



Regional Plan Association

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# Technical Appendix

NYCHA's Transferable  
Development Rights





## Technical Appendix

### NYCHA's Transferable Development Rights

This document is a technical appendix to RPA's report, "Time to Act: Restoring the Promise of NYC's Public Housing," released in October 2019. The following information focuses on RPA's assessment regarding NYCHA's Transferable Development Rights. For information on other NYCHA recommendations, please go to [rpa.org](http://rpa.org)

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# Introduction

This technical report aims to quantify the potential sale of NYCHA transferable development rights (TDRs) on a citywide scale and visualize the impact on the urban fabric around three selected neighborhoods. Based on New York City's data, RPA estimates that there are 78 million square feet of unused development rights owned by NYCHA.<sup>1</sup> The authority has set a goal of generating \$1 billion for capital repairs by selling a portion of their unused development rights to adjacent parcels.<sup>2</sup> RPA has analyzed the impacts of changes, specifically for NYCHA, in legislation governing TDRs that could be enacted by the City in order to see how much more revenue could be realized.

In order to demonstrate this concept, we focused on three NYCHA sites with the aim of representing a diversity of size and typology of both the NYCHA campuses and surrounding receiving sites. These place based design studies evaluated the potential outcomes under four different scenarios. The outputs of the assessed strategies are visualized as catchments and surrounding built context, together with likely sites of development and the massing of potential build-up. Sites likely to be sensitive to development pressure (e.g. soft sites) are spatially represented in terms of their available by-right floor area ratio (FAR) and their potential square footage absorbed from the NYCHA site of study. The intent of these visualizations is to indicate locations where development is likely to occur within each expanding geographic nexus and the potential changes to the city's urban design.

## Summary of Findings

RPA's assessment revealed that an expanded TDR program that would allow as-of-right transfers within a half mile distance from the NYCHA generating site could unlock all of the 78 million square feet of unused development rights owned by the authority. A rough estimate is that this could ultimately provide a revenue source of between \$4.2 and \$8.4 billion dollars. This additional revenue would provide necessary resources for investment in the preservation, maintenance, and improvements of NYCHA infrastructure. Developing a uniform as-of-right framework across the city for these transfers will be critical for providing the most options and flexibility, encouraging a higher rate of transactions and realizing revenue as soon as possible.

- Over 98% of NYCHA developments are currently landlocked. They either don't have parcels that can receive TDRs or the ones that can receive TDRs only have a limited capacity to absorb them.
- All of NYCHA's 78 million square feet of unused development rights would be unlocked by allowing transfers within a half-mile radius or within the same community district.
- Allowing NYCHA to transfer development rights across the street (same spatial rules as individual landmarks) would leave over 50 million square feet of unused development rights still landlocked.
- More receiving sites without more generating sites would result

in a higher rate of competitive bidding, likely increasing prices and realizing revenues sooner. Based on neighborhoods with precedents of previous TDR and comparable deals, RPA estimates that potential revenue generated could be between \$4.2 and \$8.4 billion dollars.

- Requiring Quality Housing zoning regulations on receiver sites would maintain overall envelope and bulk zoning restrictions while still allowing for NYCHA unused development rights to be transferred, with a 100% absorption rate under the scenario that allows transfers within half-mile distance.
- Developing an as-of-right framework will be critical for encouraging a higher rate of transactions and realizing revenue sooner. A city wide text amendment that allows transferring NYCHA's unused development rights within half mile distance should aim to achieve this.

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<sup>1</sup> Estimation based on The Primary Land Use Tax Lot Output (PLUTO™ 18v1) provided by NYC Department of City Planning. Attribute information utilized for calculation: Built Floor Area Ratio (BuiltFAR), Residential Allowable FAR (ResidFAR), and Property Lot Area (LotArea).

<sup>2</sup> NYCHA 2.0, Strategy 3: Transfer to Preserve (December 2018).



# Transfer programs in NYC and the Region

Programs operating in New York City and throughout the region show the range of possibilities in which TDR mechanisms can be designed and implemented. While there are significant differences between programs, primarily regarding geographic scope, an overview of the most prominent examples provides references and lessons learned that could be of value for NYCHA.

## Programs Operating in New York City

Nationally, various TDR schemes were forwarded in the late 1960s and early 1970s as part of an effort to preserve historic landmarks in the face of a long post-war building boom that increasingly threatened their viability, especially in the high-density downtown areas.<sup>3</sup> In New York City owners of landmark buildings, Times Square theaters, lots under the High Line, and some properties in East Midtown may sell their unused air rights in order to generate income and to compensate for restrictions on development on their own lots.<sup>4</sup>

In New York City, zoning resolution section 74-79 was established as part of historic preservation legislation passed by the City Council in the 1960s following the uproar over the demolition of the original Pennsylvania Station. The city created a Special Permit that enabled landmark owners to sell unused development rights to “adjacent” properties, which include “contiguous” properties plus those directly across the street or that share an intersection. It was further amended to allow landmark owners to establish adjacency through a chain of lots “owned” (via zoning lot mergers) by the transferor or transferee, in theory allowing transfers at greater distances. Except in high-intensity commercial districts, each transfer under 74-79 is limited to 20 percent above the maximum floor area on the receiving lot. Transfers must also be accompanied by a maintenance plan for the landmark. In theory, the mechanism provided economic relief to owners of landmarked properties, thereby furthering the purpose of the landmark preservation law and provided the city a measure of legal protection from a takings challenge.<sup>5</sup>

Special district transfers are different from those permitted under 74-79 as they encompass broader boundaries in which transfers may occur, thus including a larger number of potential receiving sites. In 1972, as part of an effort to save the historic South Street Seaport from a string of foreclosures, the City designed a highly technical mechanism complete with designated granting and receiving sites and the City’s first and only functioning TDR Bank. Aside from an attempt to implement a similar mechanism in Sheepshead Bay the following year, the city would not attempt another Special District

mechanism for twenty years, in the Grand Central Subdistrict in 1992, and then the Theater Subdistrict in 1998. In the 2000s, Special District mechanisms enjoyed favor as a tool to achieve large-scale urban design and open space goals, supporting the creation of the High Line, Hudson Yards, the Manhattanville expansion of Columbia University and more recently the East Midtown rezoning.<sup>6</sup>

The current Theater Subdistrict TDR mechanism is widely viewed as a success by the terms of the program’s preservation objectives, with 15 transfers totaling over 470,000 square feet since its current iteration was implemented in 1998. An additional 10 theaters have transferred development rights through zoning lot mergers. The purpose of the program was to preserve the Broadway theater industry in the face of office and residential development encroaching from adjacent neighborhoods. Theaters benefiting from these various bonuses and transfer mechanisms had to agree to continue to operate as a “legitimate theater” for the life of the receiving development. At the time, it was understood that the preservation of the Broadway theater industry was crucial to the regional economy. In this case the price of the TDRs is set by the market, according to public reports, the most recent transfers have been in the \$225 price per square foot range.<sup>7</sup>

In 2017, the City Council approved the East Midtown rezoning, the latest special district involving TDR mechanisms. In order to achieve the maximum buildable density, the rules allow for as-of-right transfers from the subdistrict’s landmark buildings via chair certification. Projects that use landmarked buildings’ TDRs are required to make a contribution to the Public Realm Improvement Fund. The contribution will equal 20 percent of the sale value, or a minimum contribution of \$78.60, whichever is greater. The fund is dedicated to critical transit and pedestrian improvements throughout the area such as additional, relocated, or reconstructed stair, ramp and escalator connections within the Grand Central subway station as well as a full range of at-grade public realm improvements.<sup>8</sup>

Currently the New York City Council is considering a legislative package that will bring additional transparency to TDR transactions and a formal mechanism to catalog zoning lots.<sup>9</sup> Having such legislation in place will likely improve conditions for advancing new and more flexible TDR programs. This will improve the opportunities for a NYCHA program, as it will bring accuracy to the number of available development rights per development, as well as allowing for the general public and NYCHA residents to consult details of a potential transaction, including sales price and additional agreed requirements. This will also help ensure that the average square foot

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3 Department of New York City Planning. A Survey of Transferable Development Rights in New York City (February 2015).

4 New York City Bar, City Bar Center for Continuing Legal Education. The Do’s and Don’ts of Zoning Lot Mergers and Development Rights Transfers in New York City (December 2017).

5 Department of New York City Planning. A Survey of Transferable Development Rights in New York City (February 2015).

6 Ibid

7 Ibid

8 Department of New York City Planning. East Midtown Rezoning (August 2017).

9 Intro 1691-2019 would assign a unique identifying number to each zoning lot in the city. Intro 1692-2019 would create a public interface showing the location of zoning lots. Intro 1701-2019 would require community notifications to transfers of development rights.



of air rights is paid at a fair price and as much as what the local real estate market will bear.

## Programs Operating in the Metropolitan Area

TDR programs outside of New York City have also been operating for several decades. These regional TDR programs have been implemented to help preserve natural areas and sources of drinking water. Such programs apply to large geographic areas, typically covering hundreds of thousands of acres. Even though their geographic scope goes well beyond anything applicable to New York City, the framework by which they operate can offer important lessons for a TDR program for NYCHA.

The Central Pine Barrens preserve, a natural area of approximately 105,000 acres in eastern Long Island, is a valuable ecosystem that plays an important role in maintaining the quantity and quality of surface water and groundwater for the region's supply system. In recognizing the importance of this area, and to ensure the long-term integrity of the ecosystem, a TDR program was implemented in 1995. The program aims to preserve the most sensitive areas of the preserve, while promoting development in compatible growth areas where potential receiving sites are located. Each Pine Barren credit represents development potential that can be transferred from a privately-owned parcel of property within the core preservation area, or other sensitive area identified in the land use plan, to a parcel in a designated area outside the core.<sup>10</sup> The Pine Barren program is different from most existing TDR mechanisms in New York City as it relies on a bidder and auction format, rather than typical direct negotiations between seller and receiving parcels. This provides a benefit that allows for setting minimum quantities for asking price and number of credits. Given the large extension of the compatible growth area and the number of potential receiving sites contained within, the auction and bidding process creates a system that provides the proper amount of incentives that drives the transactions.

Comparable programs have been operating in New Jersey for decades. The Pinelands Development Credit Bank was set in place to guide development over a 1.1 million acre area in southern New Jersey that contains a vast groundwater aquifer estimated at over 17 trillion gallons. The Pinelands Commission regulates land use in a 337,000 acre Preservation Area, where no development is allowed, and the much larger Protection Area, where development is encouraged in specific growth areas.<sup>11</sup> Since its inception in 1985, the Bank has helped Pinelands property owners who wish to sell the credits for their land and preserve it in perpetuity. As with other preservation programs, developers buy and use Pinelands Development Credits, or PDCs, to increase building densities in designated regional growth areas, thereby promoting efficient use of land and preventing sprawl.<sup>12</sup>

The more recent Highlands Development Credit program adopted in

2008 had a similar approach for protecting the drinking water sources of northern New Jersey located in the Appalachian Highlands. The State of New Jersey moved aggressively to address the preservation of the 850,000 acre region that makes up the New Jersey Highlands.<sup>13</sup> As with the other programs, development credits from the Highlands may be sold to developers for use in appropriate voluntary receiving zones.<sup>14</sup> However, it appears that the Highlands program has not achieved the same level of success as its Pinelands counterpart. The Highlands program has received criticism over the onerous review process, which some say explains the low number of applications seeking to transfer development rights.<sup>15</sup> As with any TDR program, its success depends on balancing the demand for development with the level of review and discretionary approvals.

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10 Central Pine Barrens Joint Planning & Policy Commission. Program Overview: <https://pb.state.ny.us/our-work/credit-program-tdr/program-overview/> (Accessed July, 2019)

11 A Region at Risk, The Third Regional Plan for the New York-New Jersey-Connecticut Metropolitan Area (1996)

12 Pinelands Development Credit Bank: <https://www.nj.gov/pinelands/pdcbank/> (Accessed July, 2019)

13 Regional Plan Association. The Economics of Transferring Development in the New Jersey Highlands (October, 2006)

14 Highlands Development Credits (TDR Programs): <https://www.highlands.state.nj.us/njhighlands/hdcbank/> (Accessed, July 2019)

15 Le Highvalley live: [https://www.nj.com/news/2011/06/with\\_2\\_christie\\_appointees\\_hig.html](https://www.nj.com/news/2011/06/with_2_christie_appointees_hig.html) (Accessed July, 2019)



# A Framework for NYCHA TDRs

All special districts, including those that involve TDR programs, have a legal obligation to zone “in accordance with a well-considered plan”. Components for TDR districts must generally address four parameters: (i) Planning Rationale, (ii) Geographic Nexus, (iii) Size of Transfers, and (iv) Discretionary Review.<sup>16</sup>

1. Compelling Planning Rationale: Which properties are eligible to transfer TDRs?
2. Geographic Nexus: Where Can TDRs be Used?
3. Size Limits: How Large Can the Transfer Be?
4. Discretionary Review: What Must the Parties Do to Complete the Transfer?

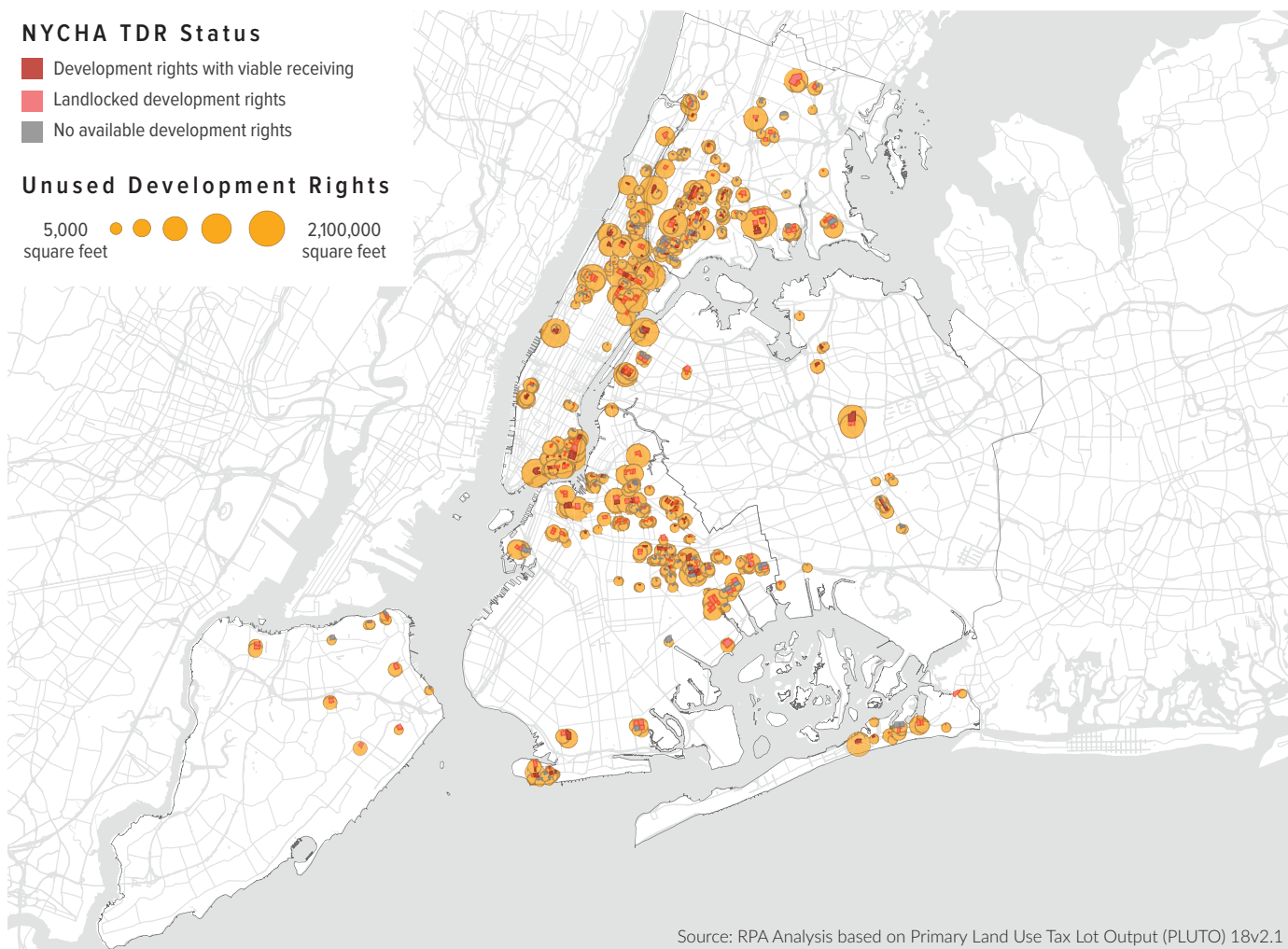
## Which Properties Are Eligible to Transfer TDRs?

Based on RPA's estimations, there are 672 NYCHA properties holding a total of approximately 78,200,000 square feet of unused development rights. However, the number of sites where NYCHA TDRs could be transferred is very limited; about 1,500 parcels are adjacent to NYCHA parcels that have unused development rights. Many of these potential receiving sites are already overbuilt or

are limited by envelope restrictions imposed by contextual zoning districts. This further reduces the number of viable receiving parcels to approximately 555. Such a small number of viable receiving sites means that almost half of NYCHA parcels cannot transfer their unused development rights. Finally, because development rights are not evenly distributed across the city and underlying zoning imposes limits to the amount of TDRs any given site could absorb, 98% or roughly 77 million square feet of NYCHA TDRs will likely remain unusable or landlocked. Current market conditions from development limit the practical application of these rights even further.

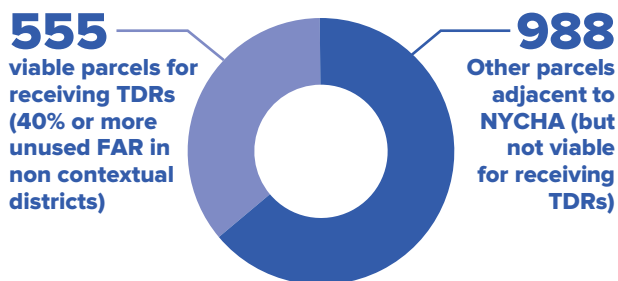
When recognizing affordability requirements, and other impositions governing public housing, it may be argued that treating all of the authority's unused development rights in a special way is justifiable and reasonable. A more robust program would recognize the vital role of public housing and justify the necessity of preserving its infrastructure through a flexible TDR framework that works for all NYCHA properties, instead of just a few of them.

16 Furman Center. Unlocking the Right to Build: Designing a more flexible system for Transferring Development Rights (March 2014)

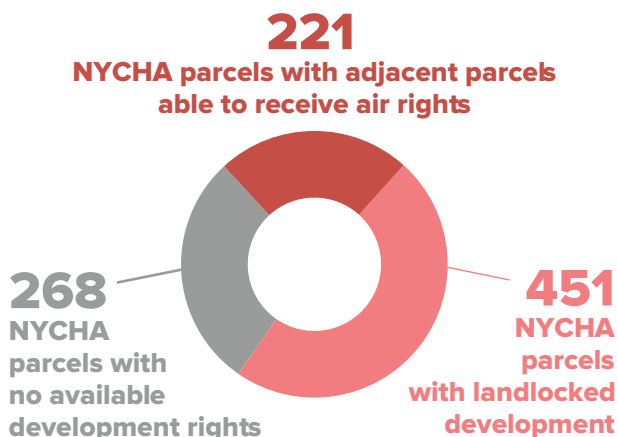


## Most development rights are landlocked:

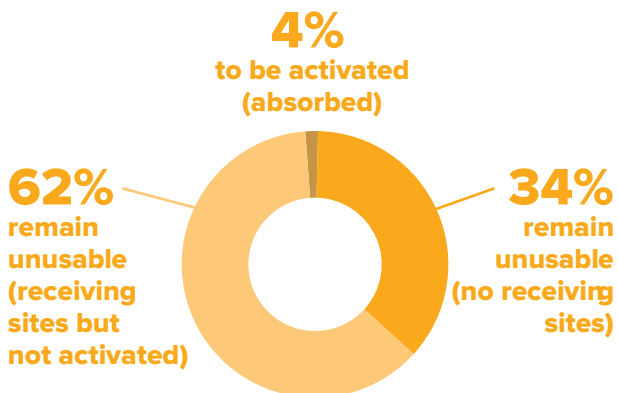
### Potential Sites Receiving NYCHA TDRs



### NYCHA Property by TDR Status



### NYCHA Unused Development Rights



## Where Can TDRs Be Used?

RPA evaluated a range of different scenarios for NYCHA's transferable development rights. After assessing these scenarios, we determined that modifying the rules of zoning lots as to allow NYCHA land to transfer development rights within half mile distance has the best potential for unlocking all of NYCHA's unused development rights while maintaining a reasonable geographic nexus. Based on further study and outreach, New York City should advance a citywide Generic Environmental Impact Statement and public review process aiming

to amend the zoning code to unlock NYCHA's development rights through an as-of-right framework.

The five scenarios evaluated by RPA were as follows:

- **As-of-Right (current rules):** Transferring development rights to parcels that are directly adjacent to NYCHA properties via zoning lot mergers (development rights remain within the same block).
- **Conduit Parcels:** Allowing NYCHA sites to transfer development rights via zoning lot mergers and jumping over parcels that are not immediately adjacent to NYCHA (adjacent lots that are not able to receive NYCHA development rights would become conduit parcels for the transfer and density would remain the same within the block)
- **Across Streets:** Allowing NYCHA sites to transfer development rights directly across street boundaries – either next to, across the street from or diagonally across an intersection from it. This would provide the same spatial rules that individual landmarks have for transferring TDRs. A variation of this scenario would combine the rules of conduit parcels, in theory allowing transfers at greater distances.
- **Within a Half Mile:** Creating a mechanism whereby unused development rights from NYCHA campuses would be permitted to be transferred within a half mile from the generating NYCHA site.
- **Community District:** Allow NYCHA properties to transfer development rights to any site within the same community district and/or within a half mile from the generating NYCHA site. This would be based on the Inclusionary Housing certificates model.

Additional spatial considerations should be embedded into NYCHA's TDR program in a way that promotes density where it makes the most sense. For example, receiver parcels in proximity to transit stations should be prioritized, while parcels located in future floodplains should be avoided. The case studies demonstrated that even with these additional filters, the half-mile distance scenario would still unlock all of NYCHA's TDRs.

## How Large Can The Transfer Be?

The analysis estimated the potential square footage absorbed by viable parcels under Quality Housing regulations.<sup>17</sup> The square footage absorption (also referred to as activated air rights) represents the area that could be utilized beyond by-right FAR limits but within the existing height and lot coverage restrictions.<sup>18</sup> The air rights transfer from NYCHA in this study fills the gap between FAR restrictions and a full building envelope under Quality Housing bulk regulations. The analysis demonstrated that the average increase in floor area of the redeveloped receiving site would range between 26% and 48% with respect to what is granted by the underlying zoning.

Such an increase in floor area might be interpreted as triggering Mandatory Inclusionary Housing (MIH), which would require between 20-30% of the housing units at the redeveloped site to remain below market in perpetuity. However, a central concept behind any TDR district is the idea that density allowed by right can be transferred

<sup>17</sup> Viable parcels were defined as having at least 40% of the remaining by-right FAR, which can then be softened to 50% remaining with a potential addition of air rights from a NYCHA site. For more see methodology section.

<sup>18</sup> Additional considerations beyond zoning envelope restrictions such as dwelling unit factor or window requirements by building code should be further evaluated.



within a defined geography, which is different from creating new density. The City's position with respect to this is that MIH only applies when you create new residential capacity, and not simply when you move the existing capacity around. Based on this precedent, and previous permits seeking bulk modifications, it could be argued that the strategies that this report analyzes would not directly trigger MIH requirements and that any FAR bonuses would be separate.<sup>19</sup> Without triggering MIH, the price per square foot paid by the receiver sites should be at full value.

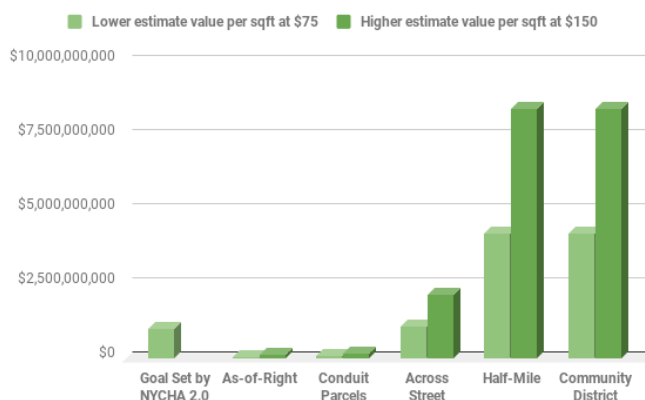
## What Must the Parties do to Complete the Transfer?

The tradeoff between the degree of oversight and the number of transfers is of central importance as the city considers TDR policy. Developing an As-of-Right framework will be critical for encouraging a higher rate of transactions and realizing revenue sooner, especially if Quality Housing regulations are required on receiving sites. A citywide text amendment for allowing special rules for transferring NYCHA's unused development rights should aim to achieve this. In addition, the City should also explore implementing a bidder and auction format, similar to the Long Island Pine Barren program. This could provide the benefit that allows for setting minimum quantities for asking price per square foot. Given the large extension and the number of potential receiving sites contained within strategies 3 and 4 (a half-mile and community districts), the auction and bidding process would likely create a system that provides the proper amount of incentives to drive the transactions. A variation from the previous alternatives would be providing development bonds in exchange of NYCHA's TDRs, which would generate compounded interests over time, instead of the single transaction typical in most TDR deals.

