

### **Station Evaluation Process**

#### **Methodology**

There were 239 transit stations analyzed for this report to determine the demand for bicycle parking. Potential locations were compiled from several sources including CDOT, the Metropolitan Transportation Authority, the staff of the NYC Department of City Planning-Transportation Division, and the *New York City Bike Parking Survey*. After discussing the scope of the study with the CDOT Bicycle Program, a list of transit stations were provided to DCP; all of which CDOT staff were interested in having surveyed as a part of this study to establish the level of demand for bicycle parking at each listed station. The Strategic Initiatives Division of the MTA expressed an interest in the study and were interested in finding out what the actual demand for bicycle parking was along the (7) subway line in the borough of Queens. As a result, all of the stations along the (7) line were added to the list of locations to be surveyed. A meeting was also held with staff members of DCP-Transportation Division to get a sense of possible demand for bicycle parking at transit stations in the outer boroughs where cycling may be a primary means of transportation for many people. In addition, terminal stations at the end of the subway lines and stations with connectivity to other modes of transportation were added to the list. The land-use for each station varied and included schools, residential areas and commercial areas.

*The New York City Bike Parking Survey* was a survey conducted via the internet by two Hunter College students as a part of a graduate school project to find out where New Yorkers would like to have bicycle parking placed to meet their needs. The *New York City Bike Parking Survey* was approaching its final stages of data collection concurrently with the assembly of the preliminary list of transit stations for this study. Because the locations provided by the respondents were located throughout the city, it was determined that the information from the survey would be valuable for use in this study. The locations that were in close proximity to train stations were extracted from the survey data and added to the list of locations. (See Appendix C for complete list)

Prior to surveying each station, DCP staff were trained by a CDOT *CityRacks* inspector on the correct method of siting a location for *CityRacks* installation. Upon the completion of training, each station was surveyed using the specifications provided in the CDOT Bicycle Parking Clearance Standards. (See Appendix D) The stations were visited between the hours of 9am and 5pm throughout the summer months between June and August 2008 during suitable bicycle riding conditions. The existing conditions of each subway station was documented and included a general description of the sidewalk widths, the number of bicycles found at the station, the available bicycle parking and recommended locations for potential bicycle parking placement. Unable to determine whether all of the bicycles noted during this study belong to commuting cyclists or those simply running errands in the area, recommending bicycle parking regardless of the user, ensures the need for bicycle parking is being met. After all of the stations were surveyed, the data was entered into a spreadsheet and analyzed to establish stations that exhibited a demand for bicycle parking, the type of racks that were at each station and whether the existing bicycle parking demand was being met by the available bicycle parking.

## ***Bicycle Access and Parking for Subway & Commuter Rail Users***

---

While the stations were being surveyed, research was conducted to establish a list of bicycle parking designs that are secure and able to get the maximum use of the rack within the available space. After extensive research, eight bicycle parking designs were chosen that were not only secure but implementable in New York City. Each design was also chosen based upon its ability to function under specific conditions. Each station has its own conditions and level of demand. In an attempt to satisfy the demand for bicycle parking without making adjustments to the space, the selected designs were adjusted to meet each station's needs fulfilling the site specific criteria of the study. With security as a main concern for many New York City cyclists, all of the bicycle parking options that were selected had to meet basic security standards, which included resistance to pipe cutters and the user's ability to lock their bicycle to more than one point on the rack. It is important to note that while site specific bicycle parking designs were chosen for this study, each station can benefit from the installation of *CityRacks bicycle rack*. In addition, a complete list of the stations surveyed for this study has been made available to the *CityRacks* Division at CDOT for *CityRacks* installation according to their to be determined schedule.

Once the data was collected, the demand for each station was determined and the bicycle parking designs were selected. The data was sorted a second time to include an installation priority rating and a site specific bicycle parking treatment. The installation priority system from highest to lowest (1+ - 3) is based upon the number of bicycles found at each station and whether the demand is being met with the provided bicycle parking. At stations where many bicycles were found parked but there were only two inverted "U" *CityRack*, those stations were assigned a priority level 1. A station under the previously described circumstances could have several bicycles parked along the sidewalk and station entrances, posing a hazard to transit users and pedestrians. With a high rating, it is understood that immediate bicycle parking is needed to meet the existing demand and minimize the possible risks posed to the public. On the other hand there were stations that had a low existing demand for bicycle parking that may or may not be met with available bicycle parking. In this case the station receives a rating of 3 indicating that while bicycle parking is needed, the impact of not having immediate installation will have a minimal effect on the station and the cyclists in the area.

Upon closer review of the stations sorted by borough, it was determined that under the existing priority system the boroughs of Staten Island and the Bronx were at a great disadvantage in comparison to the other boroughs because borough-wide there were very few bicycles at the observed transit stations. The results under the established system generated a borough-wide low priority rating. If these results correlated with an actual implementation phasing system, both the Bronx and Staten Island would be the last boroughs to receive services. It was determined that in order to maintain equity, the boroughs with the lowest demand should not be measured at the same scale as the other boroughs with a higher bicycle parking demand. A new installation priority system was developed from highest to lowest (1\* - 3\*) to be used only for the Bronx and Staten Island. (See Appendix D for complete priority rating list)

## ***Bicycle Access and Parking for Subway & Commuter Rail Users***

---

**Priority Table used for stations in  
Brooklyn, Manhattan & Queens**

<b># of Bicycles</b>	<b>Priority Level</b>
>50	1*
11-49	1
6-10	2
0-5	3

**Priority Table used for the Bronx and Staten Island**

<b># of Bicycles</b>	<b>Priority Level</b>
1-4	1*
0	3*

After each station was assigned a priority rating and all possible site specific bicycle parking designs were examined, a case study recommendation matrix was created to assist in selecting the station that could best demonstrate the benefits and functionality of each chosen bicycle parking system within a specific environment. To create the matrix, all of the stations with a priority rating less than (1 or 1\*) were extracted from the total data set. Those stations that required additional evaluation from CDOT or whose supply of existing racks met the current demand were also extracted from the data set. The remaining stations were sorted by borough and were added to the case study recommendation matrix. With the matrix complete, the field notes and pictures for the corresponding stations were reviewed to determine which station was best suited as a case study for each bicycle parking design. It was also important when choosing the stations for case studies that each borough was represented. From this process the nine stations for selected for case studies.

