



**City of Yes:**

A Multi-Criteria Decision Analysis Exploring  
Potential Affordable Housing Sites in *Brooklyn, NY*



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Brooklyn Border  
Parcels  
Street Network



0 0.5 1 2 Miles



# Introduction

## What is City of Yes?

Rooted in the idea that the future of housing is the future of New York City; City of Yes for Housing is an initiative led by Mayor Eric Adam that aims to right the wrongs of history and end exclusionary zoning, cut red tape, and transform New York City from the ground up.

Mayor Adams has described this initiative as “**the most ambitious change to zoning in the history of the City.**”

New York’s housing crisis is the result of decades of limited housing production. For more than 40 years, job growth has outpaced housing growth, to the point where more and more New Yorkers have fewer options to live. When the demand for housing is higher than the supply, rents go up, landlords have more leverage, and disadvantaged tenants are forced into displacement. As a result, more than half of New York City’s renters spend over a third of their income on rent, homeownership is increasingly out of reach, working New Yorkers face long commutes, and displacement pressure is stronger.

This initiative is very relevant to the practice of planning because it is driven by an awareness of **the human costs if zoning revisions are not made soon.** Inaction will only lead to high rents, displacement and gentrification pressure, segregation, homelessness, poor housing quality, tenant harassment, and other features of a “landlord’s market.”

As NYC Planning gears up for a Spring 2024 City Council vote on this initiative it stands at the precipice of a transformative era for urban housing. **City of Yes proposes progressive amendments to Zoning** that pertain to Universal Affordability Preferences (UAP), Office to Residential Conversions, Town Center Zoning, Parking Mandates, Accessory Dwelling Units, Transit-Oriented Development, and Campuses.

## What is Town Center Zoning?

Town Center Zoning, a pivotal concept within the scope of this research, represents **a zoning framework strategically designed to promote mixed-use development** in specified urban and suburban regions.

In the context of our focus on introducing **affordable housing atop single-story commercial spaces**, understanding and advocating for the legalization of town center zoning in New York City becomes paramount. This zoning designation is characterized by its emphasis on creating dynamic, walkable environments through a thoughtful blend of commercial, residential, and civic elements.

The potential impact of legalizing Town Center Zoning is particularly noteworthy, as it would facilitate the realization of our research goal – the development of affordable housing integrated seamlessly onto existing commercial structures. Such a move aligns with contemporary urban planning ideals, emphasizing inclusivity, sustainability, and vibrant community spaces.

## Research Objectives

As part of this research initiative, I aim to **systematically identify Single Story Commercial Sites** in Brooklyn, NY, that align with the outlined criteria for optimal affordable housing development.

Leveraging a comprehensive analysis that encompasses rent burden, new builds, single-story commercial spaces, proximity to transportation stations, child services, schools, and health-care, this research seeks to pinpoint locations that not only address the acute need for affordable housing but also contribute to the sustainable and inclusive growth of urban communities.

Through a meticulous examination of each criterion, I intend to develop a robust spatial understanding of potential sites, ensuring that the selected areas not only meet the immediate housing needs of residents but also contribute to the overall well-being and resilience of the community.

The overarching objective is to **provide actionable insights** that guide policymakers, urban planners, and developers in making informed decisions for the **strategic development of affordable housing in Brooklyn.**



# Introduction - Site

## Single Story Commercial Spaces in Brooklyn, NY - Parcel Map

My research is centered in Brooklyn, NY. I was particularly interested in studying Brooklyn as a borough because of its land mass, large population size, and extensive corridors of **Single Story Commercial Spaces** in the outer parts of the Borough.

Brooklyn has 3,093 Single Story Commercial **Parcels**. When looking at their distribution on a map, I began to reimagine how transformative it would be if these corridors of Single Story Commercials were to have housing on top.

*Single Story Restrictive Zoning*



*Town Center Zoning*



Brooklyn Border  
Parcels  
Single Story Commercial Parcels  
Street Network

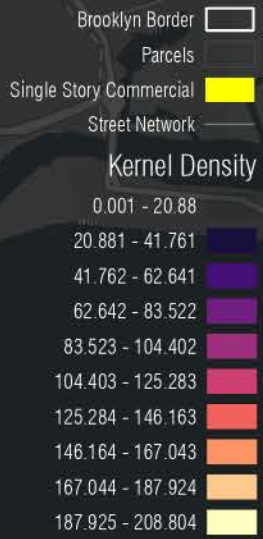
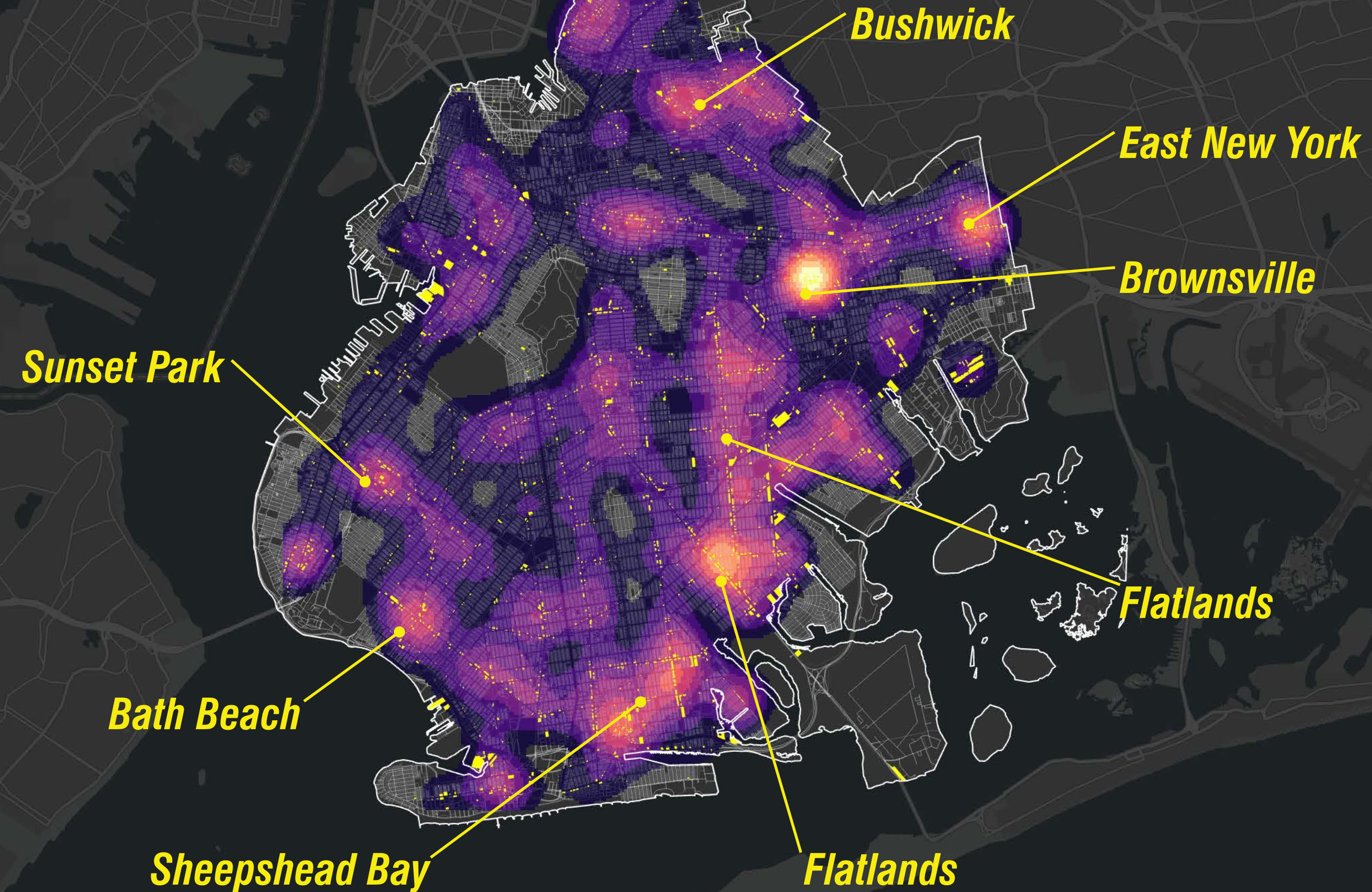
0 0.5 1 2 Miles



# Introduction - Site

## Single Story Commercial Spaces in Brooklyn, NY - Kernel Density Map

Utilizing a Kernel Density analysis, it becomes evident that numerous “hot spots” of Single Story Commercial Parcels are concentrated along the outer perimeters of Brooklyn. The resulting Kernel Density map highlights areas where these parcels form clusters, providing a spatial representation of their distribution. To discern optimal sites for further investigation, I have employed a Multi-Criteria Decision Analysis.





# Methodology

## Multi-Criteria Decision Analysis:

What does this mean?

Multi-Criteria Decision Analysis (MCDA) is a systematic approach used to evaluate and make decisions based on multiple criteria or factors.

In this instance, GIS technology helps integrate and analyze various factors simultaneously to providing a comprehensive understanding of where Affordable Housing should be built in the study area.

By assigning weights to criteria based on their importance, MCDA allows decision-makers to objectively evaluate and rank different locations, aiding in the selection of the most suitable site that aligns with specific goals or objectives.

In essence, MCDA in GIS helps make more informed and well-rounded decisions by considering a multitude of factors simultaneously.

## Multi-Criteria Decision Analysis (MCDA)





# Data

## Spatial & Non Spatial Data

The spatial data sources for this research encompass a comprehensive array of geographic information vital for understanding the urban context of Brooklyn, NY. Subway lines and stations data contribute crucial insights into the transportation network, aiding in the assessment of accessibility for potential affordable housing sites. NYC Facilities data provides a valuable layer by identifying essential amenities and services within the study area, influencing the overall livability of chosen locations. The datasets of NYC Boroughs and NYC Map Pluto offer administrative boundaries and land-use information, respectively, providing a foundational framework for the study. NYC Streets Centerline and NYC Tiger Census Tracts data contribute street-level details and demographic patterns, offering a nuanced understanding of the urban fabric. The Interborough Express Line and its stations add an additional layer of transportation consideration, enhancing the overall spatial analysis.

