Atlantic Avenue Corridor Transportation Study

New York City Department of City Planning

Unified Planning Work Program
Atlantic Avenue Corridor Transportation Study

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New construction on Atlantic Avenue near Buffalo Avenue

Introduction

This study examines the transportation network along Atlantic Avenue in Brooklyn between Vanderbilt Avenue and Eastern Parkway Extension, running through multiple neighborhoods including Crown Heights, Clinton Hill/Fort Greene, Bedford Stuyvesant and Ocean Hill.

The corridor contains a wide variety of land uses, including manufacturing, commercial, and residential; the balance among these uses has shifted over time. The residential population has grown significantly over the past three decades, and is anticipated to continue to grow. In light of this growth, this study aims to assess the current performance of Atlantic Avenue as a major traffic corridor, and to anticipate how this performance might be affected by continued growth along the corridor.

The analysis included in this study should be considered within the context of adjacent transportation and land use studies, including *Sustainable Communities: East New York*, a comprehensive study released in June 2014 by the Department of City Planning in partnership with several public agencies, and numerous traffic studies and Vision Zero projects being conducted by the NYC Department of Transportation (NYCDOT). Further improvements by DOT or other agencies could affect this analysis.

Turning lanes under the Long Island Railroad at Atlantic Avenue and Nostrand Avenue

Purpose and Methodology

In light of the continued growth along Atlantic Avenue and the surrounding neighborhoods, the Department of City Planning set out to assess the ability of the street network to handle additional travel demand that could be spurred by this development.

To do this, the Department first collected traffic data from key intersections along the Atlantic Avenue corridor. This data was analyzed to determine how the intersections were performing, both in terms of traffic volumes and delay and safety. Then, a “stress test” was performed, in which a potential future mixed-use growth scenario was developed for the corridor. The resultant increase in travel demand due to this development was estimated, and this increased traffic was applied to the network to identify intersections that could be problematic in the future. With this data, the City Planning developed operational improvements to determine if these problem areas could be remedied.

These results can be used to support future planning efforts by the City and inform land use decisions for the neighborhood.

