34 percent, if the site were upzoned by 50 percent, and to more than 40 percent, if the zoning density were doubled. With lower cross-subsidy potential, the increases in the affordable set-aside that upzonings could support in our moderate market type are much smaller.

In our moderate-low market type, if located outside the GEA, no affordable housing would be required to qualify for tax exemption under current 421-a rules, and the cross-subsidy potential is relatively low. As a result, as Figure 7 shows, even if the zoning density were doubled, we estimate that the additional density would only support an affordable set-aside up to seven percent of the whole building in this type of location without affecting the feasibility of the project. Because development in our moderate-low market type is not financially feasible inside the GEA, we omit it from Figure 7.

Effect of additional density on development feasibility

One important caveat to the cross-subsidy potential we estimate is that development on a given site may not be feasible, even if rents are higher than the thresholds in Table 4. In some cases, the site may be priced by the landowner higher than the developer is willing to pay, given her estimates of market rents, construction and operating costs, and required NOI yield. This is particularly likely in areas where the density level permitted by the current zoning is not substantially higher than the density of the

existing buildings.[35] In cases where development is currently infeasible, additional density with a set-aside requirement equal to the cross-subsidy potential percentages shown in Table 6 will not tip a project into financial viability. As we define it, the cross-subsidy potential is calibrated to make additional density generate the minimum NOI yield only on the construction costs of that additional floor area, leaving no room for higher land acquisition costs.

If policymakers wish not only to require more affordable housing in otherwise feasible development, but also to encourage more development overall, the set-aside requirements applicable to additional density would need to be lower than the cross-subsidy potential we estimate. In neighborhoods with rents above the thresholds in Table 4, a lower set-aside requirement would allow additional floor area to generate the minimum NOI yield on the additional construction costs of that floor area plus a higher land price.

Returning to Furman Tower, our hypothetical high-rise/strong market development, the landowner may not be willing to sell the site for $44.4 million, the amount the developer could afford to pay under the initial scenario. In this case, the project would remain infeasible even with the 47 units of additional density, if 25 of those units have to be affordable (i.e. reflecting the full cross-subsidy potential of the additional density). However, if only 15 units of additional affordable housing were required (reducing the set-aside from 52 percent of the additional density to 32 percent), the 47 additional units would generate enough net income to allow the developer to pay about $6.2 million more for the land without reducing the NOI yield below the required 5.25 percent. If the landowner is willing to sell the site for $50 million, the enlarged Furman Tower would now be financially viable, even with the more demanding landowner (albeit with fewer affordable units than in our earlier upzoning scenario).

Threshold effects of adding zoning density

Another caveat to interpreting the levels of cross-subsidy potential shown in Table 6 and Figure 4 is that they assume incremental new zoning density of a specific construction type (high-rise or mid-rise) is being added to a project of that same type. Of course, an upzoning or voluntary bonus program can only add so much density to a potential mid-rise development before it becomes a high-rise, with significantly higher construction costs per square foot. The marginal value of density added at the point at which a project needs to switch to a more expensive construction method, then, is significantly discounted, perhaps even negative, because it requires that even the pre-existing zoning density be built out at higher costs than was previously required. As a result, if it pushes a potential development past the construction method tipping point, the actual capacity of additional zoning density to cross-subsidize affordable units will be lower than suggested by Table 6 and Figure 4. If the additional density is offered through a bonus program, developers may elect to forego the bonus and continue building mid-rise

[35] In other research, the Furman Center has found that the "softness" of a site—the share of the permitted zoning density that the existing building takes up—is a significant factor in its chances of being redeveloped. Been, V. et al. (2009). Underused Lots in New York City (Working Paper WP09VB1). Cambridge, MA: Lincoln Institute of Land Policy. Retrieved February 2, 2015, from http://www.lincolninst.edu/pubs/1682_Underused-Lots-in-New-York-City

buildings if the required set-aside does not reflect the higher construction costs of high-rise development.

To illustrate this threshold effect, we can model an upzoning that increases the permitted FAR of development with property tax exemption in our strong market type from 5.0 to 10, a 100 percent increase. If we assume that the tipping point between mid- and high-rise construction for a given site occurs just above a FAR of 8.0, additional density added up to that point would have a cross-subsidy potential of 62 percent, as shown in Table 6 for the mid-rise/strong market project type (assuming affordability at 60 percent of AMI). However, the cross-subsidy potential of the additional density that would bring the FAR from 8.0 to 9.0 is negative; even if that additional density were entirely market-rate, it would not generate the NOI yield we assume a developer would require, after taking into account the higher construction costs that would be necessary for the first 8.0 worth of FAR now that the entire building would be a high-rise. Above a FAR of 9.0, additional density would have a cross-subsidy potential of 52 percent (as shown in Table 6 for the high-rise/strong market project type). If we look at the total increase in permitted density from a FAR of 5.0 to 10, we estimate that its cross-subsidy potential is about 43 percent. This would translate to an affordable set-aside for the entire building of 31 percent, assuming that 20 percent of the base density would have been affordable to qualify for the tax exemption.