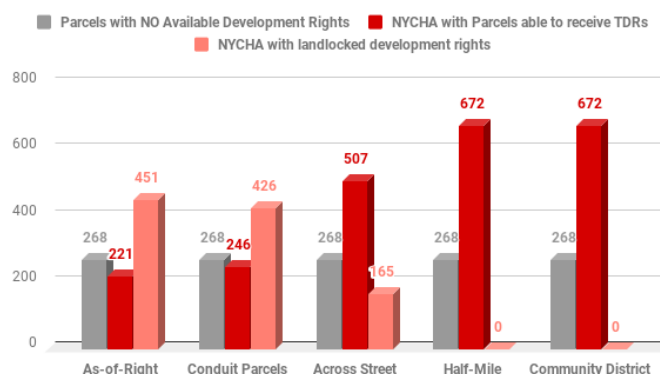
## Findings for Each Citywide Scenario

- **As-of-Right:** 98% of NYCHA's unused development rights (over 77 million square feet) would remain landlocked. There are only a limited number of parcels that can receive and absorb NYCHA's TDRs.
- **Conduit Parcels:** While the number of potential receiver sites almost doubles when compared to the As-of-Right scenario, still most all of NYCHA unused development rights (over 76 million square feet) would remain landlocked.
- **Across Streets:** With almost 6,000 potential receiver parcels, approximately 20 million square feet of NYCHA's unused development rights could be unlocked (25% from the total). The estimated revenue generated would likely surpass \$1 billion dollars, but over 50 million square feet of air rights would remain landlocked.
- **Within a Half-Mile:** With over 68,000 potential receiver parcels, all of NYCHA's unused development rights would be unlocked. The potential revenue generated would range between \$4.2 and \$8.4 Billion Dollars.
- **Community District:** With almost 120,000 potential receiver parcels, all of NYCHA's unused development rights would be unlocked. The potential revenue generated would be comparable to the previous scenario, ranging between \$4.2 and \$8.4 Billion Dollars.

## Estimated Value Generated per Evaluated Scenario



## NYCHA Properties that would be able to participate in a TDR program



Detailed results of the quantitative analysis can be consulted at the following [online spreadsheet](#).<sup>20</sup>

<sup>19</sup> Adorama redevelopment and special permit ULURP No. 160082ZSM and CEQR No. 16DCP106M

<sup>20</sup> <https://docs.google.com/spreadsheets/d/1dEhLuSsvX21aFx8PNrqdBIKZQMZ2bJ4goDRU2VCA3E/edit#gid=1929581257>

# Methodology

## Citywide Assessment

A citywide spatial analysis was conducted to measure the impacts under each of the previously discussed scenarios. Catchment areas were defined and a preliminary soft site analysis was performed to assess the number of parcels that could engage in the TDR program.

The estimated number of NYCHA development rights that any single receiver parcel would be able to absorb was determined by the weighted averages of the neighborhood specific design studies. Once the absorption rate (number of NYCHA development rights activated) was estimated we proceeded to calculate the potential amount of revenue that could be generated. Revenue estimation was based on NYCHA's unused development rights located in neighborhoods defined as TDR market areas, where at least 20 zoning lot mergers, TDR deals, or comparable agreements have occurred within the boundaries of a given community district. The median price per square foot of NYCHA TDRs that could be sold was assumed to be \$75 and \$150, a conservative estimate.

These calculations were based on PLUTO 18V1, Real Property Master, and Real Property Legals. PLUTO is provided by the NYC Department of City Planning, and real property data recorded at the Automated City Register Information System (ACRIS). Additional attribute fields were included in the database to describe NYCHA TDR status for each scenario:

- Attribute field labeled as **“dev\_rights”** represents NYCHA TDR status under As-of-Right conditions.
- Attribute field labeled as **“dev\_right\_1”** represents NYCHA TDR status under Conduit Parcel scenario.
- Attribute field labeled as **“dev\_right\_2”** represents NYCHA TDR status under Across Streets scenario.
- Attribute field labeled as **“dev\_right\_3”** represents NYCHA TDR status under Half-Mile scenario.
- Attribute field labeled as **“dev\_right\_4”** represents NYCHA TDR status under Community District scenario.

These attribute fields label NYCHA parcels under three different possibilities:

- **“No Available Rights”** means that the NYCHA parcel has no available development rights to transfer, regardless of potential receiving sites in proximity. This field remains the same under all scenarios.
- **“Development rights with viable receiving”** means that the NYCHA parcel has the ability to transfer unused development rights to a receiver site in proximity.
- **“Landlocked development rights”** means that the NYCHA parcel has unused development rights, but no viable receiving sites were identified.

The edited PLUTO dataset may be [downloaded here](#).<sup>21</sup>

## Neighborhood Case Studies

The methodology for the place based studies started by selecting ‘viable’ parcels within the different geographic catchment alternatives. Viable parcels were defined as having at least 40% of the remaining by-right FAR, which can then be softened to 50% remaining with a potential addition of air rights from a NYCHA site. A 50% underbuilt benchmark is a general standard for real estate soft site analysis.

The sites were also filtered for large commercial buildings, other NYCHA owned sites, parks, and transportation/utility uses. These sites may still be considered as conduit parcels to link relevant sites, but in most cases not appropriate for potential buildup.

For the half-mile and Community District scenarios, additional filters were applied in a way that prioritized potential receiver sites located within a quarter-mile of a transit station and zones unaffected by future floodplains.<sup>22</sup>

In addition to the remaining FAR, the case studies estimated the potential square footage absorbed by the viable parcels under Quality Housing regulations. The square footage absorption (also referred to as activated air rights) represents the area that could be utilized beyond by-right FAR limits but within the existing height and lot coverage restrictions (zoning envelope). The air rights transfer from NYCHA in these studies would fill the gap between FAR restrictions and a full building envelope under Quality Housing bulk regulations. The estimated absorption ratios range between 26% and 48% of floor area that could be added per receiver site while still maintaining general Quality Housing bulk regulations. These absorption ratios calculated for the case studies were then used to inform citywide projections under each scenario.

## Other Considerations:

- The increase in residential FAR represents the percentage of residential FAR beyond by-right zoning regulations that a building envelope could potentially absorb from a NYCHA site while remaining within the by-right envelope.
- This percentage specifically represents the increase beyond base residential FAR that could exist at the receiver building footprint. This includes calculating for wide versus narrow streets and corner lot coverage, but not explicitly for window requirements or yard requirements (although the latter is implicit to the lot coverage and mostly applicable only in sections of Queens).
- The analysis assumes a 10-foot exterior floor-to-floor, coverage percentage according to zoning regulations, and base height / setback height according to zoning regulations.
- While the average citywide price for air rights has been estimated at \$315 per square foot, the methodology assumed an average price

21 [https://rpa.carto.com/tables/nycha\\_development\\_rights\\_xi/public](https://rpa.carto.com/tables/nycha_development_rights_xi/public)

22 2050's 100-year floodplain based on FEMA's preliminary work map data and the New York Panel on Climate Change's 90th Percentile Projects for Sea-Level Rise (31 inches). Sites within a quarter mile of a subway stop identified by a 0.25 mile radius (Euclidean buffer).



ranging between \$75 and \$150. The estimation of the potential revenue generated only took into account NYCHA parcels located in neighborhoods in which previous TDR transactions have occurred. TDR market areas were defined as neighborhoods that had at 20 TDR or more similar deals, while non TDR market areas were defined as below such threshold.

- While potential receiver sites that could make use of alternate height factor zoning regulations were not analyzed for calculating absorption capacity, these are expected to be a small fraction of sites located within the catchment areas.

## TDR Principles

The New York City Zoning Resolution allows two ways of transferring floor area from one or more tax lots to another tax lot: mergers of contiguous tax lots into a single zoning lot, or transfer of development rights pursuant to a codified mechanism in the Zoning Resolution.

- **Zoning Lot Mergers of Contiguous Tax Lots**

This mechanism enables development rights to shift around a single zoning lot, formally referred to as zoning lot development agreements (ZLDAs). The merger of two contiguous tax lots is an as-of-right ministerial procedure accomplished by filing with the New York City Department of Buildings and the New York City Department of Finance. This mechanism does not require any discretionary approvals from any government agency. The NYCHA 2.0 transfer to preserve strategy relies on this as-of-right procedure as the sole mechanism for transferring development rights.

- **Transferable Development Rights (TDRs)**

This mechanism enables development rights to hop from one lot to another-sometimes at a distance of several blocks. A TDR may be accomplished either by (i) transfer in accordance with special regulations for a Special Zoning District (may be as-of-right or by certification, authorization or special permit by the City Planning Commission); or (ii) transfer from a landmark site to an adjacent lot or a lot across the street by special permit from the City Planning Commission pursuant to ZR §74-79.

The scenarios explored in this report assume the creation of a special citywide category under the zoning resolution for transferring NYCHA development rights. Selected strategies in this report use a number of variations of spatial parameters regulating TDR districts in combination with rules on how to create zoning lot mergers.

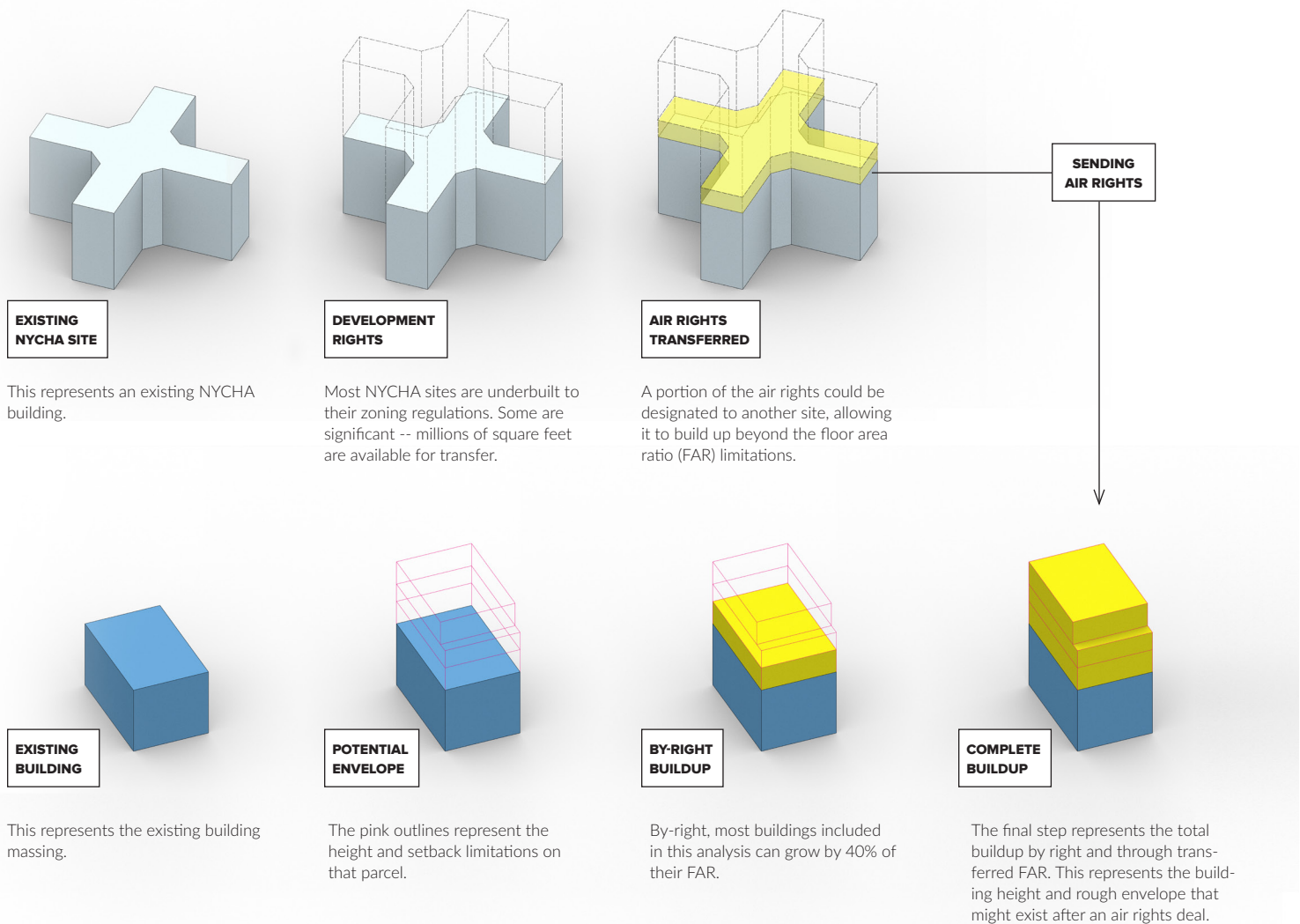
## Key Terminology

- **By-Right Zoning:** The set of characteristics a building can have on a given lot based on the NYC Zoning Resolution. These rules define the setbacks, height, floor area ratio (FAR) and other measures.
- **Envelope:** The overall external dimensions of a building.
- **Floor Area Ratio (FAR):** FAR is the allowable built area on a given lot. The number is expressed as units of the parcel / lot area size, relative to the lot being developed. A 10,000 square foot lot with an allowed FAR of 2.0 could have 20,000 square feet of building area. FAR is divided into multiple categories, including commercial,

residential, community facilities, and others.

- **Remaining FAR:** Remaining FAR is expressed as a percentage of the unused by-right residential FAR divided by the total by-right residential FAR. An empty lot would have 100% remaining FAR, and a building at by-right capacity would have 0% FAR. Remaining FAR is frequently used in "soft site" analysis for real estate development to identify lots that may be suitable for redevelopment.
- **FAR Activation / Absorption:** FAR activation or absorption is a measure that reflects how much FAR a lot could utilize from a NYCHA site. Specifically, it measures how much floor area beyond by-right FAR but within by-right height limits a lot could use.
- **Flood Plain Exposure:** Flood plain exposure is a selection criterion used in later scenarios (a half mile and community district alternatives) that looks at any exposure to the 2050's 100-year floodplain based on FEMA's preliminary work map data and the New York Panel on Climate Change's 90th Percentile Projects for Sea-Level Rise (31 inches).
- **Transit Access:** Subway access is a selection criterion used in later scenarios applying to sites within a quarter mile of a subway stop. This measure is identified by a 0.25 mile radius (Euclidean buffer).
- **Viable Lot:** Lot Viability is a core selection criterion across all scenarios. A lot is considered viable if it possesses 40% or more remaining residential FAR and is not owned by NYCHA or another NYC governmental body.

## Transferring NYCHA Development Rights







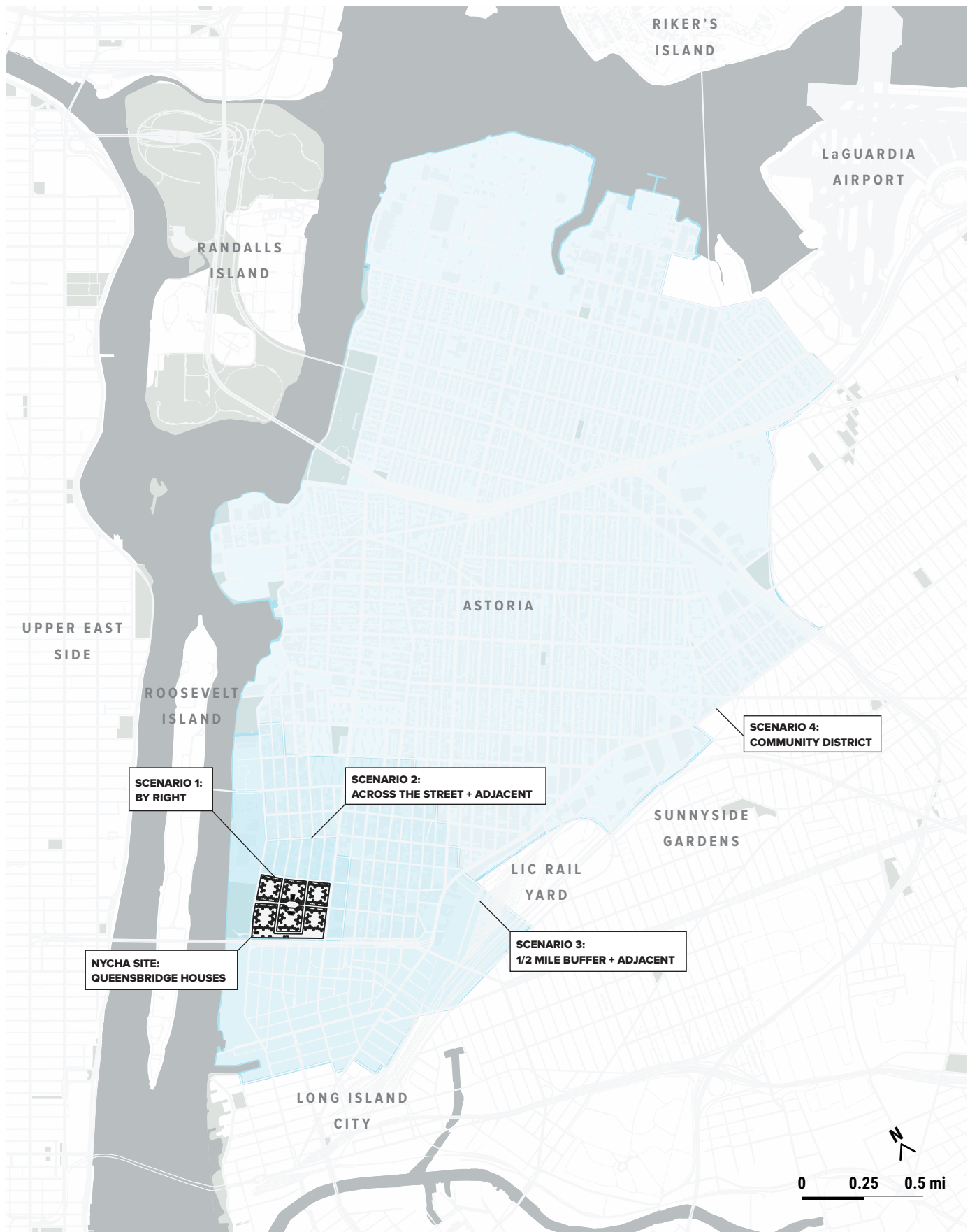
# Air Rights Case Study: Queensbridge Houses

## Introduction

---

Just north of the Queensboro Bridge and 500 feet to the east of the East Channel and Roosevelt Island, the Queensbridge Houses are a critical part of affordable housing in New York City. The complex, spread over six blocks of housing, consists of 3,142 apartments that are home to roughly 6,900 people. The Queensbridge Houses is the largest public housing development in the Western Hemisphere, and the buildings form an iconic 'Y' shape repeated across the site, a representative development pattern for NYCHA complexes across the City. Completed in 1939, the Queensbridge Houses have faced issues over the later half of the 20th century in crime, reputation, and capacity; at the same time, the houses have been the birthplace to numerous important musicians and artists.

Today, the Queensbridge Houses face serious challenges from deferred maintenance and future risk of flooding; nearly half of the site is exposed to the 2050 100-year floodplain. The Queensbridge Houses six parcels combined have 1.82 million square feet of available development rights. At an average price of \$75 per square foot, these development rights represent a minimum of \$136 million in revenue for NYCHA, a significant sum towards repairing existing units. The surrounding area is a rich mix of commercial, residential, and manufacturing landscapes, rapid development in nearby Long Island City has increased interest in this area. Through four policy scenarios, we will visualize the likely development sites ranging from current regulations to more substantial changes. Each scenario will map the likely development sites and how many development rights they would receive. Then, using a 3D map of the city, this document will visualize the impact to the urban fabric of a maximum build-up under current height restrictions but unlocked by NYCHA air rights.



# Scenario 1

## Overview

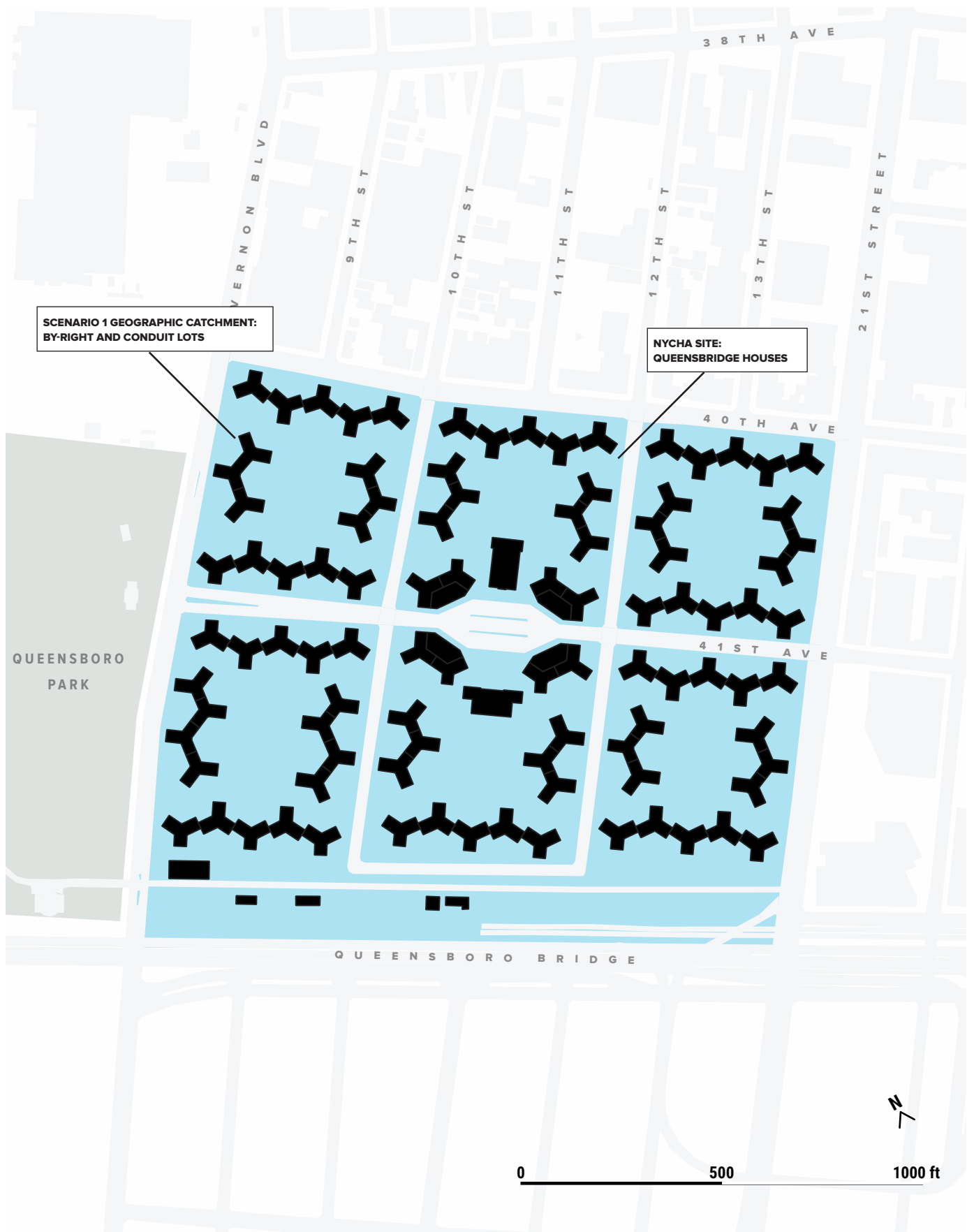
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Scenario 1 represents by-right transfer of development rights and relevant tax lot mergers. The potential parcels are filtered by available As-of-Right built residential FAR, and any parcel with less than 40% remaining is excluded. Additionally, buildings close to their commercial FAR limit, NYCHA properties, and parks are excluded as receiving parcels.

The key metrics for this and the following case studies lay out the number of parcels viable for redevelopment and the characteristics of those parcels. A viable parcel is defined here as an already underbuilt site or a “soft” site that may be sensitive to development pressure. Under each scenario, this analysis breaks down the potential air rights sold to these parcels that maximize the building envelope beyond the by-right FAR limit. For example, if a 10,000 square feet lot had an FAR limit of 1.0, 100% coverage, and a two story height limit, it could activate 10,000 square feet (an additional 1.0 FAR) of air rights from the NYCHA site.

For the Queensbridge Houses, no parcels are available in the first scenario. In other words, they are land-locked. This scenario highlights the limitations of current TDR policy on NYCHA, where 1.82 million square feet of development rights are locked and dormant.