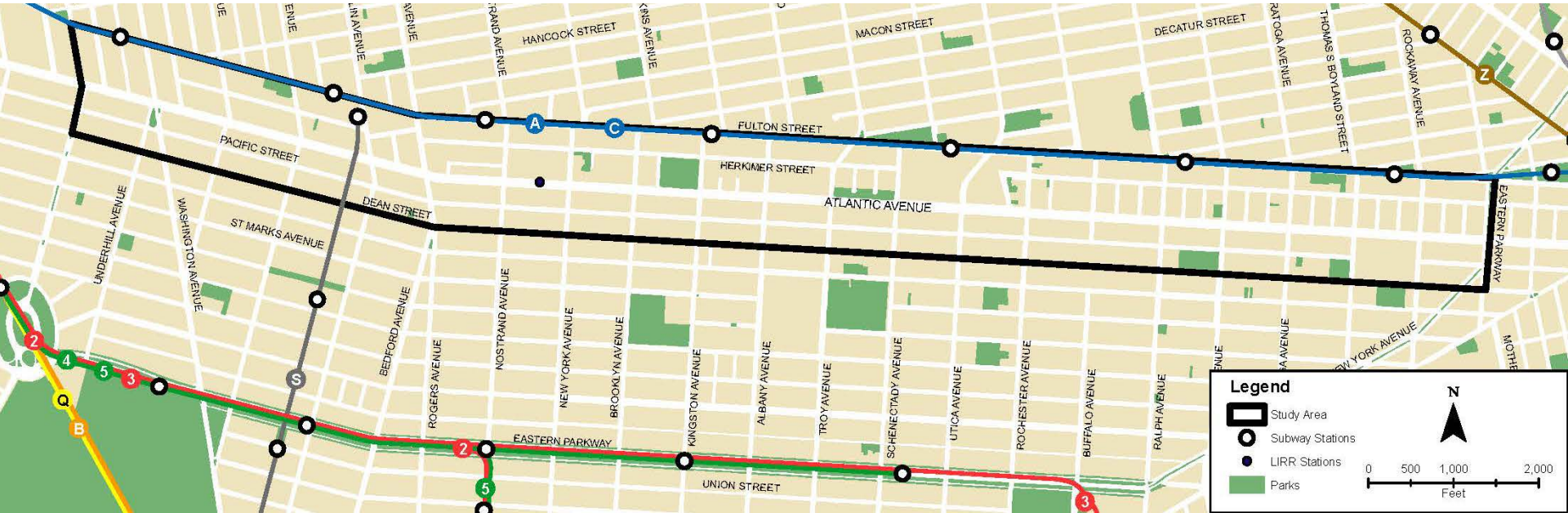
Study Area

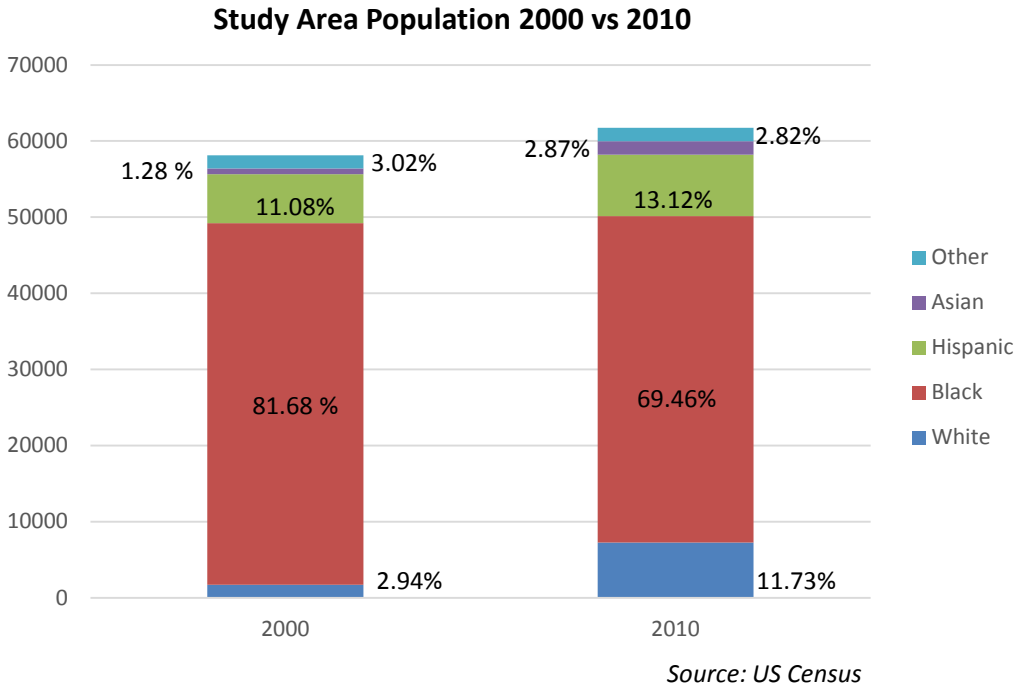
The study area features a mix of manufacturing, commercial, and residential uses, though low-rise manufacturing districts are particularly prominent along Atlantic Avenue itself. Scattered throughout these manufacturing districts are multiple vacant or under-utilized sites.

The study area is densest to the west, closest to Atlantic Terminal and Downtown Brooklyn. Clinton Hill and Fort Greene feature medium-density, three- to four-story buildings along Atlantic Avenue, with Barclays Center anchoring the intersection of Atlantic and Flatbush Avenues. The large-scale Pacific Park mixed-use development (formerly Atlantic Yards) is currently under construction. Further east, residential areas become characterized by smaller walk-up buildings, and Atlantic Avenue by low-rise warehouse and auto-oriented uses. The eastern edge of the study area, in Ocean Hill, contains a mix of housing types. While the neighborhood is mostly populated by smaller buildings, there are two twenty-three story residential towers along the south side of Atlantic Avenue.

The population of the study area grew 6.17% from 2000 to 2010, from 58,147 in 2000 to 61,734 in 2010. This population growth rate is higher than that of Brooklyn (1.6%) and New York City as a whole (2.1%) over the same period. However, the study area has a lower population density than some surrounding neighborhoods.

The Atlantic Avenue Corridor study area





Source: US Census

The neighborhoods around the Atlantic Avenue corridor are predominately black or African American, with just under 70% of the 2010 population identifying as part of this group. Many of the neighborhoods along the corridor, such as Bedford-Stuyvesant and Crown Heights, have long been known for their vibrant African American communities. Although these neighborhoods are still predominately black, demographic shifts have occurred over the past decade. The white population has increased to approximately 12 percent since 2000, with Hispanics now making up about 13 percent of the population. The remaining 5 percent of the study area's population is comprised of Asians and people of varying races. The black population is distributed fairly evenly throughout the study area, but the white population is clustered west of Bedford Avenue and the Hispanic population east of Utica Avenue.

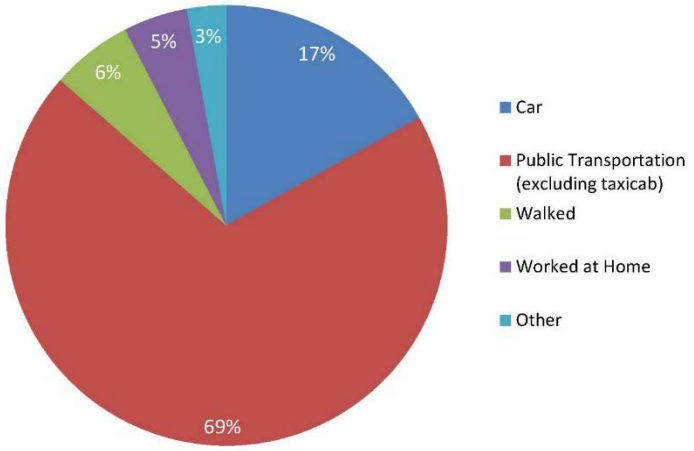
The median household income for the study area was $42,114 in 2013, which was below the medians of both Brooklyn and the City. In 2013, 27.3 percent of individuals of the study area were below the poverty level, a greater portion than in Brooklyn and New York City overall. Census tracts west of Washington Avenue are generally more affluent than the rest of the study area. The unemployment rate of the study area—7.6 percent— was higher than that of Brooklyn and New York City, which were 6.78 percent and 6.74 percent respectively.

More than two-thirds of the area's residents travel to work by public transit—60 percent by subway and 8 percent by bus. About 15 percent of residents travel to work by car, and an additional 3 percent by bicycle. Residents of the western portion of the study area were more likely to use the subway or a bicycle to get to work.

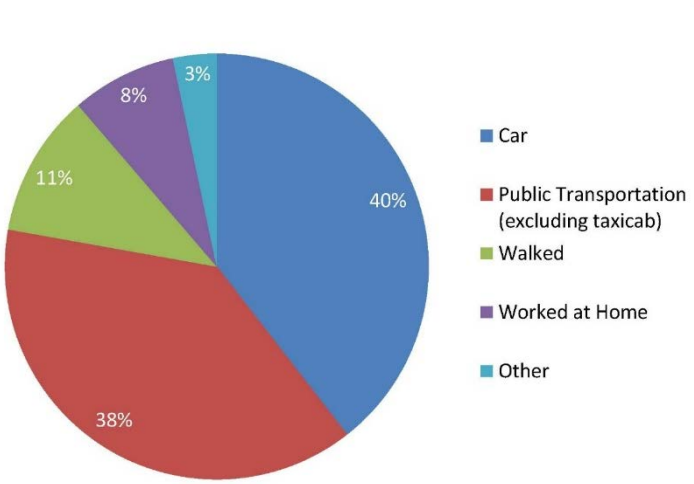
In contrast, people who live in other neighborhoods and commute into the study area for work primarily use automobiles, with 40 percent of these travelers using cars. Just over 20 percent of inbound commuters arrived by unspecified "other" modes. Only 0.22 percent of inbound commuters arrived by bicycle.