*(See matrix on next page.)*

## Bicycle Access and Parking for Subway & Commuter Rail Users

### Case Study Recommendation Matrix

	CityRack	Retrofitted Parking Meter	Tree Guard	Vertical Bicycle Rack	Bike Lockers	Curb Extension	2-Tiered Bicycle Parking	Cemusa	Multiple "U"	Indoor Parking
<b>Brooklyn</b>										
Lafayette ( C )		X								
Carroll St. (F,G)		X								
7th Avenue (B,Q)		X	X	X						
DeKalb Ave* (B,Q,R,M)				X						
Graham (L)		X							X	
Metropolitan Avenue (G)										X
Court St. Borough Hall (M,R,2,3,4,5)								X	X	
<b>Bronx</b>										
Spuyten Duyvil (Metro North)					X					
Fordham (Metro North)	X									
Kingsbridge Road (4)									X	
Bedford Park Blvd (D)	X									
<b>Manhattan</b>										
Astor Place (6)									X	
Delancey St-Essex St (F,J,M,Z)		X								
2nd Ave/LES (F,V)		X								
116th St-Columbia University (1)			X							
23rd St (F,V)			X						X	
Brooklyn Bridge/City Hall (4,5,6)							X		X	
1st Ave (L)		X								
6th Ave (L)		X								
14th St-6th Avenue (F,V)									X	
14th St-Union Square (L,N,R,W,Q,4,5,6)							X			
<b>Queens</b>										
Flushing (LIRR)		X								
74th St-Broadway (7,E,F,V,R,G)		X				X				
46th St (7)			X						X	
Jackson Heights-Roosevelt Ave (E,F,G,R,V)				X					X	
Vernon Blvd/Jackson Ave (7)						X			X	
90th St/Elmhurst Ave (7)		X				X				
Astoria/Ditmars Blvd (N,W)	X								X	
<b>Staten Island</b>										
Eltongville (SIR)		X								
St. George (SIR)								X		
Grant City (SIR)	X									

X Station has met criteria for specific parking system  
X Station chosen as a Case Study

### **Data Analysis by Borough**

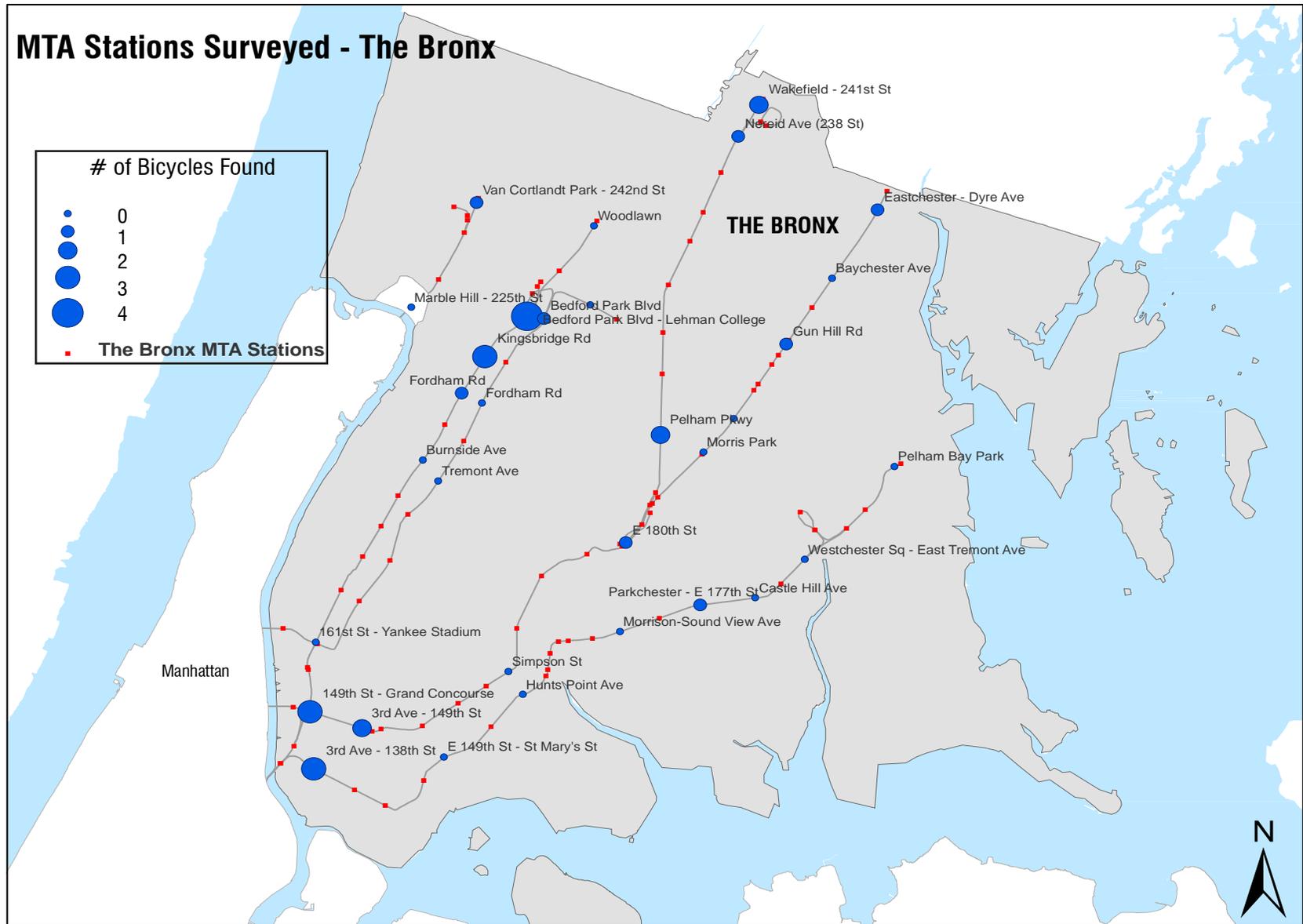
After surveying the 239 transit stations throughout the five boroughs, it was discovered that there were many more cyclists in the outer boroughs than previously expected. This study uses the number of bicycle found at each station as the determining factor for bicycle parking demand. The method of analysis used in this study does not distinguish the difference between commuter cyclists and cyclists using the available bicycle parking while conducting errands or for everyday bicycle storage. While this survey does not accurately indicate the total number of cyclists that ride to and from transit on a daily basis, it is a starting point to determine whether or not the demand for bicycle parking regardless of its user exists at the observed stations and whether this demand is being met. This chapter summarizes the data for each borough, and includes maps of each borough depicting the stations that were surveyed and the number of bicycles found at each one. These maps show some significant patterns pertaining to bicycles parked near transit, such as higher concentrations of parked bicycles in certain neighborhoods (e.g., Manhattan below 23rd Street); or along certain subway lines (#7 train in Queens). Priority maps have also been included to depict the distribution of stations throughout each borough based upon the priority rating system included in the methodology.