# Scenario 1

## Key Metrics

---

**VIABLE PARCELS:** N/A

**AVERAGE FAR AVAILABLE:** N/A

**ACTIVATED AIR RIGHTS:** N/A

**POTENTIAL REVENUE:** N/A

**LOCKED AIR RIGHTS:** 1,820,000 SQ FT

**LOCKED REVENUE:** \$136,500,000

## Air Rights Pricing

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For each site, this study estimates the value of air rights in a real estate market. Based on a 2016 transaction from Astoria Houses and the more recent one at Ingersoll Houses a \$75 square foot price was assumed in this case.<sup>1</sup>

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<sup>1</sup> NYC Department of Finance Office of the City Register Document ID: 2018051000503002 and Brooklyn Daily Eagle October 10, 2019: <https://brooklyneagle.com/articles/2019/10/10/unprecedented-nycha-air-rights-deal-nears-completion-at-ingersoll-houses/>



# Scenario 2

## Overview

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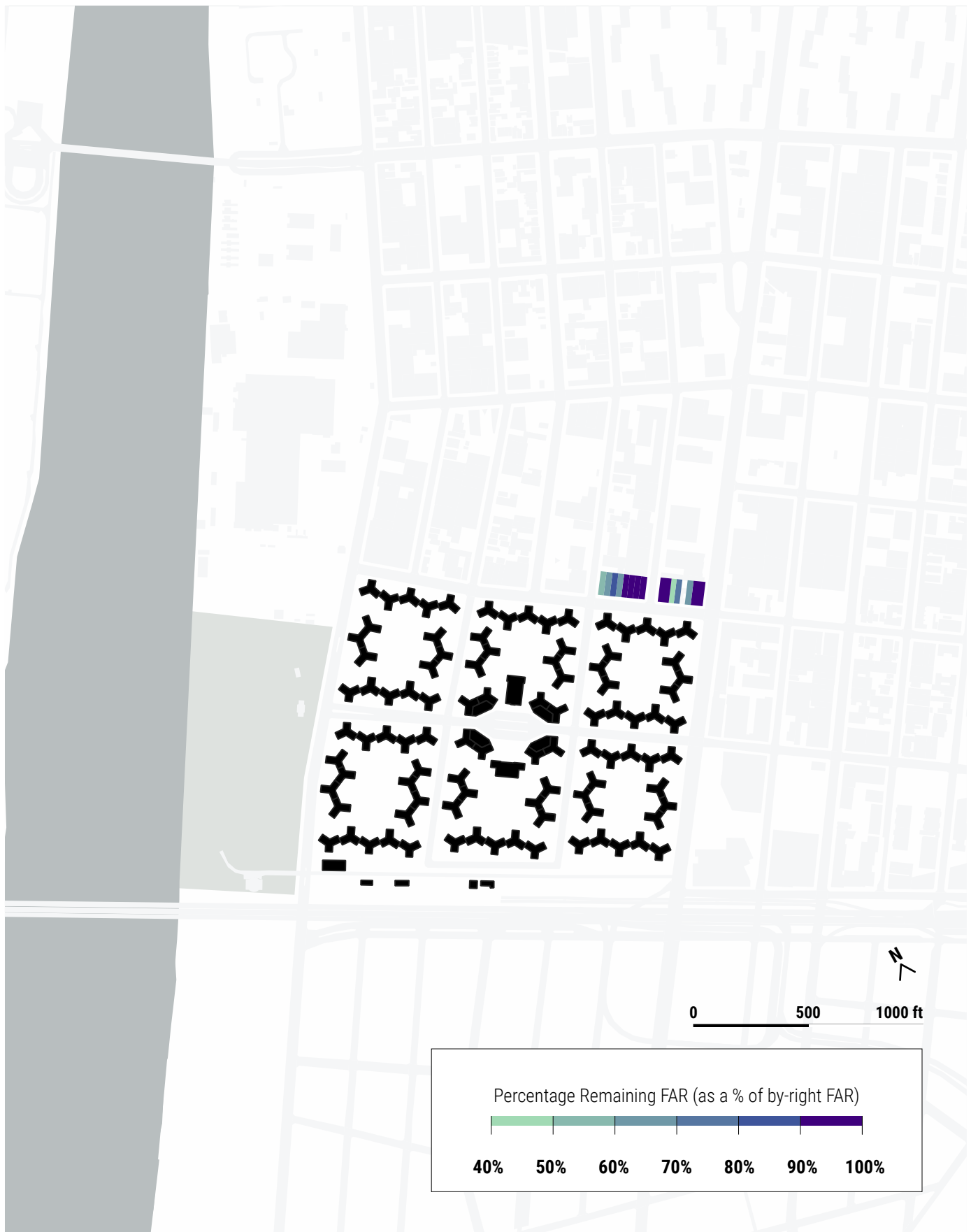
Scenario 2 loosens the geographic catchment of air rights transfer to across street boundaries, and potential conduit parcels adjacent to those lots. The massing visualization on page 23 illustrates how the buildup may occur if tax lots are provided unlimited floor area ratio (FAR) but still bound by height restrictions. This produces a relatively realistic landscape where build-up reaches the same height as the current built up properties.

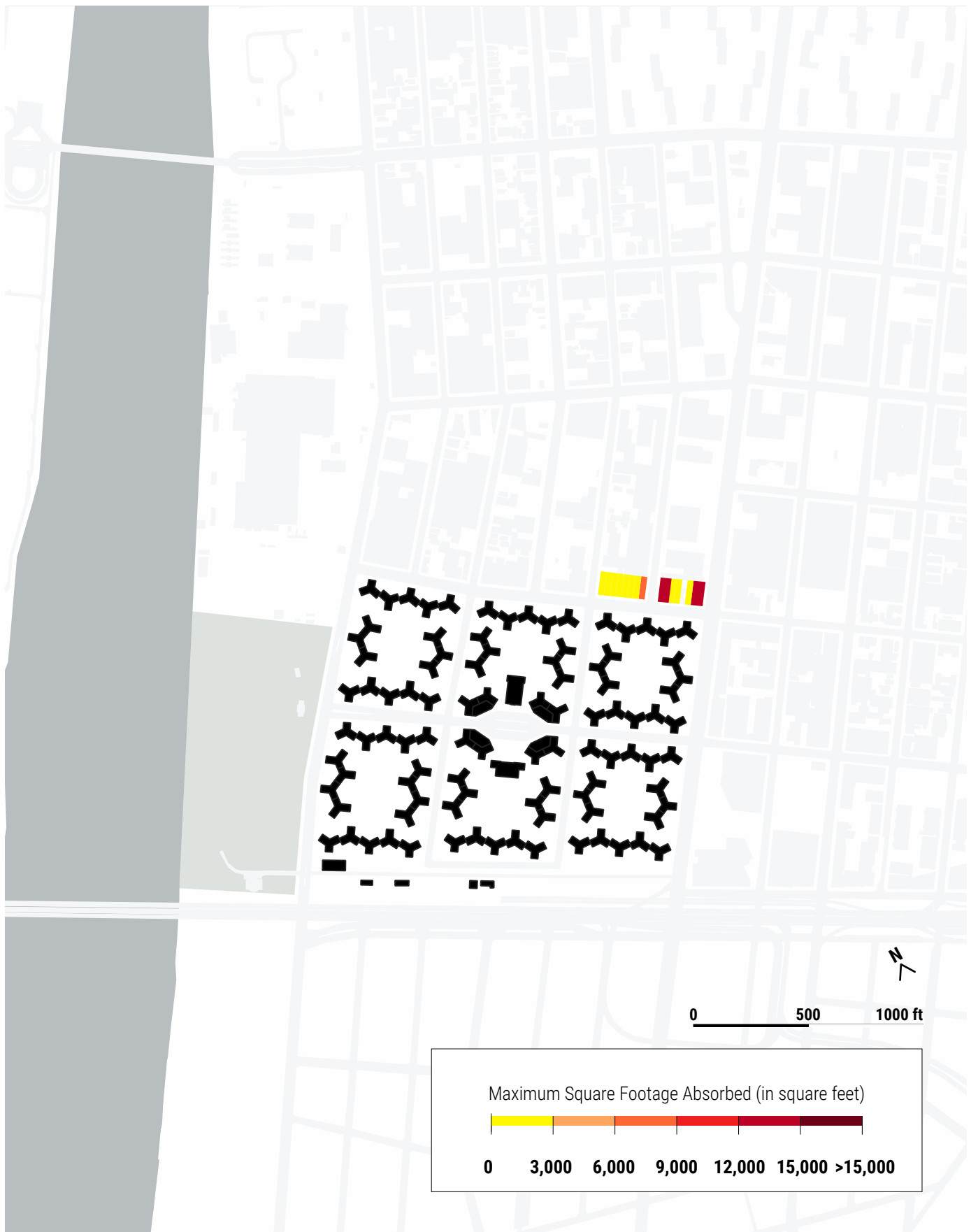
As is the case with the other air rights case studies, a number of few, large lot size buildings make up the majority of potential massing increase. At this scale, we observe that the massing gains the potential to complete larger form building silhouettes, but generally does not exceed nearby context.

Neighboring blocks for the Queensbridge Houses are primarily zoning for light industry, M1-2/M1-3/M3-1 and others. Because of the complexity in organizing these zoning district for residential purposes, areas zoned solely for manufacturing are excluded from this study.









# Scenario 2

## Key Metrics

---

**VIABLE PARCELS:** 13

**AVERAGE FAR AVAILABLE:** 81%

**ACTIVATED AIR RIGHTS:** 53,482

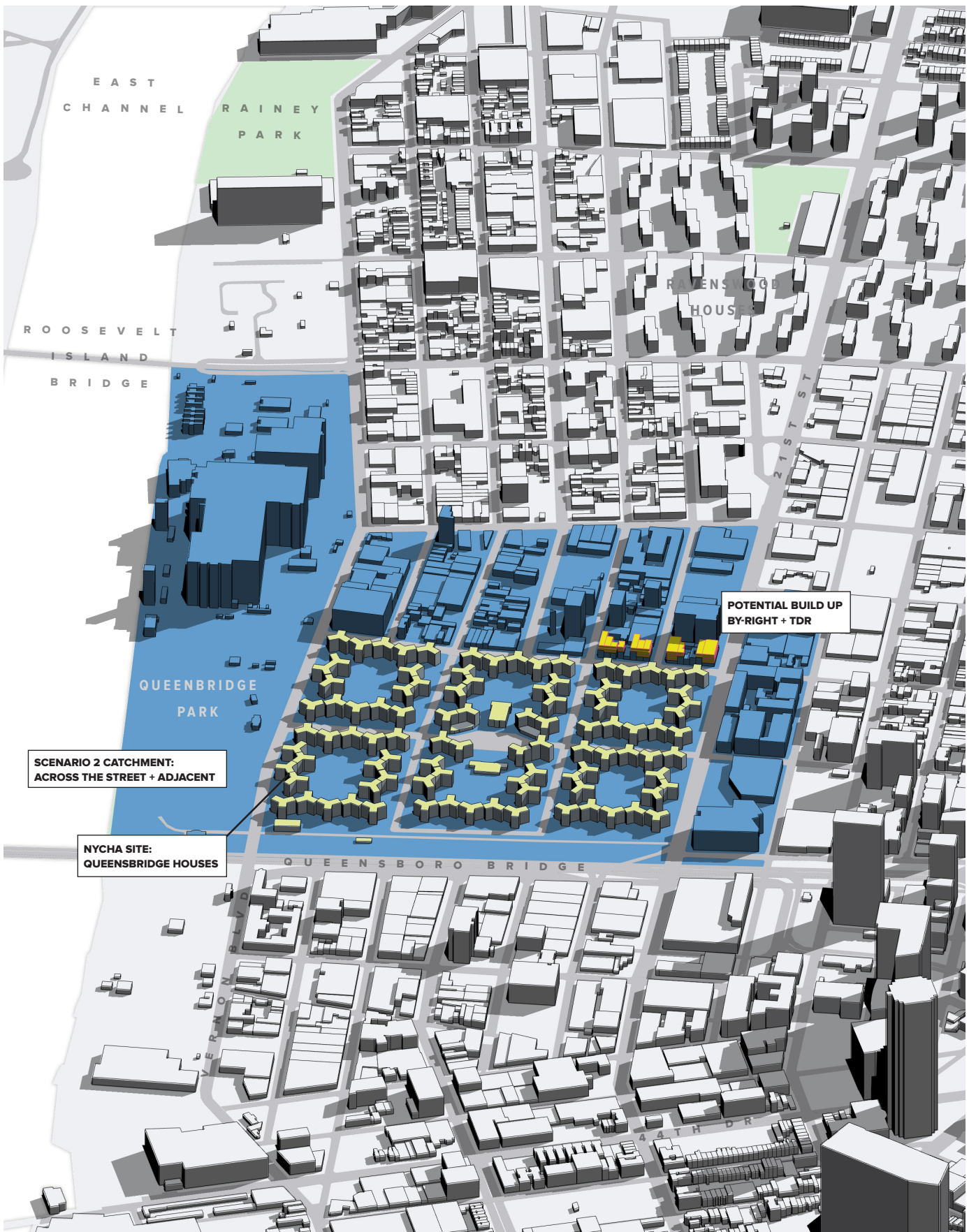
**POTENTIAL REVENUE:** \$4,011,150

**AVERAGE % INCREASE IN FAR:** 53.6%

**LOCKED AIR RIGHTS:** 1,766,518

**LOCKED REVENUE:** \$132,488,850





# Scenario 3

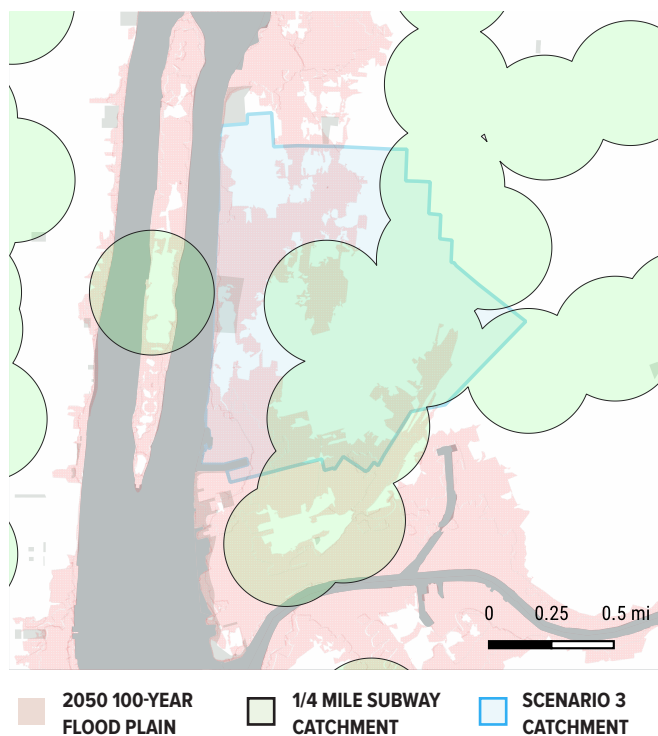
## Overview

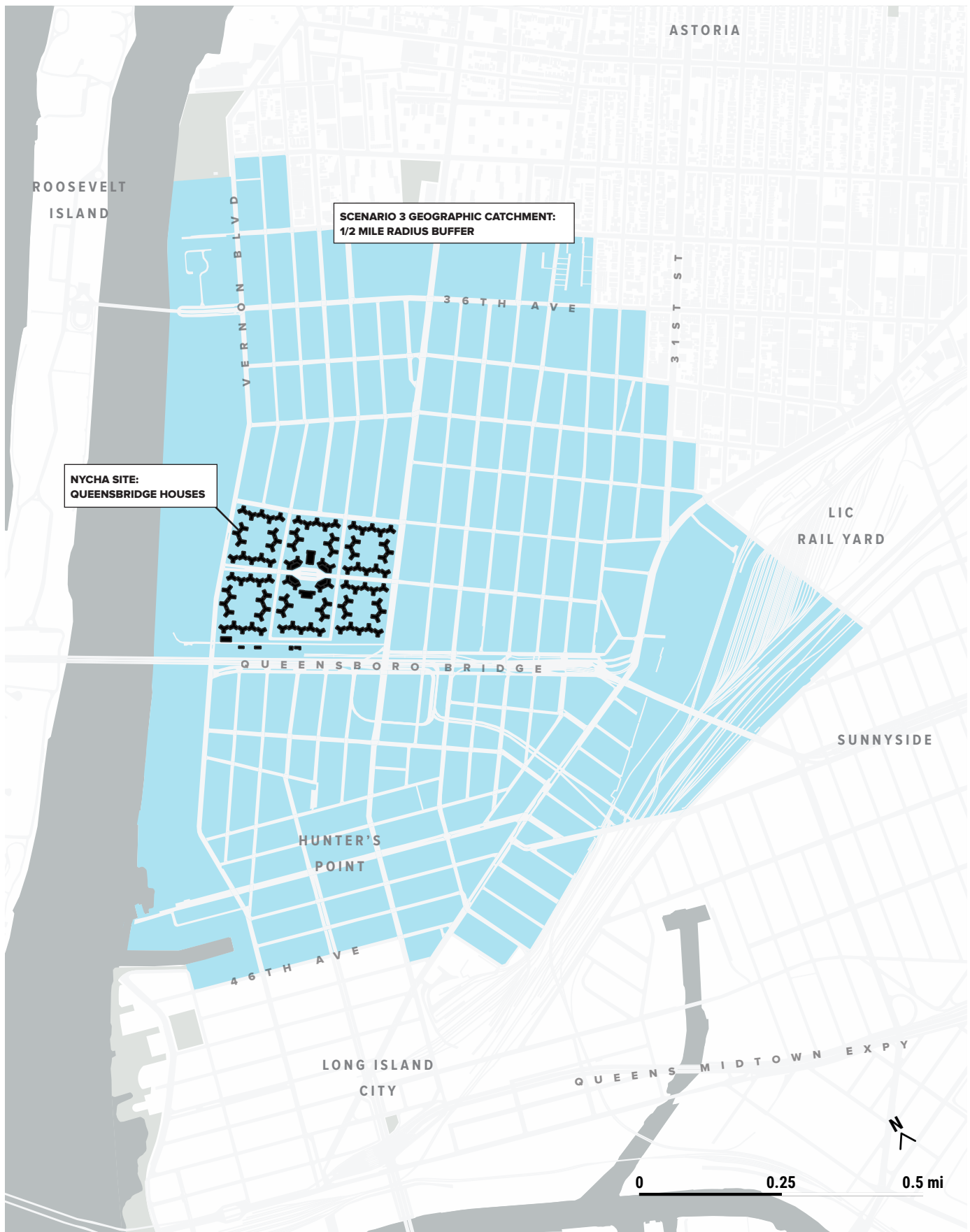
Scenario 3 expands the geographic catchment to include a half mile radius around the Queensbridge. This catchment is limited by the east river and borough boundaries. Much of the waterfront including up to Rainey Park is included in this Scenario, and the catchment begins to expand towards the Ravenswood Houses NYCHA development.

This catchment incorporates areas beyond the manufacturing districts that surround Queensbridge, including significant areas in Long Island City.

In this scenario and scenario 4, the available viable parcels could activate air rights that are beyond the capacity of the Queensbridge houses. Secondary selection criteria are employed to narrow viable lots: first, properties exposed to the 2050 100-year floodplain are eliminated, then locations outside a 1/4 mile buffer of a subway stop are excluded, and finally properties are ranked by available residential FAR.

## Secondary Selection Criteria











# Scenario 3

## Key Metrics

---

**VIABLE PARCELS:** 844

**AVERAGE FAR AVAILABLE:** 81%

**ACTIVATED AIR RIGHTS:** 1,820,000 AVAILABLE | 13,794,336 CAPACITY

**POTENTIAL REVENUE:** \$136,500,000

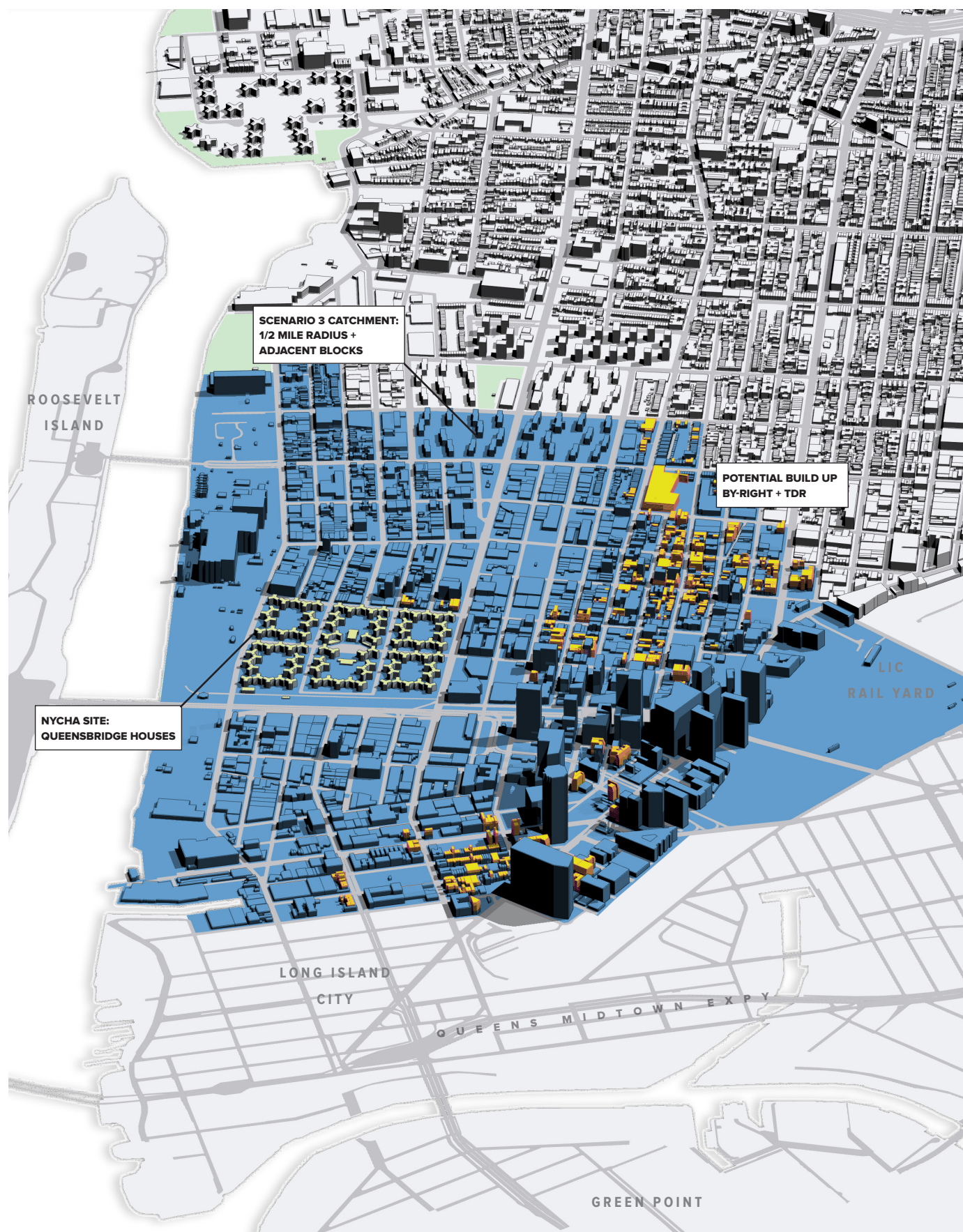
**AVERAGE % INCREASE IN FAR:** 54.2%

**RECEIVING SITES NEEDED TO**

**UTILIZE FULL RIGHTS:** 13.2%

**LOCKED AIR RIGHTS:** NONE - FULL USAGE

**LOCKED REVENUE:** NONE - FULL USAGE



# Scenario 4

## Overview

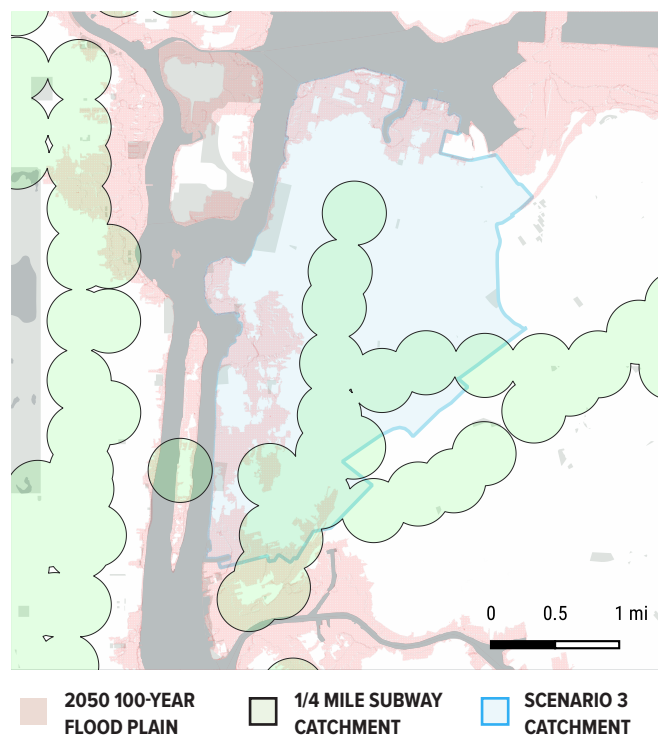
The final Scenario encompasses the entire community district or half a mile buffer from the site. Because the Queensbridge Houses are bounded by the river and borough boundary, only the community district and area to the south is indicated here. Scenario 4 approaches a more abstract scale but there are some important considerations:

The 2050 100-year flood plain covers much of this part of Queens, and this Scenario may enable new development outside of the major risk areas.