The corridor features multiple transit options. The study area is crisscrossed by multiple bus routes, and the A and C trains of the MTA New York City Subway run underneath Fulton Street. The Atlantic Branch of the Long Island Railroad (LIRR) travels under Atlantic Avenue, becoming elevated from Bedford Avenue to Dewey Place. The LIRR's Nostrand Avenue stop lies about midway through the study area, and its Atlantic Terminal and East New York stops are not far from the western and eastern edges, respectively.

Atlantic Avenue is also an important truck route, forming a key east-west link through Brooklyn and Queens.



Means to Work, Residents of the Study Area (2010)



Means to Work, People Who Work in the Study Area (2010)

Source: US Census

As a major arterial, Atlantic Avenue has become an area of focus for the City's Vision Zero initiative. The street is wide, and the mix of cars and large vehicles can be dangerous for pedestrians and cyclists.

A Vision Zero Priority Corridor, Atlantic Avenue has been the site of multiple targeted safety improvements, such as signal timing changes, bicycle lanes on side streets, and intersection improvements. In 2014, the corridor was made an arterial slow zone, reducing the speed limit from 30 to 25 miles per hour.

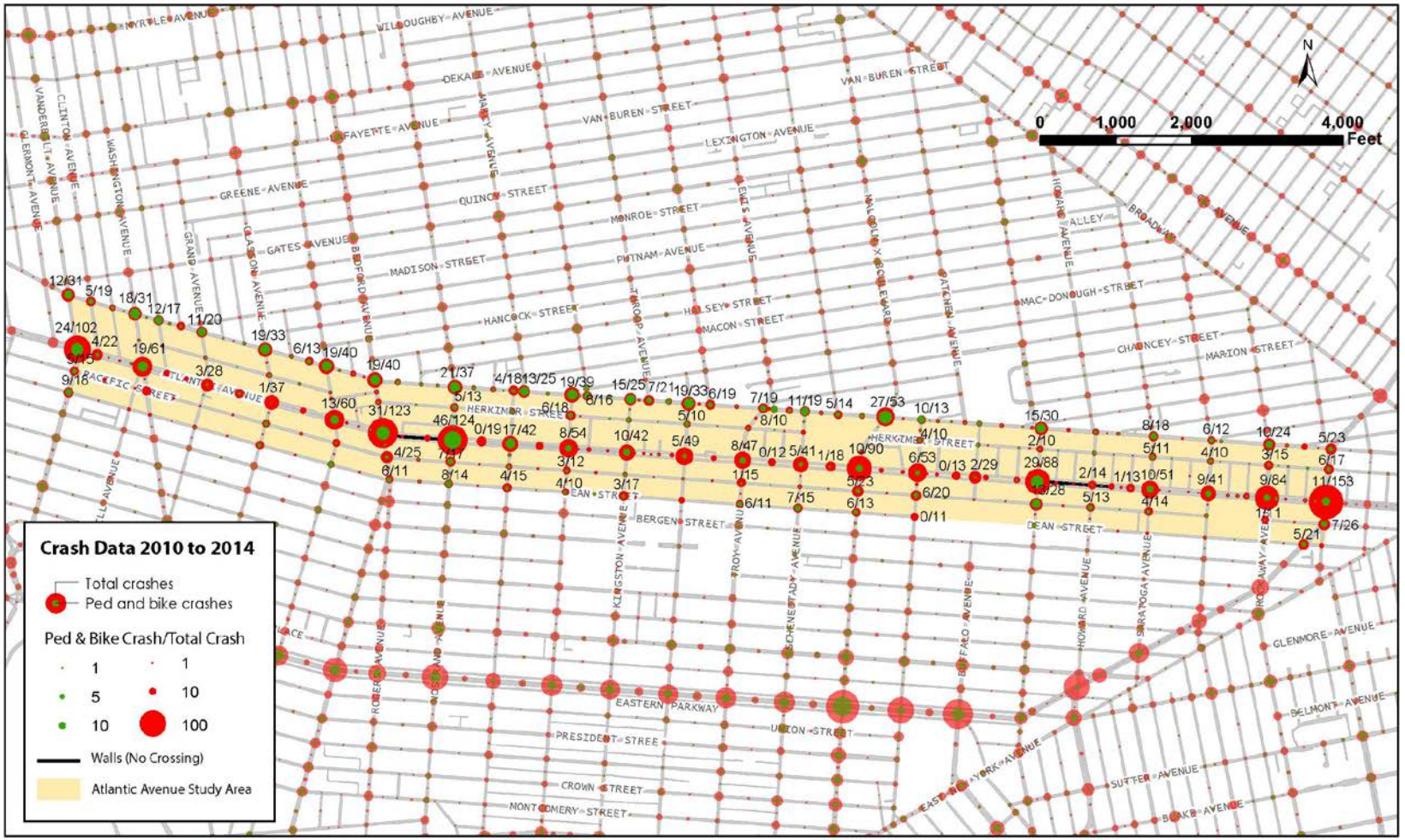
In light of these safety priorities and to help determine where to perform traffic counts, one of the first steps taken by the Transportation Division was a crash analysis. Data from 2010 through 2014, provided by New York City DOT, was analyzed to determine high-crash locations and to understand the key characteristics of these crashes. The following pages detail the findings of this analysis.