Rezoned manufacturing land

Estimating the cross-subsidy potential of an upzoning is further complicated when it occurs in an industrial area previously zoned only for manufacturing uses. In these types of rezonings, the value of a potential development site is affected not only by the increase in permitted density, but also by the change in permitted use of the original base density. In some cases, even at the base level of density (which is generally quite low for manufacturing districts), a site will be more valuable when zoned to permit residential development. If so, a mandatory inclusionary zoning program would be able to require affordable housing even from the base density without depressing its initial land value. Alternatively, the base density may be more valuable when manufacturing uses are permitted than it would be if zoned for residential development, so the change of use on its own would actually reduce the land value. In this case, in order for the upzoning to offset all of the costs of an affordable set-aside, the set-aside would need to be lower than the percentages shown in Table 6 and Figure 4 to make up for the reduced value of the base density.

Policy implications

The potential for using additional density to cross-subsidize affordable units without depressing underlying land prices or developer returns varies widely, even among relatively expensive neighborhoods, based primarily on market rents and the type of construction most likely to occur on an affected site. Additionally, how this cross-subsidy potential translates into a specific set-aside requirement also depends on the existing zoning that applies to a site, how much additional density policymakers are willing to add, and whether or not policymakers wish to increase the pace of development, by tipping more potential projects into financial feasibility.

For policymakers looking to mitigate the risk that a new inclusionary housing policy will chill development activity, this complex variation across sites and neighborhoods has significant implications for different policy approaches.

One approach is a broadly applicable policy with a uniform set-aside requirement, which would be relatively simple for the city to enforce. In this case, the policy's requirements would have to address neighborhood variation by setting the requirements low enough to be within the cross-subsidy potential of the entire area to be affected. Depending how widely drawn this area is, it would likely mean that, in some parts of the affected area, a significant amount of value from additional density is realized by landowners and developers instead of being used to cross-subsidize affordable units. Policymakers may have reasons other than providing affordable housing to increase zoning density, so this may or may not be a drawback. Alternatively, if the requirements are set higher, in some of the affected area, feasibility of development may require that land prices drop or that developers accept a lower return, which could inhibit some development.

For an approach that seeks to maximize the production of affordable units without depressing land values or developer returns, the variation we find suggests that there could be significant benefits to customizing a policy's requirements by neighborhood, despite the additional complexity of design and cost of administration. Of course, more closely matching the requirements to the cross-subsidy potential increases the risk that a mandatory policy would chill development if, for example, the city incorrectly estimates the cross-subsidy potential of additional zoning density added to a neighborhood or if market conditions materially change (as discussed in the final subsection).

A third approach focuses on promoting or preserving economic diversity within neighborhoods by requiring affordable units specifically where missing from the neighborhood's current housing stock. Because of rent-stabilization, public housing, and privately developed subsidized housing, neighborhoods with relatively high market rents may have very different levels of economic diversity from one another. Under this third approach, policymakers would seek to tailor an inclusionary housing program to increase economic diversity where it is most lacking. The variation we find in cross-subsidy potential suggests that policymakers will have significantly more leeway in some neighborhoods than others to impose inclusionary housing requirements before they begin to depress land values or potentially inhibit development.

3. In high-rent markets, on-site affordable units are extremely expensive in terms of foregone rent.

In neighborhoods where market rents are high, the cost to developers in foregone income from rent-restricting new floor space is extremely high. In our very strong market type, we estimate that the present value of the foregone income from rent-restricting 1,000 rentable square feet of floor area in a

building with a 20-year property tax exemption is over $1 million, even if rents are affordable to households earning 80 percent of AMI.[36]

As Table 8 shows, the effective cost of setting aside affordable units is somewhat lower in fully taxed buildings. Under 421-a, the property tax burden is fixed at a very low amount during the length of the exemption, so the tax burden is not affected by any reduction in rental income. Without the exemption, the property tax burden for a large rental building is tied to its net operating income. In fully taxed buildings, the decrease in income from rent-restricting floor area would result in reduced property taxes, offsetting some of the lost value.

Table 8: Present value* of foregone revenue from rent-restricting 1,000 rentable square feet of floor area, by market type and affordability level

	40% AMI	60% AMI	80% AMI
Very strong market			
Full property taxes	$823,792	$759,237	$694,682
With 20 year tax exemption	$1,289,983	$1,189,984	$1,089,985
Strong market**			
Full property taxes	$578,287	$513,913	$449,540
With 25 year tax exemption	$906,099	$806,369	$706,638
Moderate market			
Full property taxes	$322,229	$269,198	$216,167
With 25 year tax exemption	$510,888	$428,149	$345,409
Moderate-low market			
Full property taxes	$261,287	$207,443	$153,598
With 15 year tax exemption	$414,697	$330,678	$246,659

*Discounted at the unleveraged IRR for the corresponding full building models (see Appendix A).
**Based on our high rise/strong market project type.

Policy Implications

Based on our estimates in Table 8, the current value to a developer of the foregone income from rent-restricting 1,000 square feet of new apartment floor area in our very strong market type at 60 percent of AMI is about $1.2 million. A developer participating in a program requiring this type of rent-restriction on-site implies that her overall development offers a sufficient financial return despite foregoing this revenue. However, the developer may be indifferent among incurring this loss by rent-restricting 1,000 square feet on-site, writing a $1.2 million check to the city, or providing $1.2 million in direct subsidy for off-site affordable housing, and may even prefer the latter two options. Subject to legal constraints, it is up to policymakers to determine how that value can best be put to public use.