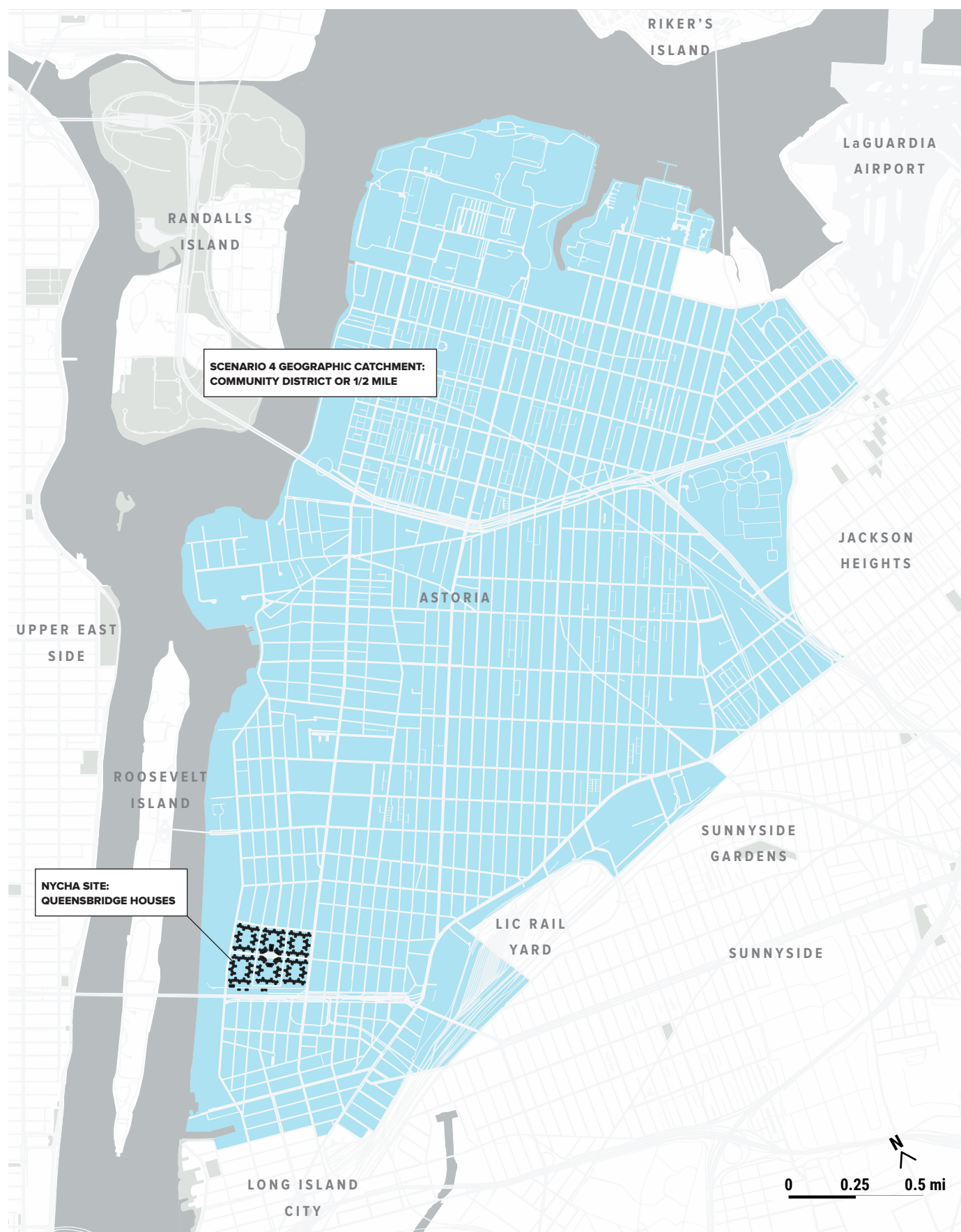
The sites in the community district most sensitive to development pressure and with the greatest capacity to intake air rights are generally along commercial corridors.

Manufacturing sites have been excluded from this analysis, but potential sites across the community district could present exciting opportunities for new development.

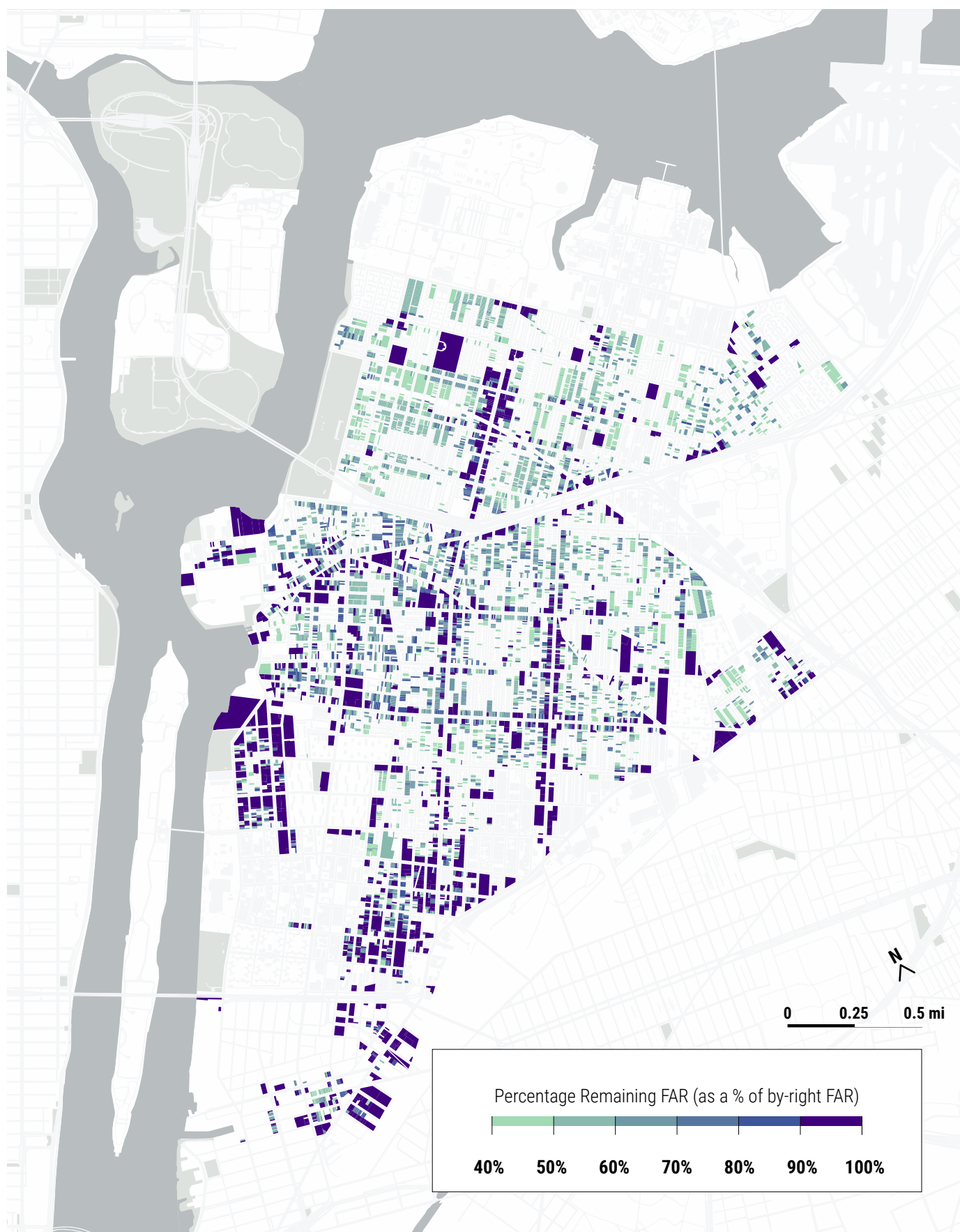
## Secondary Selection Criteria

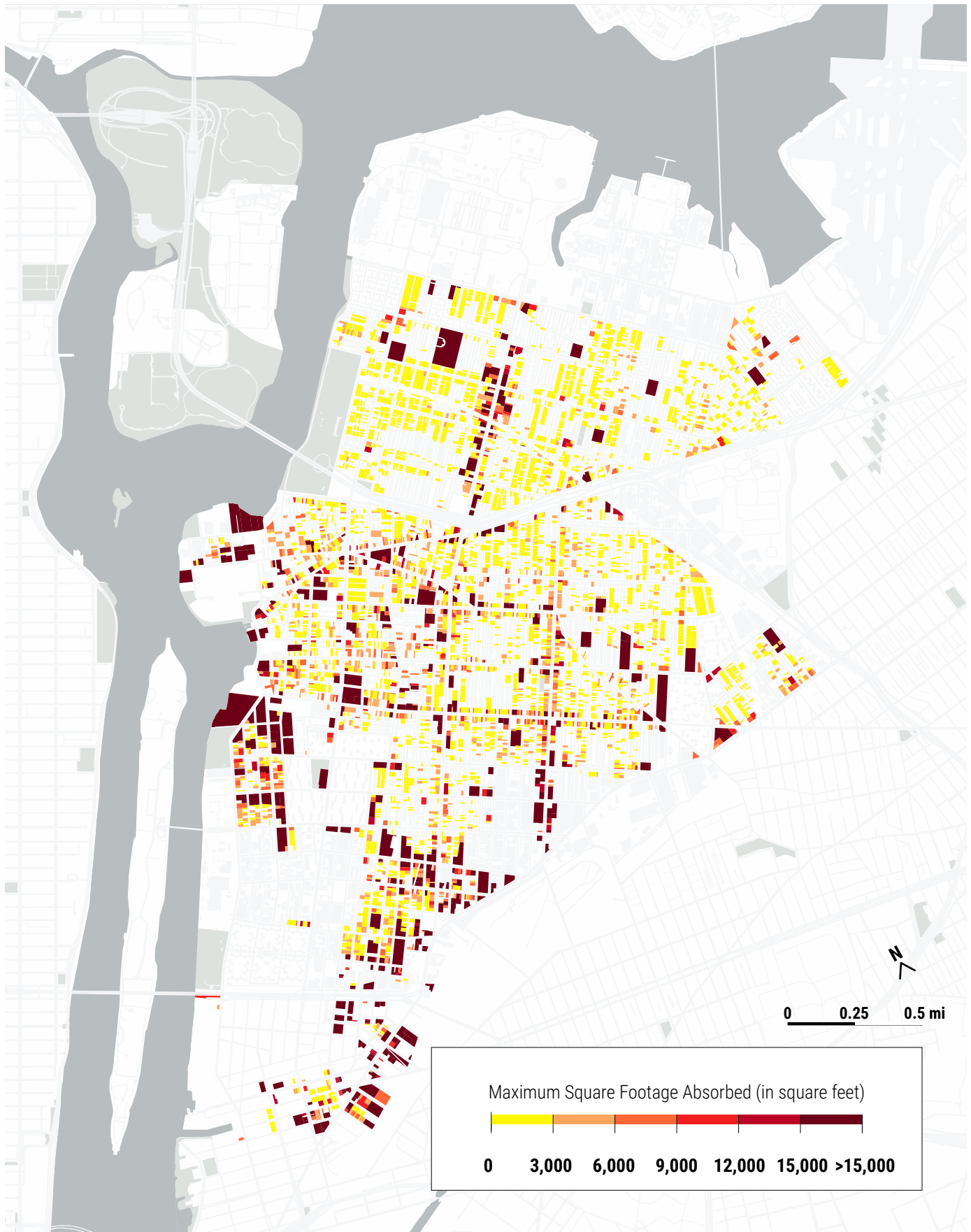












# Scenario 4

## Key Metrics

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**VIABLE PARCELS:** 7,796

**AVERAGE FAR AVAILABLE:** 64.4%

**ACTIVATED AIR RIGHTS:** 1,820,000 AVAILABLE | 45,364,924 CAPACITY

**POTENTIAL REVENUE:** \$136,500,000

**AVERAGE % INCREASE IN FAR:** 52.8%

**RECEIVING SITES NEEDED TO**

**UTILIZE FULL RIGHTS:** 4.0%

**LOCKED AIR RIGHTS:** NONE - FULL USAGE

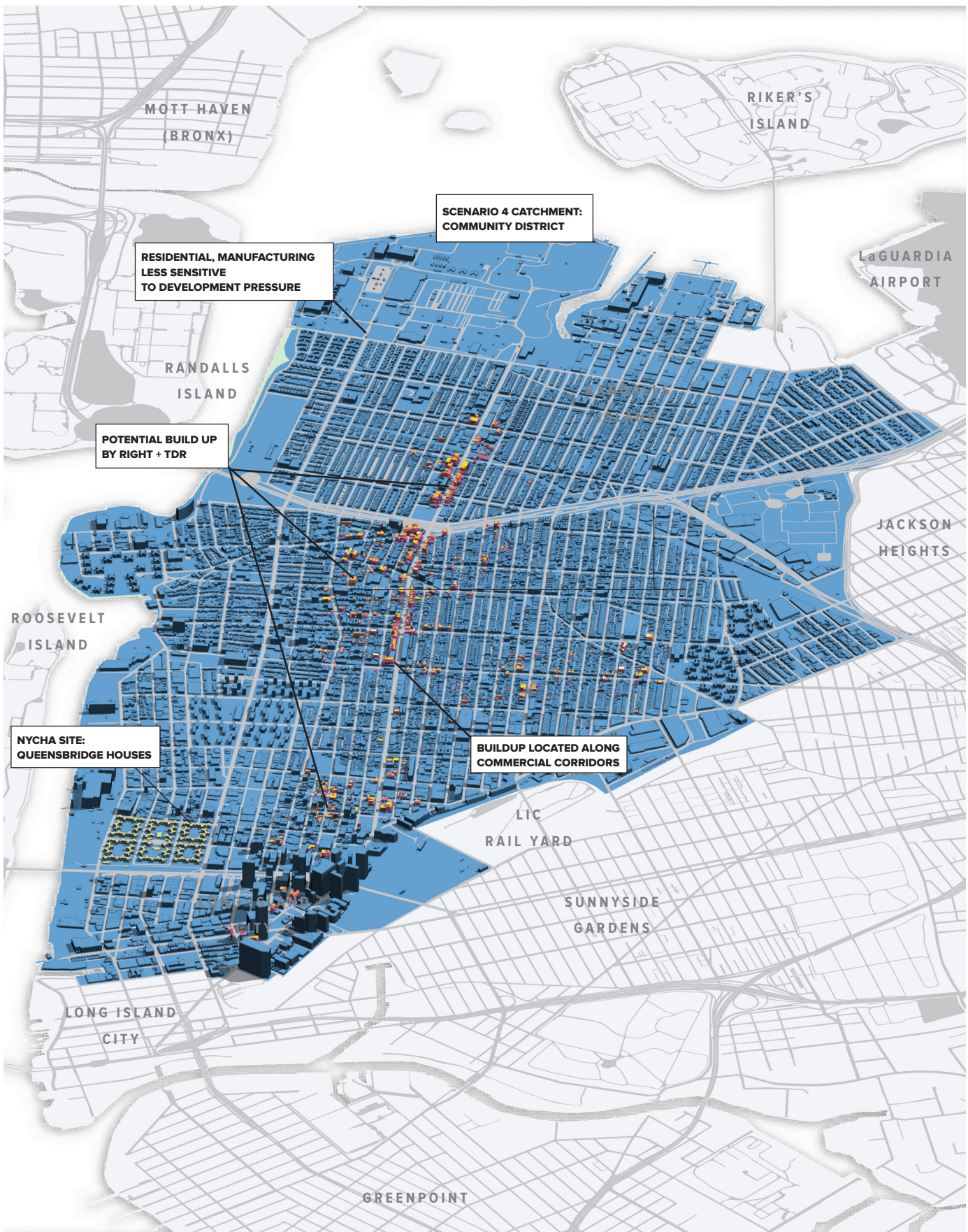
**LOCKED REVENUE:** NONE - FULL USAGE

## Summary Table - Queensbridge

---

	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Viable Parcels	0	13	844	7,796
Average FAR	N/A	81%	81%	64.4%
Activated Air Rights (%)	N/A	2.9%	>100%	>100%
Potential Revenue	N/A	\$4M	\$136.5M	\$136.5M
Locked Air Rights	100%	97.1%	N/A	N/A
Sites Needed to Utilize Full	N/A	N/A	13.2%	4.0%





# Air Rights Case Study: Nathan Straus Houses

## Introduction

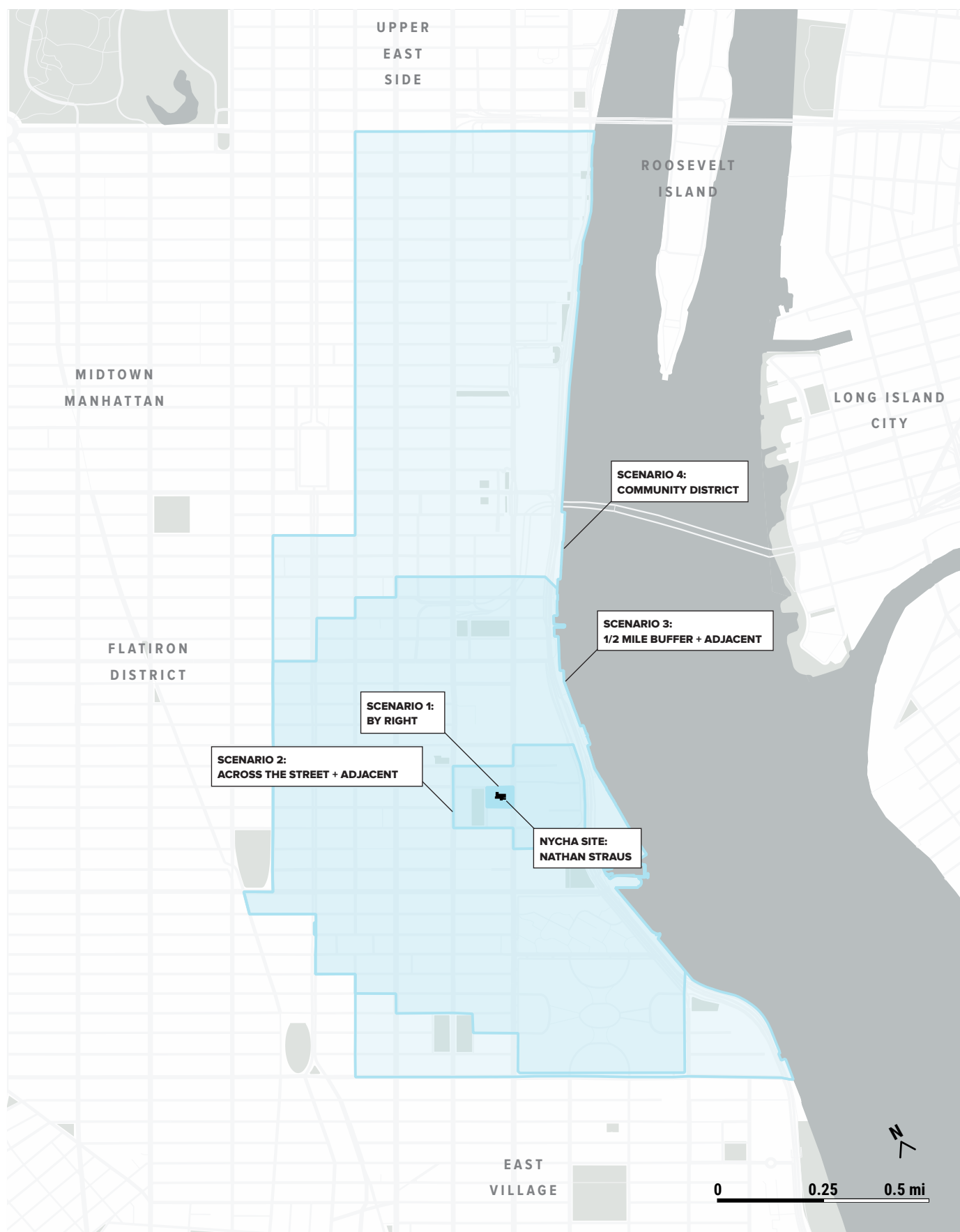
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Located in Manhattan community district six, the Nathan Straus Houses in Kip's Bay represents a more integrated NYCHA development with its surroundings. However, the physical design of the tower has significant open space surrounding a tower. The building is also isolated from the complex's other sites, located a few blocks west. The main site of study, bounded by Madison Square to the west, Murray Hill to the north, and Bellevue / Grammercy to the south, it is served primarily by the 6 and RW subway lines. The eastern portion of the neighborhood along FDR Drive sites several major hospitals and healthcare systems. The zoning districts in Kip's Bay and CD6 are primarily mid-rise and high-rise buildings mostly ranging from R7 to R9 and equivalents. Some older buildings rising only 3-4 stories remain, such as the United Nations International School.

NYCHA's 344 E 28th Street site studied here was constructed in 1970, five years after the other nearby Nathan Straus Houses (1965). The site lies between the Bellevue South Park to the west and the Bellevue / Hunter Hospital Complex to the east. It houses 225 apartments in the 26 floor building, all of which are scheduled to transition to section 8 (Rental Assistance Demonstration under NYCHA 2.0 Pact to Preserve program). As of April 26, 2019, documents indicate that 74 units have been transitioned, and the rest, along with 21 other NYCHA developments, are set to be transitioned.

The Nathan Straus campus additionally includes two buildings located to the east - 481 2nd Avenue and 228 E 28th Street. The latter is current overbuilt by roughly 14,000 square feet and the former underbuilt by 22,000 square feet. These locations are also not currently slated for the RAD process. While the air rights available from 481 2nd Avenue are not insubstantial, this study will focus on the 344 E 28th Street site.



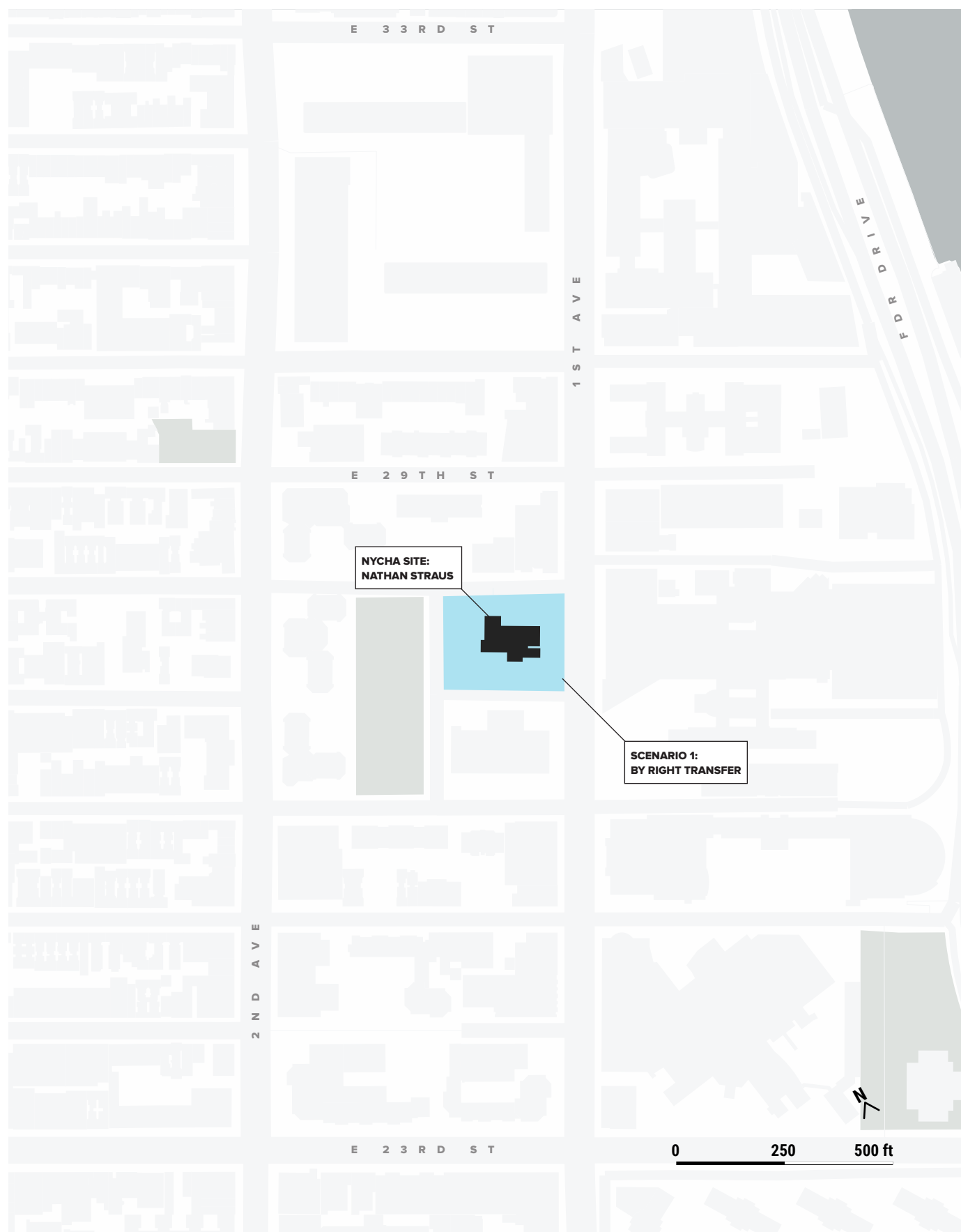


# Scenario 1

## Overview

---

Immediately adjacent to 344 East 28th is Carmel Place, an apartment building with commercial first floor. As with the other cases, this property is unlikely to be redeveloped in the short term, and this scenario demonstrates the limitations of current air rights regulations on NYCHA's ability to fundraise.