**The Bronx**

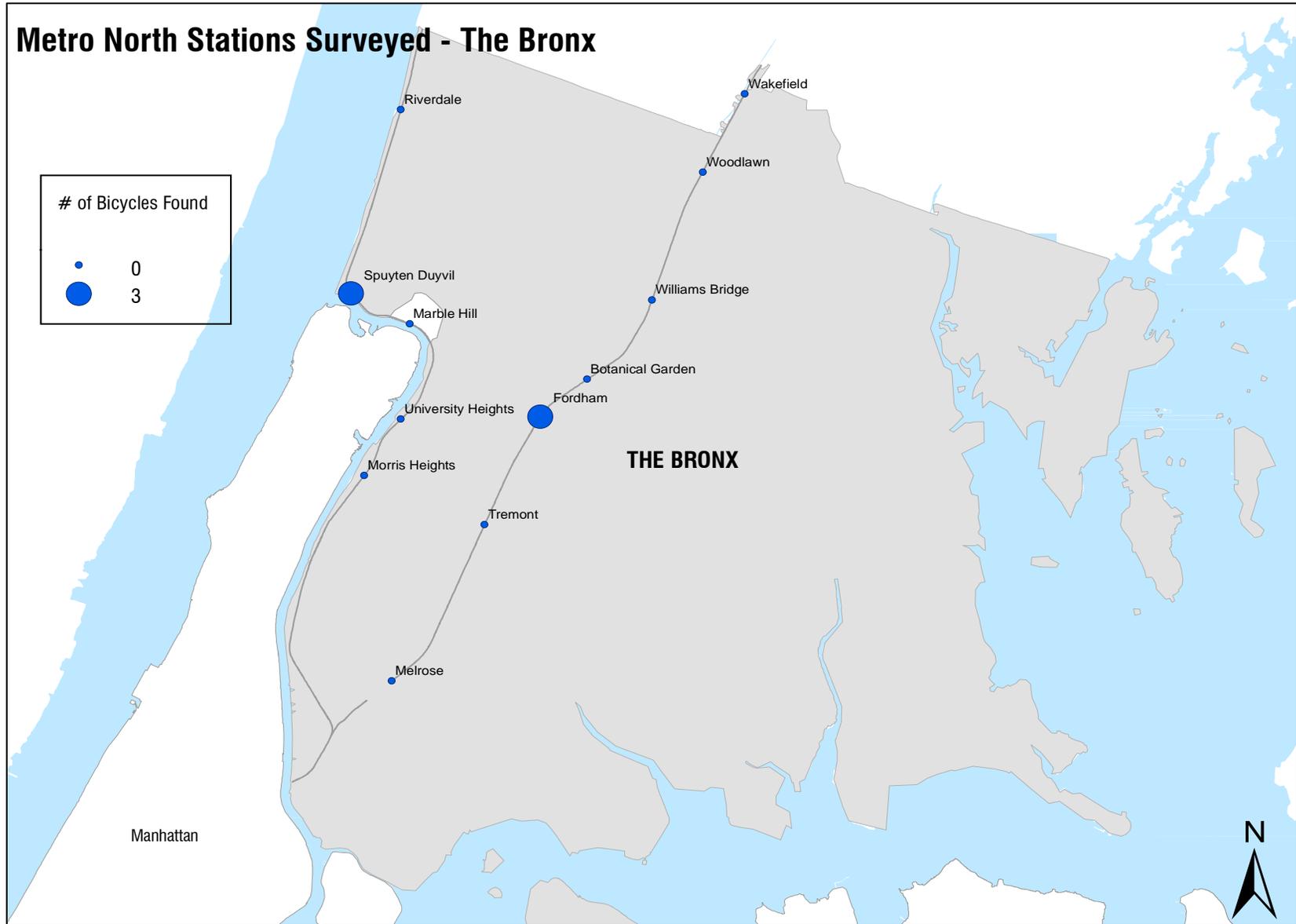
In the Bronx, 44 stations were surveyed including 12 Metro North stations. Of the stations surveyed, 17 stations exhibited bicycle activity with a maximum of three bicycles found parked at a station. Five percent of the stations surveyed provided bicycle parking. Based upon this limited survey, it is very difficult to determine the reason for such a low demand for bicycle parking at transit stations throughout the borough. It appears that such low bicycle activity could be attributed to the suspicion of bicycle theft and/or the absence of secure bicycle parking at the transit stations. If there is no secure bicycle parking available at the surveyed transit stations in the Bronx, it is fair to assume that the cyclists in the area will not bring their bicycle to the stations. Another factor may be the lack of existing bicycle infrastructure that leads to and from the transit stations. When compared to a map of existing Class I, II, & III bicycle lanes throughout the borough, the western end of the borough with the greater number of bicycle lanes was the same area found during this study to have the greater number of bicycles at the transit stations. If there is no safe route to and from the stations, cyclists, particularly novice cyclists will not feel comfortable riding to transit as a link in their daily commuting chain.

Based upon the findings of this bicycle parking study, it is recommended that basic secure bicycle parking be provided at most transit and Metro North stations throughout the borough. Increasing the amount of bicycle lanes borough-wide may also encourage potential users to bike to transit.