[36] This calculation uses a discount rate equal to the unleveraged IRR we estimate for our full building model and includes the reduced value of the building in a year 12 sale (see Appendix A).

This type of decision raises complicated trade-offs policymakers must weigh between the value of on-site affordable units versus other options for fulfilling an inclusionary housing policy's requirements. On-site affordable units ensure that low- and moderate-income tenants have access to the same neighborhood amenities as market-rate tenants of new buildings, which may include high quality schools, public safety, and proximity to employment options. Including affordable units in mixed-income buildings may also help ensure the long-term sustainability of those units because the income from the market-rate units provides a lasting incentive for the landlord to maintain and operate the building. Finally, requiring on-site affordable units provides certainty that the costs incurred by developers to comply with the inclusionary housing program are actually spent on affordable housing. A fee-in-lieu payment, in contrast, could end up being spent by the city for other public needs.

Table 8 makes clear that these benefits of on-site affordable units carry a potentially high opportunity cost for the city. There are only about 1.4 units, on average, in 1,000 square feet of rentable floor area, meaning that the value of the foregone income for the average affordable unit (at 60 percent of AMI) in new construction with property tax exemption in a very strong market is about $850,000. That amount could likely be used to provide affordable housing to a larger number of households, or households with lower incomes, if spent in lower-rent neighborhoods or to rent-restrict older housing units. For example, Table 8 suggests that this same value could be used to "buy down" the rent of more than 2,000 square feet of floor area in our moderate market to be affordable to households earning 60 percent of AMI, enough for almost three units.[37]

On the other hand, there may be practical limitations on the city's ability to maximize the number of affordable units by offering alternative methods for meeting program obligations. Requiring a higher number of affordable units when provided off-site (which the IHP currently does not do), for example, risks deterring participation if the city miscalculates the actual cost savings in other neighborhoods or fails to update the requirement as markets shift. Similarly, in-lieu fees, even if properly set and devoted by the city to affordable housing, may not be efficiently spent by city housing programs.

Additionally, allowing off-site affordable units risks diluting the potential of inclusionary housing to promote economic diversity if it means developers will rarely build affordable housing in the most expensive neighborhoods. However, some of this risk can be mitigated by limiting where off-site units can be built.[38]

4. In high-rent markets, the level of affordability for the set-aside matters relatively little to a market-rate project's financial feasibility.

Table 8 also shows that, in the highest-rent neighborhoods, the present value to developers of the foregone revenue from making on-site units affordable at 40 percent of AMI is not much greater than at

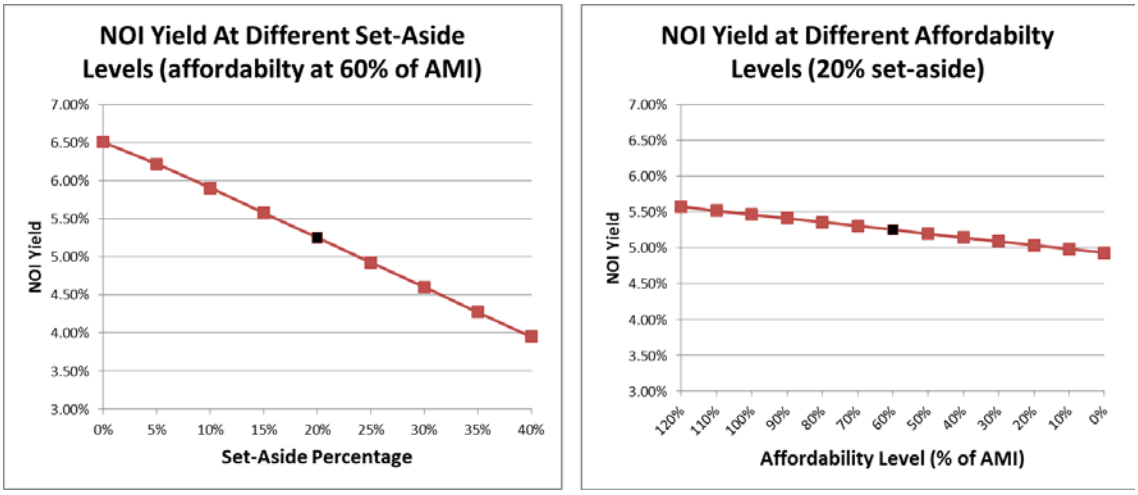
[37] If this value were used in conjunction with other state and federal housing subsidies, it could leverage an even larger number of affordable units.

[38] For example, by requiring proximity to the market-rate project (as the IHP does), or setting minimum neighborhood performance standards for affordable building sites based on factors like school performance, crime rates, and air quality.

60 percent of AMI, in the context of such a high loss of value. The difference between the two levels of affordability is swamped by the enormous gap between market rents and either level of rent-restriction. In our very strong market type, for example, the present value of revenue lost by rent-restricting 1,000 rentable square feet in a building with property tax exemption at 40 percent of AMI is only eight percent higher than rent-restricting at 60 percent of AMI. As a result, setting aside a unit to be affordable at any level far below market has a much larger effect on a project's financial return than the exact level of affordability it must comply with.