Complementing these spatial datasets, non-spatial data sources are equally critical for the research. The 2021 American Community Survey data, specifically detailing median income and annual rent, provides essential economic insights crucial for evaluating the affordability landscape. This non-spatial information serves as a pivotal component in the holistic analysis, guiding decisions related to the development of affordable housing in Brooklyn. Together, these spatial and non-spatial data sources create a comprehensive foundation, allowing for a thorough exploration of the factors influencing affordable housing development in the borough.

## Spatial Data:

- Subway Lines
- Subway Stations
- NYC Facilities
- NYC Boroughs
- NYC Map Pluto
- NYC Streets Centerline
- NYC Tiger Census Tracts
- Interborough Express Line
- Interborough Express Stations

## Non Spatial Data:

- 2021 American Community Survey Median Income & Annual Rent



# Criteria for Site Selection

## Rent Burdened Neighborhoods

Rent burden analysis is paramount for affordable housing site selection, as it unveils areas where residents allocate a substantial portion of their income to housing costs. By pinpointing neighborhoods with high rent burdens, the analysis directly targets regions where the need for affordable housing is most acute, ensuring that new developments address the economic challenges faced by residents.

## Areas with New Construction

The density of new construction since 2008 serves as a key indicator of urban development. Integrating this criterion allows us to identify areas undergoing growth and transformation. In selecting sites for affordable housing, a focus on emerging neighborhoods provides an opportunity to align with broader urban development trends, contributing to the vitality of evolving communities.

## Areas with Single Story Commercial Parcels

The identification of single-story commercial spaces is critical, signaling potential redevelopment opportunities. Building affordable housing atop existing commercial structures not only maximizes land use but also supports sustainable, mixed-use urban planning. This approach enhances the adaptive reuse of underutilized spaces, fostering economic diversity and meeting the demand for affordable housing.

## Areas near Transportation Stations

Proximity to transportation stations is fundamental for fostering accessible and connected communities. Considering this criterion ensures that affordable housing sites are strategically located near public transit options, promoting inclusivity and easing commuting challenges for residents who rely on public transportation for work, education, and daily activities.

## Areas near Child Services

Analyzing the availability of child services, including schools and amenities for children, is pivotal for family-centric affordable housing developments. Identifying areas with proximity to such services ensures that families have access to essential resources, creating a supportive environment that enhances the appeal and sustainability of affordable housing projects.

## Areas near Schools

The evaluation of school proximity directly impacts the desirability and success of affordable housing developments, especially for families with school-age children. Ensuring access to quality education contributes to the overall livability of the community, attracting and retaining residents seeking affordable housing options within the vicinity of educational resources.

## Areas near Healthcare

Proximity to healthcare facilities is a crucial factor in site selection, contributing to the overall well-being of residents in affordable housing developments. Access to healthcare services ensures that residents have convenient and timely medical assistance, promoting community health and enhancing the overall quality of life within the affordable housing community.



# Criteria for Site Selection

## Rent Burdened Neighborhoods

For the purposes of this research, Rent Burden Percentage is defined as Median Household Income / Median Annual Rent.

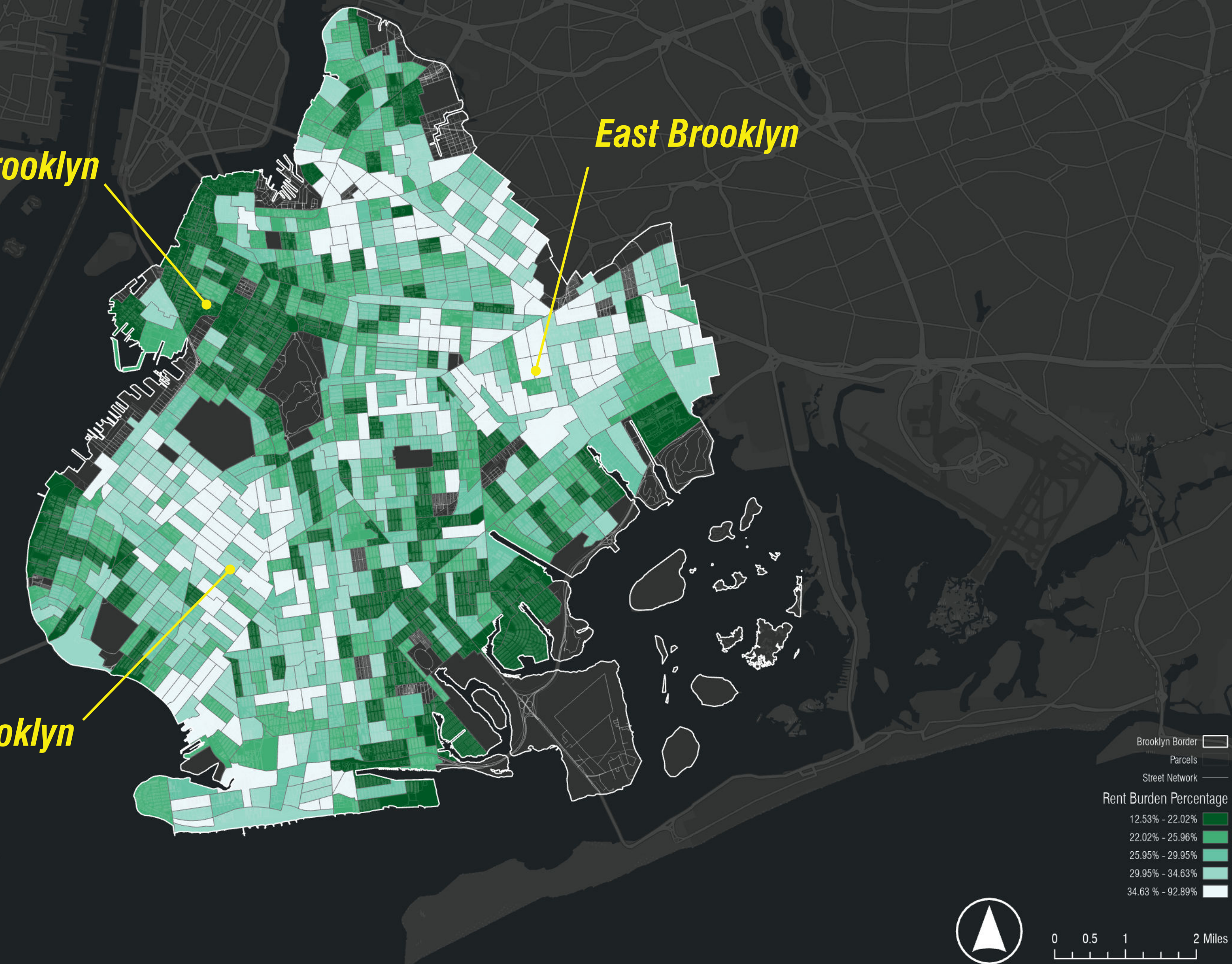
It is apparent that Rent Burden is a spatial issue.

Neighborhoods in **North Brooklyn** such as *Park Slope*, *Brooklyn Heights*, *Fort Greene*, and *Williamsburg* all have low percentages of Rent Burden. While Neighborhoods in **South Brooklyn** such as *Sunset Park*, *Bensonhurst*, *Gravesend*, *Coney Island*, and *Brighton Beach*, and neighborhoods in **East Brooklyn** such as *Brownsville*, *East New York*, and *Bushwick*, all have high percentages of Rent Burden.