# Scenario 1

## Key Metrics

---

**VIABLE PARCELS:** 0

**AVERAGE FAR AVAILABLE:** N/A

**ACTIVATED AIR RIGHTS:** N/A

**POTENTIAL REVENUE:** N/A

**LOCKED AIR RIGHTS:** 70,000

**LOCKED REVENUE:** \$10,500,000

## Air Rights Pricing

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Air rights deals in lower Manhattan tend to be more expensive than elsewhere in the city due to high demand and lower availability. Roughly, available deal information trends at 1.5-2x pricing of the city-wide average. Because of this, the Nathan Straus case study scales accordingly, evaluating air rights at \$150/sq ft.





# Scenario 2

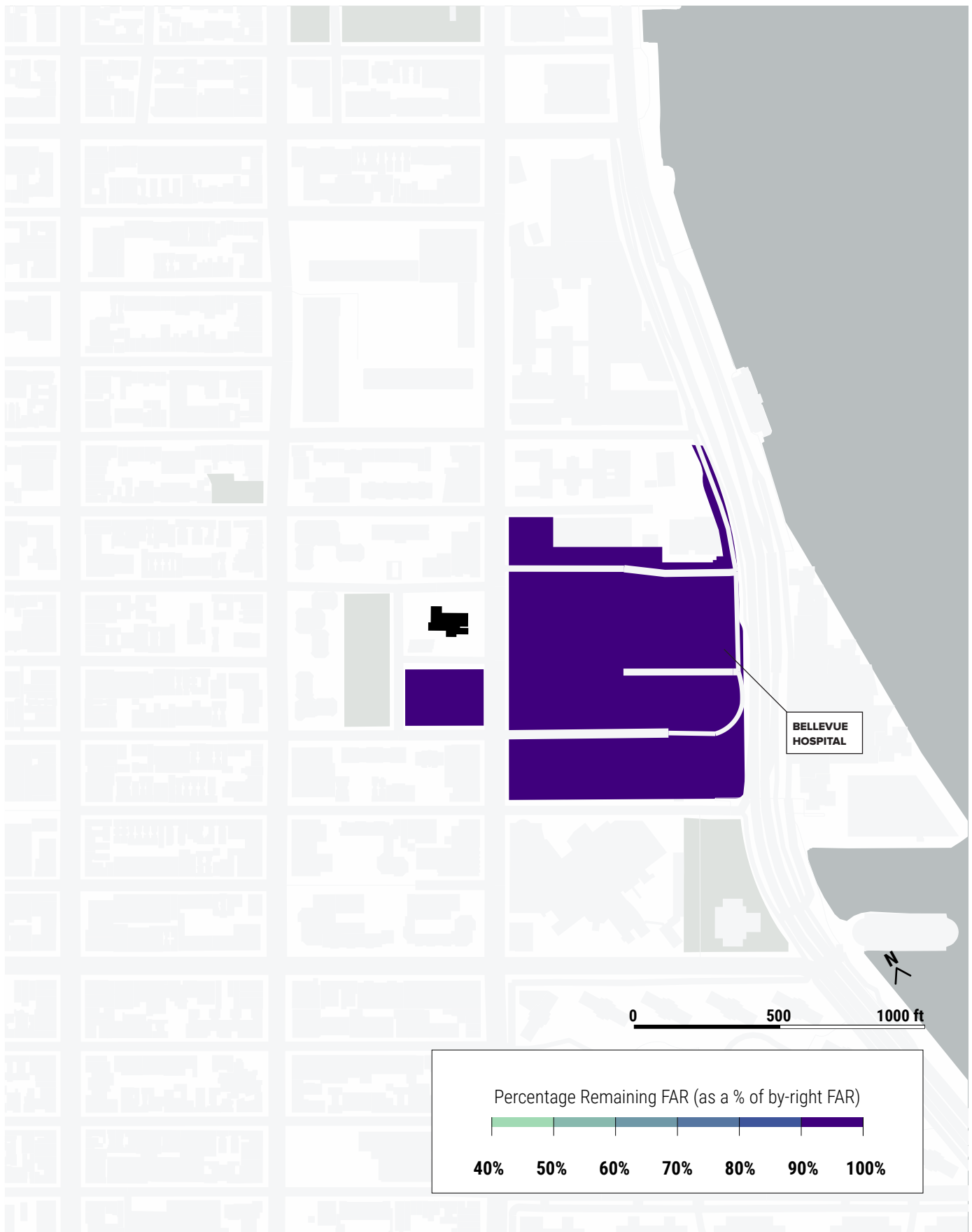
## Overview

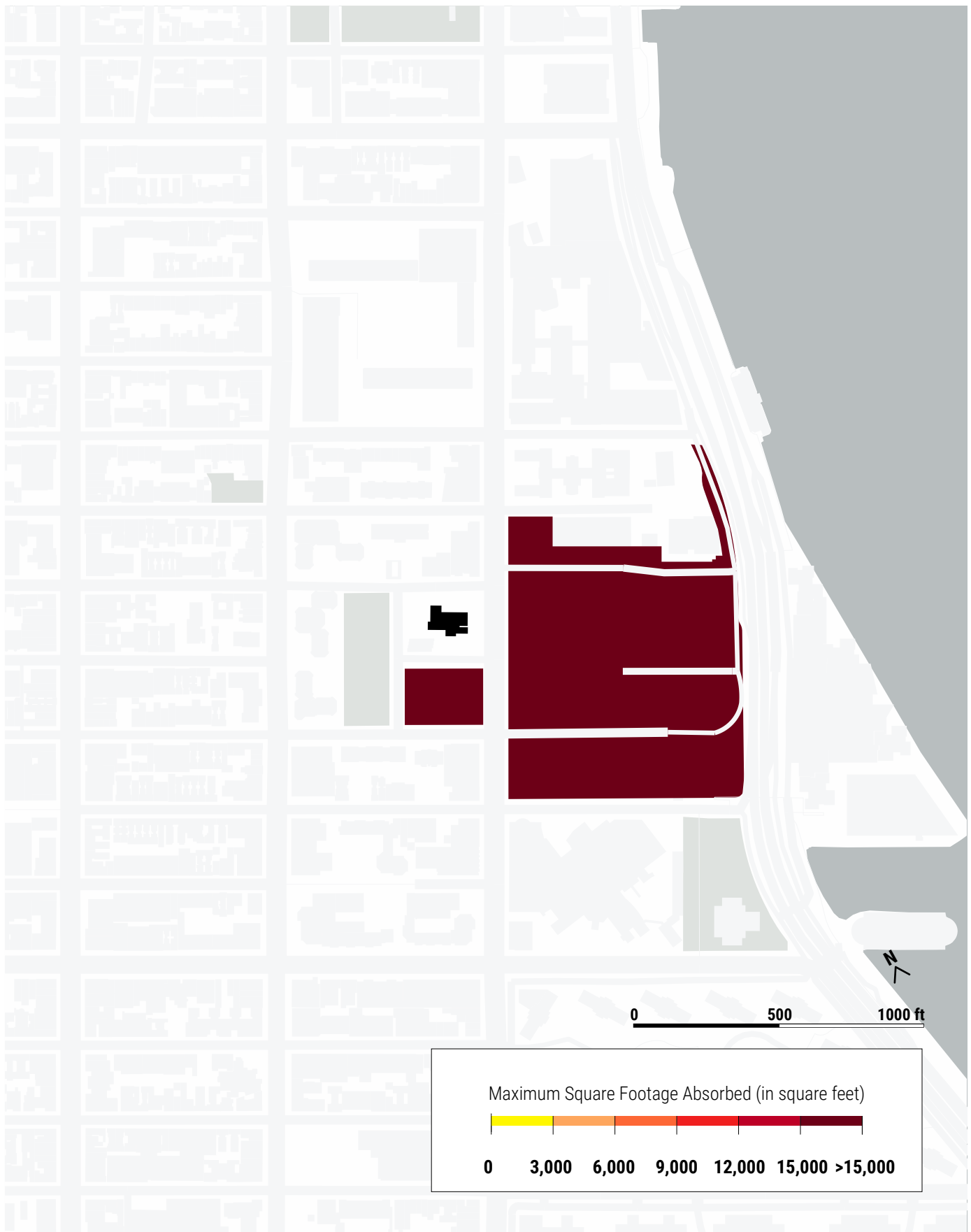
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Scenario 2 incorporates parcels across the street from the NYCHA site and their adjacent parcels. Directly to the east across 1st Avenue, the Bellevue / Hunter Hospital Complex represents huge possibilities for development. Across this and future strategies, the air rights from 344 East 28th Street are likely capable of being utilized by two to three buildings, given their relatively small area (70,000 sq ft) and the relatively large absorption from the parcels in Nathan Straus (averaging 22,000).

Within the catchment of Scenario 2, the only likely viable parcel is connected to the Bellevue / Hunter Hospital Complex that spans multiple blocks. This parcel could potentially absorb an enormous volume of air rights given the large tax lot. For this scenario of the Nathan Straus Houses, this study nominally limits the absorption of the Hospital campus to 70,000 square feet, the capacity of the NYCHA site.







# Scenario 2

## Key Metrics

---

**VIABLE PARCELS:** 1

**AVERAGE FAR AVAILABLE:** 61%

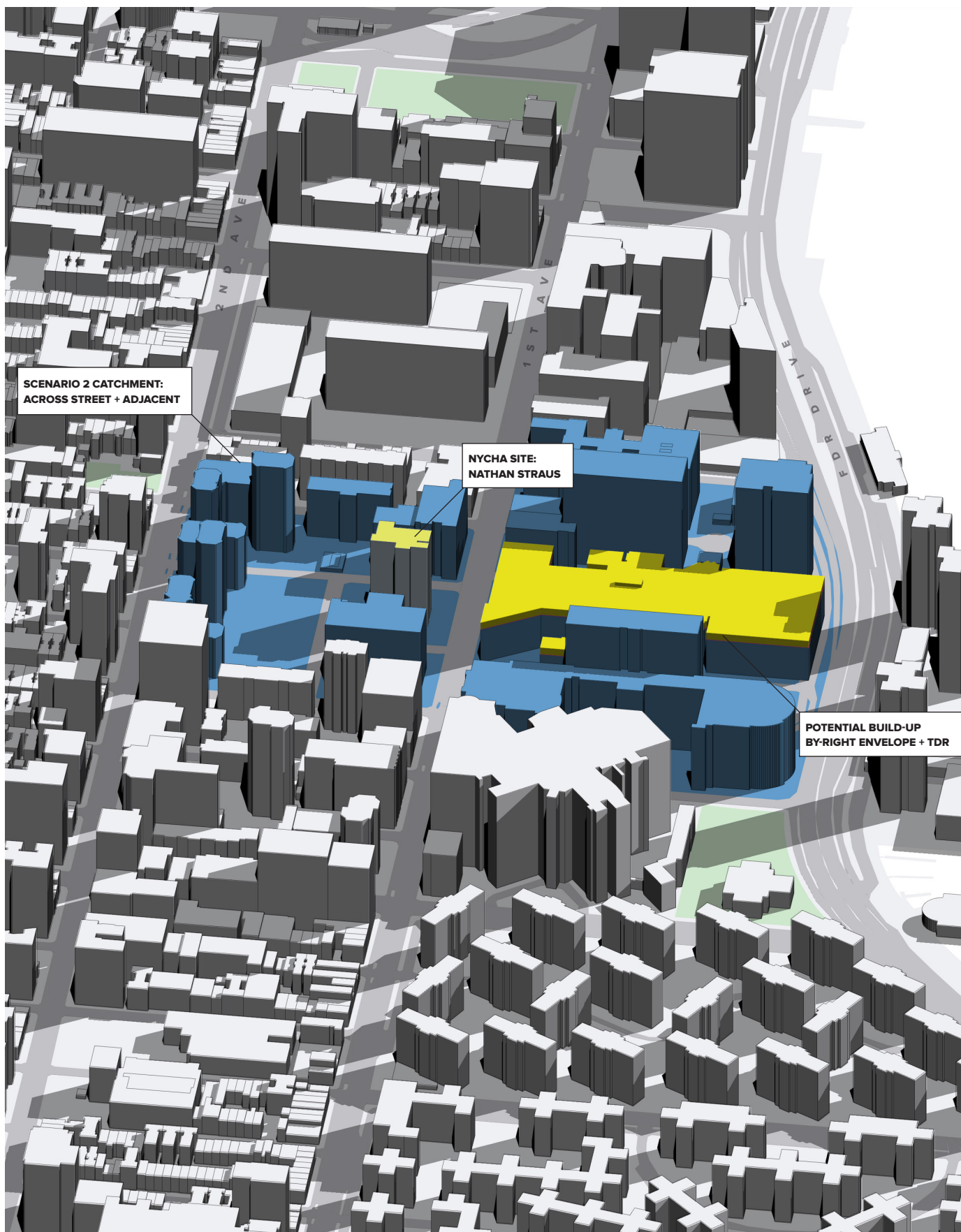
**ACTIVATED AIR RIGHTS:** 70,000

**POTENTIAL REVENUE:** \$10,500,000

**LOCKED AIR RIGHTS:** 0

**LOCKED REVENUE:** 0





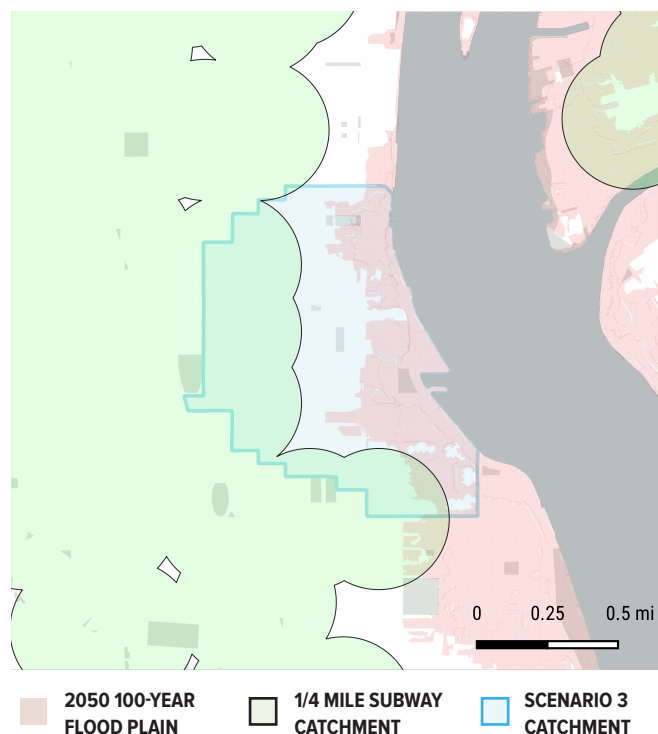
# Scenario 3

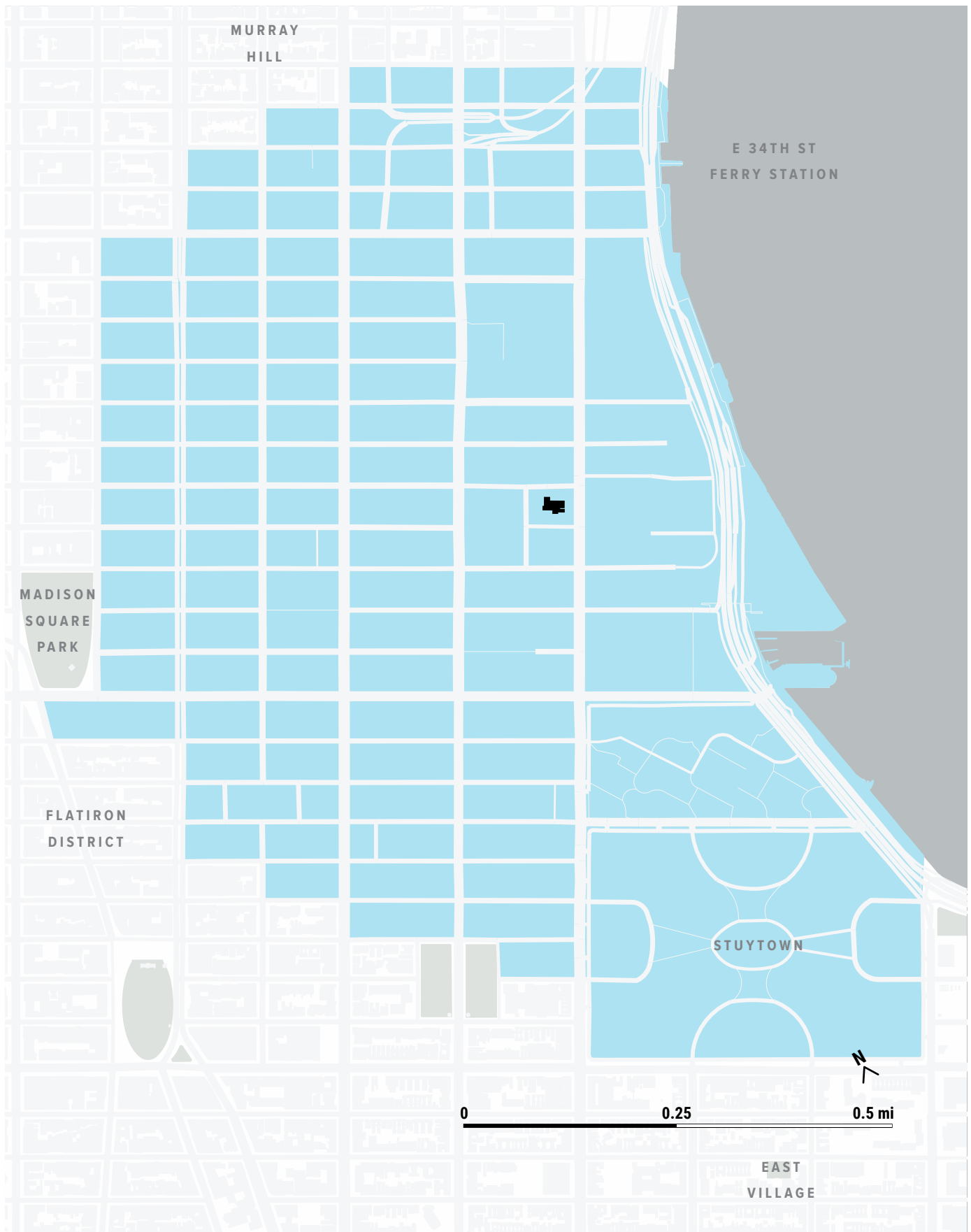
## Overview

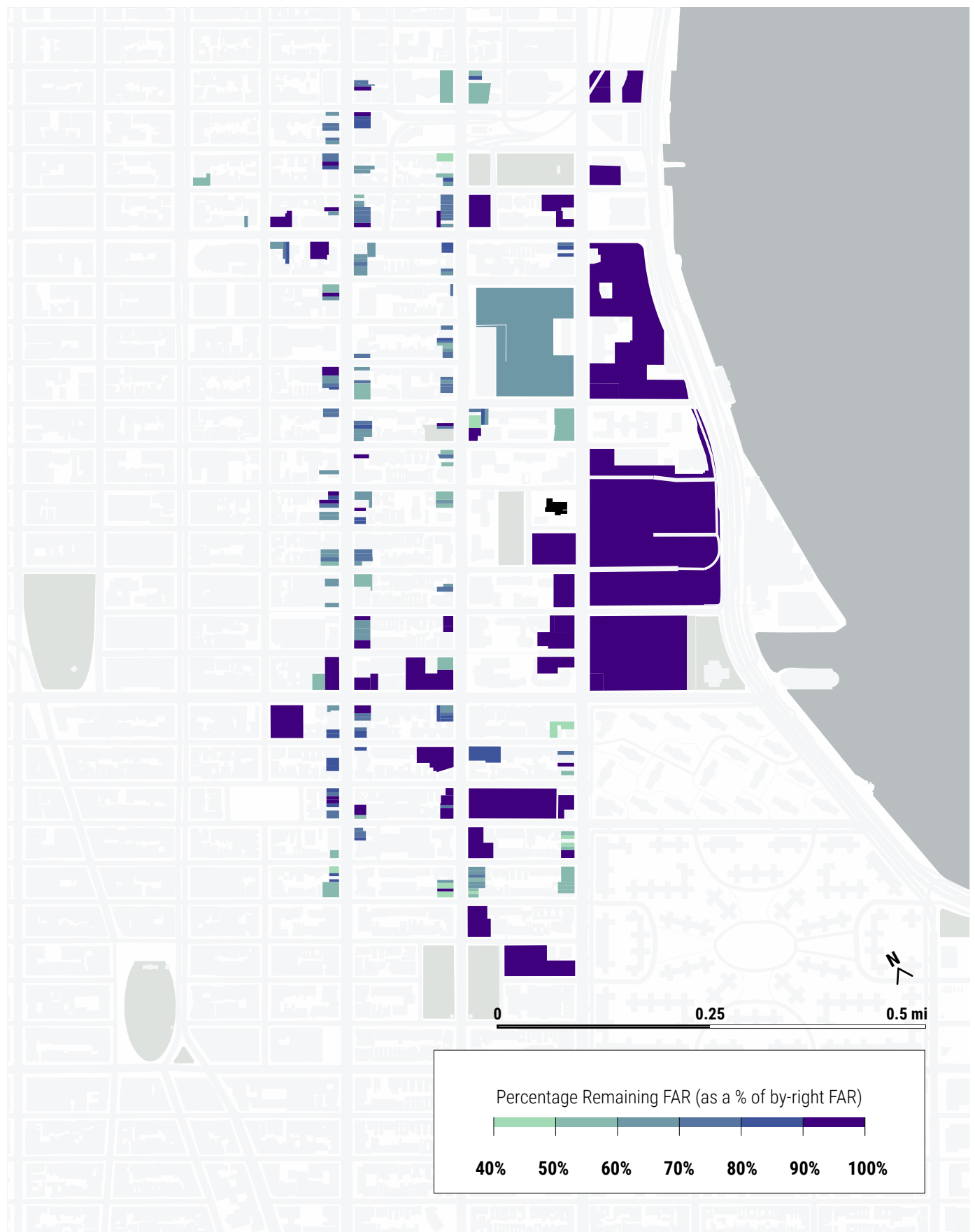
The third scenario, encapsulating a half mile euclidean buffer and adjacent parcels, includes a number of higher-zoned commercial strips, evident in the following maps. This scenario also creates the possibility to send air rights outside of the 2050 100-year flood plain, which exposes much of the eastern-most block of Manhattan to significant flooding.

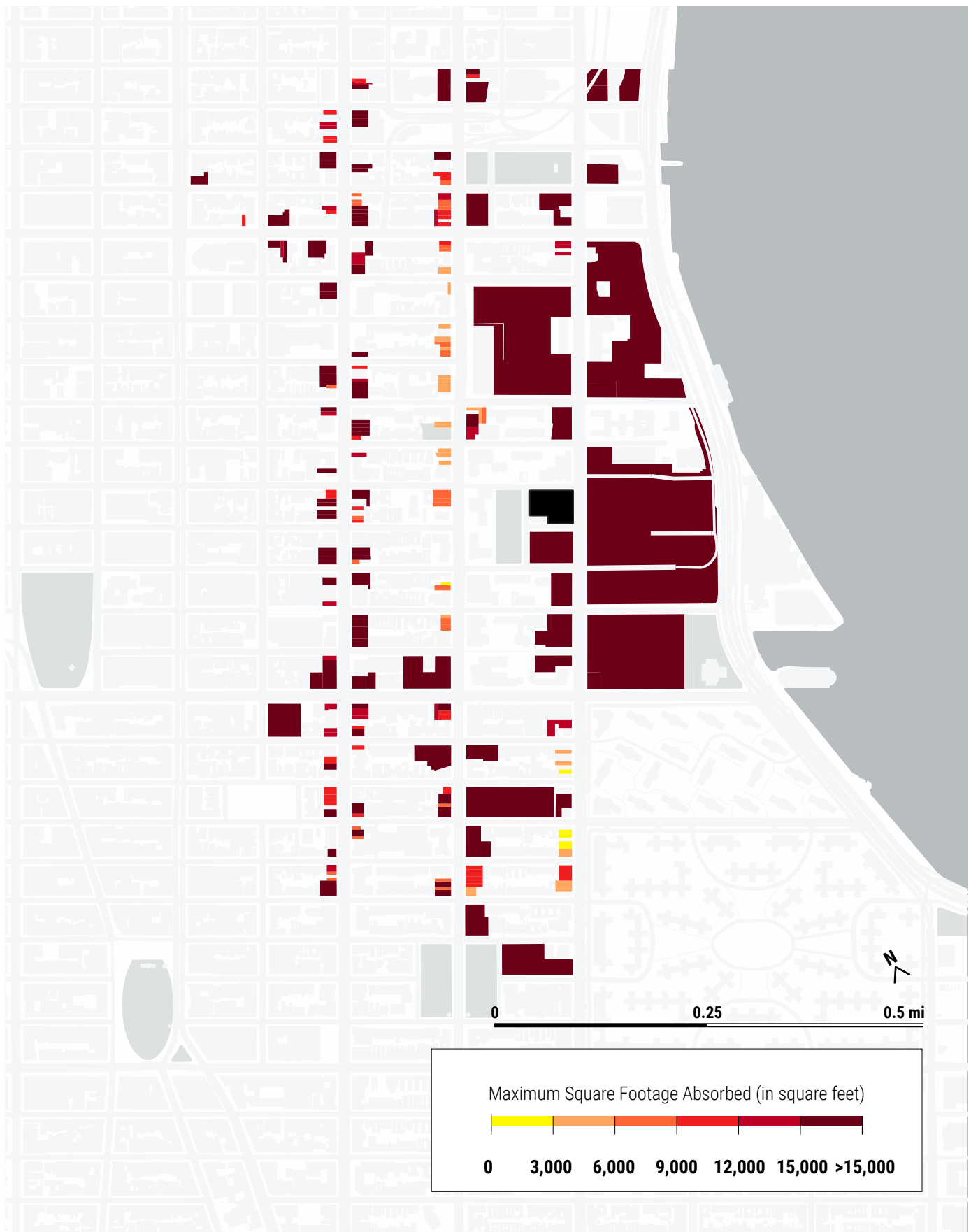
Beginning with this scenario, the 3D visualization will display the entire viable build-up followed by three likely development clusters. The 70,000 square feet from the Nathan Straus Houses will not have as dispersed of an impact as the other case studies, so the overview of viable sites represents an envelop but not a likely impact. Each likely development, separate from the overall buildup visualization, is a more likely representation of the impact on city form. These development scenarios are informed by the secondary selection criteria from the other cases (flood plain exposure and subway catchment).