# Bicycle Access and Parking for Subway & Commuter Rail Users



*Bicycle Access and Parking for Subway & Commuter Rail Users*



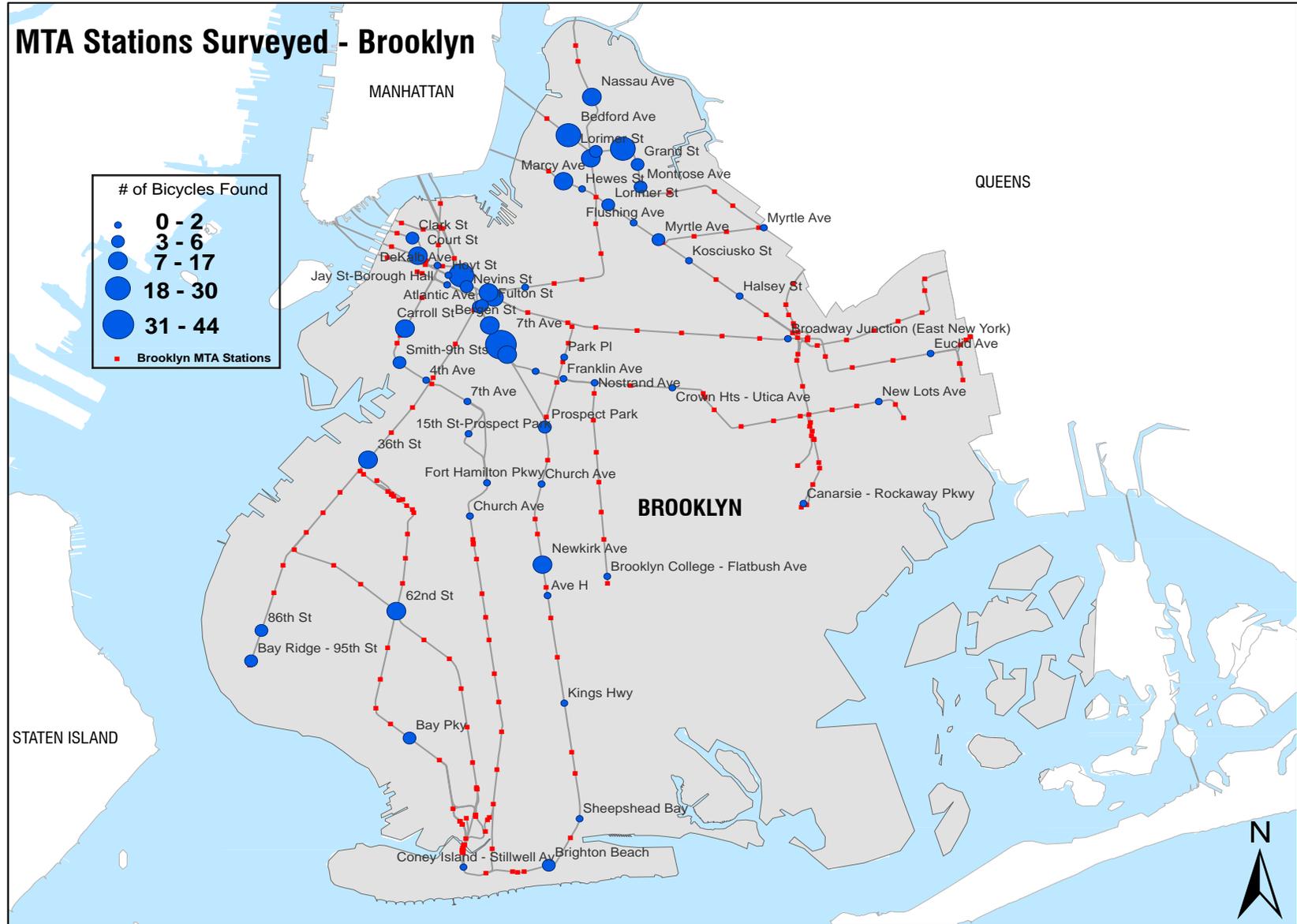


### **Brooklyn**

In the borough of Brooklyn, there were 60 stations surveyed. Among the stations surveyed, those with 11 or more bicycles found were considered high priority stations. 47 percent of the stations surveyed provided some form of bicycle parking. However, it was observed that the available parking was either not sufficient for the current demand, or the available parking provided was not the best fit for the space. In the northern section of Brooklyn, there are more bicycles than there is space to park them. In areas with such high demand for bicycle parking, alternate methods of bicycle parking are needed to minimize clutter and maximize the use of available space on sidewalks and inside subway stations.

Overall, there is a large amount of bicycle activity within the borough of Brooklyn, unfortunately this activity is concentrated in small areas, such as the Williamsburg neighborhood. Through expanded bicycle infrastructure, potential users can be encouraged to include cycling in their commute which will increase the demand for bicycle parking at transit stations in other neighborhoods in the borough.