**North Brooklyn**

**East Brooklyn**

**South Brooklyn**



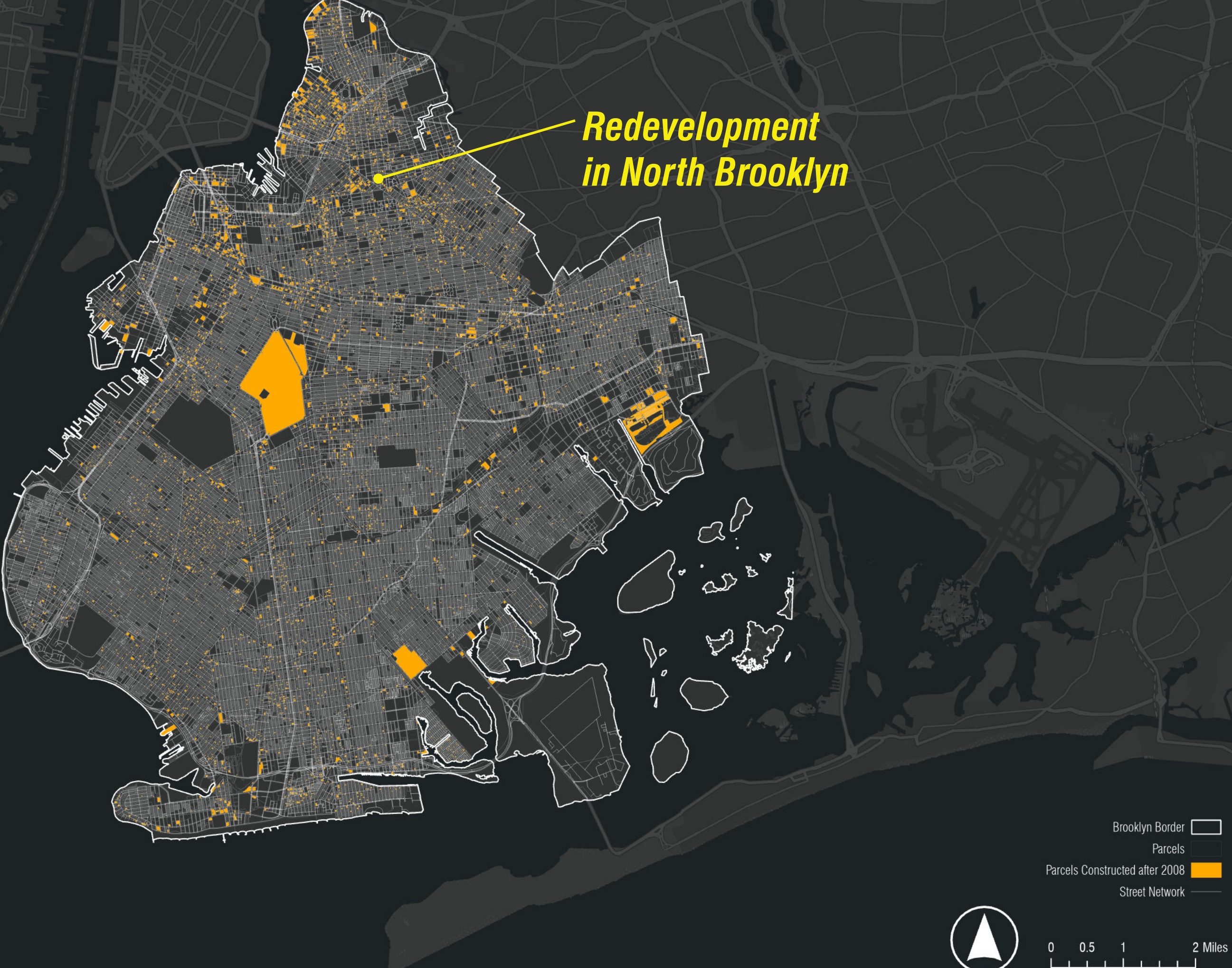


# Criteria for Site Selection

## Areas with New Construction

For the purposes of this research, New Construction is defined as Parcels that were constructed in or after 2008.

As a researcher, the choice of using 2008 as a pivotal indicator for **“new construction”** is deliberate and strategic. The year 2008 signifies a crucial turning point in urban development dynamics, following the global financial crisis. This period is marked by a notable slowdown in construction activities, and studying data from 2008 onward allows us to capture the subsequent resurgence and renewed momentum in new construction projects. Analyzing post-2008 data provides a nuanced understanding of urban growth patterns, economic recovery, and areas experiencing transformation. By employing this specific timeframe, our research aims to identify sites that align with contemporary urban development trends, contributing valuable insights for optimal site selection in the context of affordable housing development in Brooklyn, NY.



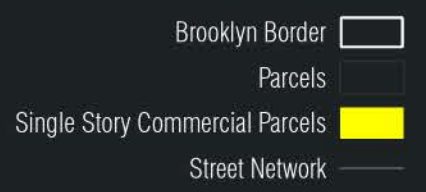
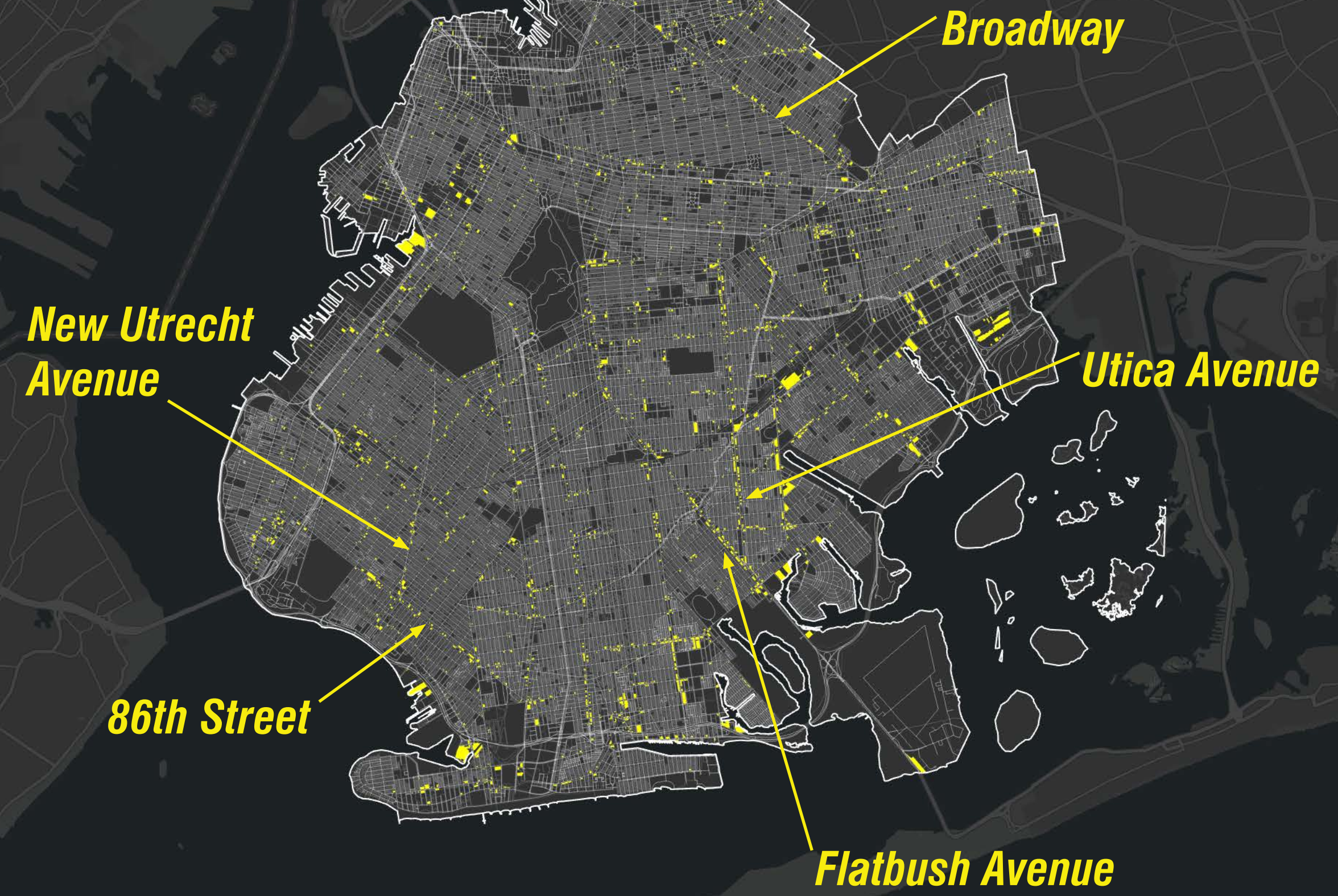


# Criteria for Site Selection

## Areas with Single Story Commercial Parcels

For the purposes of this research, Single Story Commercial Parcels are defined as Parcels that have less than Floors and are designated with Land Use 5 by NYC OpenData's MapPluto.

When initially exploring the data, intriguing patterns of Single Story Commercial Parcels quickly emerged, particularly along prominent thoroughfares such as New Utrecht Avenue, 86th Street, Flatbush Avenue, Utica Avenue, Broadway, and various other street networks across Brooklyn. These corridors represent a distinctive feature in the borough's urban landscape, and their prevalence along key street networks piqued my interest, signifying potential zones for targeted investigation and site selection.





# Criteria for Site Selection

## Areas near Transportation Stations

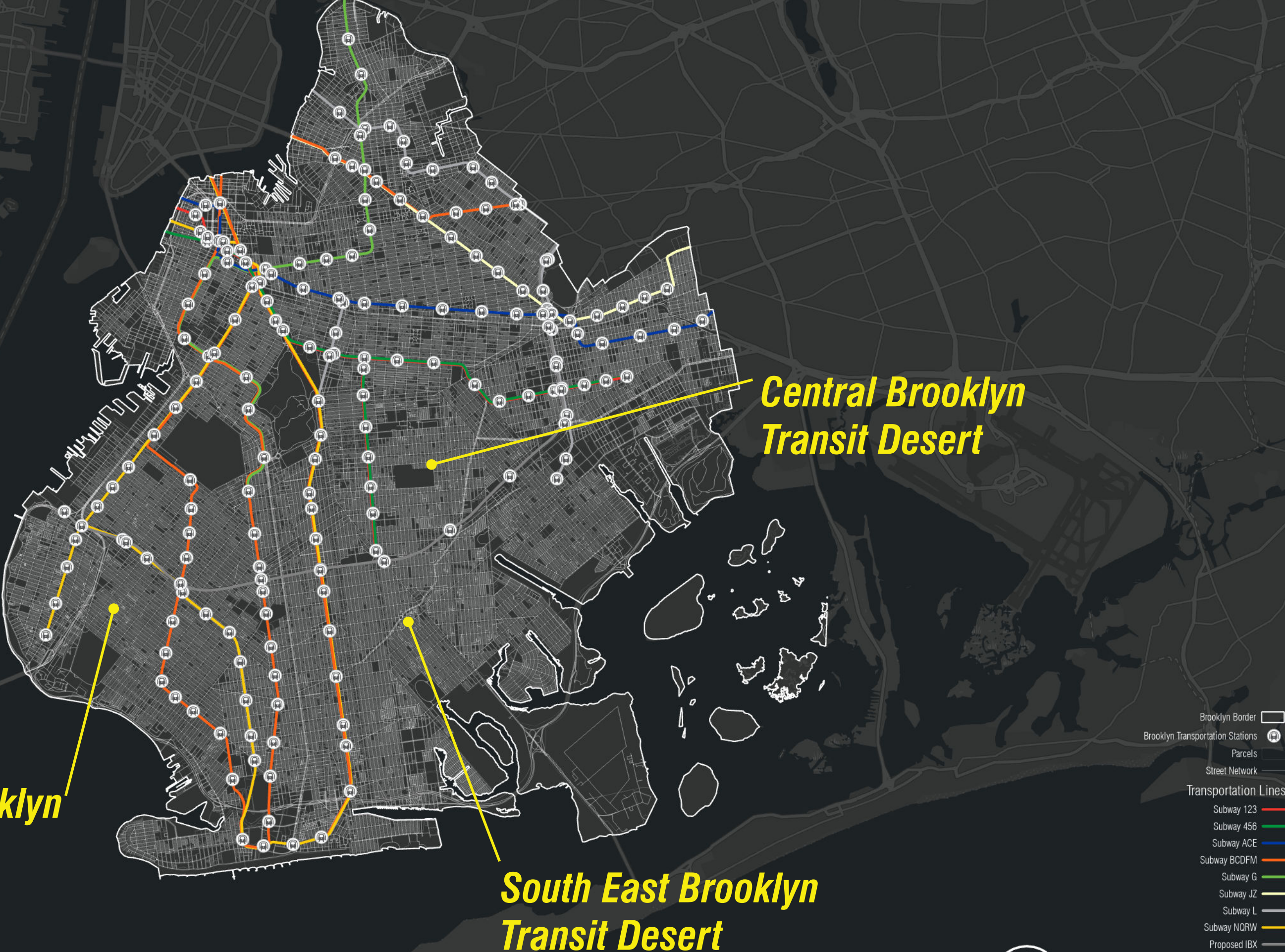
For the purposes of this research, Transportation Stations are defined as New York City MTA Subway Stations and proposed MTA Interborough Express Stations.