The differential effects of rent restricting an otherwise market rate unit versus changing the affordability level of an affordable unit in a market with very high rents is clear if we compare the sensitivity of the NOI yield to each factor. Figure 8 shows how shifts to the set-aside percentage (assuming affordability at 60 percent AMI) and the affordability level (assuming a 20 percent set-aside) affect the NOI yield for a high-rise project with property tax exemption in our very strong market type. The starting point in both figures (the black square in the middle) is for this project type with a 20 percent set-aside affordable at 60 percent of AMI. As the figure shows, increasing the set-aside from 20 to 25 percent has the same effect on NOI yield (moving it from 5.25 percent to just below 5 percent) as reducing the affordability level from 60 percent of AMI to zero—meaning not charging any rent at all for the affordable units.

Figure 8: Effects of Set-aside and Affordability level on NOI Yield for High-rise /Very Strong Market Project Type with Property Tax Exemption



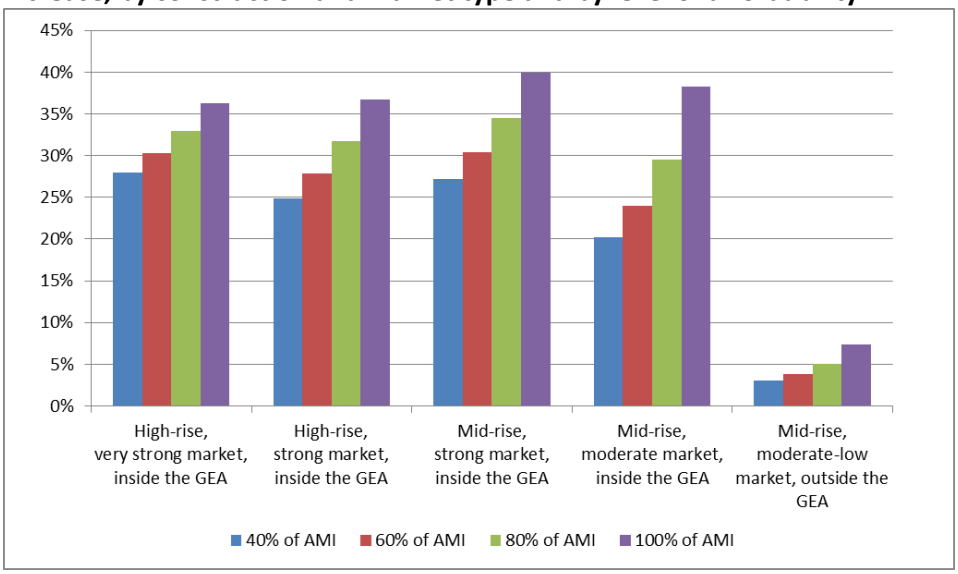
In relatively weaker markets, the cost of shifting to incrementally lower affordability levels is proportionately more significant because of the smaller gap between market rents and affordable rents. In our moderate-low market, for example, the net present cost of rent restricting 1,000 rentable square feet of floor area at 40 percent of AMI is about $84,000 more than at 60 percent of AMI. This is only slightly less, in absolute terms, than the incremental cost difference for our very strong market, but represents a 25 percent increase in the cost to the developer of setting aside the affordable floor space.

Affordability level and cross-subsidy potential

The differential effect of deeper affordability is also evident if we look at the interaction between affordability levels and NOI yield and the resulting changes to the affordable set-aside that additional density can cross-subsidize. Figure 9 shows for different construction and market types, how the total share of affordable units that can be required after a 33 percent increase in zoning density changes as the level of required affordability changes. For a high-rise in our very strong market type, deepening the affordability of rent-restricted units from 60 to 40 percent of AMI would require decreasing the affordable set-aside only slightly, from 30 percent to 28 percent, in order to make up for the lost revenue. The decrease in the set-aside for high-rise and mid-rise development in our strong market type would be only three percentage points.

On a percentage point basis, the decrease in capacity to cross subsidize affordable units in incremental floor area is also small in our moderate and moderate-low market types, but is proportionately more significant because the gap between market rents and affordable rents is smaller.

Figure 9: Potential affordable set-aside for tax-exempt development following a 33 percent zoning increase, by construction and market type and by level of affordability.



Affordability level and uniform set-aside requirements

The differential trade-off between set-aside and affordability level in our market types also has implications for designing flexible compliance options for policies that otherwise have uniform requirements across neighborhoods.

For example, in every neighborhood within the GEA, 421-a requires development that does not receive other government subsidy to be 20 percent affordable at 60 percent of AMI to qualify for the property tax exemption (unless the developer qualifies by purchasing certificates). Table 9 shows for each of our market types, the share of units in an entire building that can be set aside at other affordability levels while resulting in the same net operating income as the current requirement. In our very strong and

strong market types, a policy could require deeper affordability than 421-a without affecting a building's finances by reducing the set-aside by only two percentage points. Similarly, allowing affordable units that serve middle-income residents earning 80 percent of AMI in these markets would only allow buildings to increase the set-aside by two or three percentage points.