# Bicycle Access and Parking for Subway & Commuter Rail Users





## ***Bicycle Access and Parking for Subway & Commuter Rail Users***

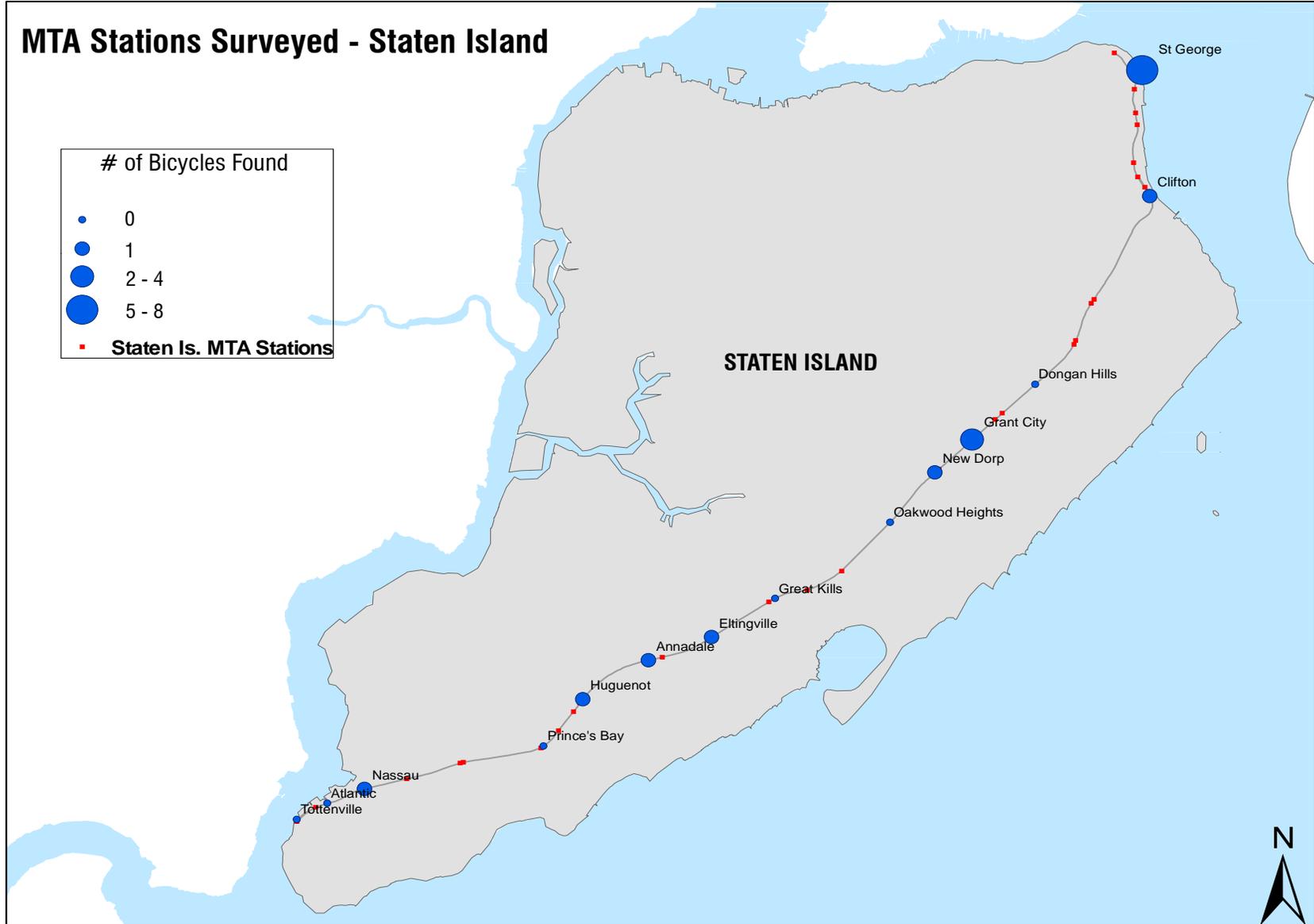
---

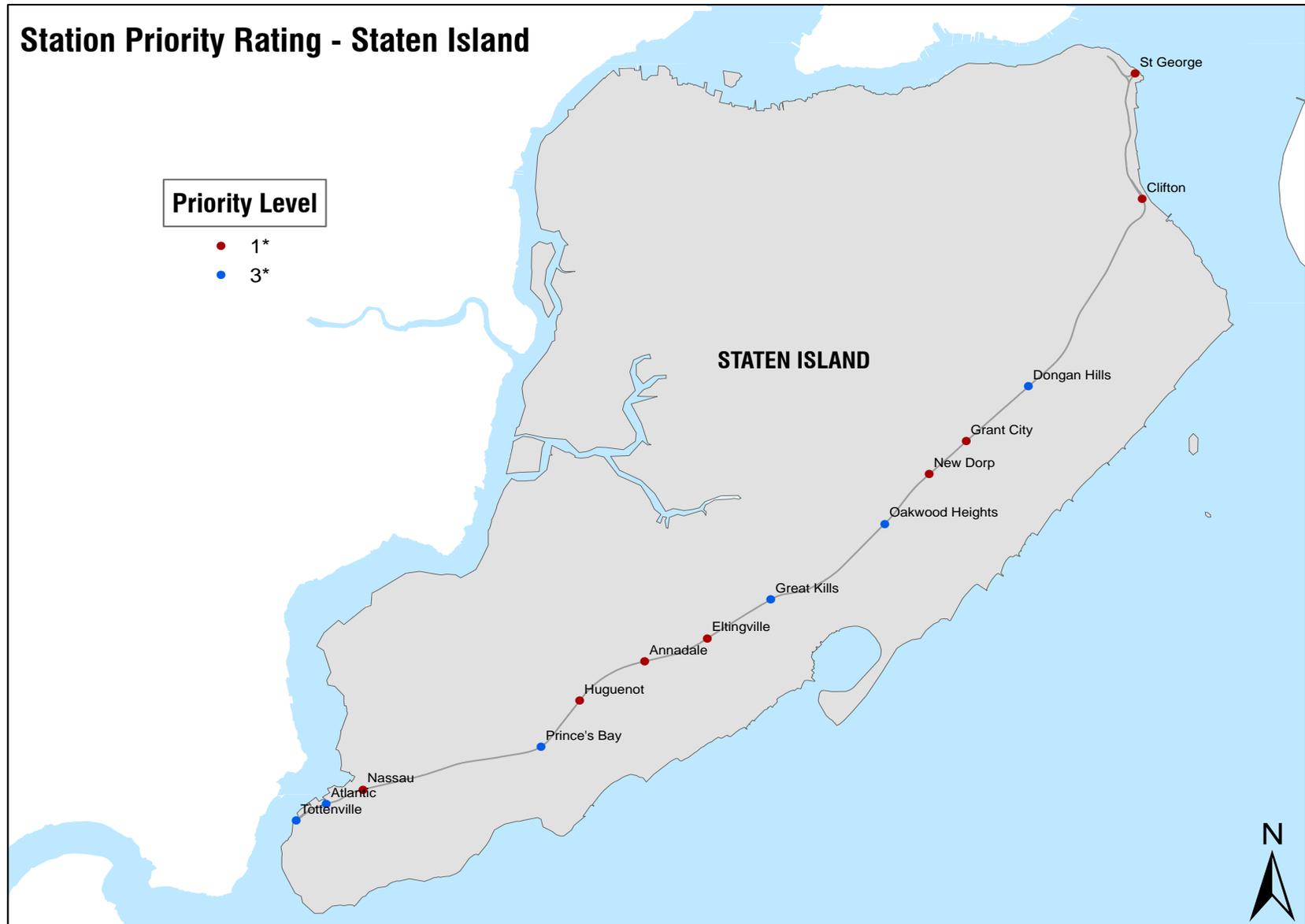
### **Staten Island**

The Staten Island Rail Road travels north and south along the eastern side of Staten Island. Out of 22 stations along the Staten Island Rail Road, 14 stations were observed for this study. Fifty percent of the stations observed displayed signs of bicycle activity. There were eight bicycles found at the St. George Ferry terminal. (The actual number of cyclists that travel to the ferry terminal is unknown because many cyclists take their bicycles onto the ferry and continue their commute once they arrive in Manhattan.)