Pedestrians crossing at Atlantic Avenue and New York Avenue

Findings: Crashes

The map below shows total reportable crashes in the study area from 2010-2014, meaning that the crash resulted in an injury, a death, or at least $1,000 in property damage. Overall crashes are clustered at intersections of Atlantic Avenue and large cross streets, such as Bedford Avenue and Eastern Parkway. Red circles represent total crashes at a given intersection, and the green circles represent the pedestrian and bicycle crashes at the intersection. Details of the crash analysis are presented in Appendix A.

Source: NYC Department of Transportation

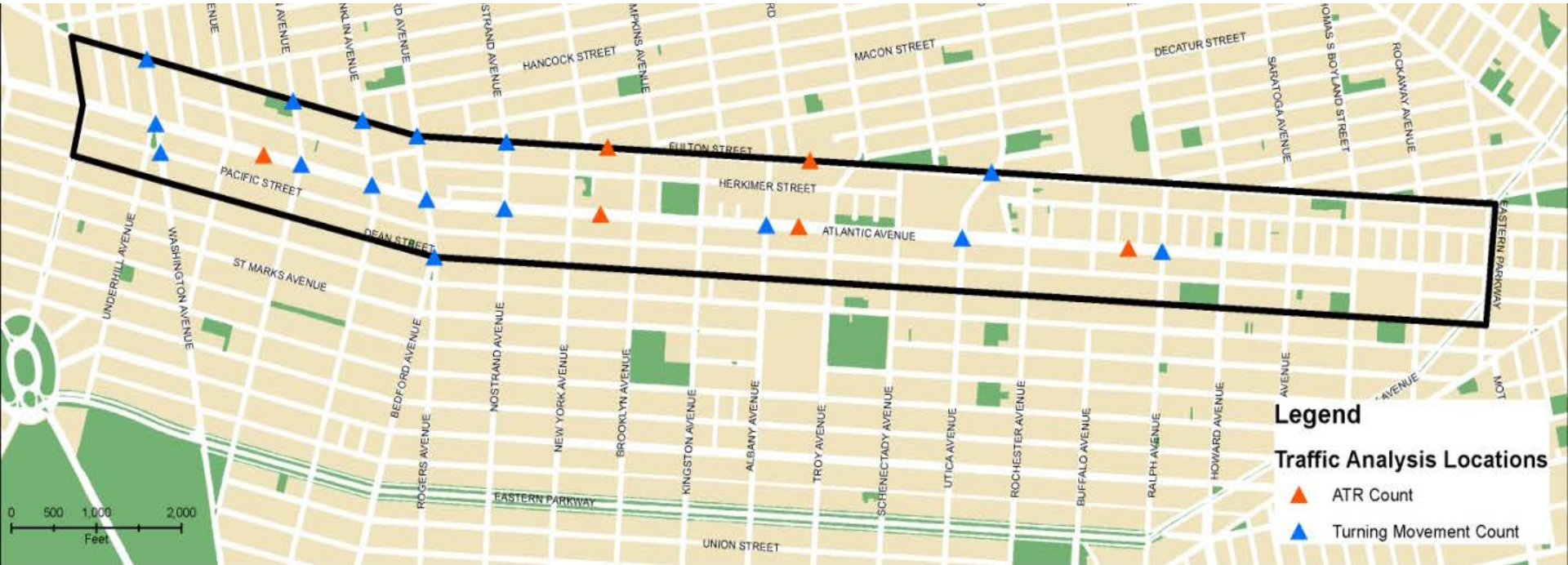


Selection of Intersections

Based on the crash analysis and site visits, 16 intersections were chosen for Level of Service analysis. These intersections were chosen based on crash frequencies, types of crashes, and field observations made by staff.

Data was collected in early 2015. Automated Traffic Recorders measured traffic over 24-hour intervals to determine peak traffic periods, and turning movement counts were taken at intersections during those peak periods.

- Washington Avenue and Fulton Street
- Washington Avenue and Atlantic Avenue
- Washington Avenue and Pacific Street
- Classon Avenue and Fulton Street
- Classon Avenue and Atlantic Avenue
- Franklin Avenue and Fulton Street
- Franklin Avenue and Atlantic Avenue
- Bedford Avenue and Fulton Street
- Bedford Avenue and Atlantic Avenue
- Bedford Avenue and Dean Street
- Nostrand Avenue and Fulton Street
- Nostrand Avenue and Atlantic Avenue
- Albany Avenue and Atlantic Avenue
- Utica Avenue and Fulton Street
- Utica Avenue and Atlantic Avenue
- Ralph Avenue and Atlantic Avenue



