



# A Comprehensive Brooklyn Bus Network Redesign

Version 3.5      25 Nov 2019

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VERSION 3.5 11/25/19

### **ABSTRACT**

This document shows how to restructure Brooklyn's local bus network with the objective of increasing ridership by making the system more user-friendly. It accomplishes this objective by making most trips possible using only one or two buses or bus and subway. Service gaps are filled; routes are generally longer, straighter and more direct, but with most buses traveling shorter distances to better increase reliability and better fit service to demand. Airport access and interborough travel are also improved. Implementation is accomplished in phases with a small investment in increased operating costs to generate greater revenue.

by Allan Rosen

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## EXECUTIVE SUMMARY

The MTA's borough network redesign studies make incorrect generalizations resulting in formulas to remedy problems. It is not correct that simple direct bus routes always better serve the public; underperforming bus routes should readily be eliminated; and exclusive bus lanes are needed on every wide street with bus operation. Formulas lead to poor decisions resulting in unexpected consequences such as lower ridership. Problems need to be studied and decisions to correct them made on a case-by-case basis.

There is too much emphasis on: improving bus speeds, ignoring passenger trip times; increasing frequency on heavy demand routes at the expense of reducing network coverage; using articulated buses to reduce service; and expanding Select Bus Service (SBS) and exclusive bus lanes.

Improving bus speeds vs. improving passenger trip times are different. The latter results from better reliability, more frequent service, reduced walking time, and the need for fewer connections as well as from improving bus speeds. Fewer bus stops and more direct routes could improve bus speeds, but could also increase passenger trip time. Some underperforming routes might be necessary to provide adequate coverage in low density areas. Exclusive bus lanes may not be a cost-effective way to improve reliability.

Routes cannot always be simple and direct because of grid system irregularities; major destinations may not be accessible with a straight route without a long or inconvenient walk. The positives of an indirect route may outweigh the negatives.

[Bronx riders were asked to choose](#) between frequency or coverage. This assumes the MTA cannot provide both, when both are crucial to a well-functioning system. It is like asking a prisoner who hasn't had anything to eat or drink for the past 24 hours if he wants food or water. A survey showed more passengers preferred frequency to coverage; routes that have fewer bus stops to ones with more bus stops; simpler and direct routes to indirect routes; and SBS or LTD service to local service. Those results are being cited so the MTA can claim the effort is customer driven. Data should not be used to support predetermined conclusions. Proof that this is the case is that no recommendation was made to permit riding three buses for one fare which riders also suggested.

If the public input really is wanted, the dates, locations and times for the design workshops would be easily accessible on their website; they would not ask passengers at the workshops to write all their ideas to improve service on a four-inch square post-it note.

One goal of the [Queens Bus Redesign](#) is to eliminate bus routes that are redundant with or compete with the subway. Whenever there is a subway blockage, it can often take hours for replacement bus service that is usually inadequate for the demand. These redundant routes are necessary.

These studies emphasize SBS and articulated buses because they are perceived to be more efficient. Articulated buses are also more difficult to maneuver, have less traction during snow storms, and have higher labor costs. Though more efficient when ridership is heavy, they are less efficient when ridership is light such as overnight.

Success is declared by analyzing data and finding something positive to say, ignoring negatives. After one year, [Staten Island express bus service](#) is 1.3 mph faster, and the average dwell time is 23 seconds less. However, complaints about reduced service spans on some routes adding 40 minutes to some commutes or that more passengers must now stand, are dismissed. Rather than first considering a lower off-peak fare to encourage ridership, the MTA chose to eliminate trips. A good plan requires minimal fine-tuning. The Staten Island Express bus redesign continues to undergo revisions for over one year with many passengers still dissatisfied.

Clear criteria should be established to measure the effectiveness of a network redesign. To what extent has reliability has improved, have passenger trip times has decreased, and has ridership increased?

Is the real purpose to save operating costs? Bus routes with fewer bus stops and buses cost less to operate. Straight routes cost less than ones which divert to better serve major traffic generators. Is a minor bus speed improvement with no regard to passenger trip time the best use of funds?

The Fall 2019 schedule revisions saved \$7 million. [Reducing service](#) was chosen over reallocating it. Service cuts were recently announced for the B38 and [severe cuts to the B46 Utica Avenue route](#), by instituting articulated service. Articulated buses originally were purchased to reduce crowding, not to enable service reductions.