While Brooklyn boasts a robust transportation network, certain neighborhoods in Central, Southwest, and Southeast Brooklyn are characterized as Transit Deserts, indicating a lack of convenient access to public transportation options. These Transit Deserts pose a challenge for affordable housing development, as accessibility to transportation is integral for fostering connected and inclusive communities. In alignment with this, areas within a 0.5-mile radius (approximately 10 city blocks) of a transportation station are prioritized for analysis, ensuring that potential affordable housing sites are strategically located to enhance commuter convenience and support the broader goals of sustainable urban development in Brooklyn, NY.

**South West Brooklyn  
Transit Desert**

**Central Brooklyn  
Transit Desert**

**South East Brooklyn  
Transit Desert**



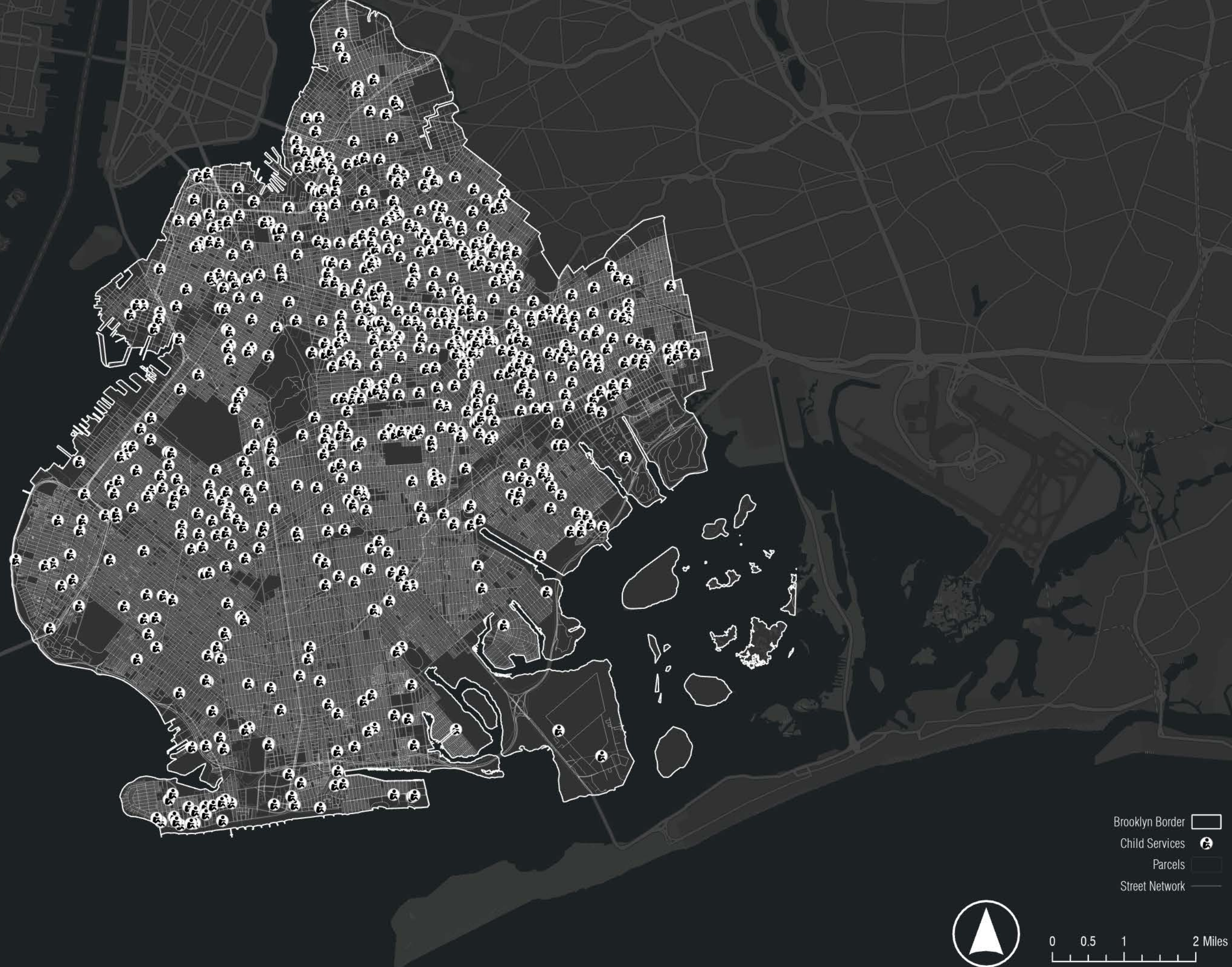


# Criteria for Site Selection

## Areas near Child Services

For the purposes of this research, Child Services are defined as NYC Facilities that have been designated the Facility Group “Child Services.”

It is apparent that Child Services are prevalent throughout Brooklyn, however, they appear to be clustered in North and Central Brooklyn.



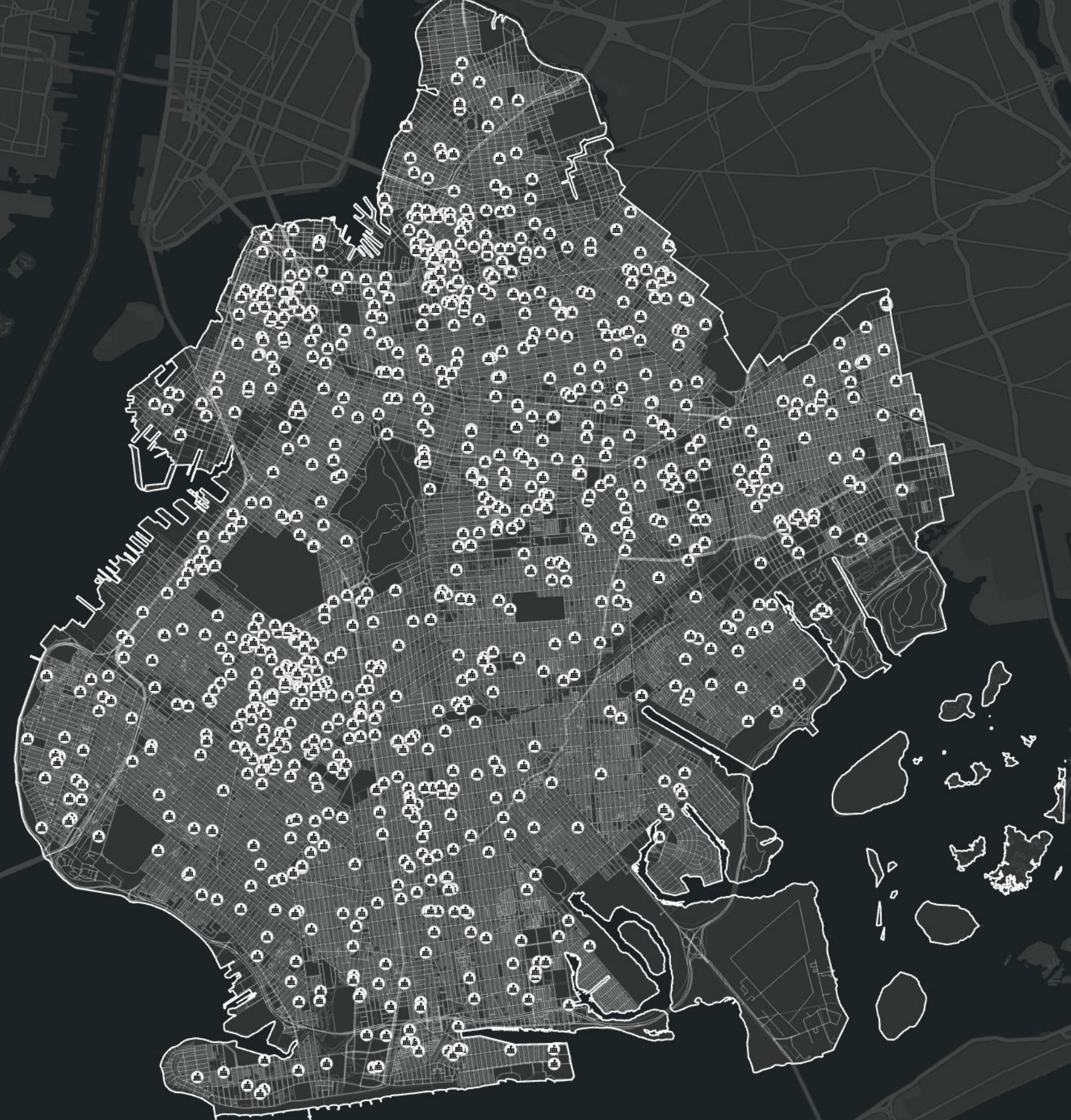


# Criteria for Site Selection

## Areas near Schools

For the purposes of this research, Child Services are defined as NYC Facilities that have been designated the Facility Group “Schools K-12.”

It is apparent that Child Services are prevalent throughout Brooklyn, however, they appear to be clustered in Southwest and Northwest Brooklyn.