## Secondary Selection Criteria











# Scenario 3

## Key Metrics

---

**VIABLE PARCELS:** 231

**AVERAGE FAR AVAILABLE:** 76%

**ACTIVATED AIR RIGHTS:** 70,000 || 5,176,941 CAPACITY

**POTENTIAL REVENUE:** \$10,500,000

**RECEIVING SITES NEEDED TO**

**UTILIZE FULL RIGHTS:** 1.35%

**LOCKED AIR RIGHTS:** 0

**LOCKED REVENUE:** 0

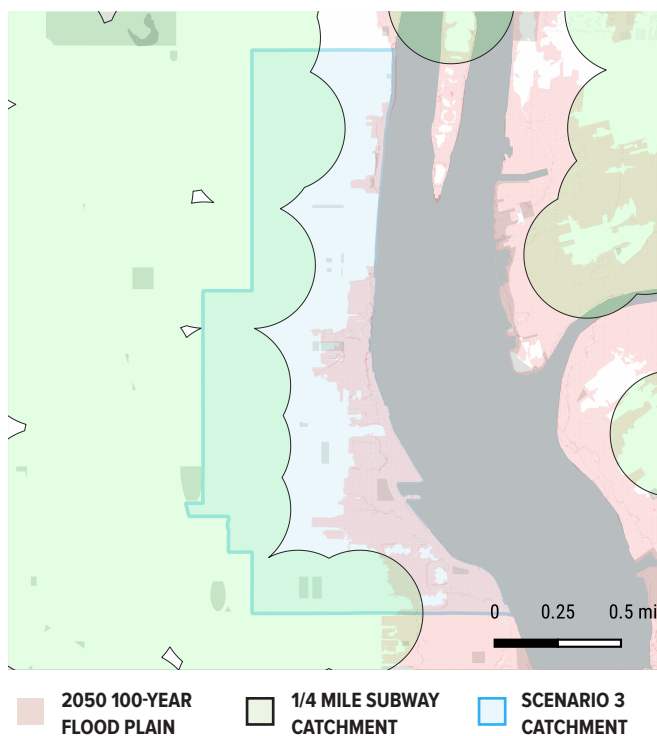


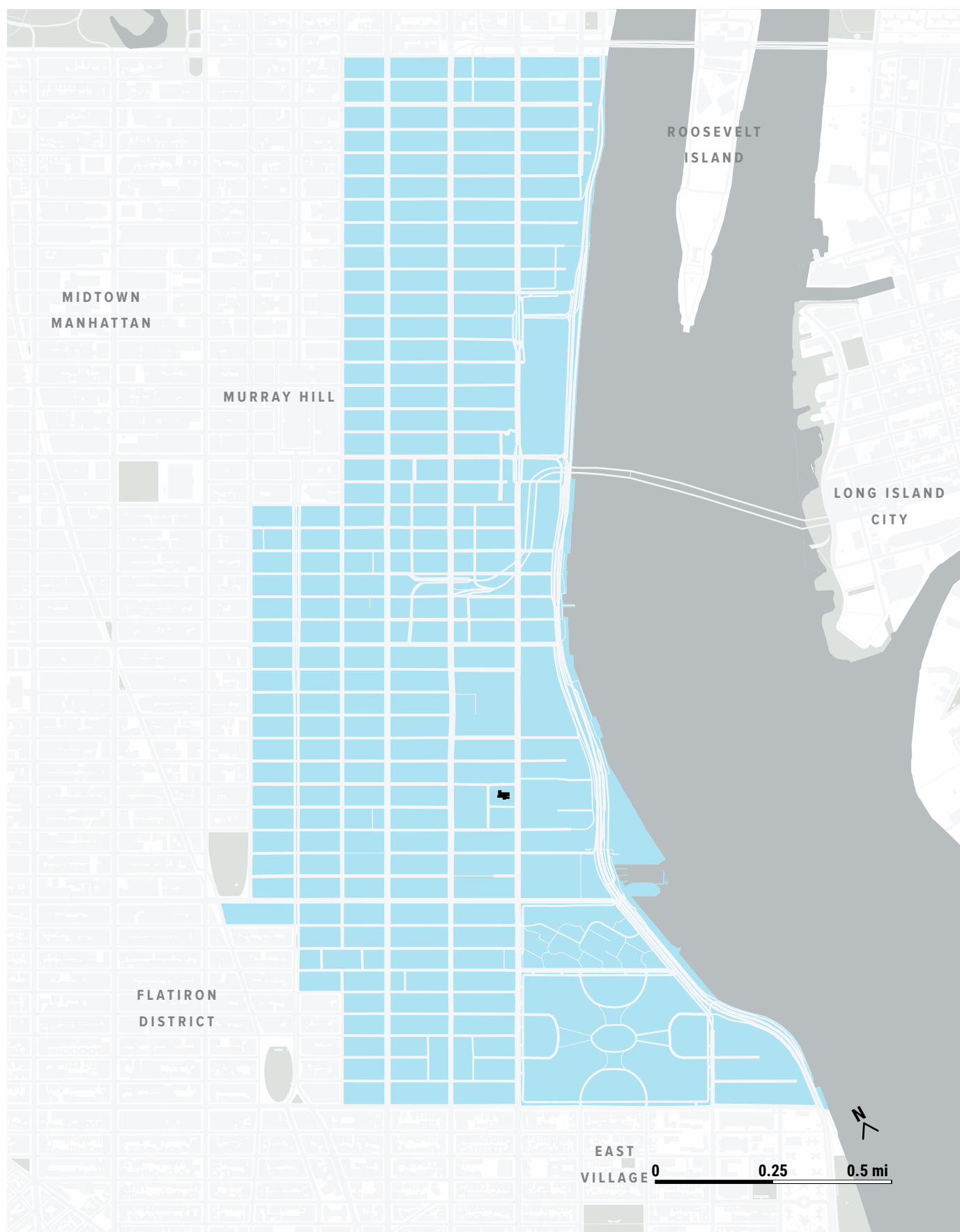
# Scenario 4

## Overview

The final scenario creates an expansive region for air rights to be distributed. From Stuytown to the southern edge of the upper east side, this geographic catchment allows for a desirable and high value selection of potential parcels.

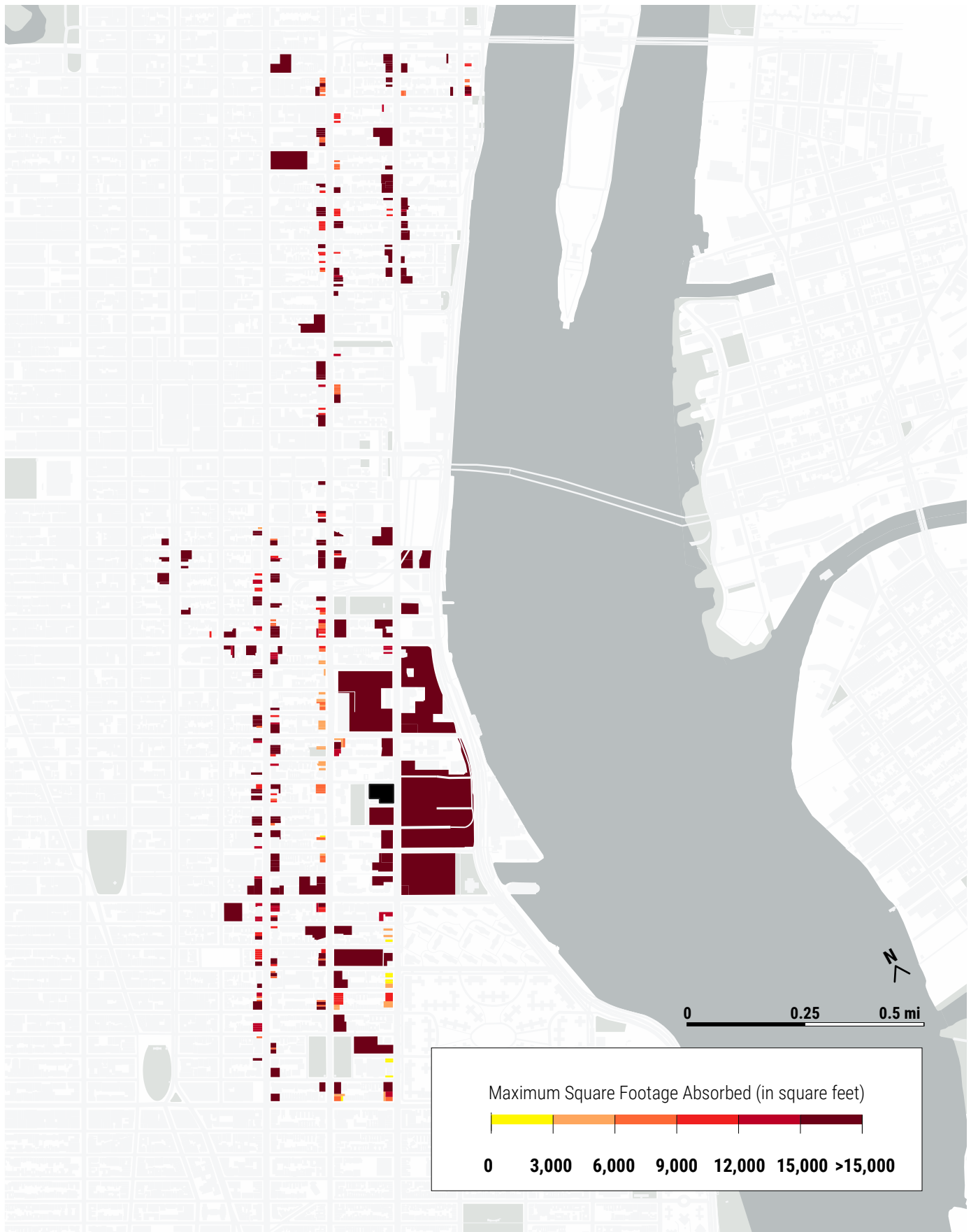
## Secondary Selection Criteria











# Scenario 4

## Key Metrics

---

**VIABLE PARCELS:** 395

**AVERAGE FAR AVAILABLE:** 77.6%

**ACTIVATED AIR RIGHTS:** 70,000 || 8,738,585 CAPACITY

**POTENTIAL REVENUE:** \$10,500,000

**RECEIVING SITES NEEDED TO**

**UTILIZE FULL RIGHTS:** 0.8%

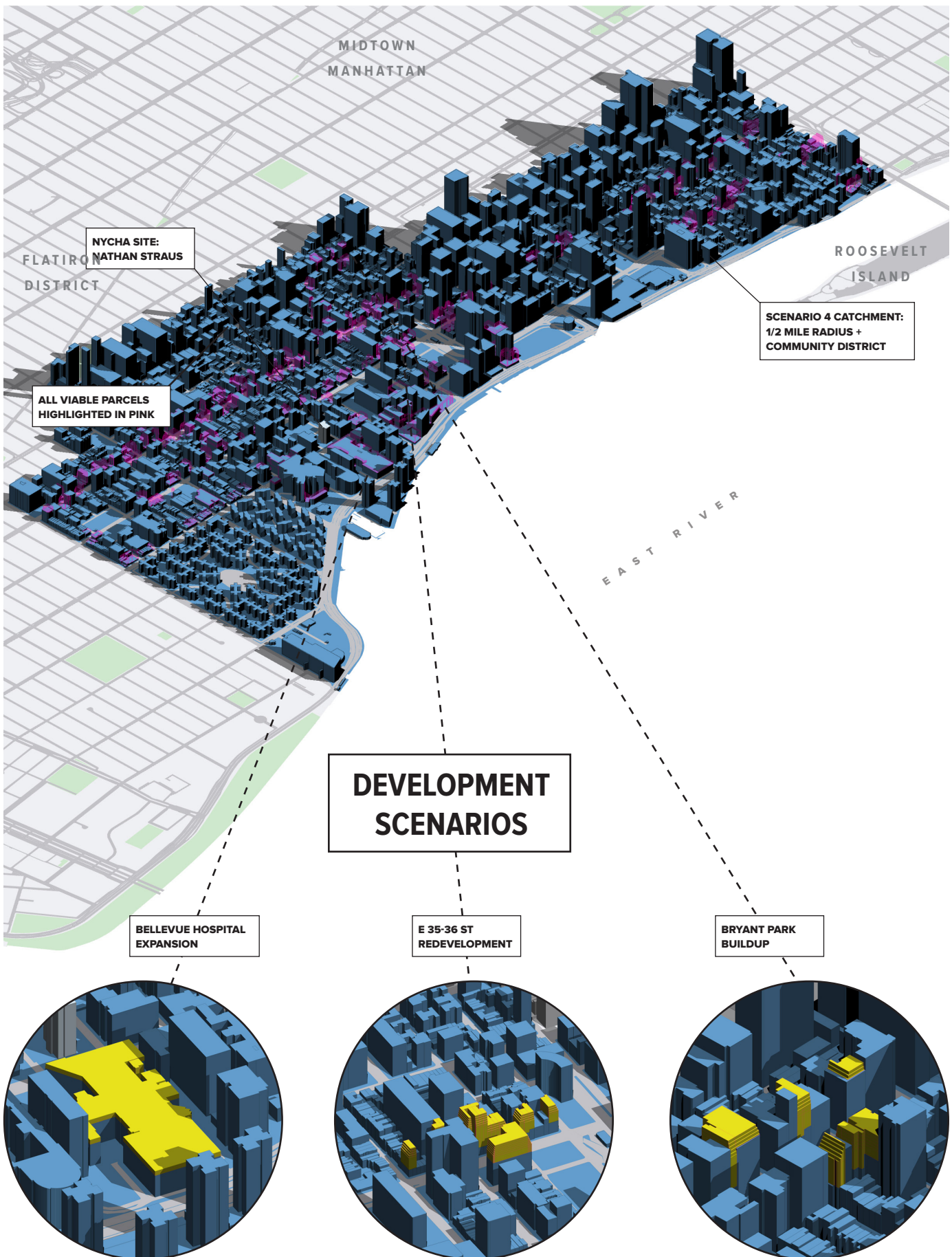
**LOCKED AIR RIGHTS:** 0

**LOCKED REVENUE:** 0

## Summary Table - Nathan Straus

---

	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Viable Parcels	0	1	231	395
Average FAR	N/A	61%	76%	77.60%
Activated Air Rights (%)	0	100%	>100%	>100%
Potential Revenue	0	\$10.5M	\$10.5M	\$10.5M
Locked Air Rights	100%	N/A	N/A	N/A
Sites Needed to Utilize Full	N/A	100%	1.35%	0.80%



# Air Rights Case Study: Douglass Houses

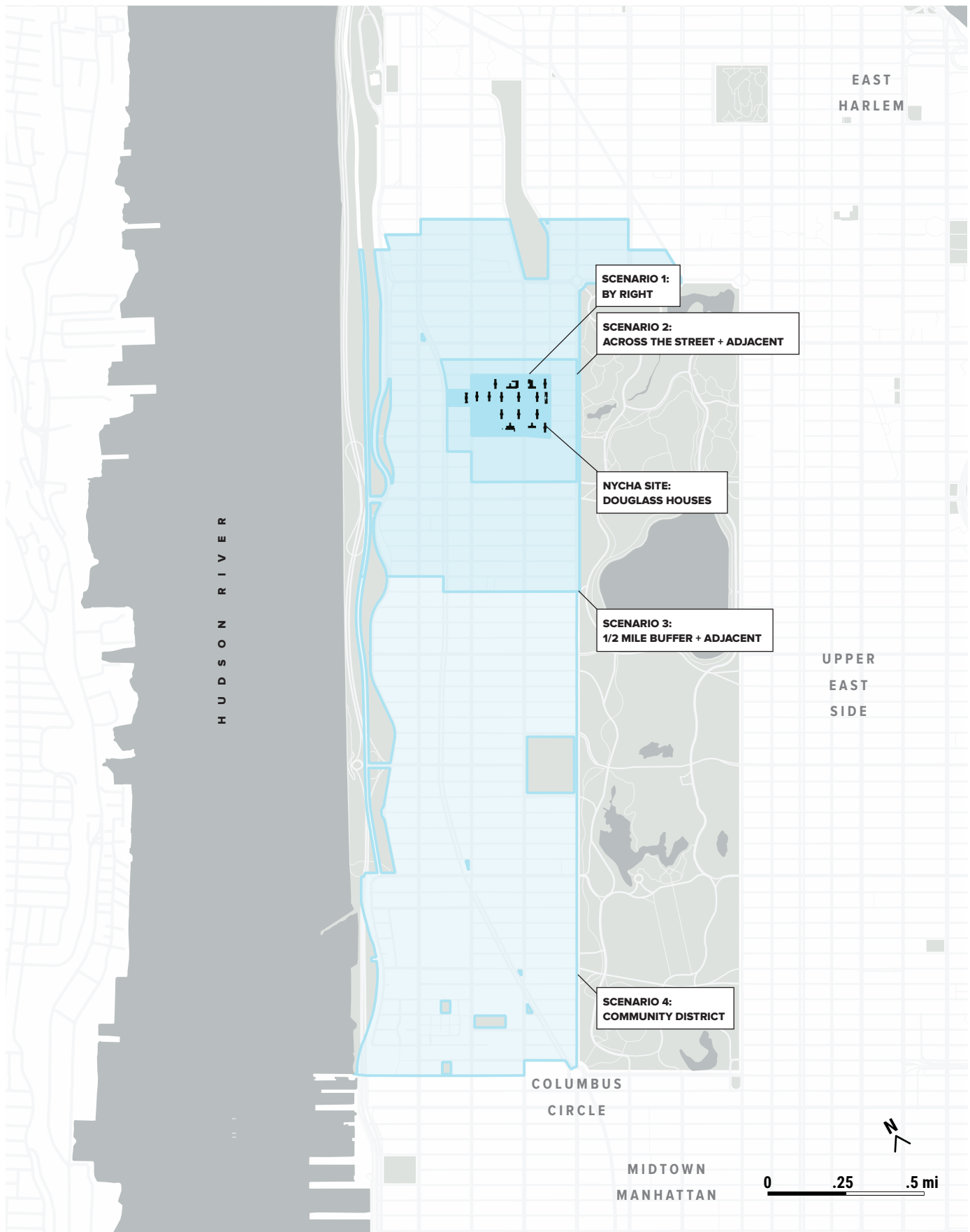
## Introduction

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The Frederick Douglass Houses in the Upper West Side represent a typical NYCHA development. Completed in 1958, the campus is bounded between W 100th and W 104th Streets in-between Manhattan and Amsterdam Ave. The campus houses 2,056 apartments and an estimated 4500 residents call the Douglass Houses home.

The context of the Upper West Side is primarily R7-R10 zoning districts with commercial overlays along Broadway, Amsterdam Ave, and other major commercial corridors. Close access to Central Park to the east and Riverside Park to the west makes the location a desirable place to live. Transit via 1/2/3 and A/B/C lines in addition to the West Side Highway makes this area readily accessible in the context of the two other site studies.

The Douglass Houses are important to NYCHA's presence in the city, sitting in a growing and developing area that is relatively safe from flood risk. Excellent resources and access in the area make the Douglass Houses a critical site for renovation to benefit NYCHA residents and the surrounding community.



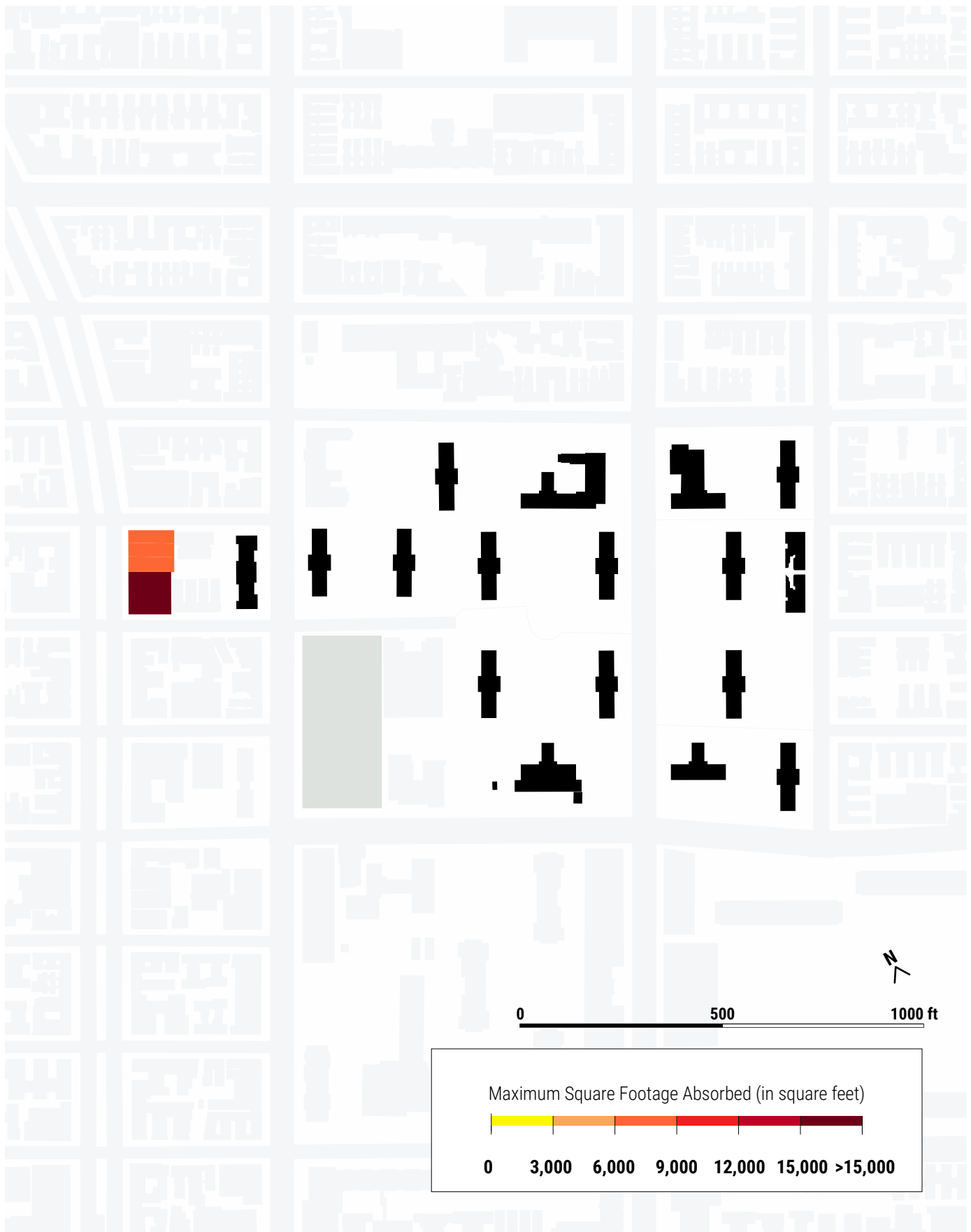


# Scenario 1

Scenario 1 includes by-right parcels adjacent to the Douglass Houses. The nearby playground represents an important quality of life element for family in Douglass and the community, and directly to the north east of the main campus is a significant commercial development. Looking east to the parcels adjacent across Amsterdam Avenue, several potential sites for development activate a small amount of the available air rights.