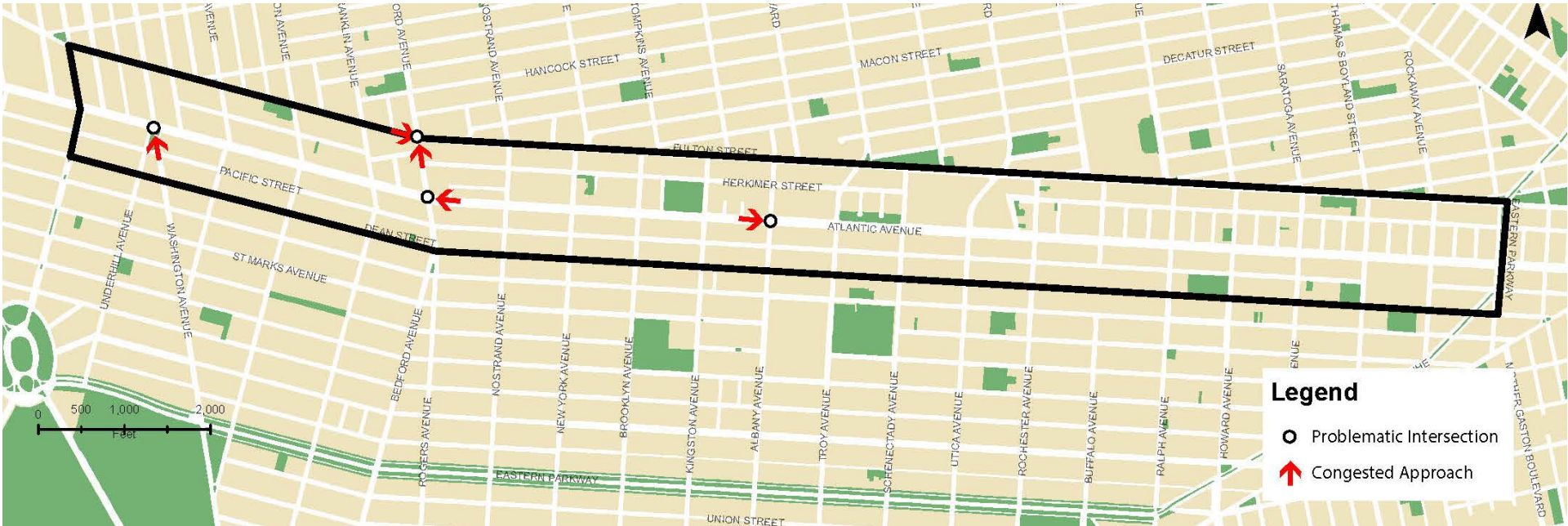
Findings: Existing Level of Service

Twelve of the sixteen intersections were determined to be operating at an acceptable Level of Service (A through D). However, four intersections were found to be operating with unacceptable delay:

- Washington Ave and Atlantic Ave (AM & PM)
- Bedford Ave and Fulton St (AM & PM)
- Bedford Ave and Atlantic Ave (AM)
- Albany Ave and Atlantic Ave (Sat)

Three intersections emerged as having both significant safety issues and congestion issues under existing conditions:

- Bedford Avenue at Atlantic Avenue
- Utica Avenue at Atlantic Avenue
- Bedford Avenue at Fulton Street



Growth Scenario for Future Level of Service

In order to determine how future growth could affect the traffic network, two aggressive, deep-future scenario templates were devised and used to perform a “stress test” on the traffic network.

Scenario One is less intensely developed, with all retail in the local retail category, which is more walkable and less auto-oriented. Lots with frontage along Atlantic Avenue were assumed to be developed at a higher density than blocks not along Atlantic Avenue. Additionally, In Scenario Two, some larger-scale regional retail is added, bringing larger destination stores and creating more travel demand.

	Location	Density	Mixed Residential and Local Retail	Regional Retail	Office	Light Industrial
Scenario One	Along Atlantic	High	100%	0%	0%	10%
Scenario One	Not Along Atlantic	Medium	85%	0%	15%	10%
Scenario Two	Along Atlantic	High	75%	10%	5%	10%
Scenario Two	Not Along Atlantic	Medium	75%	0%	15%	10%

Growth Scenario for Future Level of Service

Applying the usage percentages from the preceding table with lots identified as potential growth areas described in Appendix B produced the following two potential growth scenarios. These results represent aggressive, deep-future scenarios in which every identified lot is built out to its full potential.

	Lot Area SF	Total Floor Area SF	Housing Units	Residential SF	Ground Floor Local Retail SF	Regional Retail SF	Office SF	Light Industrial SF
Scenario One	2,174,981	12,142,009	9,516	9,516,476	1,832,325	0	575,709	217,499
Scenario Two	2,180,248	13,219,798	8,688	8,688,459	1,226,390	883,567	1,099,403	1,321,980

To aid in trip generation and analysis of potential future traffic patterns, the growth sites were divided into twelve clusters. The size and positioning of these clusters was influenced by the location of analysis intersections as well as the quantity and density of potential growth sites. This resulted in more numerous, smaller clusters on the western end of the study area and fewer, larger clusters on the eastern end of the study area, as seen in the map below.

Once the clusters were defined, standard procedures from New York's City Environmental Quality Review (CEQR) Manual were used to estimate the amount of new traffic that would be produced by each cluster. These new trips were then added to the network and the traffic analysis re-run to determine how the network might perform in a future scenario.

Findings: Future Level of Service

Scenario 1 was analyzed in detail. This land use scenario resulted in eight intersections that, in the absence of adjustments to the street or traffic network, deteriorated to an unacceptable level of performance based on standard traffic planning criteria.

Scenario 1 assumed the creation of local, walkable retail as part of a mixed-use corridor. Scenario 2 assumed larger amounts of auto-oriented, regional retail, and somewhat less new housing. Based on traffic assumptions for these respective types of activities, Scenario 2 generated far more automobile trips than Scenario 1, and therefore would be expected to result in comparably more congestion and reduced Level of Service.