- Brooklyn Border
- Brooklyn Schools
- Parcels
- Street Network



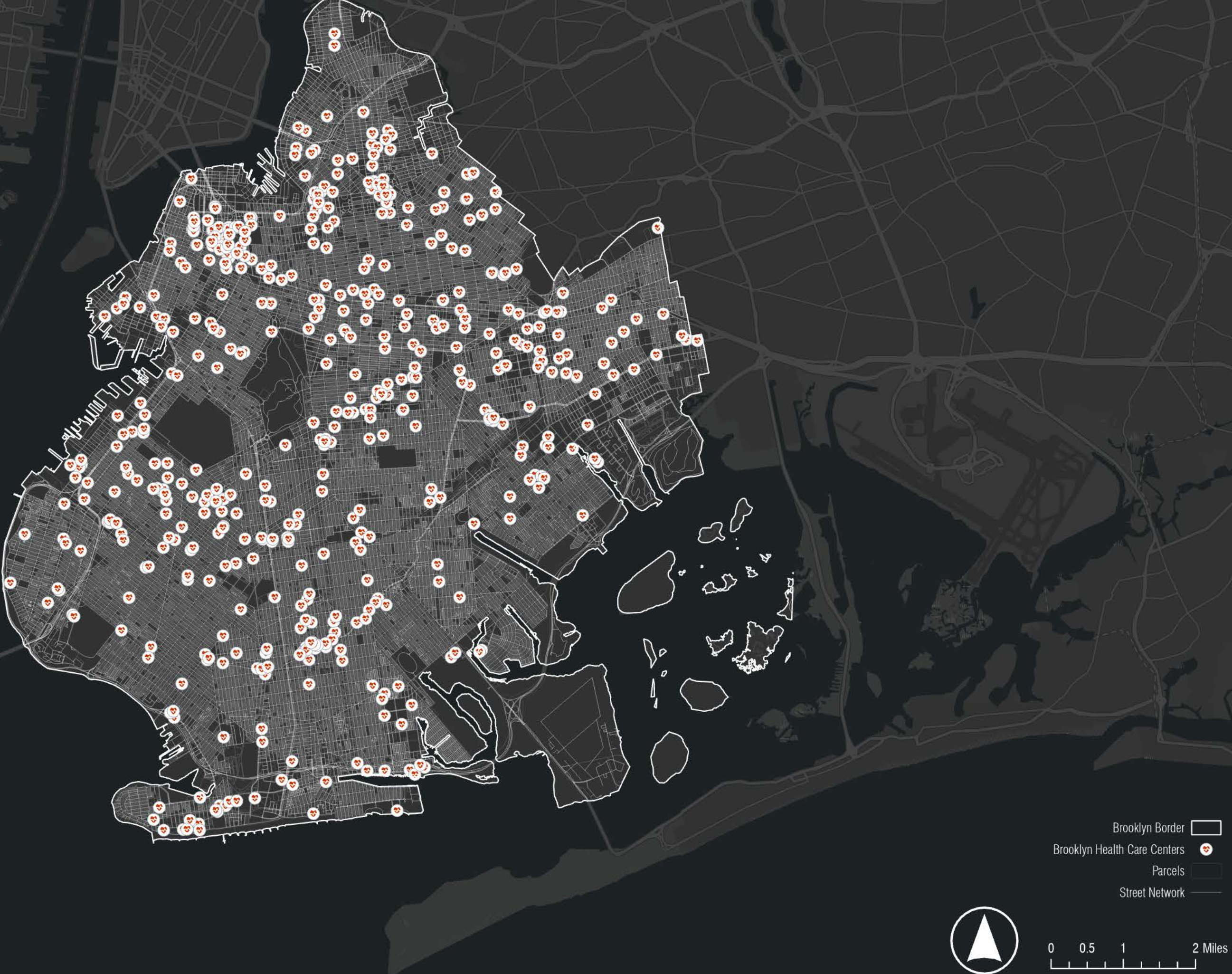
0 0.5 1 2 Miles



# Criteria for Site Selection

## Areas near Healthcare

For the purposes of this research, Healthcare are defined as NYC Facilities that have been designated the Facility Group "Health-care." It is apparent that Healthcare centers are prevalent throughout Brooklyn, however there are visible gaps in clusters.



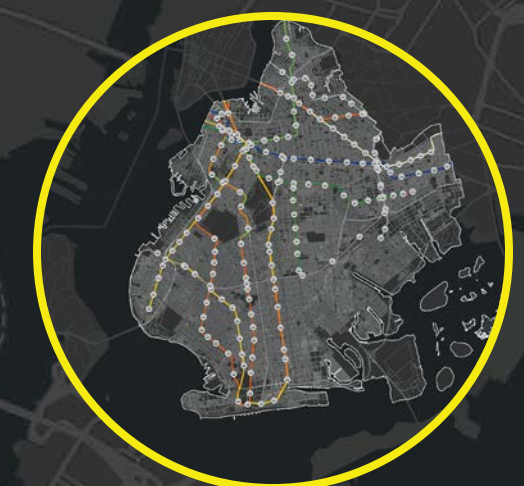


# Implementation

## Network Analysis

I utilize walkshed buffers of 0.25 and 0.5 miles around key features such as Transportation Stations, Child Services, Schools, and Healthcare facilities. These buffers represent the distance I can reasonably walk within 5 and 10 city blocks, respectively, from these critical amenities. By incorporating these walkshed buffers, I aim to understand the immediate accessibility of essential services, ensuring that potential affordable housing sites are strategically located within a walkable distance from public transit, child services, educational institutions, and healthcare facilities. This approach not only considers geographic proximity but also emphasizes the importance of fostering pedestrian-friendly environments, enhancing the overall livability and convenience for residents in the selected areas.

Transportation Stations



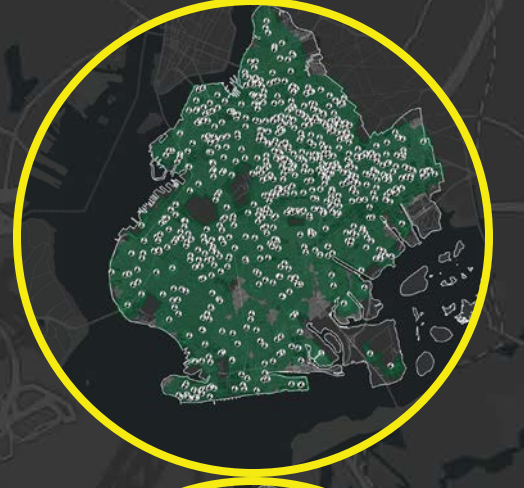
.25 Mile & .50 Mile Walksheds



Child Services



.25 Mile & .50 Mile Walksheds



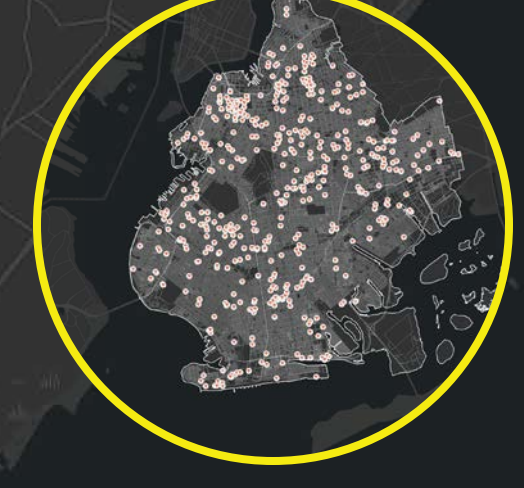
Schools



.25 Mile & .50 Mile Walksheds



Healthcare



.25 Mile & .50 Mile Walksheds



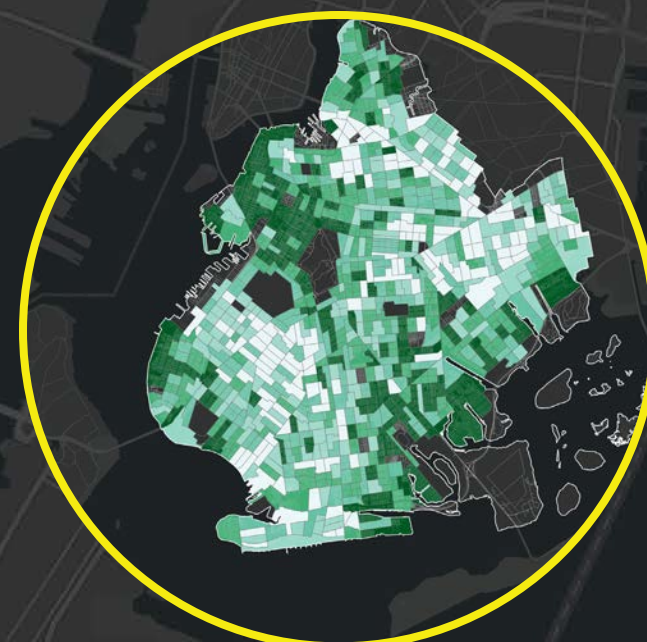


# Implementation

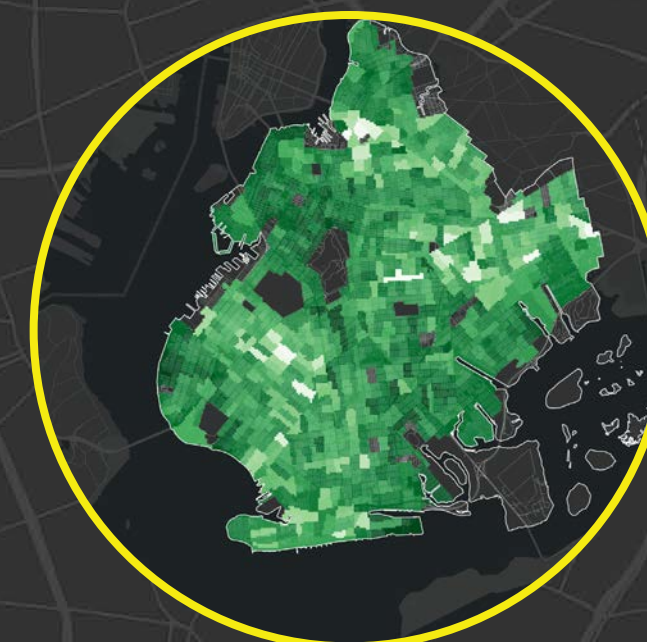
## Rasterization

I employed several techniques to derive valuable insights for site selection. Firstly, I rasterized a Rent Burden Choropleth Map, transforming the geographical representation of rent burden data into a grid of pixels. This rasterization process allowed for a more detailed and granular examination of rent burden patterns across Brooklyn, providing a nuanced understanding of areas with heightened housing cost challenges. Additionally, I conducted a kernel density analysis focused on new construction, utilizing this spatial technique to highlight concentrated areas of development post-2008. This analysis helped me pinpoint zones with heightened growth potential, aiding in the identification of evolving neighborhoods suitable for affordable housing integration. Furthermore, I applied a similar kernel density analysis to Single Story Commercial Parcels, shedding light on corridors with substantial concentrations of these spaces. This approach aids in recognizing potential redevelopment opportunities, supporting my goal of maximizing land use efficiency for affordable housing projects. Together, these rasterization and kernel density methods contribute to a comprehensive spatial analysis, guiding my site selection process for the strategic development of affordable housing in Brooklyn, NY.