# Scenario 1

## Key Metrics

---

**VIABLE PARCELS:** 4

**AVERAGE FAR AVAILABLE:** 90%

**ACTIVATED AIR RIGHTS:** 42,056

**POTENTIAL REVENUE:** \$4,205,600

**LOCKED AIR RIGHTS:** 1,957,944

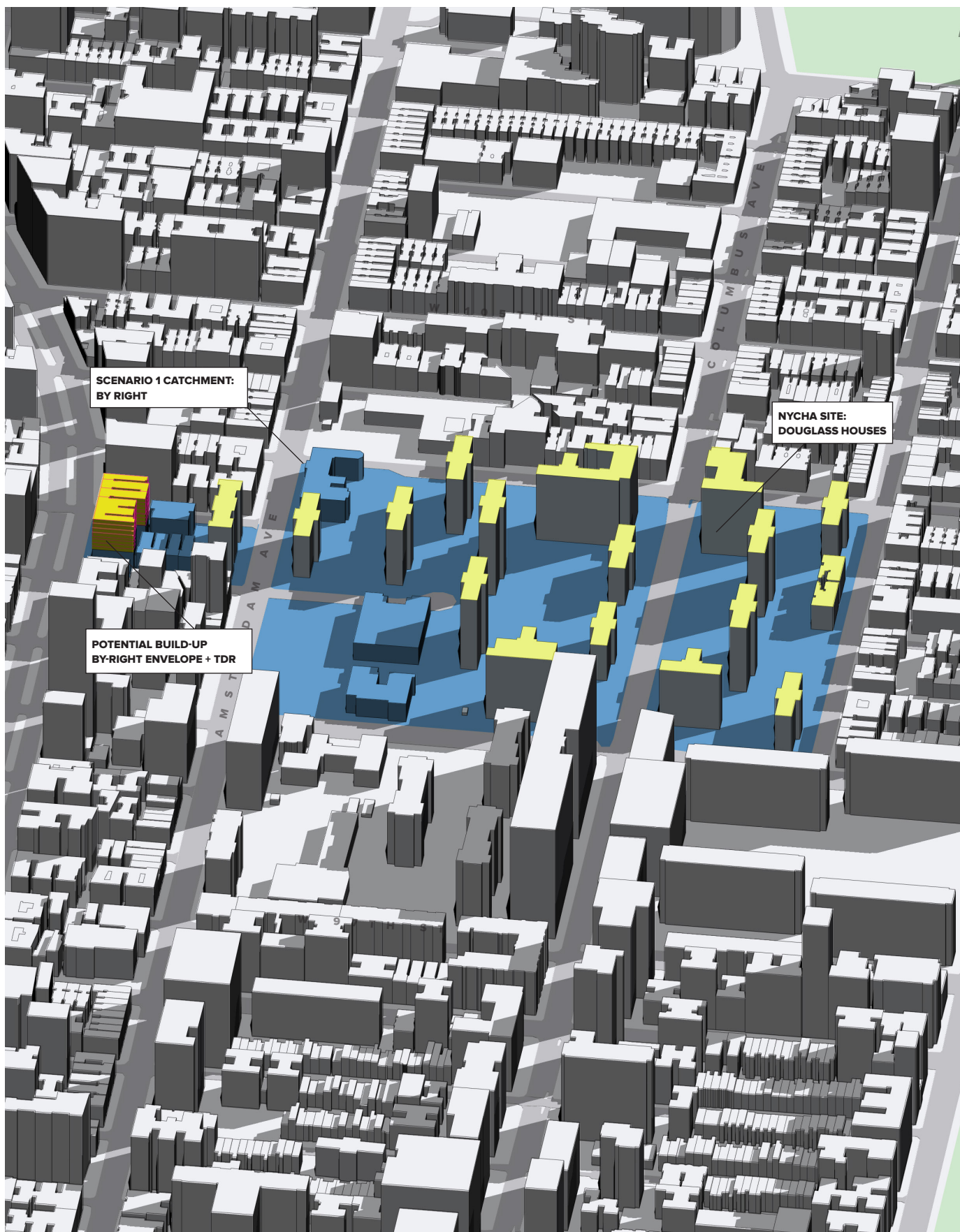
**LOCKED REVENUE:** \$195,794,400

## Air Rights Pricing

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Air rights pricing for Midtown and the upper neighborhoods of Manhattan can be highly variable, but generally trends at around 20% higher than the city average. Given this, the Douglass Houses case study will assume a \$100/sq ft market rate achievable for the rights transfer.



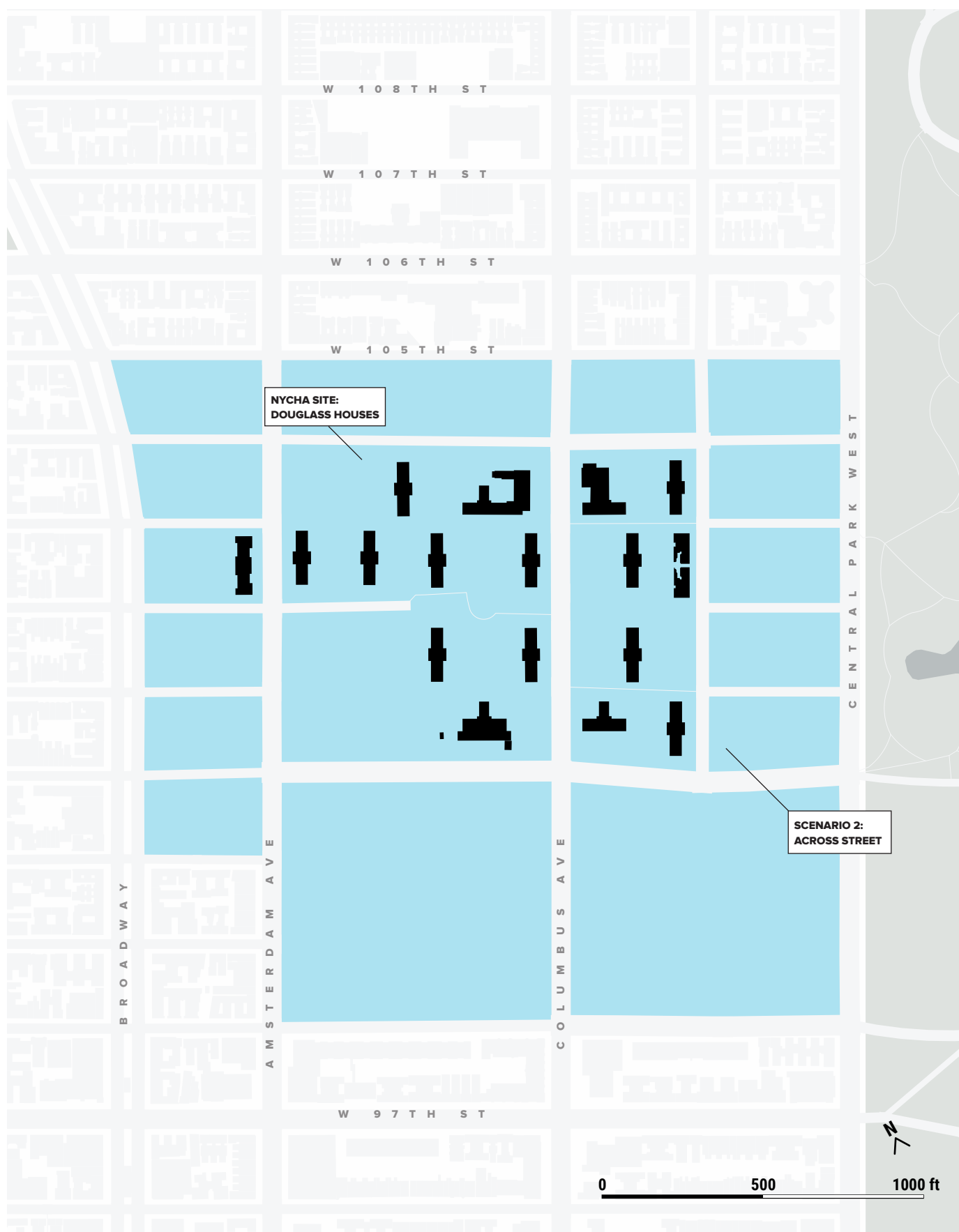


# Scenario 2

## Overview

---

Scenario 2 expands the geographic catchment to include a variety of sites, including commercial / mixed use developments to the sound and more residential buildings in the surrounding blocks. This strategy activates more of the air rights, but a large number remain locked.







# Scenario 2

## Key Metrics

---

**VIABLE PARCELS:** 21

**AVERAGE FAR AVAILABLE:** 66%

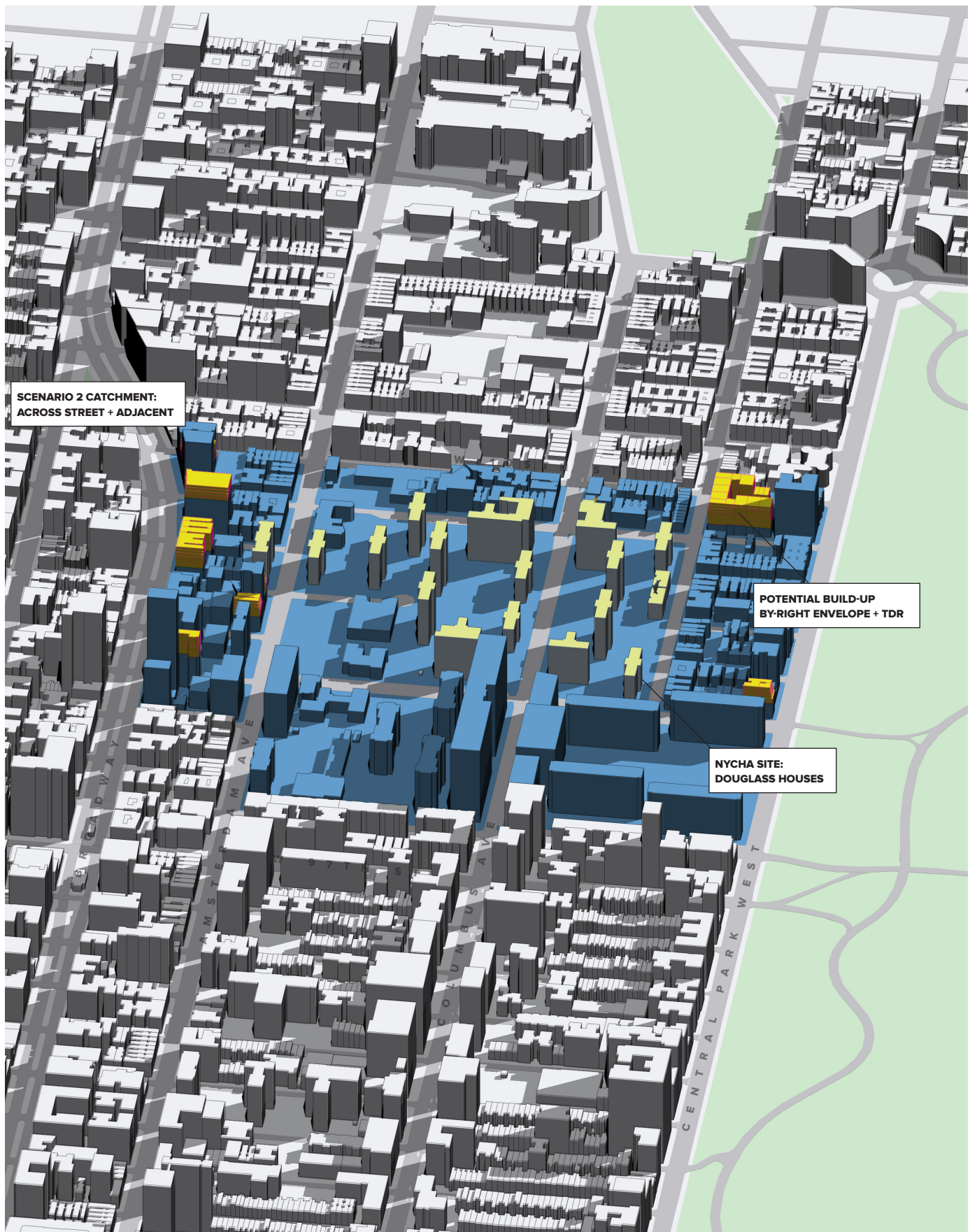
**ACTIVATED AIR RIGHTS:** 181,104 SQ FT

**POTENTIAL REVENUE:** \$18,110,400

**LOCKED AIR RIGHTS:** 1,818,896

**LOCKED REVENUE:** \$181,889,600



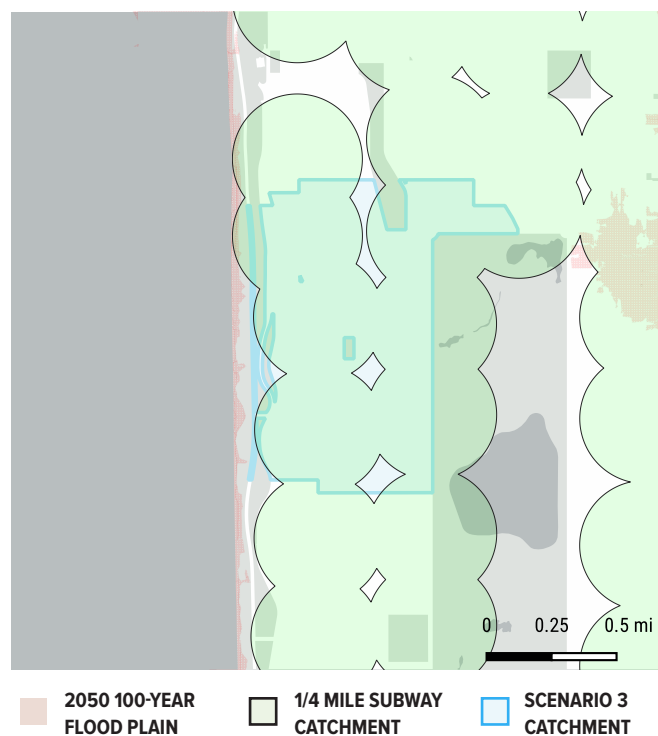


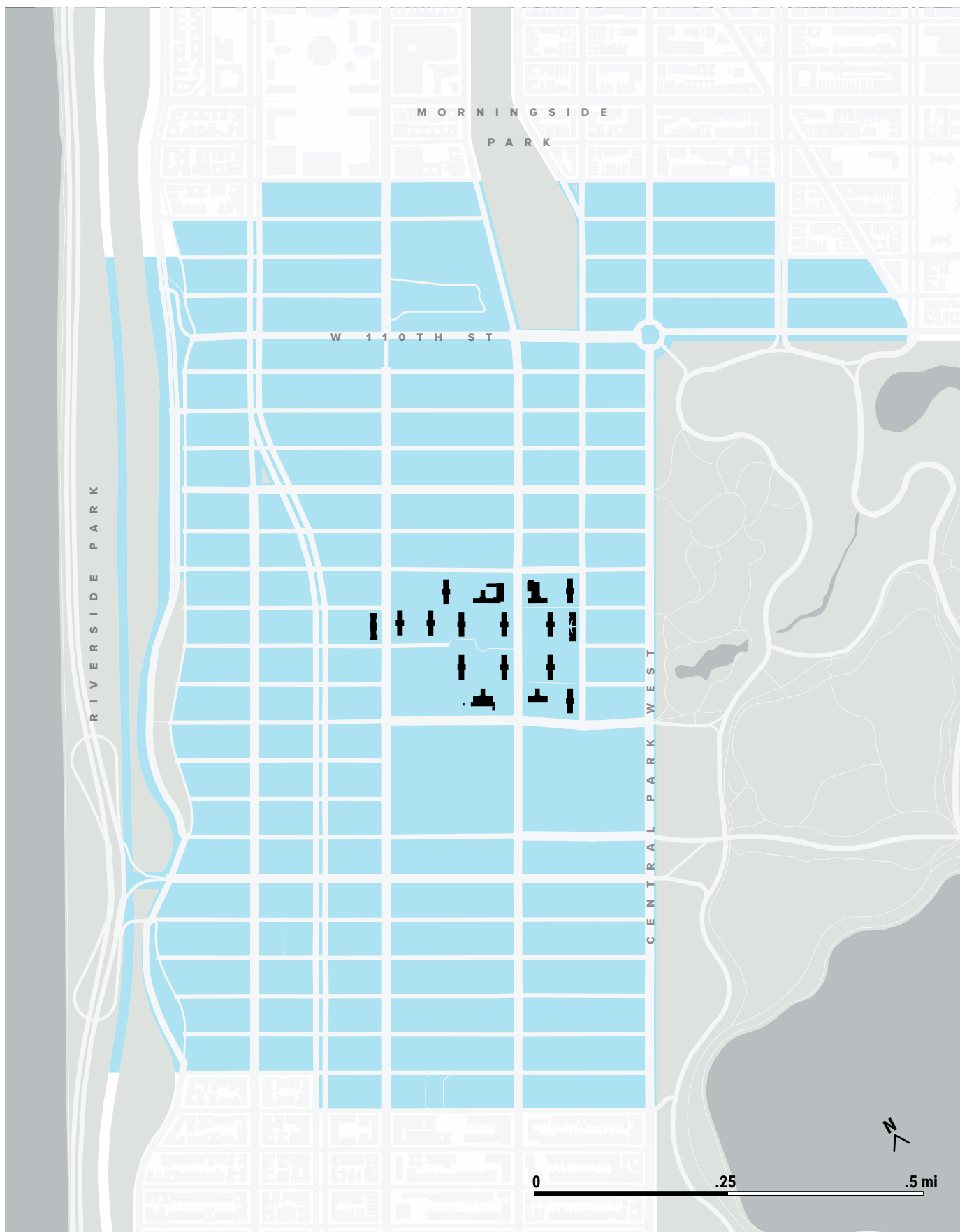
# Scenario 3

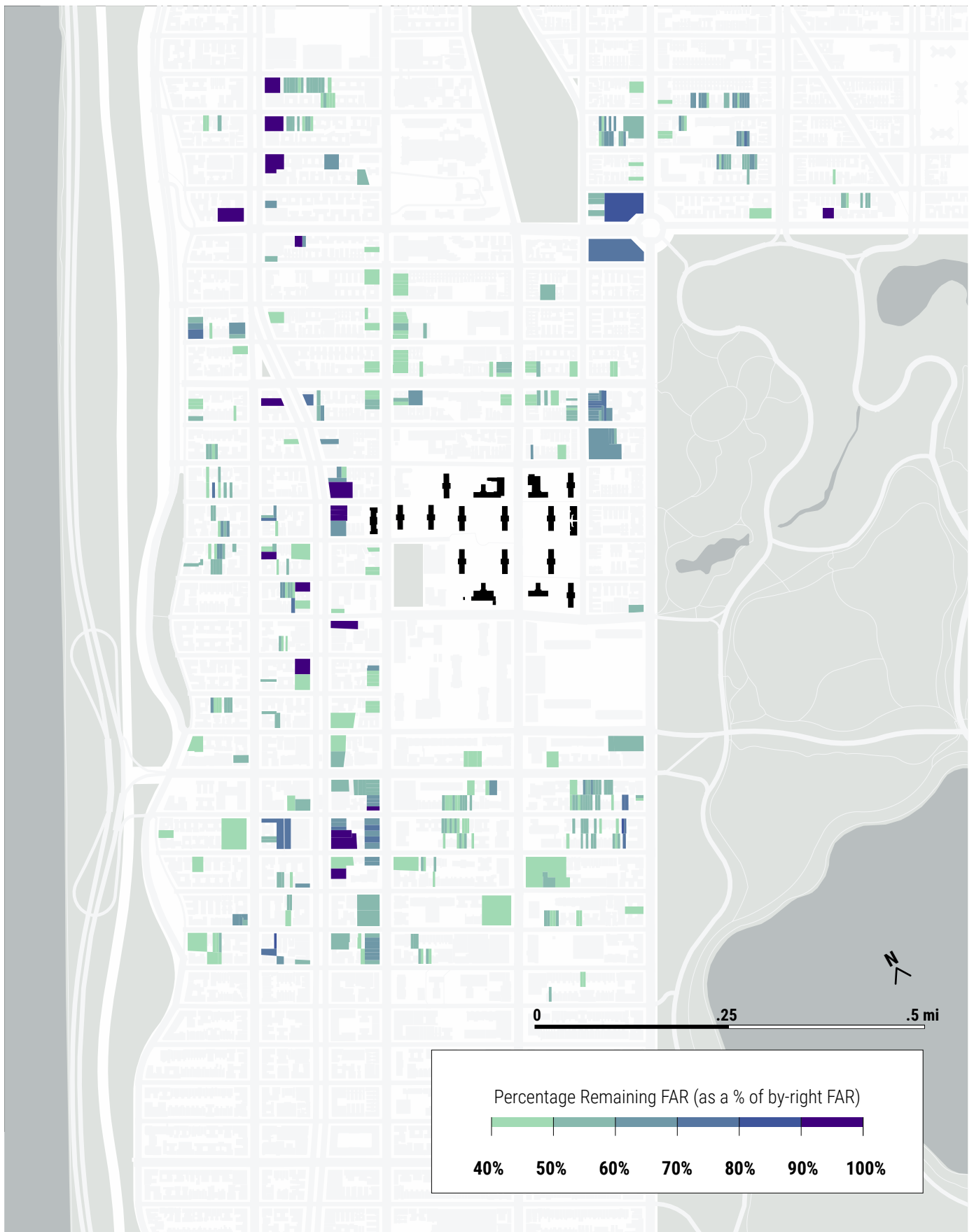
## Overview

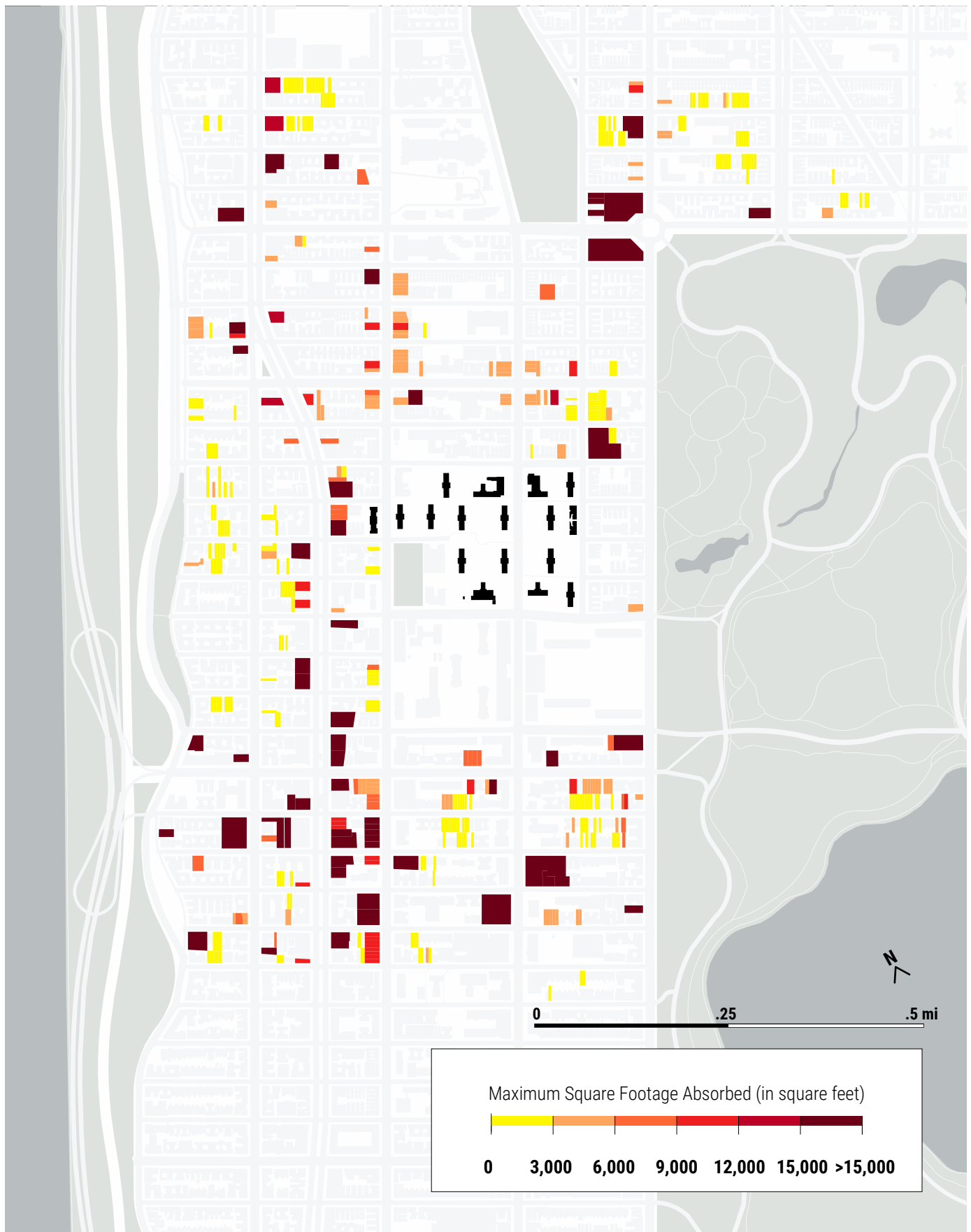
Beginning with Scenario 3, all of the Douglass Houses unused development rights could in theory be distributed (activated). Taken in this context, it becomes apparent as well that the NYCHA site, zoned R7-2, is surrounded by a large number of R8 and higher districts. The metrics for this scenario and Scenario 4 will consider how an upzoned NYCHA site could generate more revenue to renovate units.