[Fare evasion on buses may be as high as 25 percent systemwide](#). Is cutting service wise when patronage may not have really declined? These studies rely on formulas, are myopic in their approach focusing only on paid customers, and ignore latent demand. Simplistic solutions have resulted in today's transit and traffic problems.

In April, the city [proposed spending \\$280 million](#) to add 30 miles per year of exclusive bus lanes that will increase average bus speeds by only one mph! That plan has since been expanded to 150 miles of exclusive bus lanes over three years at [a cost of \\$1.7 billion](#), also including new bike lanes. Page 9 of [Let's Go Transit](#) proposed each redesigned bus route feature an exclusive bus lane. That is expensive and unnecessary when bus service is infrequent, resulting only in increased traffic congestion.

The redesign proposed here improves accessibility and reliability. Increased operating costs would be offset by increased revenue. My 1972 Master's Thesis correctly predicted the addition of free transfers would greatly increase bus ridership. It rose to its highest level since World War II after free transfers were instituted. Better routes and reliability would have the same effect.

#### **Redesign Features:**

- Improved interborough and airport access and separate night time network;
- Includes the following:
  - Better connects neighborhoods north and south of Greenwood Cemetery and east and west of Prospect Park.
  - Straightening north/south routes in Borough Park to improve connections to Bensonhurst providing north/south access to Maimonides Medical Center.
  - Filling east/west service gaps between St. Johns Place and Church Avenue; on St. Johns Place in Ocean Hill; in Canarsie on Foster Avenue to serve Canarsie Plaza Shopping Mall; in southern Brooklyn between 60 Street and Bay Ridge Parkway; in Flatlands between Avenue H and Avenue N; and between Avenue M and Avenue U.
  - Filling north/south service gaps on 16<sup>th</sup> Avenue, between Utica and Nostrand Avenue; and in East New York between Pennsylvania and Fountain Avenues.

Passenger trip time must not be ignored. Criteria for evaluating bus network redesigns must be established; minor improvements do not indicate success. A broader approach that considers latent demand, [a time-based fare](#), and express bus fare discounts is also needed.

Congestion Pricing monies should offset operating cost increases needed for improvements, rather than used solely for capital improvements such as unnecessary bus lanes to improve average bus speeds by one mph. A state law requiring vehicles to give the right of way to buses pulling out of bus stops would speed buses more than SBS. A bus network redesign should seek to improve accessibility between neighborhoods with strategic investments, not to lower gross operating costs.

The MTA is currently performing a Brooklyn Bus Network Redesign. A comprehensive redesign with route descriptions including short route services, to improve reliability and further tailor service to demand, and encourage discretionary trips is presented here. This plan also includes justifications, and maps showing different sections of the borough and individual route maps. Express bus routes were not studied and no changes are recommended, although some may be warranted.

## PART 1 – PLANNING A BUS NETWORK REDESIGN

Too much emphasis is placed on improving in-route travel time without improving passenger travel time. The two may sound similar but are very different. Decreased in-route travel time results from improved bus speeds. Decreased passenger travel time results from better reliability, more frequent service, reduced walking time, the need for fewer connections and improved bus speeds. Fewer bus stops and more direct routes could decrease in-route travel time, but could also increase passenger travel time.

### Use of Formulas

There are no formulas. It would be **incorrect** to assume:

- Shorter routes are preferable to longer routes because they are more reliable.
- Simpler direct routes such as a grid system always better serves the public than indirect routes.
- Bus routes that have stops spaced further apart always travel more quickly than routes with more frequent stop spacing.
- A system that prioritizes frequency over coverage better serves the public.
- Select Bus Service (SBS), Limit Stop buses (LTDs) or articulated buses are more efficient than traditional local service and would always be preferred in high density corridors.
- Exclusive bus lanes should be instituted when there is infrequent bus service without regard to traffic impacts.
- Bus routes with a lower cost recovery ratio are poor performers and should readily be discontinued.

Statistics are only guidelines. Redesigning a bus network that serves the public well with operating efficiency is no easy task. Seeking formulas to draw general conclusions is the easy way out – It could lead to poor decisions resulting in unexpected consequences such as lower ridership.