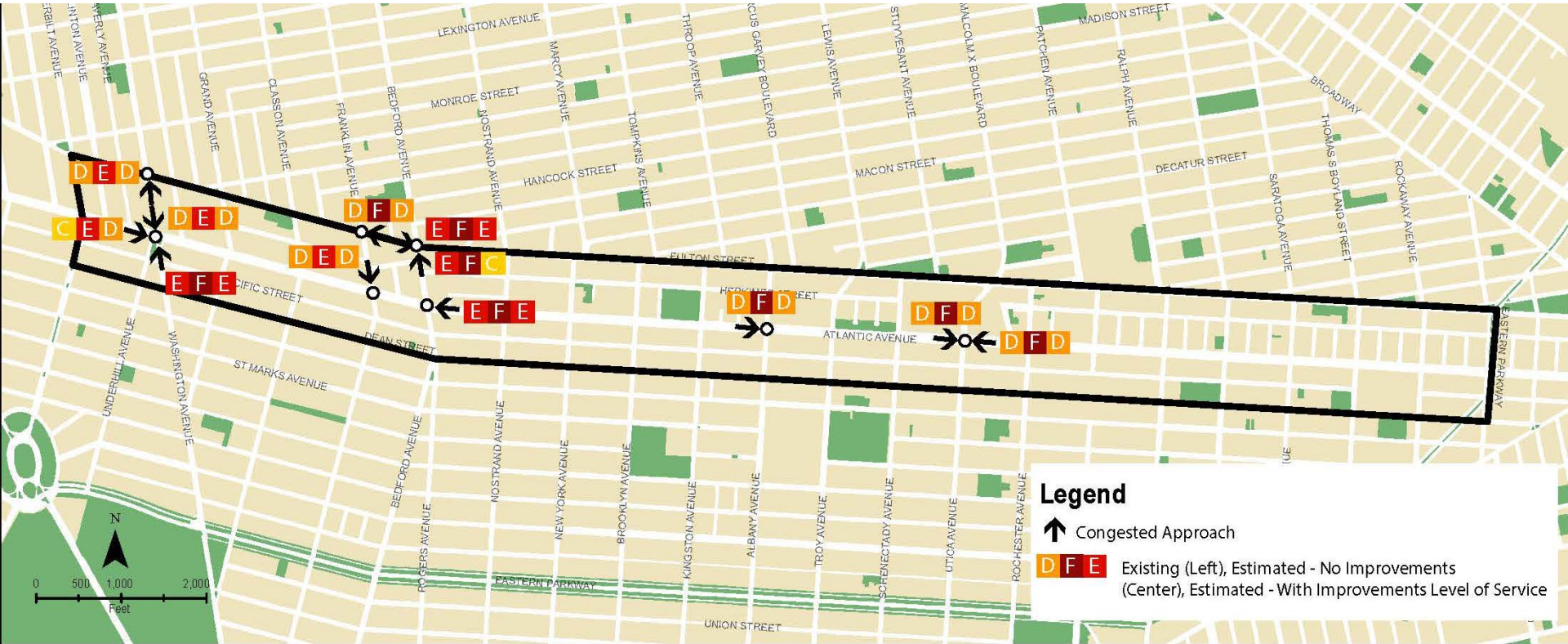
1. Washington Ave and Fulton St (AM)
2. Washington Ave and Atlantic Ave (AM & PM)
3. Franklin Ave and Fulton St (AM & SAT)
4. Franklin Ave and Atlantic Ave (PM)
5. Bedford Ave and Fulton St (AM, MD & PM)
6. Bedford Ave and Atlantic Ave (AM & SAT)
7. Albany Ave and Atlantic Ave (MD & SAT)
8. Utica Ave and Atlantic Ave (MD, PM & SAT)

The map below illustrates the problematic intersections and movements under Scenario One. The first letter is the existing Level of Service, and the second letter is the potential future Level of Service.

In light of the results of the traffic analysis, the transportation team revisited the problematic intersections of Scenario One to determine if the unacceptable Levels of Service could be remedied.

The potential future growth scenario was re-analyzed with basic improvements made at problematic intersections. These improvements—such as signal timing changes and rush hour parking restrictions—were designed to reduce congestion and ease turning movements.

With intersection improvements, all Level of Service F ratings and almost all Level of Service E ratings were eliminated. The results of this analysis suggest that, with adjustments to signal timing and parking regulations, the street could continue to support travel demand under the growth assumptions of Scenario 1. The map below shows the results of the traffic analysis for the problematic intersections. From left to right, the three letters represent the intersection's Level of Service under current conditions, the Level of Service under potential future conditions without improvements, and the Level of Service under potential future conditions with improvements.



Vision Zero Initiatives

Vision Zero is New York City's initiative to eliminate traffic-related death and injury on city streets. With the philosophy that "traffic deaths and injuries are not accidents, but crashes that can be prevented," the City aims to make streets safer through public education, law enforcement, street design, and legislation.

Atlantic Avenue has been named a Vision Zero priority corridor, and as such, has been and will continue to be the site of many improvements by New York City DOT. NYCDOT uses a number of strategies to improve safety on its streets. It has created Neighborhood Slow Zones, reducing speed limits across entire neighborhoods, as well as declared major arterials (such as Atlantic Avenue) slow zones with lower speeds of 25 miles per hour. At many intersections, DOT has implemented Leading Pedestrian Intervals (LPIs). In an LPI, pedestrians get the "walk" signal before cars get the green light, allowing them to enter and clear the intersection before cars begin to turn, minimizing conflicts. The Department has also embarked on a number of "major safety projects" that involve more significant capital investment, such as the addition of bicycle lanes, curb extensions, intersection reconfigurations and traffic calming, and others. Recent Vision Zero initiatives within the study area are shown on the map below.

Leading Pedestrian Intervals
Major Safety Projects
Arterial Slow Zones
Speed Humps
Safe Streets For Seniors
Neighborhood Slow Zones

Source: Vision Zero website

Atlantic Avenue from the Nostrand Avenue Long Island Rail Road station

In the near future, NYC DOT plans to begin work on several major Vision Zero projects adjacent to the study area. These include:

- Major Great Streets improvements on Atlantic east of the study area, from Georgia Avenue to Rockaway Boulevard. These improvements include sidewalk reconstruction, an extended planted median, left turn bays, curb extensions, and potential pedestrian cut-throughs
- Intersection improvements at Jamaica Avenue and Jackie Robinson Parkway, featuring new crosswalks and pedestrian signals, reconstructed and expanded pedestrian islands, and new pedestrian refuges in medians
- Conduit Boulevard improvements, including a reduced speed limit, high-visibility crosswalks, and sidewalk and median extensions at several intersections.

It is important to note that all analysis done in the Atlantic Avenue Corridor Transportation Study was based on existing conditions. The aforementioned projects, or any other future initiatives within or adjacent to the study area, could affect traffic in the area; any such effects are not accounted for in the results presented in this report.

Conclusions

The Atlantic Avenue corridor is a major truck route and an important link between western Brooklyn and eastern Brooklyn and Queens. The study area, located between Atlantic Terminal and East New York, has experienced a growing population over the past decade, affecting the corridor's current and potential future traffic performance. Land use and transportation are inextricably linked; changes in one aspect will affect the other.