Unlike the other boroughs, Staten Island is a more suburban community where cars are the dominant mode of transportation, and the narrow roadways and topography can make it difficult to encourage cycling as a form of commuting. In order to increase the overall number of commuter cyclists in the borough, the proper bicycle infrastructure must be in place to allow people to feel safe while riding their bicycle on the roadway. Simultaneously, secure bicycle parking must be made available to cyclists at the rail stations once they arrive. Installing a standard inverted “U” bike rack at each station would meet existing and potential demand in the future, provide safe and secure parking, and encourage others to consider cycling as part of their commute to the station.

# Bicycle Access and Parking for Subway & Commuter Rail Users



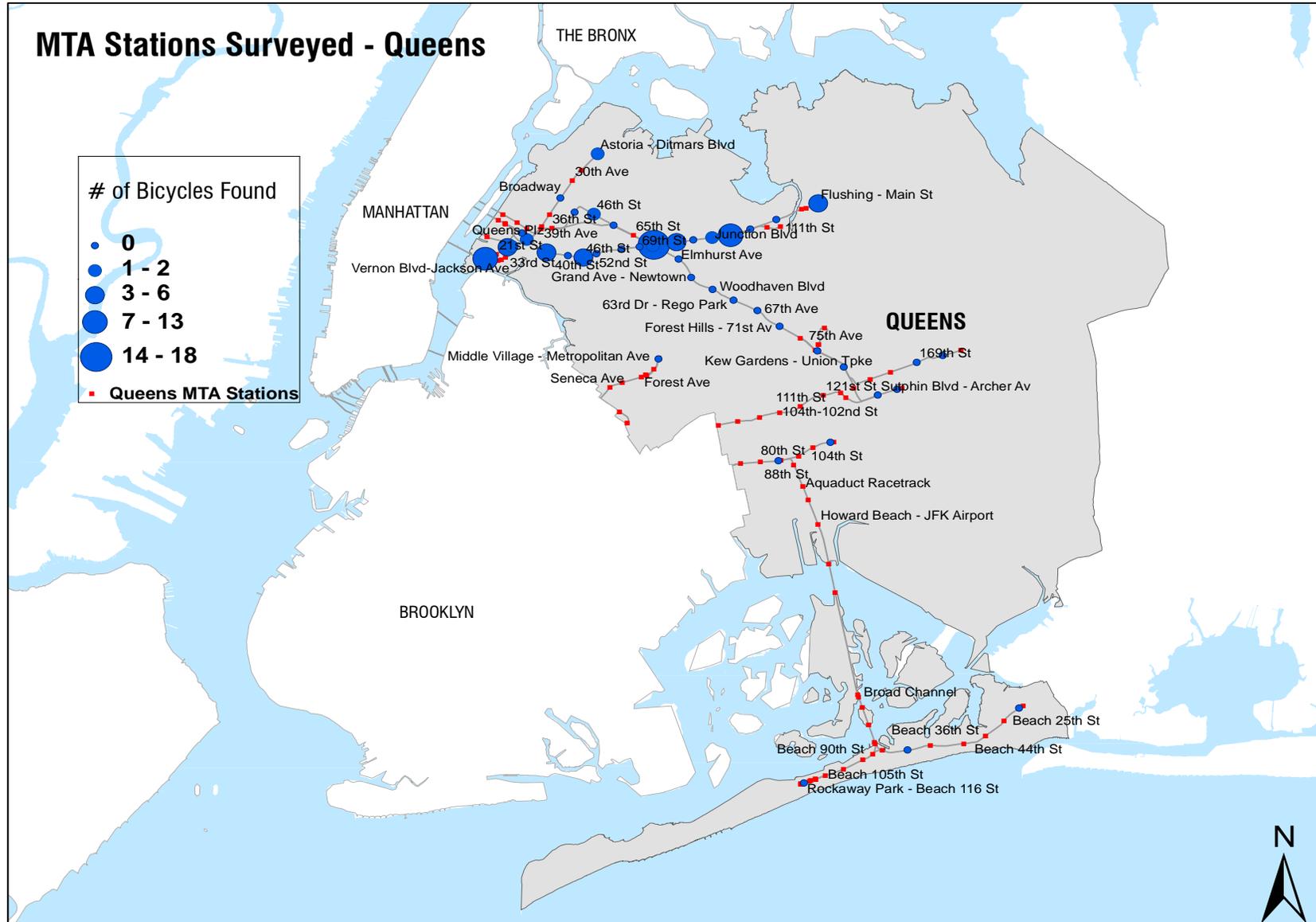


### **Queens**

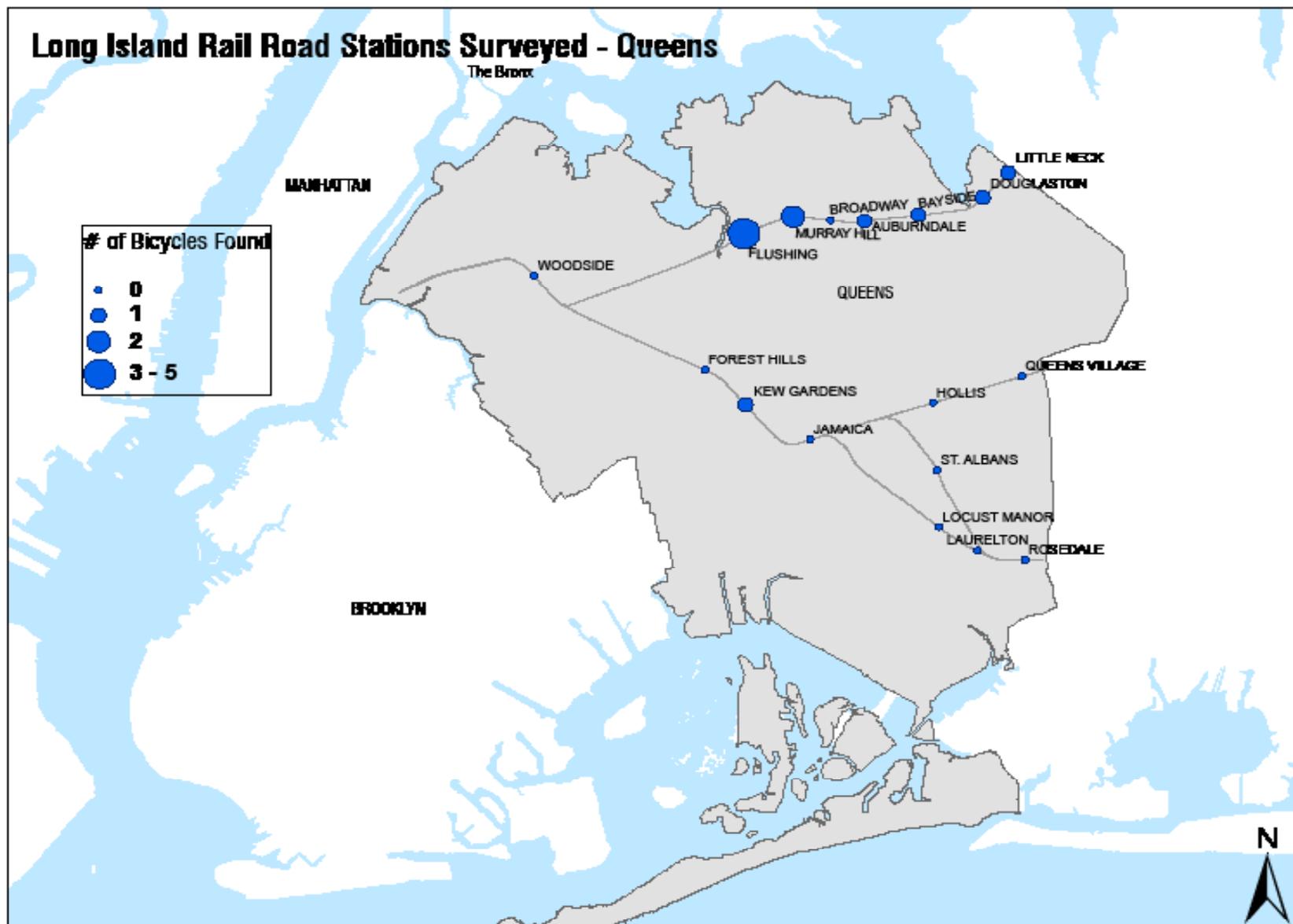
Based on surveys of over 60 stations in the borough of Queens, it was determined that stations with the highest number of parked bicycles were all located along the (7) subway line. In most cases