## Secondary Selection Criteria









# Scenario 3

## Key Metrics

---

**VIALE PARCELS:** 489

**AVERAGE FAR AVAILABLE:** 56%

**ACTIVATED AIR RIGHTS:** 4,589,265  
2,000,000 CAP

**POTENTIAL REVENUE:** \$200,000,000

**RECEIVING SITES NEEDED TO  
UTILIZE FULL RIGHTS:** 43.6%

## Upzoning Scenario

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**UPZONING:** FROM R7 TO R8

**TOTAL FAR:** 6.02 || 5,978,546 SQ FT

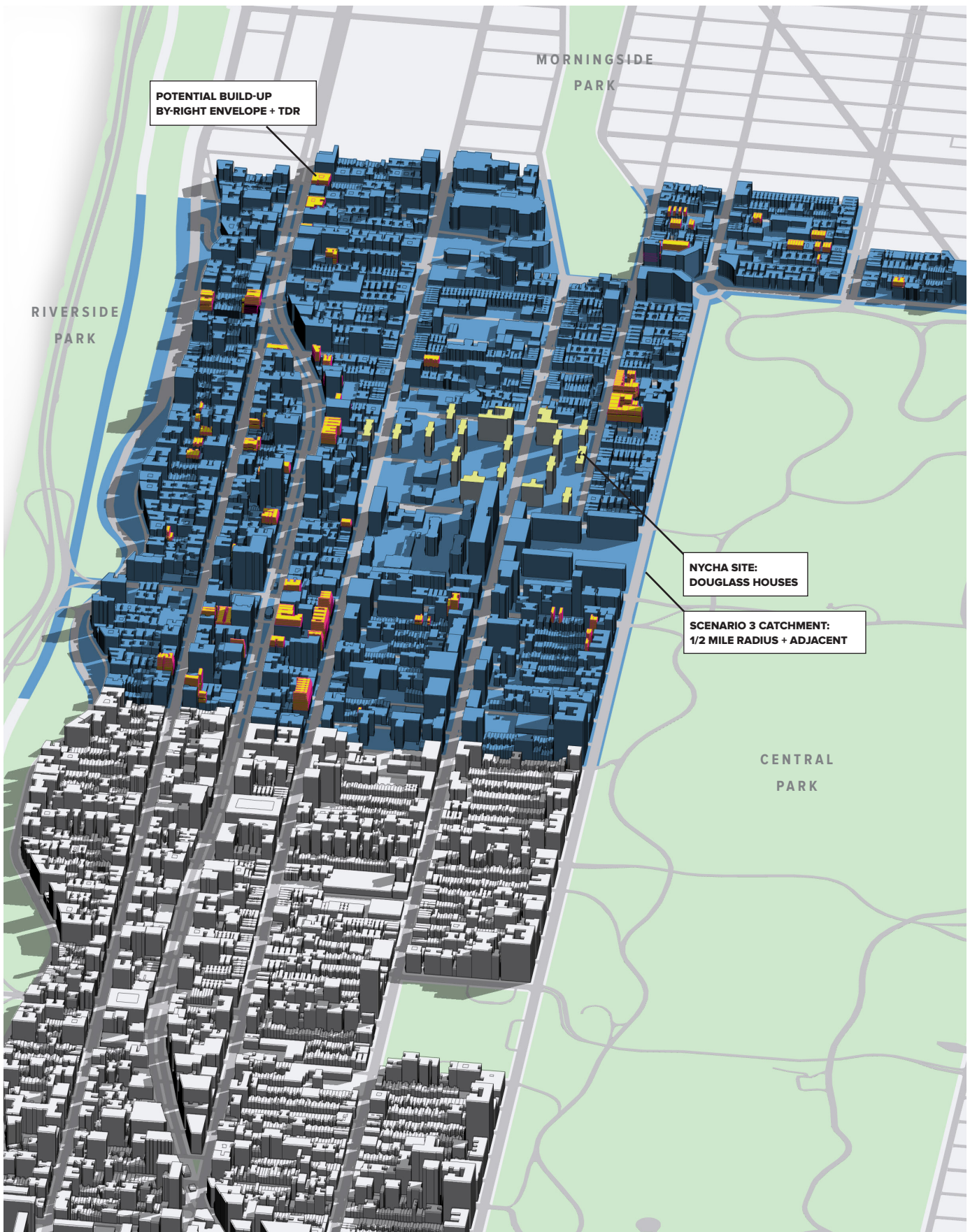
**AVAILABLE AIR RIGHTS:** 4,441,481

**ACTIVATED AIR RIGHTS:** 4,589,265  
4,441,481 CAP

**POTENTIAL REVENUE:** \$444,148,100

**RECEIVING SITES NEEDED TO  
UTILIZE FULL RIGHTS:** 96.7%





# Scenario 4

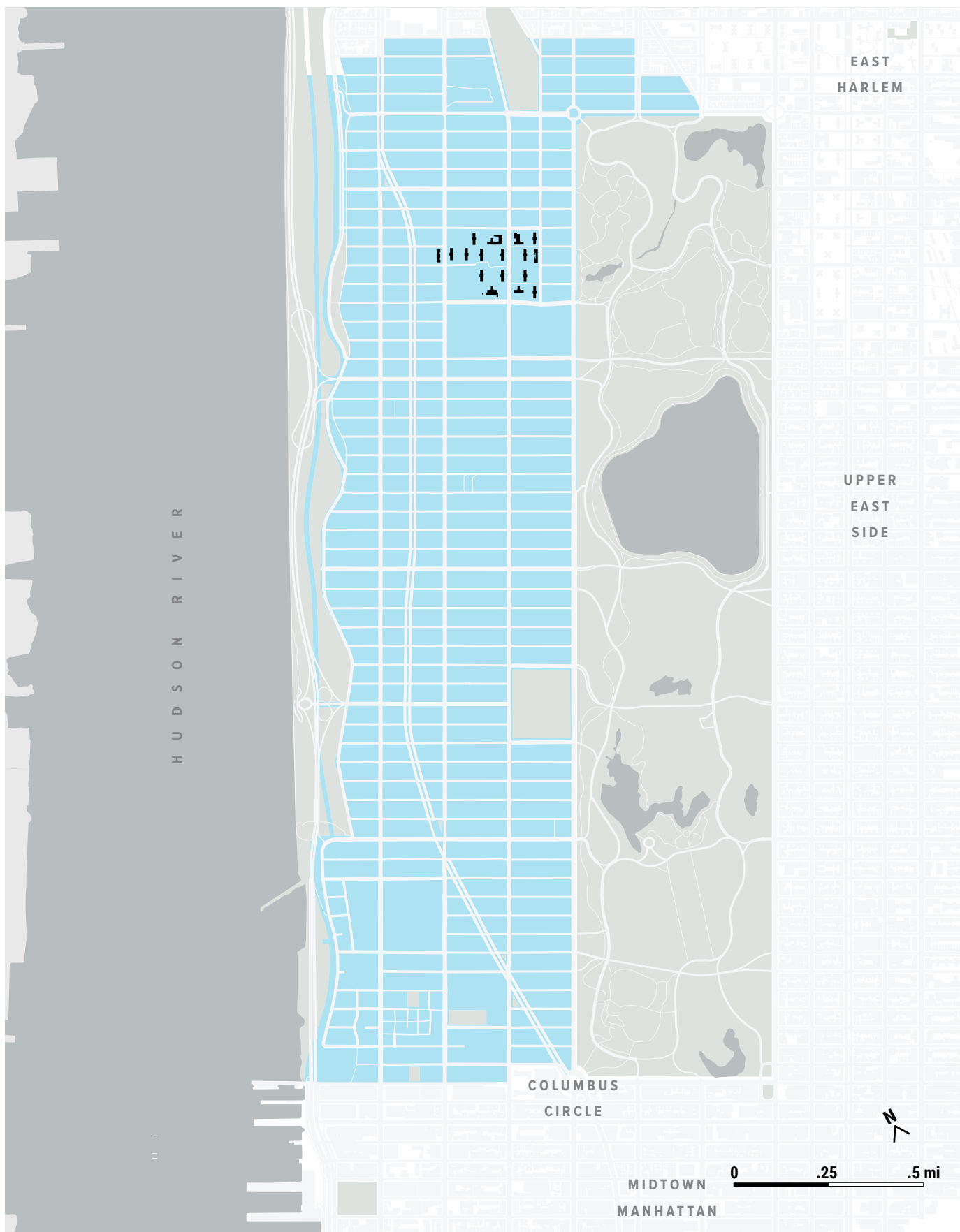
## Overview

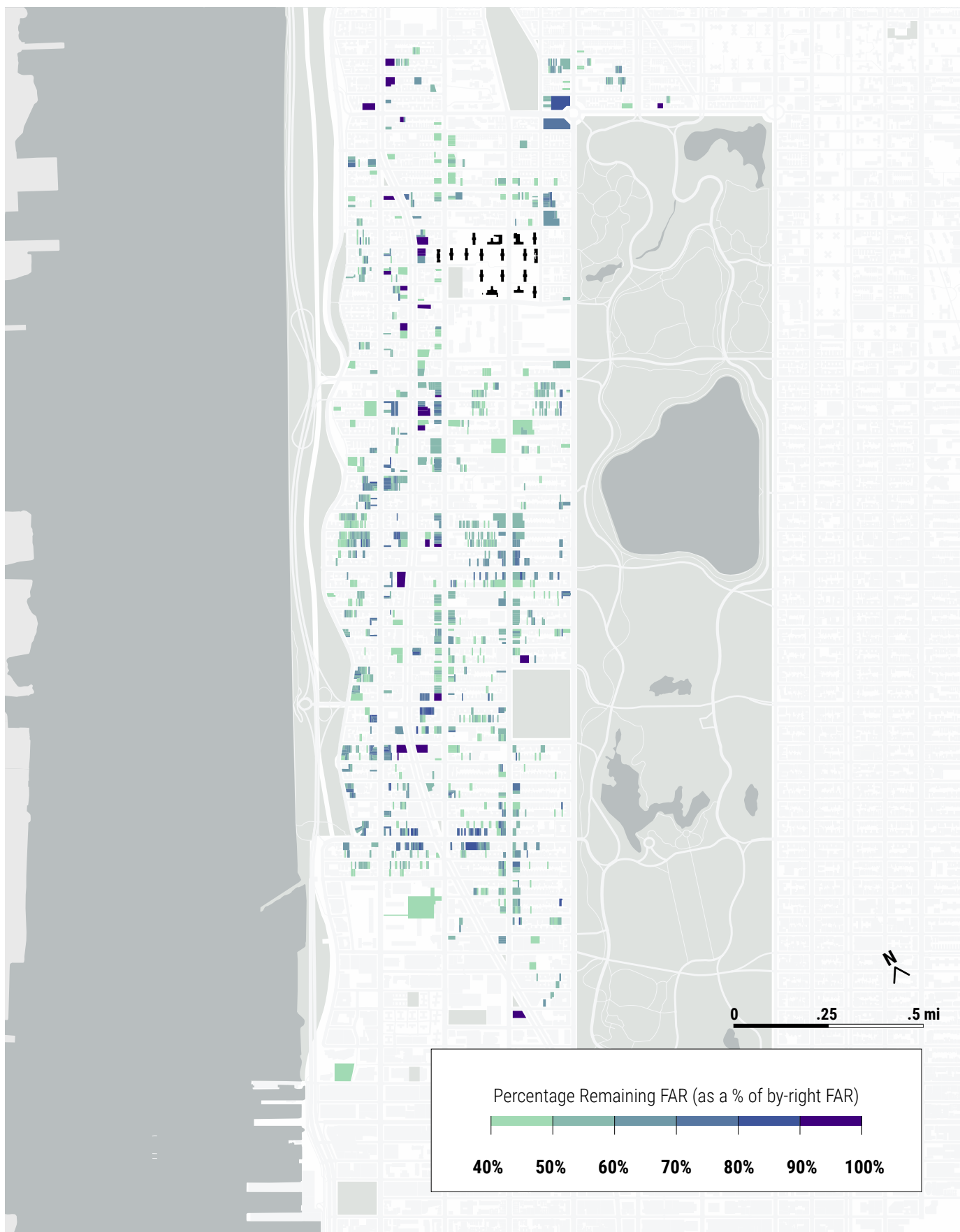
Scenario 4 activates the entire Upper West Side in the catchment, ranging from Columbus Circle to Douglass Circle. The catchment borders some flood zone areas to the southwest, but likely development centers along avenues and commercial strips. Bounded by the catchment by Riverside and Central Park, this scenario is an illustrative example of the benefits for NYCHA residents and city developers.

## Secondary Selection Criteria

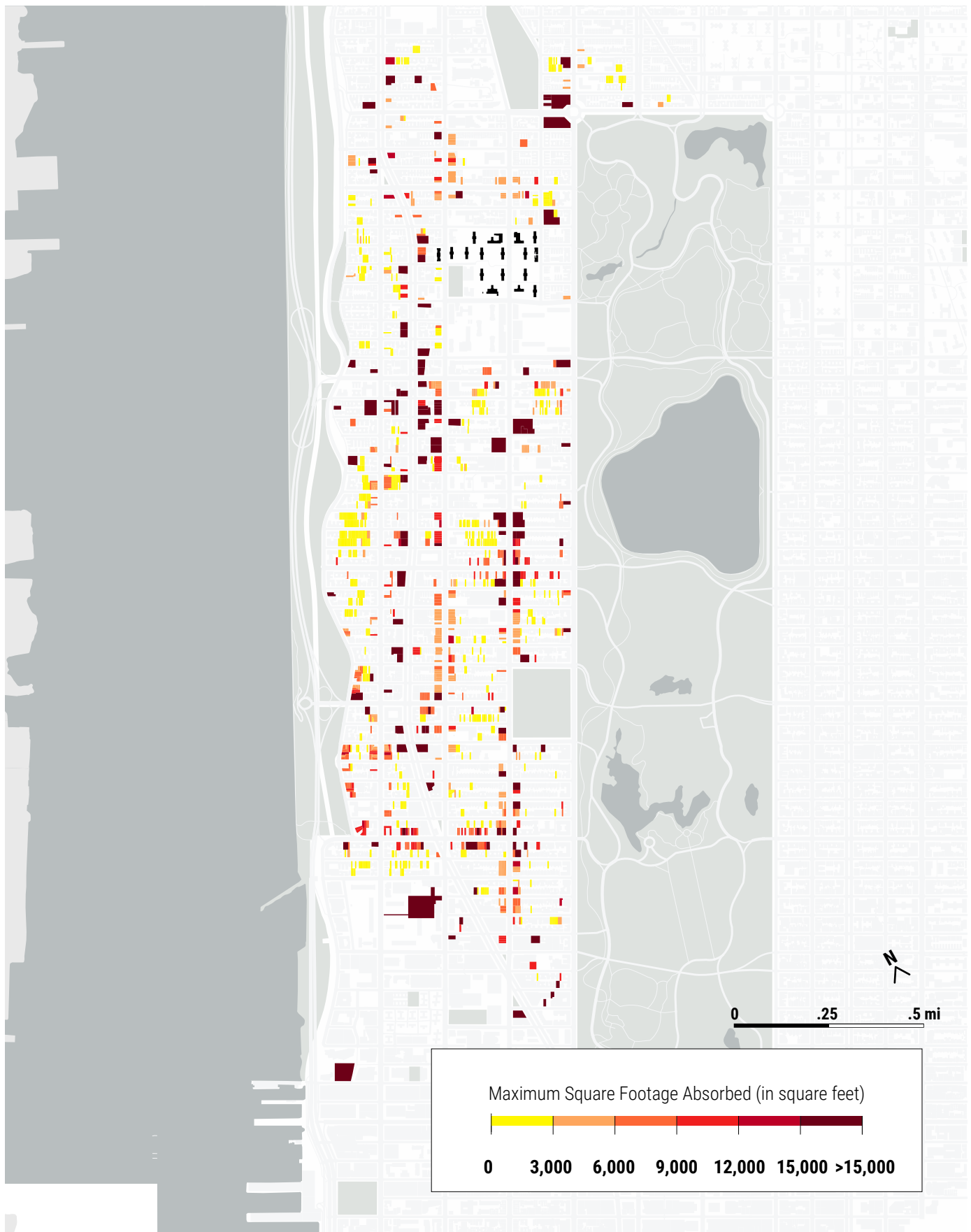


Figure Caption









# Scenario 4

## Key Metrics

**VIABLE PARCELS:** 1,396

**AVERAGE FAR AVAILABLE:** 57.5%

**ACTIVATED AIR RIGHTS:** 11,128,912  
2,000,000 CAP

**POTENTIAL REVENUE:** \$200,000,000

**RECEIVING SITES NEEDED TO  
UTILIZE FULL RIGHTS:** 18%

**LOCKED AIR RIGHTS:** 0

**LOCKED REVENUE:** 0

## Upzoning Scenario

**UPZONING:** FROM R7 TO R8

**TOTAL FAR:** 6.02 || 5,978,546 SQ FT

**AVAILABLE AIR RIGHTS:** 4,441,481

**ACTIVATED AIR RIGHTS:** 11,128,912  
4,441,481 CAP

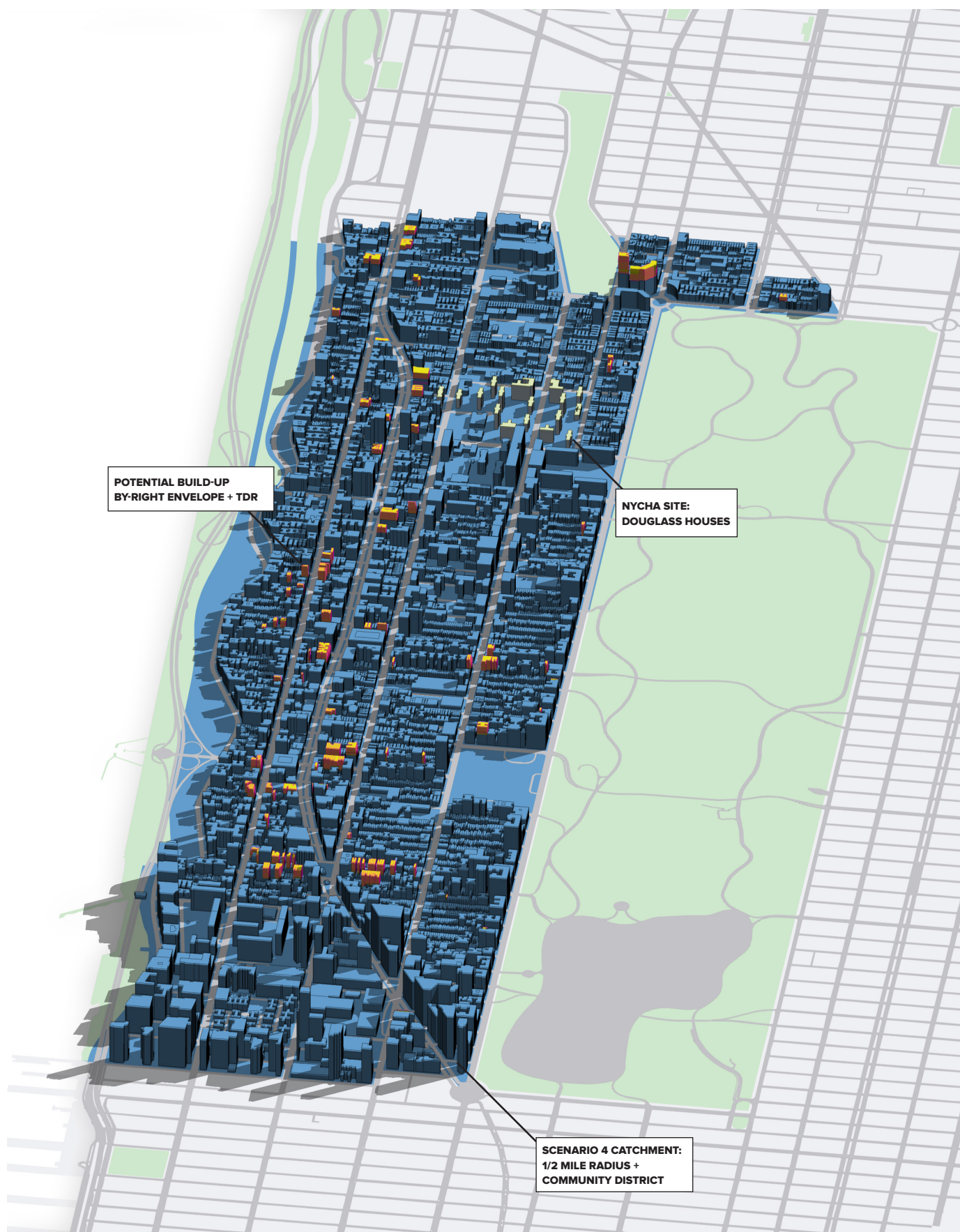
**POTENTIAL REVENUE:** \$444,148,100

**RECEIVING SITES NEEDED TO  
UTILIZE FULL RIGHTS:** 39.9%

## Summary Table - Douglass Houses

	Scenario 1	Scenario 2	Scenario 3	Scenario 4
<b>Viable Parcels</b>	4	21	489	1,396
<b>Average FAR</b>	90%	66%	56%	57.50%
<b>Activated Air Rights (%)</b>	2.1%	9%	>100%	>100%
<b>Potential Revenue</b>	\$4.2M	\$18.1M	\$200M	\$200M
<b>Locked Air Rights</b>	97.80%	91%	N/A	N/A
<b>Sites Needed to Utilize Full</b>	N/A	N/A	43.60%	18%





# Conclusion

In these three case studies, the different contexts in the City highlighted the challenges facing NYCHA sites and the residents who call them home. Through these case studies, NYCHA's capacity to repair units and the potential impact on the city come into sharper relief. Based on the strategies explored, it was determined that the air rights transfer can be used to enable full utilization of building envelope, and avoid impacting neighborhood context in a negative way.

## Site key findings:

### 1: Queensbridge Houses. Long Island City, Queens

The Queensbridge Houses site in a larger geographic catchment with a relatively lower density than the other two cases. The impact may be dispersed across a greater area, given the geography of the community district. Queens and much of Astoria also is vulnerable to flooding, which makes a compelling argument to consider larger catchments for transferring development rights.

### 2: Nathan Straus Houses. Kip's Bay, Manhattan

The Nathan Straus Houses possess fewer air rights to transfer and sit in a market capable of absorbing a large amounts of TDRs. This case also brings up the complexity of NYCHA's section 8 transfer process, the Rental Assistance Demonstration (RAD). The large institutions neighboring the site bring up possibilities of larger neighbors or partners combining NYCHA air rights into a mixed use campus.

### 3: Douglass Houses. Upper West Side, Manhattan

The Douglass Houses have a large amount of air rights and also present the most compelling case for a NYCHA upzoning scenario -- potential creating more revenue to improve the lives of residents. The site struggles to activate its air rights in Scenarios 1 and 2, given the boundaries of Central Park and a few sizable mixed and commercial developments. A healthy spread on commercial overlays down the avenues in the Upper West Side is possible in Scenarios 3 and 4.

The findings from these case studies suggest a more substantial policy change as seen in Scenarios 3 and 4 might overcome issues of landlocked air rights and encourage development away from the 2050 100-year flood plain. Questions remain on issues of oversight and approval processes, affordable housing requirements, or other conditions attached to these development rights, and the potential amount of air rights that could be transferred at each geographic catchment. This study has opened the conversation to begin understanding the concrete impacts and outcomes from a more liberal air rights policy for NYCHA, and how that policy might improve the lives of public housing residents.

## Summary Table - Queensbridge Houses

	Scenario 1	Scenario 2	Scenario 3	Scenario 4
<b>Viable Parcels</b>	0	13	844	7,796
<b>Average FAR</b>	N/A	81%	81%	64.4%
<b>Activated Air Rights (%)</b>	N/A	2.9%	>100%	>100%
<b>Potential Revenue</b>	N/A	\$4M	\$136.5M	\$136.5M
<b>Locked Air Rights</b>	100%	97.1%	N/A	N/A
<b>Sites Needed to Utilize Full</b>	N/A	N/A	13.2%	4.0%

## Summary Table - Nathan Straus Houses

	Scenario 1	Scenario 2	Scenario 3	Scenario 4
<b>Viable Parcels</b>	0	1	231	395
<b>Average FAR</b>	N/A	61%	76%	77.60%
<b>Activated Air Rights (%)</b>	0	100%	>100%	>100%
<b>Potential Revenue</b>	0	\$10.5M	\$10.5M	\$10.5M
<b>Locked Air Rights</b>	100%	N/A	N/A	N/A
<b>Sites Needed to Utilize Full</b>	N/A	100%	1.35%	0.80%

## Summary Table - Douglass Houses

	Scenario 1	Scenario 2	Scenario 3	Scenario 4
<b>Viable Parcels</b>	4	21	489	1,396
<b>Average FAR</b>	90%	66%	56%	57.50%
<b>Activated Air Rights (%)</b>	2.1%	9%	>100%	>100%
<b>Potential Revenue</b>	\$4.2M	\$18.1M	\$200M	\$200M
<b>Locked Air Rights</b>	97.80%	91%	N/A	N/A
<b>Sites Needed to Utilize Full</b>	N/A	N/A	43.60%	18%

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