Under existing conditions, there are some problematic intersections in the study area, both in terms of safety and traffic congestion. These problems are likely to be exacerbated by any further growth that happens in the region. For this study, an analysis of a deep future, aggressive potential growth scenario showed twice as many sub-par intersections in a potential future scenario as compared to current performance.

The "stress test" also showed that, with appropriate improvements, congestion and delay due to additional density could be reduced to an acceptable level at all of the affected intersections. These improvements, namely signal timing adjustments and parking regulation changes, are relatively simple and do not require major capital expenditures.

However, the analysis in this study was based on current conditions. Atlantic Avenue is one of the New York City Department of Transportation's Vision Zero Priority Corridors, and further changes and improvements are occurring in the study area. These are not reflected in the results of the traffic analysis conducted for this report.

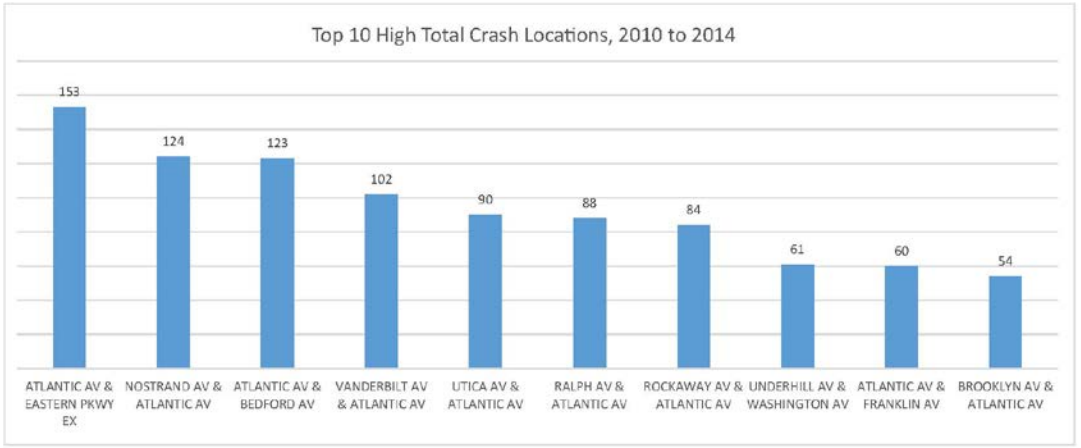
Fulton Street and Nostrand Avenue

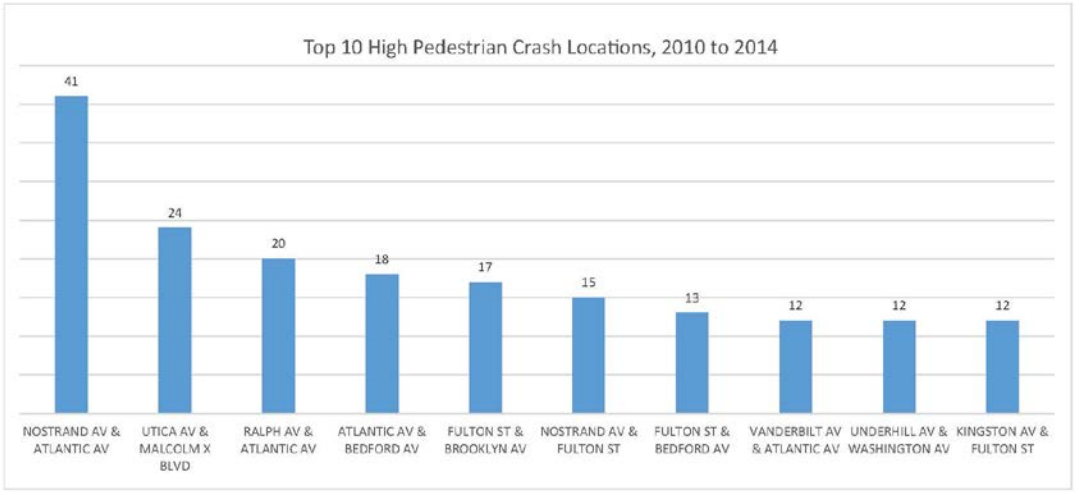
Appendix A: Crash Analysis

In order to prioritize the intersections chosen for further study, the top 10 high-crash locations for total crashes, pedestrian crashes, and pedestrian and bike crashes were calculated.

Due in part to high traffic volumes, Atlantic Avenue and Eastern Parkway, Atlantic at Nostrand, and Atlantic at Bedford were the top three locations in the study area for total crashes. Eastern Parkway in particular is a wide street with three lanes in each direction.

In terms of pedestrian crashes, Nostrand Avenue and Atlantic Avenue was by far the most dangerous location, with nearly twice as many crashes between 2010 and 2014 as the second-highest crash location, Utica Avenue and Malcom X Boulevard. Potential contributing factors to this include the presence of the Long Island Railroad station and a Select Bus Service stop.





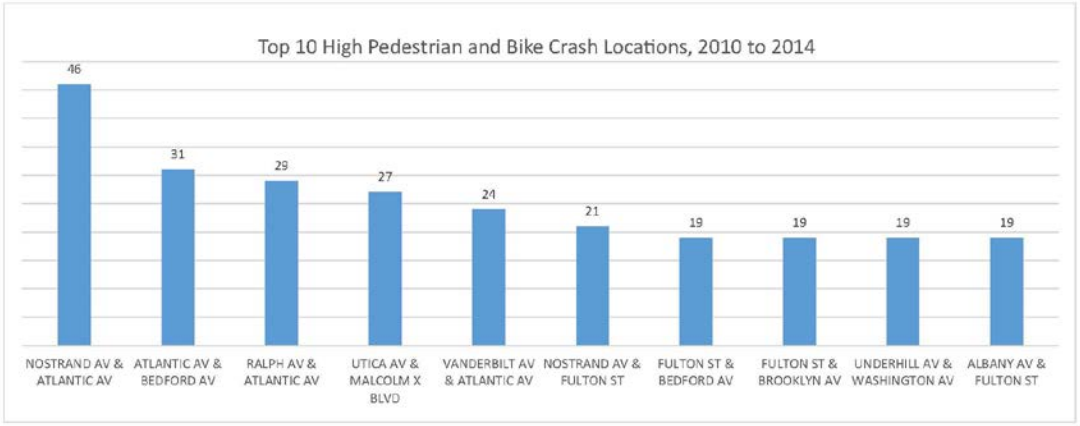
Source: NYC Department of Transportation