According to the [Final Bronx Bus Network Redesign](#), bus routes will be made simple and direct, introducing wider bus stop spacing that would eliminate or relocate existing bus stops. The MTA uses the phrase “bus stop balancing” instead of “bus stop elimination.” A net 291 local bus stops in the Bronx will be removed. (432 removed and 141 added.) Coverage will be reduced in areas that are lightly traveled, i.e. eliminating underperforming routes, in exchange for increasing frequency in high density corridors. This is inadvisable.

Additional exclusive bus lanes with better enforcement are also recommended. A fresh approach is admirable. The use of formulas is not.

The correct way to redesign a bus network is to study the problems and determine how to correct those problems. Each decision must be made on a case-by-case basis; what works in one situation may not work in another. There could be a simple reason why a bus route is a poor performer. Perhaps it should be modified, or service levels improved. Eliminating a route based only on its performance without looking any further would be the wrong approach. Similarly, just because a route performs well does not mean it could not perform even better with a route, service, or schedule modification.

### **Short Routes vs. Long Routes**

Short routes have the advantage of being more reliable; long routes have the advantage of allowing passengers to access more destinations with fewer transfers. Therefore, a compromise is needed. Most routes should not be short, nor should most buses traverse a good portion of the borough. The best compromise is long routes with most buses operating only a portion of the route. If a route is too long to be reliable and needs to be split, in most cases there should be some overlap to minimize the need to transfer.

### **Simple Direct Routes vs. Complex Indirect Routes**

It is not always possible for routes to be simple and direct because of breaks in the grid system of streets or one-way street directions. Also, some major destinations may not be easily accessible with a straight and simple route without a long or inconvenient walk. A route may have to divert to serve a population where it is not feasible to provide a separate route. Therefore, deviations from straight routes may be necessary. It must be determined in each case, whether the positive impacts of an indirect route outweigh the negative impacts.

Several years ago, the B36, in southern Brooklyn, was made more direct via Avenue Z by no longer stopping in front of the Sheepshead Bay Station. The bus travel time was reduced by one minute in each direction. The Sheepshead Bay station has the sixth highest bus/subway transfers in Brooklyn. The reason for the change was that one pedestrian was killed crossing the street in the 40 years since the buses started making that turn. One of the eliminated bus stops was replaced with a taxi stand (not exactly a way to encourage the use of mass transit).

Many transit riders believed that the advantage of the bus stopping in front of the station far outweighed the additional one-minute of bus travel time. That “savings” added two minutes of walking time for the thousands who use this transfer daily. It also significantly increased the chance of a missed connection that could add another 10 to 20 minutes to passenger trip time.

About 40 years ago, in Denver, Colorado, their bus system was redesigned to eliminate many turns to make routes straighter. When this was implemented, many former riders complained of longer trips due to the increased walking time. They switched to driving their cars instead because the new routes no longer served their needs. Bus ridership plummeted. Soon afterward, many of the old routes had to be restored.

The solution should be a compromise --straight routes where possible, but turns when necessary.

### Should Bus Stops be Spaced Further Apart?

Bus speeds on a route could be slow due to any number of reasons. These include excessive double parking, blocked bus lanes, inadequate service levels causing excessive dwell times, schedules that do not adequately reflect running times, etc. It would be too simplistic and irresponsible to blindly conclude that a bus route with close stops should have some of its stops removed to speed service by only considering bus stop distance and the number of bus stops without studying other causes for slow service.

What matters more than the number of bus stops or how closely they are spaced is how often buses actually stop at those stops and the effect of removing some of them.

Let us consider a bus stop with a daily volume of 50 passengers boarding and alighting, on a bus route that utilizes the stop every five minutes for the four peak hours, every ten minutes for another eight hours, and every 20 minutes for the final four hours. This means that 108 trips (48 + 48 + 12) pass that bus stop.

If only one person gets on or off each time the bus stops, half the buses would skip the stop anyway without it being eliminated. If two people get on or off each time a bus stops, only one in four buses would stop. Therefore, if the stop was eliminated, 75 percent of the buses would save no time.

In conclusion, if a bus stop is lightly utilized, most buses skip the stop anyway. Eliminating them saves a negligible amount of time. If there are a half-dozen adjacent lightly utilized bus stops, the elimination of some stops could result in a bus stopping at one stop instead of the adjacent stop, resulting in no time savings. The only meaningful effect would be that 50 daily passengers would have a longer walk to and from a bus stop. Eliminating high volume bus stops that are spaced close together, could result in overloading adjacent bus stops, possibly causing increased fare evasion due to impatient passengers entering the rear door.