there were *CityRacks* installed at these stations with very high counts of parked bicycles. However, the existing racks are not meeting the current demand. With such a high demand, *CityRacks* alone will not be able to quell the need for bicycle parking along the this subway line. It is recommended that the MTA and CDOT collaborate to analyze each individual station and evaluate the available space above and below ground, considering non-traditional methods of bicycle parking to meet existing and future demand.

Stations in Queens that are not located along the (7) subway line also displayed a demand for bicycle parking based on the number of parked bicycles observed during field visits. Many Queens residents do not live within walking distance of a subway station and require the use of the bus or commuter van to get to the subway. By providing adequate secure bicycle parking at the stations in Queens, residents will have the option of cycling to the subway avoiding overcrowded buses and congested roadways.

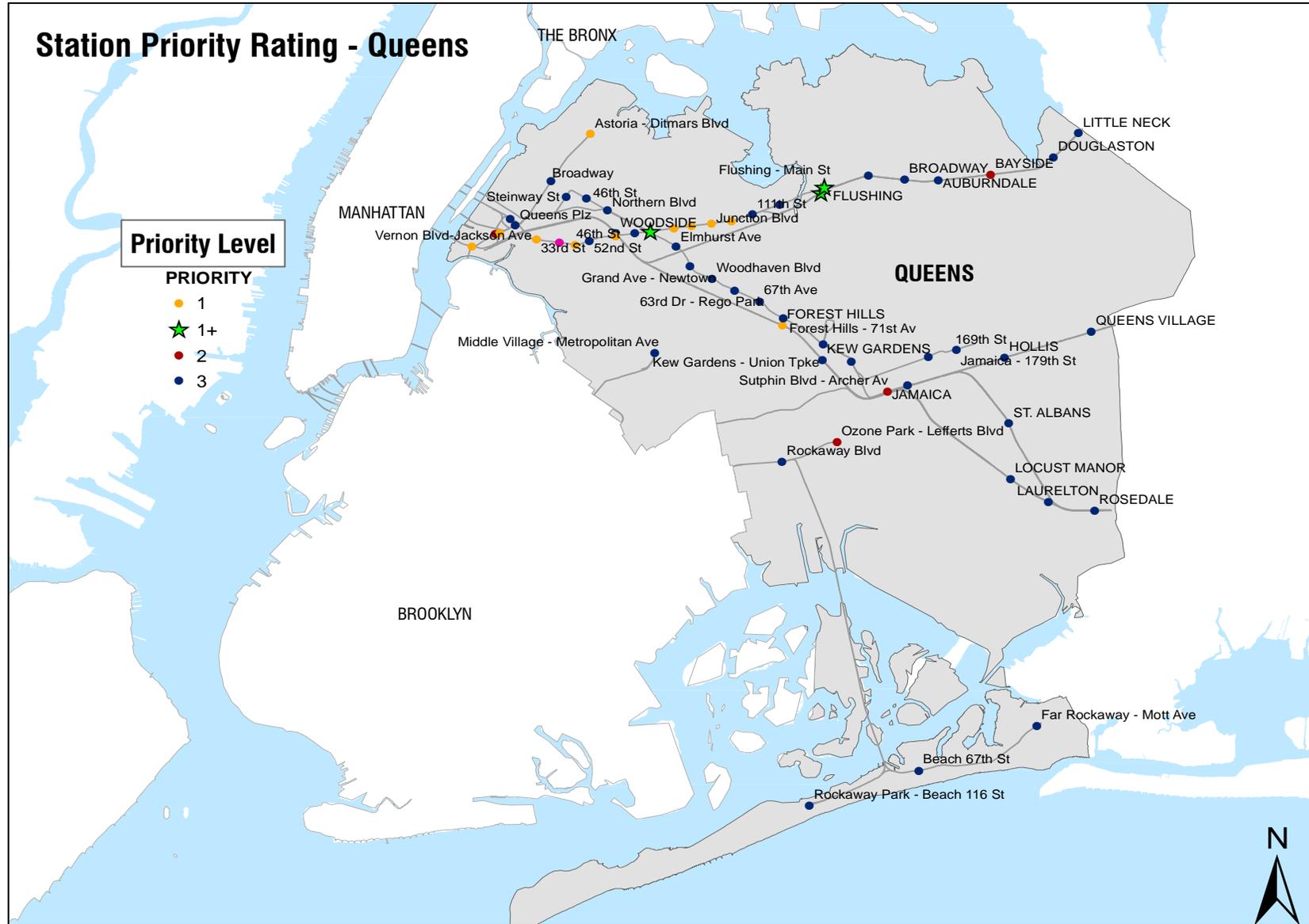
## Bicycle Access and Parking for Subway & Commuter Rail Users