Table 9: Set aside and affordability level combinations generating equivalent net operating income in buildings with property tax exemption, by market type

	40% of AMI	60% of AMI*	80% of AMI	100% of AMI	120% of AMI
Very strong market	18%	20%	22%	24%	27%
Strong market	18%	20%	23%	26%	31%
Moderate market	17%	20%	25%	32%	46%
Moderate-low market	16%	20%	26%	39%	75%

*Required by 421-a inside the GEA.

In contrast to the two strongest markets, in the moderate and moderate-low market types, the required affordability level has far larger effect on the size of the set-aside, especially as the income level served by the affordable units rises. In our moderate-low market type, the cost of complying with the current 421-a requirements is the same as making three quarters of the building affordable to households earning 120 percent of AMI, because the gap between market rents and affordable rents is so much narrower.

Policy Implications

Because the difference in revenue generated by units affordable at 60 and 40 percent of AMI matters comparatively little in the highest-rent neighborhoods, inclusionary housing policies may be particularly well suited for generating units with deep affordability in these neighborhoods. This is especially appealing in light of the large direct subsidies it might otherwise require to serve these households in this market-type.

It is possible developers may resist serving lower affordability levels for reasons other than the lower regulated rents. Developers may be concerned about non-payment risk or market-stigma resulting from having very low income units, for example.

Even so, the data in Figures 8 and 9 and Table 9 suggest that inclusionary housing programs could be designed to serve very low income households without imposing a greater financial burden on new development or greatly reducing the number of affordable units that are produced. By offering a cost savings, a program may be able to attract participation, even if the skew towards deeper affordability were voluntary. For example, if a program with requirements like those of 421-a inside the GEA allowed developers to lower the required set-aside from 20 percent to 17 percent, by making the units affordable at 40 percent of AMI, it would increase the developer's net operating income in our very strong and strong market types. Moreover, if developers expect market rents to rise faster than affordable rents (our models project both to increase at the same rate; see Appendix A), they may

prefer the option that restricts the fewest units possible, even if there were no projected difference in near term net operating income.

5. Requiring permanent affordability upfront instead of long-term affordability is unlikely to affect new development.

The city's Inclusionary Housing Program requires that affordable units remain permanently affordable. 421-a, in contrast, requires 35 years of below-market rents (plus rent stabilization for the tenant in the unit at the end of 35 years). As a result, the city will face the loss of thousands of affordable units on an ongoing basis as old mixed-income rental projects age out of their restriction periods. Policymakers may not wish to devote additional resources (even if off-budget) to pursuing longer affordability periods if it means creating fewer affordable units, but it is likely that requiring permanent affordability up front without providing any new offsetting benefits would not significantly affect the development market.

Permanent affordability and developer incentives

At the time a development project is being planned and underwritten, the difference in rent on a subset of units in year 36 is unlikely to sway the decision-making of most developers. The present discounted value of any such revenue differences so far in the future is small and some valuation methods used by developers, equity investors, and lenders would not take the difference into account at all. Accordingly, requiring permanent affordability rather than long-term, but finite, affordability is unlikely to mean that a program must offer more generous offsetting benefits.

Permanent affordability and operational sustainability

Requiring permanent affordability could have other consequences policymakers must consider, however. For example, when a rental building's property tax exemption expires, its operating costs increase substantially. Under current 421-a rules, some of this added expense is offset after 35 years, when the affordable units can begin to earn market-rate rents (subject to the rent stabilization that applies to carry-over tenants). It is theoretically possible that removing this eventual source of additional revenue could threaten the long term operational sustainability of rental buildings with 421-a exemption.

However, our financial models for full buildings suggest this is unlikely, even using pessimistic projections for rent growth and operating expense trends.[39] Under these conditions, even after the property tax exemption expires after 20 or 25 years, our models suggest that the 80 percent of the units that can charge market rents, together with the much smaller rents from affordable units, generate more than enough revenue to operate the building. As a practical matter, projecting operating costs and market rents over 35 years provides very little certainty how the economics will play out. But, if a building's operations are sustainable after the tax exemption expires, as long as market and affordable

[39] We looked at future cash flows assuming five percent annual growth in operating expenses (instead of three percent, as assumed in our models) and only one percent annual increases in rent collected from market-rate units (instead of three percent).

rents increase, on average, at least as fast as operating costs, requiring permanent affordability is unlikely to affect the long term viability of a building.

Other types of buildings, though, may not be operationally sustainable with permanent affordability, especially if there are few or no market-rate units to provide a lasting cross-subsidy. For example, an off-site option may permit market-rate developers to meet inclusionary housing obligations by building affordable units in a building made up entirely of affordable units. In these cases, the affordable units may require additional government subsidy at some point in the future if substantial reserves are not provided at the beginning and affordable rents do not grow enough to cover operating costs and maintenance over time.

6. **The economics of inclusionary housing are likely to shift over time as rents, construction costs, and operating costs change.**

The cross-subsidy potential we estimate for different project types reflects a specific set of assumptions regarding construction costs, operating costs, and rents. As these factors shift over time, land prices and developer returns will adjust and change as they normally do across market cycles.