The best bus stop candidates for elimination are moderately used stops that are very close together where there isn't an excessively high elderly population. Eliminating those bus stops reduce in-route travel times because most buses would actually make fewer stops and passenger load times would not significantly increase at the remaining bus stops. The only real benefit of eliminating other bus stops would be to increase the number of available parking spaces available, assuming there is no fire hydrant or other needed parking restrictions at the bus stop.

Bus stop elimination also can have a major effect on increasing passenger trip times if the extra walking causes a missed connection. When buses are operating infrequently, missing the bus can double or greatly increase the time it takes to complete a trip, discouraging bus usage. Increased walking distance to bus stops negatively impact the elderly and the permanently or temporarily infirmed, e.g., someone using crutches due to an injury.

Therefore, bus stop spacing needs to be analyzed on a case by case basis to ascertain which bus stops can be removed to speed service without negative impacts on passenger trip times. This analysis needs to be based on a variety of factors, not exclusively the number of stops and distance between them. No formulas.



Increasing bus stop spacing poses the following question: Is a small in-route-travel-time decrease with no regard to passenger travel time the best use of funds?

### **Frequency vs. Coverage**

The [Existing Conditions Report](#) for the Bronx Bus Network Redesign, asked passengers to choose if they preferred frequency or coverage. The assumption is that the MTA cannot provide both. No one should have to choose between the two. Both are crucial to a well-functioning bus system. It is like asking a prisoner who hasn't had anything to eat or drink in the past 24 hours if he wants food or water. The survey showed more passengers preferred frequency to coverage; routes that have fewer bus stops to ones with more bus stops; simpler and direct routes to indirect routes; and SBS or LTD service to local service. Those results are being used to redesign the bus network with the justification that the effort is customer driven.

If public's input is really wanted, the dates, locations and times for the design workshops would be easily accessible on the MTA website; Passengers at the workshops would not be asked to write all their ideas to improve service on a four-inch square post-it note.

The cities of Budapest, Singapore, and Vienna prove that frequency AND coverage are crucial to a well-functioning mass transit system. A network redesign must neither use data to support predetermined conclusions nor reduce coverage by eliminating underutilized or "underperforming" routes in exchange for increasing frequency in high-density corridors. The data should guide the conclusions. If that were the case, the Bronx Study also would have recommended three-legged transfers (the ability to ride three buses for one fare), also suggested by the passenger survey.

When the [Queens Bus Redesign](#) was announced, the MTA proposed, as a goal, to eliminate bus routes that are redundant with or complete with the subway. Whenever there is a subway blockage, it can often take hours for replacement bus service that is usually inadequate for the demand. These redundant routes are necessary for these situations and/or to comply with wheelchair-accessibility laws.

### **Traditional Local Routes vs. LTD and SBS routes or the Use of Articulated or Long Buses**

This depends on service demand. During the past ten years there has been a mass conversion of LTD routes and Manhattan Crosstown routes into SBS routes. There is also a greater reliance on articulated buses because they are perceived to be more efficient – they can carry more passengers than standard 40-foot buses. However, they are more difficult to maneuver, have less traction during snow storms, and labor costs are higher. Though more efficient when ridership is heavy, articulated buses are less efficient when ridership is light. The policy of operating these buses overnight needs to be reexamined.

There are no data that show SBS routes, where riders usually pay their fares before they board the bus, significantly reduces boarding times. The 86th Street bus saves only about two minutes for the entire crosstown trip, as shown in Figure 2 of the [progress report](#) due to fare pre-payment. The average passenger saves even less time.

SBS and LTD service also require a longer walk to or from a bus stop. These factors have to be considered to determine if either service is a viable option for a local bus service corridor. SBS also costs more to operate because of the costs of fare enforcement and fare machine maintenance.

A state law requiring vehicles to give the right of way to buses pulling out of bus stops would cost virtually nothing and speed buses to a greater extent than adding more expensive SBS routes with limited benefits. Several states have such a law.