Rent Burden



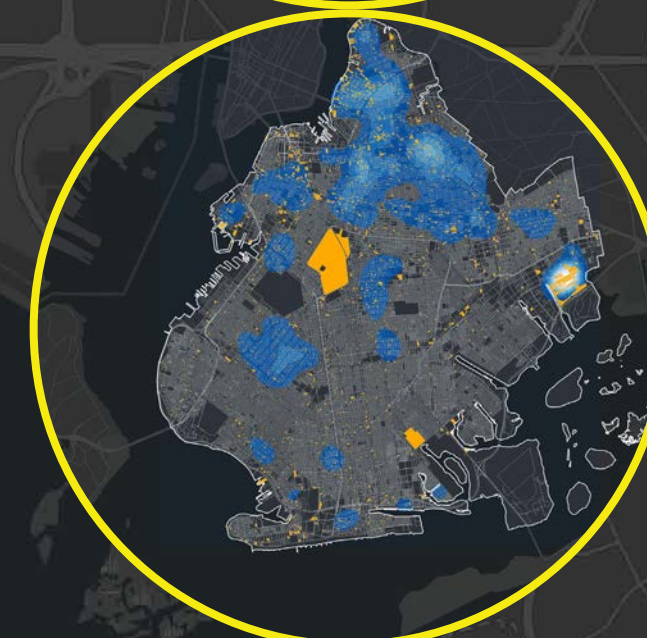
Rasterization



New Construction



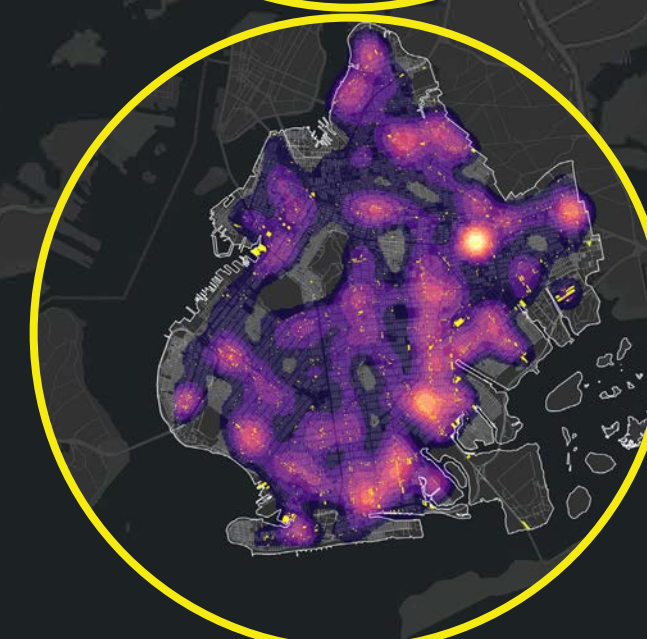
Kernel Density



Single Story Commercial Parcels



Kernel Density





# Implementation

## Reclassification

In preparing for the weighted overlay analysis, I meticulously reclassified various raster datasets, including those pertaining to rent burden, new construction, single story commercial spaces, transportation stations, child services, schools, and healthcare. This process involved transforming the continuous raster data into discrete classes or categories, enabling a more streamlined integration of diverse criteria. By reclassifying these raster layers, I assigned values that align with the significance of each factor in the site selection process, establishing a standardized framework for comparison. The reclassification ensures that each criterion contributes meaningfully to the overall analysis, allowing for a cohesive and equitable assessment during the subsequent weighted overlay. This meticulous preparation lays the foundation for a comprehensive evaluation of potential affordable housing sites in Brooklyn, NY, considering the multifaceted factors crucial for successful and sustainable urban development.



Rent Burden

*Reclassification*

New Construction

*Reclassification*

Single Story Commercial

*Reclassification*

Transportation Stations

*Reclassification*

Child Services

*Reclassification*

Schools

*Reclassification*

Healthcare

*Reclassification*



# Implementation

## Weighted Overlay

The weighted overlay analysis assigns specific weights to each criterion based on their relative importance in the site selection process. Rent burden holds the highest weight at 30%, acknowledging its central role in addressing housing affordability challenges and its direct impact on individuals. New builds follow with a weight of 20%, emphasizing their significance in identifying areas undergoing growth and aligning with broader urban development trends. Commercial spaces are assigned a weight of 15%, recognizing their potential for adaptive reuse and efficient land utilization, contributing to economic diversity. Transportation is weighted at 10%, underscoring its pivotal role in creating accessible and connected communities. Child services and schools each carry a weight of 10% and 8%, respectively, highlighting the importance of family-centric amenities and educational accessibility in affordable housing developments. Lastly, healthcare facilities hold a weight of 7%, emphasizing their contribution to enhancing overall well-being in affordable housing communities. This thoughtful allocation of weights ensures a balanced consideration of multiple criteria, guiding the identification of optimal affordable housing sites in Brooklyn, NY.