Where these shifts are problematic is on the margins, if they make a voluntary inclusionary housing program less attractive to developers or push an entire project below the threshold of feasibility because developer returns or land prices do not adjust enough (or because the project becomes infeasible, even if land prices were to drop to zero). This may be more likely if a mandatory inclusionary housing policy imposes a rigid affordable set-aside beyond what 421-a currently requires.

For voluntary programs, a shift in the value of additional density relative to the cost of construction can dramatically change the value of participation. For example, as Figure 7 shows, we estimate that the cross-subsidy potential of density added to our mid-rise/moderate market project with property tax exemption is about 36 percent. This means that if a program provides a zoning bonus in exchange for a developer setting aside the equivalent of 25 percent of the additional floor area as affordable, developers will have a financial incentive to participate. However, if construction costs (including hard and soft costs) increase 15 percent relative to the other inputs in our model, the cross-subsidy potential for density added to this project type would fall to 23 percent, which is lower than the program requirement. Under those conditions, a developer would be much less likely to participate, even if she elects to develop the base density (to which the high set-aside would not apply).

Mandatory policies do not allow developers to opt out, so any new development must include the required affordable units (or provide them off-site, if permitted), even as market conditions shift. However, imposing a rigid new affordable set-aside beyond what 421-a currently requires may increase the chances that market shifts will make an entire project infeasible.

Looking back at Table 4, we estimate mid-rise zoning density in a tax-exempt building with a 20 percent set-side at 60 percent of AMI has no value if rents are below $38. If a mandatory inclusionary housing policy increases the total set-aside to 30 percent, the threshold rent would increase to about $41. If on top of that change, construction costs (hard and soft) increased by 15 percent relative to the other

factors in our model, the threshold rent would increase to $47 per rentable square feet, which is higher than the $44 market-rent in our moderate market type. Under these conditions, development would no longer be feasible in this neighborhood type, even if land costs were driven to zero. Although the additional set-aside requirement only adds three dollars to the threshold rent, by pulling it significantly closer to market-rent, the additional requirement makes the project more vulnerable to normal market fluctuations in rents and construction costs.

The opposite situation is also possible. If rents in a neighborhood rise more rapidly in relation to construction and operating costs than initially expected, or construction costs drop, a neighborhood that previously could not support a cross-subsidy would now be able to do so. Under these conditions, without an inclusionary housing requirement in place, there would be no mechanism (other than 421-a, if inside the GEA) to ensure that new development serves a range of income levels.

Policy Implications

Whether or not a city adopts any type of mandatory inclusionary housing program, normal fluctuations in the market can tip marginal development projects into infeasibility, depress or inflate land values, and reduce or increase housing production. Nevertheless, even in neighborhoods with rents that are currently high enough to provide a cross-subsidy, a mandatory policy may amplify the risk that rising construction costs or falling rents could stifle development. If market rents drop into the range at which development would have been feasible with no, or a lower, affordable set-aside requirement, development will no longer be feasible.

If policymakers wish to ensure that a new mandatory policy will not exacerbate the possible effects of ordinary fluctuations in the market, they should consider building flexibility into their policies. For example, one option a city has is to permit waivers to a policy where developers are able to establish that projected market rents are insufficient to cross-subsidize the affordable units that would ordinarily be required and still provide a commercially reasonably financial return. This would make it easier for the city to set relatively strong affordability requirements because it would retain the ability to grant relief based on market conditions.

One downside of this approach is the uncertainty it could introduce, possibly discouraging investment when development relies on the outcome of a discretionary decision to grant a waiver. Another downside is the risk that the decision to grant waivers becomes politicized or if waivers become routine, potentially making it difficult for the city officials to impose a policy's full affordable housing requirement even where justified.

Policymakers must also consider how to address markets where rents rise relative to construction and operating costs after the adoption of an inclusionary zoning policy. One approach might be a policy mechanism that automatically adjusts inclusionary zoning requirements (e.g., the incomes served by the affordable units or the size of the set-aside) as the potential for market rate units to cross-subsidize affordable units increases. Such mechanisms, however, require a reliable barometer of market strength and development and operating costs and can be difficult to design with all the possible factors and

outcomes in mind. Such a mechanism could also be subject to political pressures. In neighborhoods where markets are too weak for there to be the potential for cross-subsidy when a policy is adopted, but where subsequent rent increases result in capacity for market-rate development to cross-subsidize affordable units, policymakers should ensure that the availability of any supplemental subsidy declines.

APPENDIX A

Modeling Assumptions

Construction Costs

Our models use the following hard and soft costs:

Construction Type	Hard Costs per gross square foot (excluding parking)	Hard Costs per gross square foot of parking area	Soft costs per gross square foot
High-rise with no parking	$375*	n/a	$75
High-rise with 20% parking ratio	$310	$200	$75
Mid-rise with 50% parking ratio	$250	$200	$75

*Based on higher estimated costs in Manhattan.

Soft costs include design and engineering costs and construction period property taxes, among other costs; however, financing costs, including construction period interest are modeled separately.

We assume annual capital reserve contributions of $300 per unit for years 3 to 12 and $600 in years 13 and later. (Contribution amounts are $300 and $600 as of year 0 but increase annually by 3%.)