According to the Bronx Bus Network Redesign [Existing Conditions Report](#), on Page 98, there are five routes that are profitable, with the Bx12 SBS leading the pack. However, when considering the cost for fare enforcement and fare machine maintenance, all SBS routes are financial losers; generally, SBS has not been proven to have significant added benefits. They are only slightly faster and reliable according to the [NYC Comptroller](#).

### **Good Performers vs. Poor Performers**

Of course, good performers are preferable. However, some routes perform poorly for a variety of reasons. They should not be eliminated because they are necessary to serve a population that has no other access to the bus system. Unfortunately, the policy is to discontinue poor performers during difficult financial times. In 2010, B71 service along Union Street in Brooklyn was discontinued because of poor performance, although residents had no alternative service.

This route operated in an east-west orientation between central and western Brooklyn via the neighborhood of Park Slope. In the five years prior to its discontinuance, between 2005 and 2010, ridership soared 29 percent due to an eastward extension. It was obvious just by looking at a map that the B71's elimination would create a new service gap, as that people who lived near the route, especially the western segment, would have no other alternative service. The B71 was eliminated anyway despite the huge increase in ridership. Elected officials have been requesting the route's return with an extension into Manhattan.

It is also foolish to use a performance system whereby bus routes falling below a certain threshold or percentile in terms of ridership or revenue are eliminated without any study. No matter how successful a system might be, some routes will always be in the lowest five percentile for productivity. A bus system redesign should not just discontinue low performing bus routes, one of the objectives of these studies.

Under that scenario, eventually there would be no system remaining. Before, any low performer is marked for elimination, the reasons for its poor performance need to be ascertained and corrective measures attempted. If the route could be salvaged, proposed solution(s) must then be recommended for implementation. That is exactly what was done in 1978 with the low performing B1 between 25 Avenue and Manhattan Beach and the low-performing B21 between Sheepshead Bay and Brighton Beach; they were thoroughly redesigned as part of the Southwest Brooklyn Bus Study. More about that later.

## What is the Real Purpose of the MTA Bus Network Redesign?

NYCT President Andy Byford deserves much credit for recognizing the need to completely redesign the bus network. The Bus Turnaround Coalition should also be commended for bringing this issue to the forefront, something I have been advocating for nearly 50 years. This redesign will be accomplished borough by borough.

The MTA claims to have taken excessive care in determining which bus stops to eliminate and move, but doesn't use the word "eliminate," instead calling it "bus stop balancing." Bus stops should not be eliminated based on a distance formula as some have proposed, but rather on a case-by-case basis which was the approach taken in the Bronx.

There is concern, however, whether the prime purpose of these studies is to better serve passengers or to reduce operating costs. One year into these studies we now have some clues. Bus routes with fewer bus stops cost less to operate than ones with more frequent stops. Similarly, straight routes with fewer turns also have lower operating costs than routes which more closely serve major traffic generators and require less walking.

The Fall 2019 schedule revisions saved \$7 million. Instead of increasing the total amount of service, or reallocating service, it was decided to [reduce service](#). Service cuts were also recently announced to the B38 and [severe cuts to B46 Utica Avenue local service](#), from 20 to 12 buses per hour, by replacing standard buses with articulated buses. Those buses can accommodate more passengers, but longer waits will encourage riders to walk further to use SBS service, which may not reduce passenger trip time. Articulated buses originally were purchased to make service more attractive by reducing crowding and providing more seating, not to enable service reductions.

B46 paid ridership has been declining during the past three years since SBS was introduced on the route. How much of the reduced ridership is due to increased fare evasion? Is reduced service retaliation by for a high rate of fare evasion? We do not know since no SBS progress reports were ever issued, as they were with all other SBS routes.

In 1978, I authored a report for the NYC Department of City Planning documenting how in 1975, the MTA cut half B46 service in rush hours from two minutes to every four minutes to reduce operating costs although the buses were already severely overcrowded. The MTA justified the cuts by stating passengers would only have to wait two additional minutes for a bus. The result was that private cars immediately started picking up passengers for hire during the rush hours because it now became impossible for many to board buses that were spilling over with passengers. Within one week, gypsy cabs replaced the private cars to take passengers to the subway. The cabs evolved into the dollar vans we have today following future service cuts on this and other routes. To add insult to injury, at the same time, the MTA is now spending \$5 million to study a new Utica Avenue subway line, [they will never build](#). How is this efficient use of scarce funding?