Rent Burden **30%**

New Builds **20%**

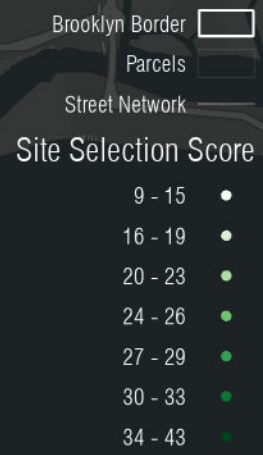
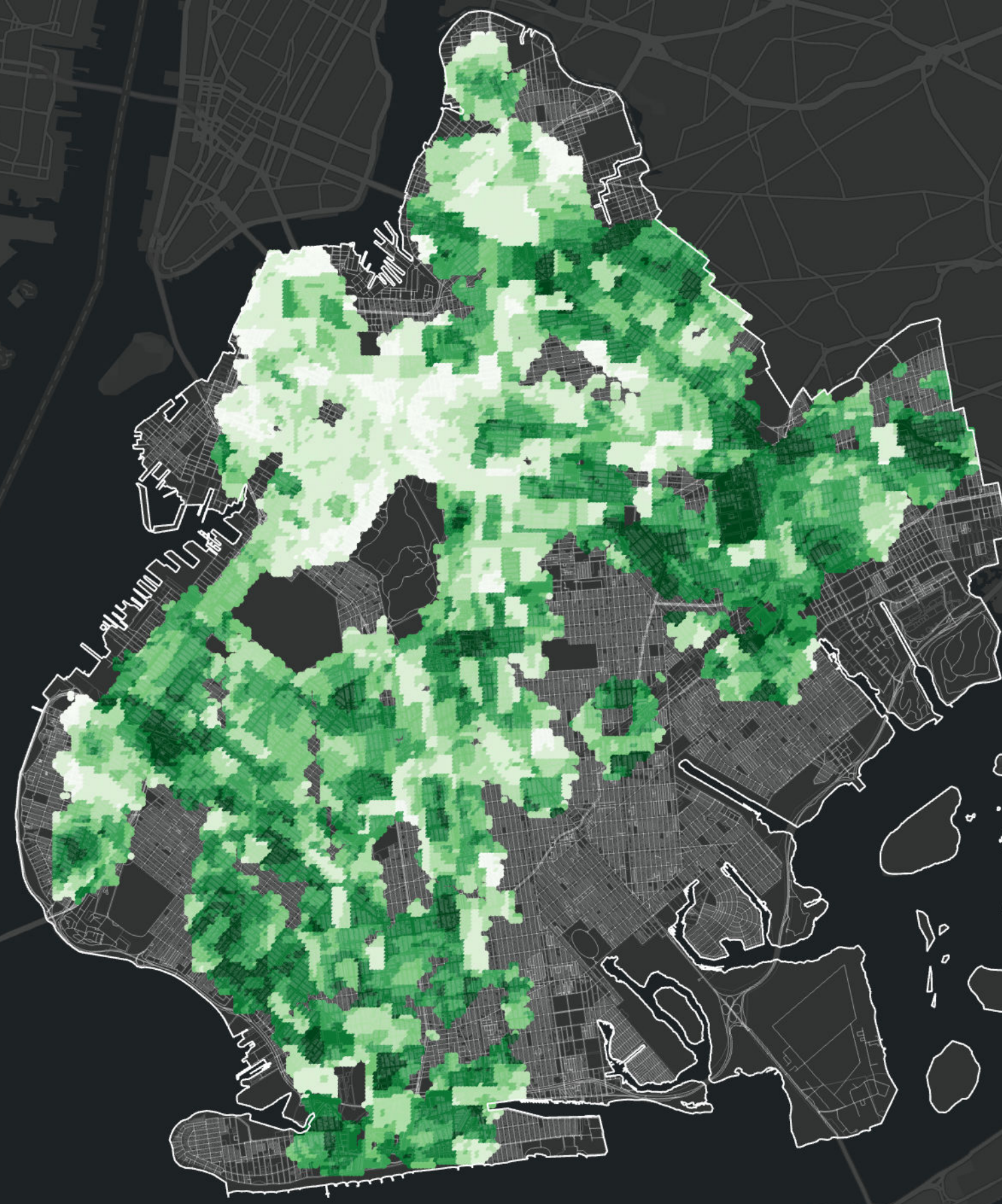
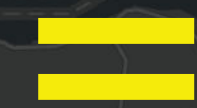
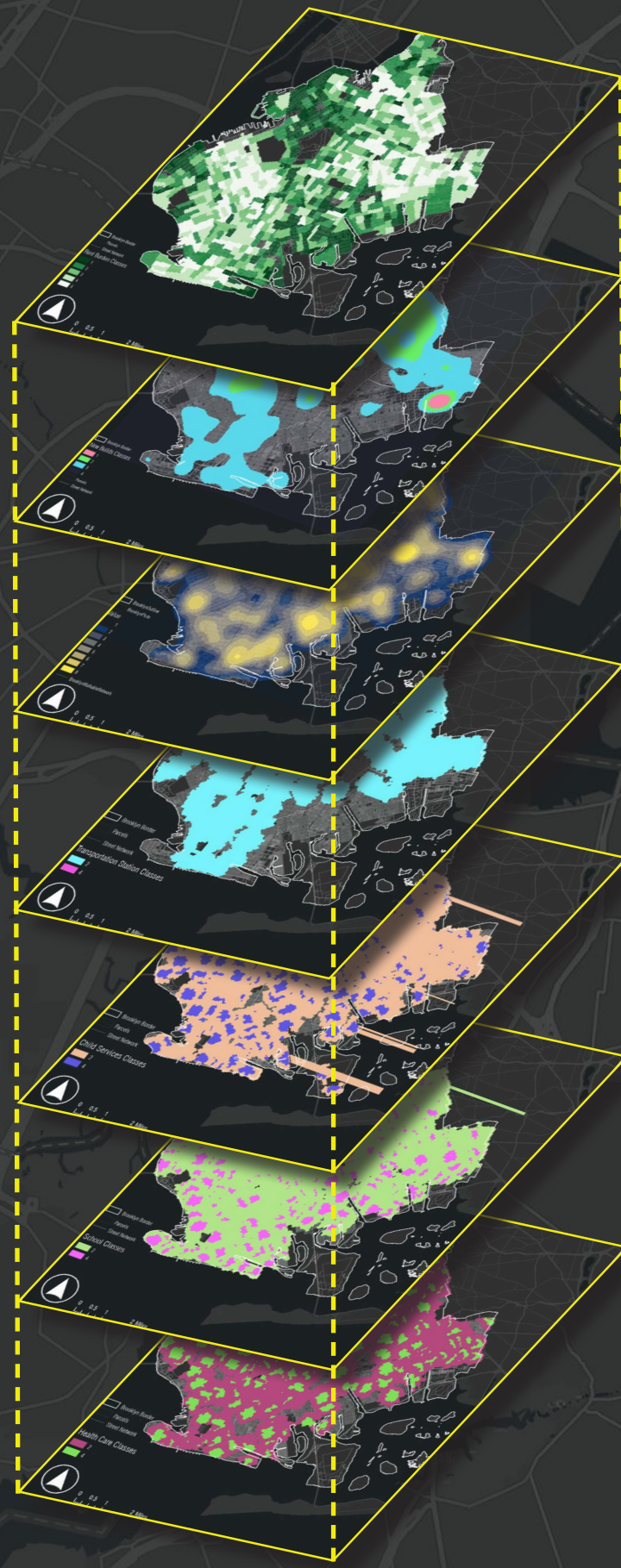
Commercial **15%**

Transportation **10%**

Child Services **10%**

Schools **8%**

Health Care **7%**

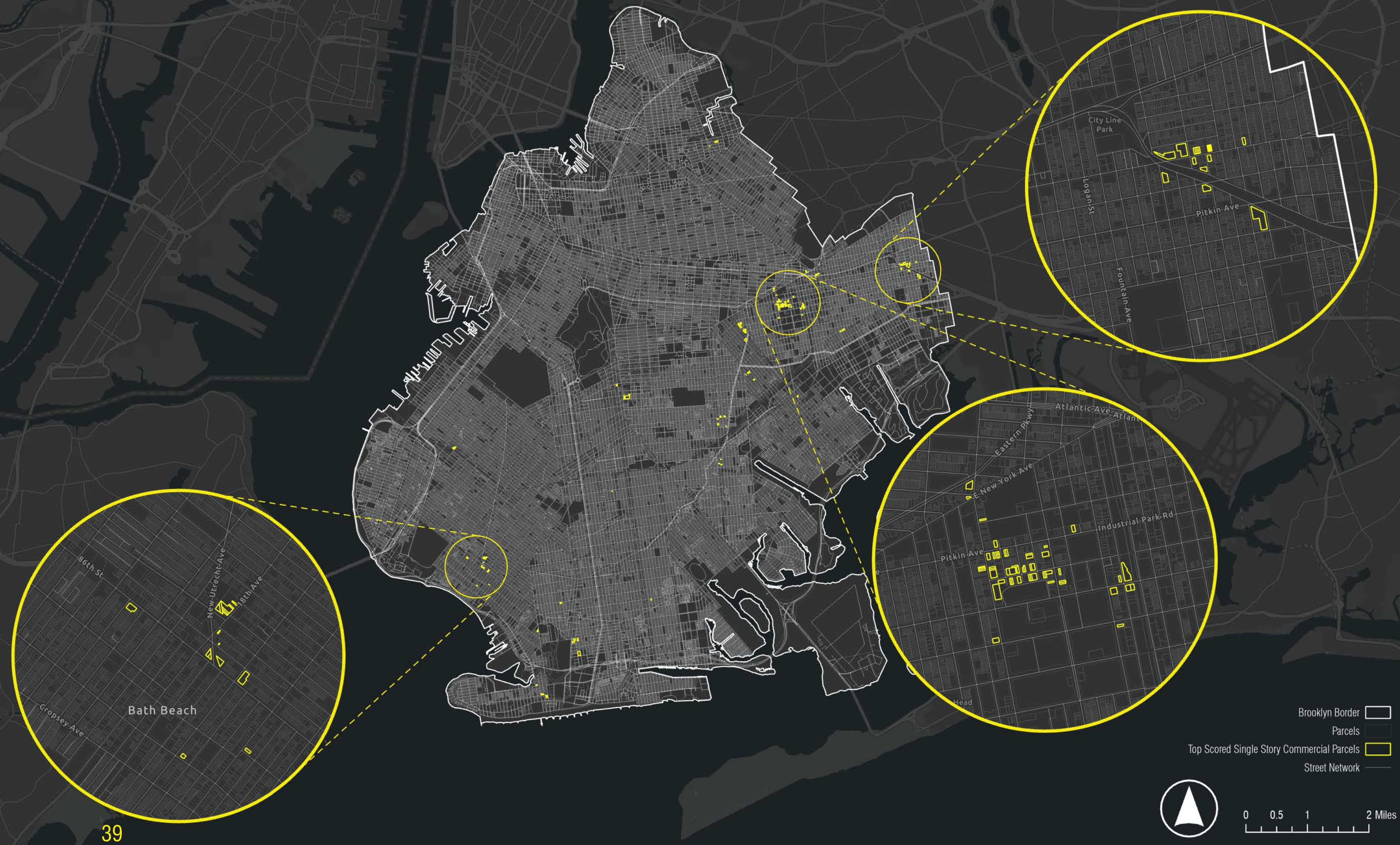




# Findings

## Weighted Overlay

In the Weighted Overlay analysis, 1,873 Single Story Commercial Parcels underwent scoring based on the weighted criteria. From this assessment, 161 parcels emerged as the highest-scoring, occupying the top quantile. The map on the right visually represents these 161 selected parcels, showcasing their strategic positioning in Brooklyn. Notably, **three main clusters or neighborhoods emerged as particularly well-scored**. The first cluster, situated on the border of **Bath Beach and Bensonhurst** in Southwest Brooklyn, demonstrates strong potential. The second cluster near **Broadway Junction/Brownsville** in East Brooklyn and the third cluster in **East New York** also stand out as high-scoring areas. Subsequently, a detailed examination of each cluster was initiated, delving into the unique characteristics and opportunities presented by these top-scoring parcels in preparation for further analysis and decision-making.