*Bicycle Access and Parking for Subway & Commuter Rail Users*



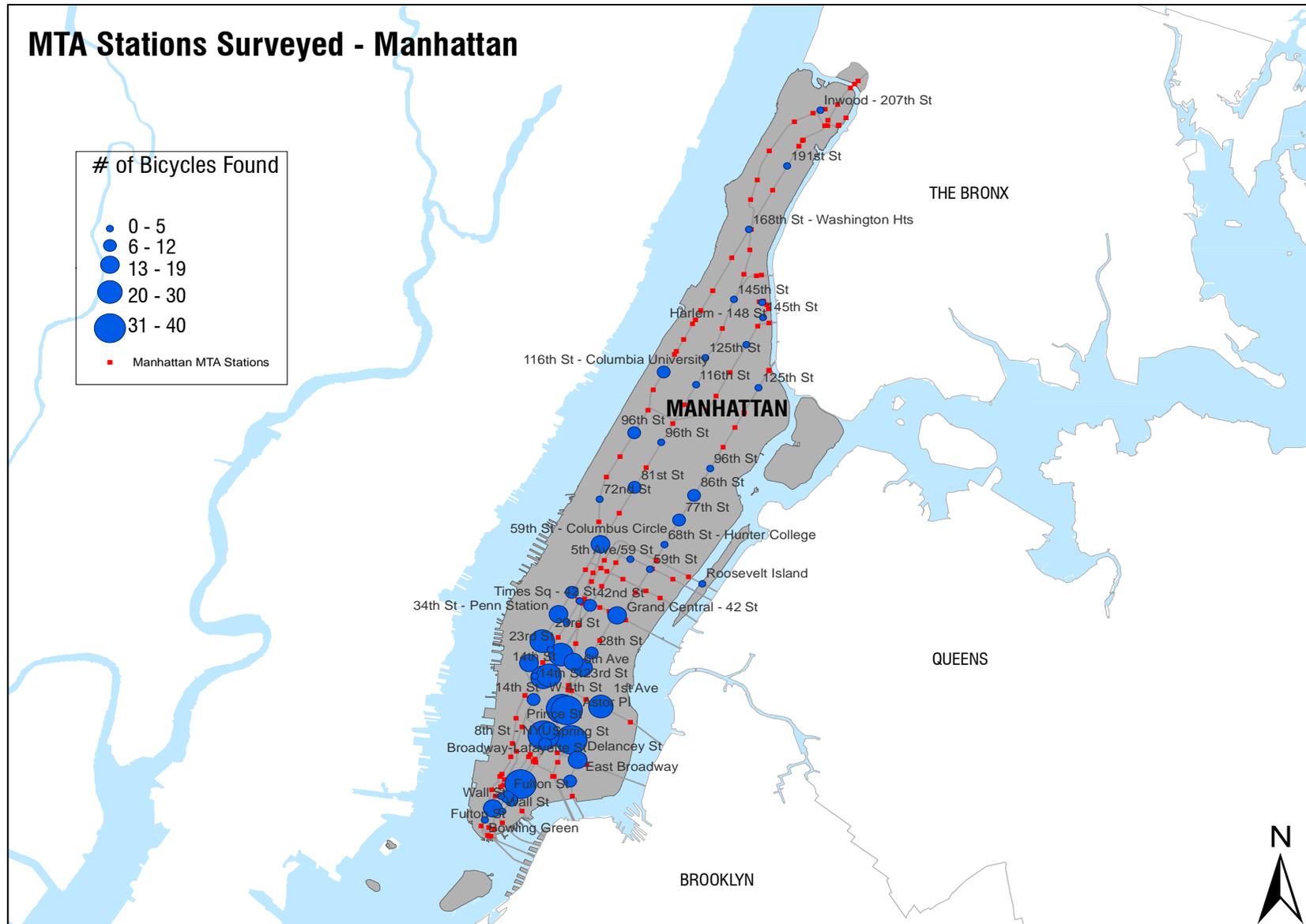
# Bicycle Access and Parking for Subway & Commuter Rail Users



**Manhattan**

From surveys of 60 stations in Manhattan, it was observed that almost 50 percent of the stations did not have bicycle parking available. At some of these stations without bicycle parking, bicycles could be found locked to the nearest available street furniture. This disorganized and informal system resulting from a lack of bicycle parking produces a safety concern for both pedestrians and passengers entering and exiting transit stations. To address this situation, it is recommended that secure bicycle parking be installed at all stations in Manhattan in relation to the documented demand. In addition to installing bicycle parking, a semi-annual observation period would help to determine if additional parking is needed to meet growing demand.

**Bicycle Access and Parking for Subway & Commuter Rail Users**



## Bicycle Access and Parking for Subway & Commuter Rail Users