[Fare evasion may be as high as 25 percent systemwide](#). Is cutting service wise when reduced paid ridership may be the result of higher fare evasion, not fewer passengers? Lower service levels and overcrowding discourage ridership and causes higher fare evasion. This in turn increases dwell time

slowing down service further, making it more unreliable, and results in further ridership losses and service cuts. Thus far fare evasion is not discussed in any of the redesign studies.

In April 2019, the city proposed to [spend \\$280 million](#) to add 30 miles per year of exclusive bus lanes to increase average bus speeds by only one mile per hour! The plan has since been expanded to 150 miles of exclusive bus lanes over three years at [a cost of \\$1.7 billion](#), also including new bike lanes. Page 9 of "[Let's Go Transit](#)" proposed each redesigned bus route feature an exclusive bus lane.

Infrequent bus services do not merit exclusive lanes. Just because a street has four lanes and a bus route, does not mean two of the lanes should be exclusively for buses. Bus riders would not benefit, and traffic congestion would increase. The city, like the MTA, also believes in formulas to improve mass transit. The proposal presented here features only one new exclusive bus lane along the shoulder of the newly-reconstructed Belt Parkway, i.e., where there would be no negative impacts to other traffic.

## **PART 2 – GOAL AND OBJECTIVES OF REDESIGNING A BUS NETWORK**

### **Background**

The MTA has resisted productive bus route changes for fifty years, and has recently attempted to increase service reliability by splitting long routes in half with little or no overlap. Route extensions, revisions, and new shuttle routes were created in a vacuum without considering these routes as part of a network. In some cases, they have been penny-wise and dollar-foolish. An example would be the B67 extension via the Brooklyn Navy Yard that ends three blocks short of Williamsburg Bridge Plaza. The B67 could have connected with the new B32 and a half-dozen other routes for increased connectivity. The reason: service could operate with one less bus.

The goal of a bus network redesign should be to reduce the dependence on the automobile and other individual forms of transit by providing a mass transit system that is both efficient and effective, as what was done in Toronto and its suburbs. That means that most trips in areas of sufficient density should be best made by mass transit, i.e. rail, subways and buses. Where that density does not exist, there may also be a legitimate role for van services, but these should be legal, not siphon off bus passengers, and be integrated into the mass transit system by allowing free transfers. Ferry services may also be a legitimate option for some, but coordination with other services is also a necessity, and the costs to the provider and the user must not be excessive. Funding should not be at the expense of improving other modes of mass transit. These borough redesign studies focus only on buses and subways, ignoring other modes which include former bus passengers.

The main objective of a Brooklyn bus network redesign should be to encourage ridership by increasing access between all areas of the borough and neighboring boroughs by filling service gaps and making most trips possible using only one or two buses or a bus and subway combination. Interborough travel, including airport access should also be improved. Reducing operating costs should not be the prime objective.

### Importance of Filling Service Gaps

Excessive passenger travel times and walking distances, poor reliability, routes that do not reflect ridership patterns and trends, too many connections and/or fares, and a perception of the lack of personal safety are the major reasons why bus service is shunned by many. All these problems with the exception of personal safety are addressed here. In many cases, alternate subway service is neither available or accessible to bus riders.

Areas where excessive walking is required to or from a bus or subway are known as transit deserts or areas with service gaps. In these areas, the predominant transportation modes are illegal vans, car services, taxis, ridesharing services, and the private automobile. Cycling, skateboarding, and walking are also options for many short trips, but are less of an option for longer trips or in poor weather. A lack of affordable public transit also discourages discretionary trips and limits locations where someone may seek employment. This is why filling these service gaps are so important. They remain because additional service costs money.

Below are the service gaps these proposals seek to fill:

#### Service Gaps Filled

- Park Slope to Borough Park (B67)
- Ft. Hamilton Parkway (B16)
- 13<sup>th</sup> Avenue (B23)
- 16<sup>th</sup> Avenue (B69)
- Albany Avenue (B40)
- Union Street / St. Johns Place (B71)
- St. Johns Place in Ocean Hill (B65)
- Empire Boulevard (B49)
- Clarkson Avenue (B16)
- Avenue K (B11);
- 65 St/Avenue P (B2)
- Foster Avenue (B80)
- Van Siclen Avenue (B85)
- Cleveland Street (B84)

One advantage of buses over a fixed rail system is that they are, in theory, more flexible allowing frequent modification. In practice however, buses have been less flexible than the trolleys they replaced. (There even were special summer trolley routes to serve the beaches.) The MTA and its predecessors have been reluctant to experiment, for example by labeling a new route as a six-month or one-year experiment with standards for retaining the route established before operation starts. The fear is that once a new route is instituted, political pressure would prevent discontinuation.