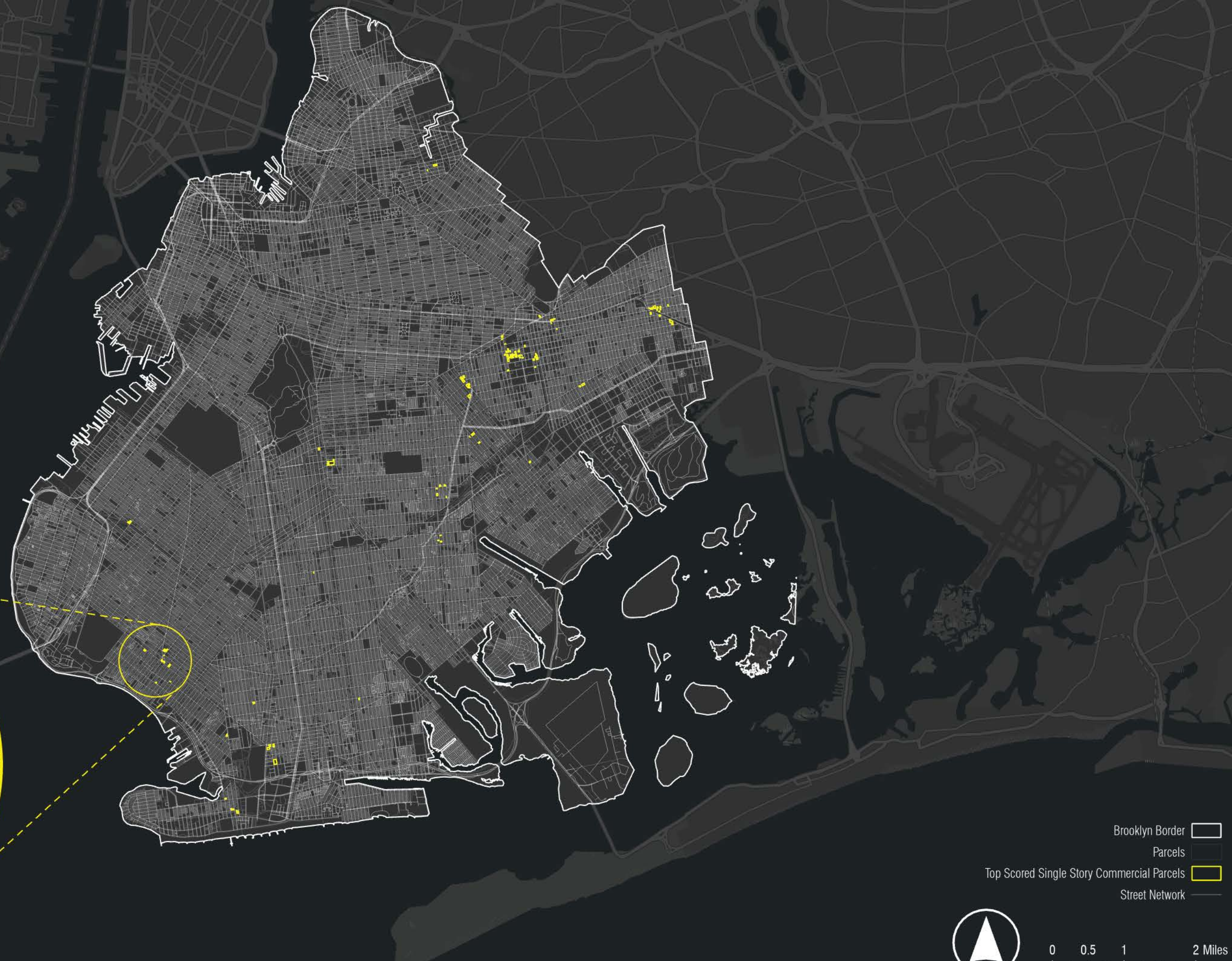




# Findings

## Bath Beach / Bensonhurst Case Study

The Bath Beach/Bensonhurst case study scrutinized 16 parcels situated at the boundary of these predominantly low-density, residential neighborhoods. Despite the residential focus, the commercial vitality of 86th Street, New Utrecht Avenue, and 18th Avenue, all bustling corridors, significantly contributes to the area. The presence of the D train overhead line above New Utrecht Avenue further enhances the accessibility of the location. Following a comprehensive examination utilizing Google Earth and Google Street View, 14 out of the 16 selected sites emerged as highly conducive for potential Town Center Zoning Affordable Housing projects. The two parcels deemed ineligible for development include a historically significant bank and a relatively small, seemingly private garage. While the model has demonstrated considerable success, a thorough review of the selected sites is imperative to ensure their appropriateness for housing initiatives.

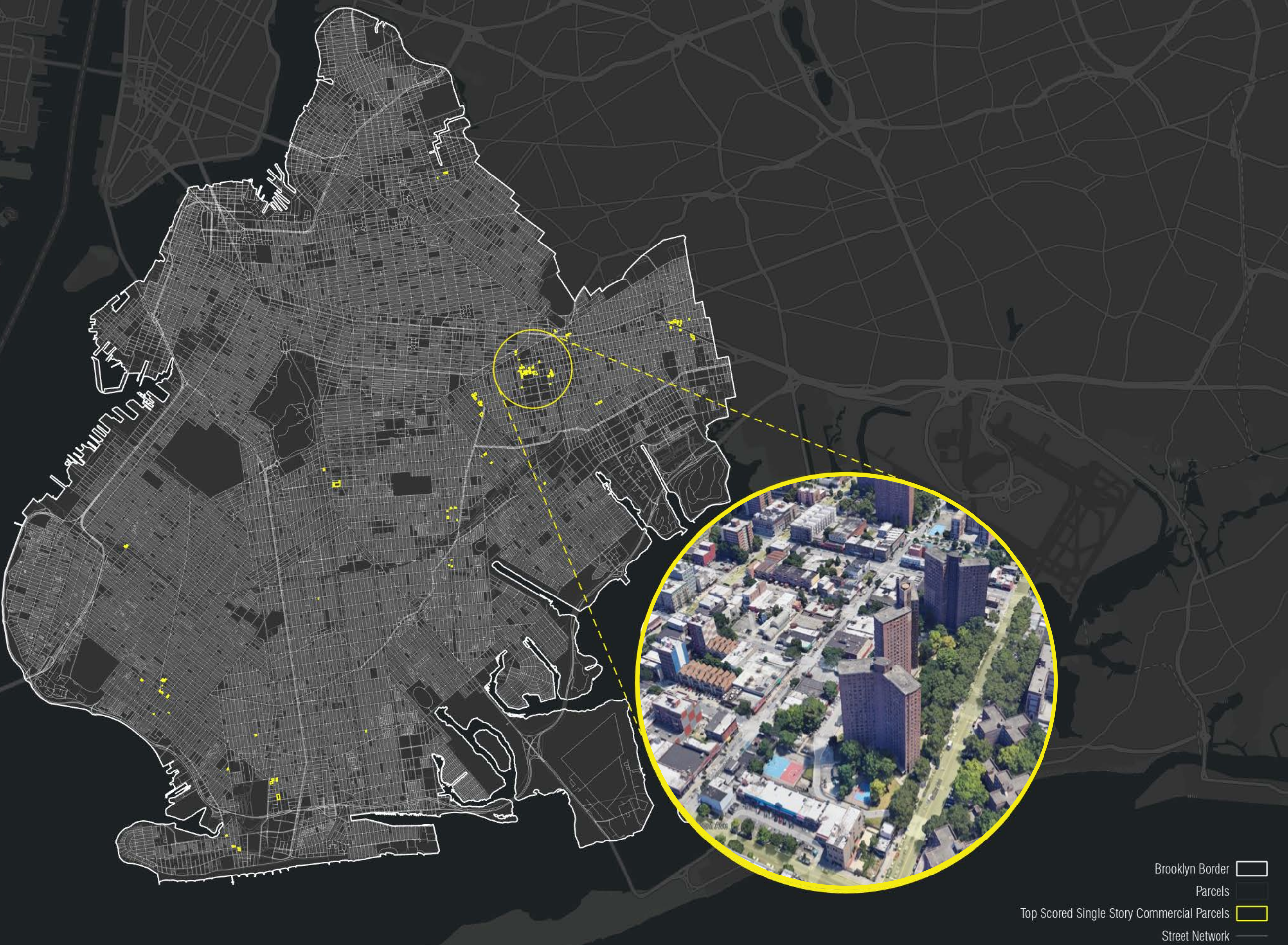




# Findings

## Broadway Junction / Brownsville Case Study

The Broadway Junction/Brownsville case study thoroughly examined 53 parcels surrounding the Langston Hughes Homes, a public housing project situated between Sutter and Pitkin Avenues. In contrast to the prevalent “towers in the park” model seen in the Langston Hughes Homes, the surrounding neighborhood primarily consists of low-density single-story commercial spaces. However, an exploration into the potential of increased density above these existing commercial structures reveals an opportunity to complement the high-density towers in the park. Integrating additional housing units above the single-story commercial spaces could offer a harmonious blend of residential and commercial functions, contributing to a more vibrant and diverse urban fabric. This approach aligns with contemporary urban planning principles, promoting mixed-use development that enhances both the livability and economic vitality of the Broadway Junction/Brownsville area.





# Findings

## East New York Case Study

The East New York case study delved into the examination of 18 parcels surrounding Conduit Boulevard. Notably, East New York stands as a predominantly low-density neighborhood. In this context, the exploration of increased housing density within the vicinity of Conduit Boulevard emerges as a potential catalyst for neighborhood enhancement. Introducing additional housing units holds the promise of addressing the growing demand for affordable living spaces, thereby contributing to the diversification and revitalization of the community. By strategically integrating increased housing options, East New York could witness improved economic vitality, increased community engagement, and a more sustainable urban landscape. This approach aligns with the broader goals of fostering inclusive and resilient neighborhoods while accommodating the evolving needs of residents in this vibrant Brooklyn community.





# Conclusive Thoughts

## Limitations:

This study is characterized by a predominantly top-down and quantitative approach, potentially overlooking nuanced community perspectives crucial for comprehensive decision-making. School capacity within the selected sites was not considered, overlooking a key factor for evaluating their suitability for increased housing. A deeper exploration of demographic data could provide a more nuanced understanding of the unique needs and characteristics of the communities under study. The reclassification process, simplifying complex data into discrete classes, may oversimplify the variations within chosen criteria, potentially affecting the accuracy of the final analysis. Furthermore, the study lacks an in-depth examination of architectural and structural feasibility for the identified sites, a crucial consideration for the practical implementation of affordable housing projects.

## Future Research:

To address these limitations, future research could involve a more thorough investigation into the demographic composition around the selected sites, providing valuable insights into the specific needs and preferences of the local population. Creating 3D models of the identified sites could enhance the visualization of development potential, offering a more realistic representation of how affordable housing projects might integrate with existing urban landscapes. A comprehensive analysis of the architectural and structural feasibility of the identified sites should be included in future studies, assessing the adaptability of existing structures or determining the feasibility of new constructions. Additionally, engaging with local stakeholders and community leaders is imperative for a holistic understanding of community needs and preferences. Future research should involve collaborative efforts to ensure the proposed developments align with the aspirations of the residents and contribute positively to the community fabric.



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