Building Size and Configuration

Our modeling assumes that developers have an effective 6% zoning density bonus by building under the "quality housing" formula available in many zoning districts in New York City, so 1000 square feet of nominal zoning density permits 1060 square feet of above-ground floor area. To calculate the amount of rentable square feet per above-ground floor area, we assume an 18% "loss factor" to account for common areas and above-grade mechanical space. This loss factor does not include square footage that is allocated to parking.

To calculate the number of units of each type per 1000 square feet of above-ground floor area, we allocate the rentable square footage as shown below, and then divide by the unit sizes shown below:

	Allocation of rentable square feet	Unit size
Studio	25%	520
One bedroom	45%	720
Two bedroom	30%	1,050

To determine the gross square feet needed for parking, we assume 300 square feet per required space. We assume all parking is below grade so does not occupy any of the permitted zoning density.

For models of full buildings, we assume a project site of 15,000 square feet and the following permitted floor area ratios:

Project Type	Permitted FAR
High-rise with no parking, very strong market, inside the GEA	13.0*
High-rise with 20% parking ratio, very strong market, inside the GEA	13.0*
Mid-rise with 50% parking ratio, strong market, inside the GEA	3.0
Mid-rise with 50% parking ratio, moderate market, inside the GEA	4.0
Mid-rise with 50% parking ratio, Moderate-low market, inside the GEA	4.2
Mid-rise with 50% parking ratio, Moderate-low market, outside the GEA	4.2

*Assumes development rights purchase through a zoning lot merger

Operating and Management Costs

Beginning in year 3, equal to $12.50 per rentable square foot for high-rise construction and $9 per rentable square foot for mid-rise construction (rates are as of year 0 and escalate 3% each year).

We also assume management fees equal to 3% of effective gross revenue for high-rise projects and 5% of effective gross revenue for mid-rise projects.

Property taxes

For models of full buildings inside the 421-a GEA, we calculate the base tax liability using the fiscal year 2014-2015 class 2 property tax rate (12.855%) and the following assessed values per square foot of land area, which reflect the average assessed values in the neighborhoods on which we base our market types.

- $200 per square foot of land area for our high-rise/very strong market project type (based on core Manhattan)
- $35 per square foot of land area in our high-rise/strong market project type (based on Downtown Brooklyn)
- $20 per square foot of land area in our mid-rise/strong market project type (based on Williamsburg)
- $35 per square foot of land area in our mid-rise/moderate market project type (based on Astoria)
- $15 per square foot of land area in our mid-rise/moderate-low market project type (based on Bedford Stuyvesant)

For full buildings and marginal floor area subject to full property tax, we calculate the tax liability as follows, based on the process used by the New York City Department of Finance (DOF) as outlined in the current version of the New York City Residential Property Taxes guide for Class 2 properties (available at https://www1.nyc.gov/html/dof/downloads/pdf/brochures/class_2_guide.pdf):

- For year 3, the tax liability is equal to the base tax (see above), increased by 10% per year since year 0. (We assume taxes for years 1 and 2 are included in soft costs).
- Beginning in year 4, the first year of full operation, we:

- Divide the building's net operating income by a total cap rate of 13.115% (the rate used by DOF for market-rate new construction) to calculate the market value;
- Multiply the market value by the 45% assessment level for class 2 properties to determine the actual assessed value;
- Divide the increase in actual assessed value since the prior year by five (i.e., to phase the increased assessed value in over five years);
- Calculate the current year's transitional assessed value by adding to the previous year's transitional assessed value the phase-in from the most recent increase in actual assessed value and the previous four phase-ins (in year 4, the transitional assessed value is equal to the actual assessed value);
- Calculate the property tax liability by multiplying the transitional assessed value by 12.855%, the class 2 property tax rate as of the 2014-2015 fiscal year. [We effectively use the current class 2 property tax rate as our projection for the tax rate in all future years of operation. It is likely that City Council will reduce the rate in the upcoming years as the city's tax base increases, but longer term, it is possible the rate will increase again when the city faces another economic contraction.]

Building Revenue

Market Rents:
We assume that market-rate net rentable square feet will generate gross rent equal to the amounts shown below (which are the same as those shown in Table 3 of the report), regardless of unit type, reduced in year 4 by a 5% economic vacancy rate.

We assume market rents will increase 3% per year.

Project Type	Gross Rent per Rentable SF*
High-rise with no parking, very strong market, inside the GEA	$80 per rentable sf
High-rise with 20% parking ratio, very strong market, inside the GEA	$60 per rentable sf
Mid-rise with 50% parking ratio, strong market, inside the GEA	$60 per rentable sf
Mid-rise with 50% parking ratio, moderate market, inside the GEA	$44 per rentable sf
Mid-rise with 50% parking ratio, Moderate-low market, inside the GEA	$37 per rentable sf
Mid-rise with 50% parking ratio, Moderate-low market, outside the GEA	$37 per rentable sf

Other income (e.g., from amenity charges, fees, etc.): Beginning in year 3, $1000* per market-rate unit per year in the very strong market type; $750* per market-rate unit per year in the strong and moderate market types; and $500 per market-rate unit per year in the moderate-weak market type.