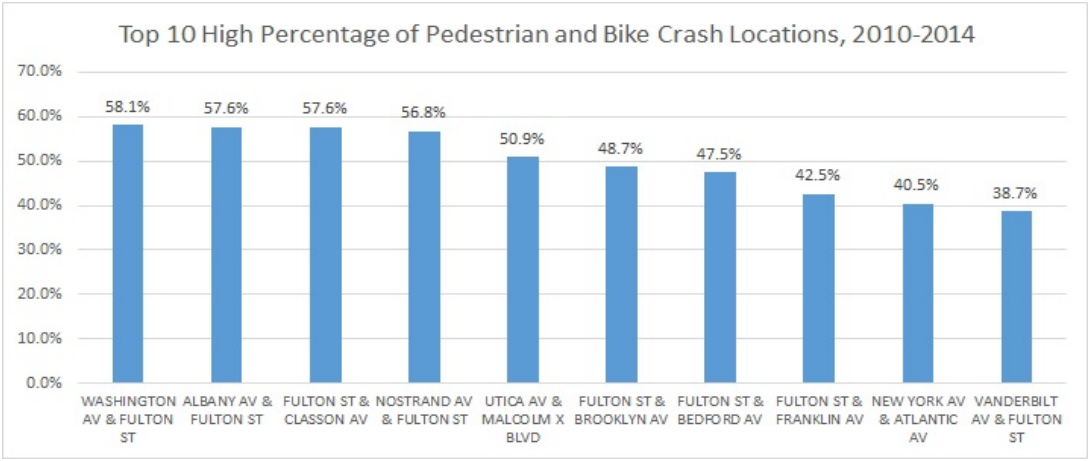
For combined bicycle and pedestrian crashes, Nostrand and Atlantic once again emerged as the location with the most incidents, though by a smaller margin than in terms of pedestrians alone. However the location with the second-highest frequency was Atlantic Avenue and Bedford Avenue, likely due to an important northbound bicycle route on Bedford Avenue.

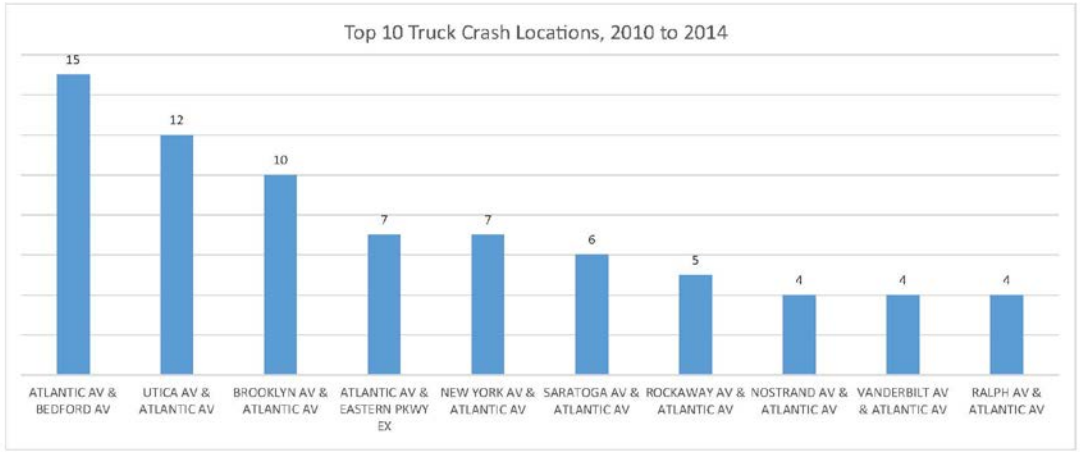
The incidence of bicycle and pedestrian crashes was also looked at from a percentage perspective, as well as raw numbers. While Washington Avenue and Fulton Street did not appear in the top 10 pedestrian or bicycle crash sites by raw numbers, it ranked highest in terms of percentage, with 58.1% of all crashes involving pedestrians or cyclists. Nostrand Avenue and Fulton Street, Fulton Street and Bedford Avenue, and Vanderbilt Avenue and Fulton Street were other hotspots. Notably, there was more consistency in the top several bicycle pedestrian crash *rates* compared to the simple number of crashes.

Atlantic Avenue is a major truck route, and thus truck crashes were also a concern. Atlantic Avenue and Bedford Avenue once again proved to be the location with the most crashes, with the intersections of Atlantic and Utica and Brooklyn Avenues rounding out second and third place. At Atlantic and Bedford, truck crashes comprised about 12.2% of the total number of vehicular crashes.

Source: NYC Department of Transportation







Appendix B

Once initial traffic analysis was complete, the Transportation Division developed an aggressive, deep future potential future growth scenario that would illustrate how the traffic network would perform with a significant amount of development.

The first step was to select sites where development might occur. Criteria used included:

- The existing zoning was manufacturing, commercial, or otherwise not contextual residential
- The lot was larger than 5,000 square feet
- The lot was built out to less than 50% of allowable development
- The lot was developed before 2011
- The lots could not be City or State owned (except for HPD vacant land)
- Community facilities, affordable housing, and landmarks were excluded from consideration

The lots that fit these criteria are mapped below.