Net parking revenue (beginning in year 3):

- For high rise construction strong market: $3,300* per space per year, with 10% vacancy, less operating expenses of $900* per space per year
- For mid-rise construction in strong market: $3,000* per space per year, with 10% vacancy, less operating expenses of $900* per space per year
- For mid-rise construction in moderate market: $2,700* per space per year, with 10% vacancy, less operating expenses of $900* per space per year
- For mid-rise construction in moderate-low market: $2,400* per space per year, with 10% vacancy, less operating expenses of $900* per space per year

Affordable Rents: equal to 30% of the applicable 2014 AMI level assuming studios will be occupied by one-person households, one bedroom units will be occupied half by one-person households and half by two-person households, and two-bedroom apartments will be occupied by three-person households. We assume AMI increases 3% each year (as it has, on average, over the past 20 years).
Rents affordable at 60% of AMI as of 2014 are:

- Studio: $882* per month
- One bedroom: $945* per month
- Two bedroom: $1,134* per month

*Amounts are as of year 0, but increase by 3% per year.

Financing

Financing costs, which we use to calculate leveraged internal rates of return for our full-building models as a further check on our estimates of an acceptable NOI yield, are based on the following assumptions:

Construction loan: total draws equal to 65% of total development costs, which include land acquisition, hard and soft costs, interest (at 3%), mortgage recording tax (2.8% of full balance), and fees (1.5% of full balance). The loan is repaid at the end of year 3 with proceeds from a permanent loan.

Permanent Loan: initial loan balance is drawn at the end of year 3 and is equal to 65% of development value (based on the un-adjusted exit cap shown in the table below and year 4 net operating income). The loan is interest only for three years and then level payments are calculated based on a 30 year amortization schedule with a 4% interest rate.

Financial Performance

Target NOI yield:

For our analyses of additional zoning density and full building models, we assume developers will need to earn the target NOI shown in the below table for each project type. These NOI yields are equal to the unadjusted exit cap rate for each project (which we estimate based on interviews with industry participants) plus 125 basis points.

Full Building NOI Yield and IRR:

We assume land is purchased at the end of year 0, construction occurs during years 1, 2, and 3 (with construction costs incurred 20% in year 1, 60% in year 2, and 20% in year 3) and lease-up begins in year 3, resulting in full occupancy (subject to 5 % economic vacancy) in year 4.

Our NOI yield is equal to the net operating income generated in year 4 divided by the total amount spent on land (for full-building models), hard and soft construction costs, and capital reserves set-aside in years 3 and 4.

Calculation of internal rate of return assumes a sale of the property at the end of year 12, with sale expenses equal to 3.5% of sale proceeds. We estimate the sale proceeds based on the year 13 net operating income and the adjusted exit cap rate shown below, which reflects the relatively short duration of the remaining tax exemption at the time of sale.

Project Type	Target NOI Yield	Exit Cap Rate	Adjusted Exit Cap Rate
High-rise with no parking, very strong market, inside the GEA	5.25%	4.00%	4.50%
High-rise with 20% parking ratio, very strong market, inside the GEA	5.25%	4.00%	4.50%
Mid-rise with 50% parking ratio, strong market, inside the GEA	5.50%	4.25%	4.75%
Mid-rise with 50% parking ratio, moderate market, inside the GEA	5.75%	4.50%	5.00%
Mid-rise with 50% parking ratio, Moderate-low market, inside the GEA	5.75%	4.50%	5.00%
Mid-rise with 50% parking ratio, Moderate-low market, outside the GEA	5.75%	4.50%	5.00%

For our full-building models, the resulting NOI yield, unleveraged IRR, and leveraged IRR are shown below:

Project Type	NOI Yield	12 Year Unleveraged IRR	12 Year Leveraged IRR
High-rise with no parking, very strong market, inside the GEA	5.25%	7.7%	10.8%
High-rise with 20% parking ratio, very strong market, inside the GEA	5.24%	7.8%	10.9%
Mid-rise with 50% parking ratio, strong market, inside the GEA	5.52%	8.0%	11.5%
Mid-rise with 50% parking ratio, moderate market, inside the GEA	5.75%	8.8%	13.5%
Mid-rise with 50% parking ratio, Moderate-low market, inside the GEA	5.16%**	7.4%	10.1%
Mid-rise with 50% parking ratio, Moderate-low market, outside the GEA	5.73%	8.6%	12.4%

**For this project type, given our market rent assumption in this market type, a building would not be able to generate an NOI yield higher than 5.16%, even with zero land cost. Accordingly, this project type is unlikely to be financially viable.

Land Values

Much of our analysis is of marginal zoning density and building floor area added to a development site, so is not affected by current land prices. However, when modeling full buildings, we derive land value based on the amount the developer could pay and still generate the required NOI yield, so values may not reflect actual market prices. The resulting values are:

Market Type	Example neighborhood	Land Value (per effective zoning sf)
Very Strong, inside the GEA	Core Manhattan	$380
Strong, inside the GEA	Downtown Brooklyn	$215
Strong, inside the GEA	Williamsburg Upland	$245
Moderate, inside the GEA	Astoria	$30
Moderate-low, inside the GEA	Bedford Stuyvesant	*
Moderate-low, outside the GEA	Bedford Stuyvesant	$25

*The mid-rise project type in this market did not generate a minimum NOI yield even with zero land cost, so mid-rise development would currently be infeasible given our assumptions.