Many portions of the borough are difficult to access because the bus system developed incrementally rather than being planned comprehensively. Some bus routes were created 80 years ago with few alterations; others started over 100 years ago as trolley routes and at that time made sense. Today, changes in land use and population shifts require their reevaluation. As additional areas developed, routes were extended or diverted with little consideration to the rest of the system. The result was an overly complex system with extra-long or convoluted routes that is inefficient and makes transferring difficult in some cases. A reluctance to operate new routes has also resulted in service gaps.

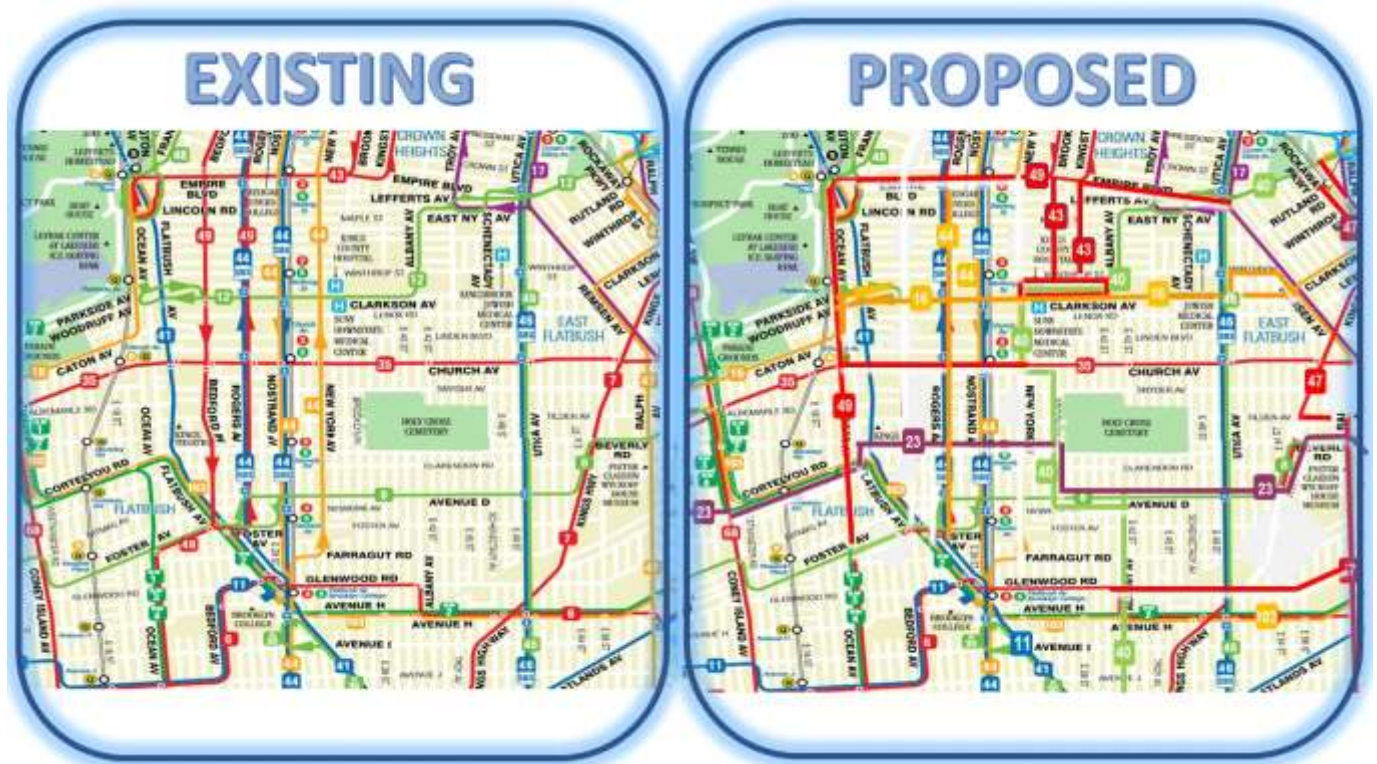
It is absurd that a route created to provide direct service to Ebbets Field from Williamsburg should still exist today when a simpler and straighter route could directly serve a major trip generator such as Kings County/State University of New York Downstate Medical Complex. Large parks and cemeteries make adjacent neighborhoods difficult to access when all routes are straight and direct. The proposed redesign should solve these problems by:



- Combining the B67 and B70 to better connect neighborhoods north and south of Greenwood Cemetery.
- Reinstating the B71 and combining part of the B12 and B16 around Prospect Park to better connect neighborhoods on the east and west sides of the park.
- Extending the B69 to fill a service gap on 16 Avenue, created by the elimination of the B23 in 2010, and returning it to Prospect Park West and 8<sup>th</sup> Avenue to better connect neighborhoods on the west side of the park.
- Straightening north/south routes in Borough Park to improve connections to Bensonhurst and provide more direct travel by a straightened B16 and a new B23. North/south bus access would

finally be provided to Maimonides Medical Center, a major borough institution for the last 50 years.

- Filling the east/west service gap in southern Brooklyn between 60 Street and Bay Ridge Parkway with an LTD route on 65 Street. An LTD is proposed because there is local service on 60<sup>th</sup> Street, a quarter-mile away.
- Filling the east/west service gap between Avenue M and Avenue U by extending Avenue R service in the westerly direction.
- Filling the east/west service gap between Avenue H and Avenue N by providing service along Avenue K via an eastward extension of the B11 to the Georgetown Shopping Center, home of a new Fairway supermarket.



- Filling the north/south service gap between Utica and Nostrand Avenue where many rely on livery services as evidenced by their large number serving Kings County Hospital with a new B40 route. This route would reduce dependence on the heavily used B44 and B46 buses and allow more direct trips to be made with less walking which would encourage additional trips and increase ridership. The B40 could be designated as B45 if that number is retired first.
- Filling the east/west service gaps between St. Johns Place and Church Avenue (where there are no through direct bus routes) by covering the length of Empire Boulevard with a rerouted B49, and Clarkson Avenue by rerouting the B16. Dependence on the heavily used Church Avenue bus route would be reduced, resulting in less walking and quicker passenger trips.

- Filling the St. Johns Place east/west service gap in Ocean Hill created in 2002 (with the elimination of the old B40) by extending the B65, improving access between Crown Heights, Ocean Hill, and Brownsville. (Additional maps are provided in Appendix 4.)
- Filling an east/west service gap in Canarsie on Foster Avenue to serve Canarsie Plaza Shopping Mall (currently without any bus access) with a new B80.
- Filling two north/south service gaps in East New York between Pennsylvania and Fountain Avenues by an extended B84 and a new B85. The community which is largely transit dependent has been requesting these service gaps be filled for nearly 50 years.

### Improved Airport Access

A Brooklyn Bus Network Redesign should also improve access to the City's airports. They are not only used by tourists, but are major employment centers.

Presently, the only ways to access John F. Kennedy International Airport (JFK) by mass transit is with the B15 and a combination Long Island Rail Road, or A/C subway ride, to the Airtrain. This is grossly deficient since those routes serve a very small portion of the borough. As a result, most trips to JFK are made by taxi, private livery services, ride sharing or private automobile. La Guardia (LGA) access is not even possible using two buses or a bus and train except for the F/R and Q70 combination. Under this proposal, access to both airports are greatly improved. LGA access from parts of northern Brooklyn is made possible by a two-bus ride.

Additional direct access to JFK is proposed by direct routes from central and southern Brooklyn via LTD service. A direct route to LGA is not proposed due to chronic congestion on the Brooklyn-Queens Expressway (BQE) and no possibility of an exclusive bus lane. A route to LGA via the BQE from Williamsburg Bridge Plaza (because of the numerous bus connections available there) may be feasible during certain hours with the newly expanded Kosciuszko Bridge, but is not proposed here.

Improved airport access is accomplished as follows:

- Split the **B24** in half. Extend the Greenpoint Avenue segment to connect with Q70 SBS to LGA and combine with B32 to provide two bus access to LGA from Greenpoint Avenue and the current B32 route service area.
- **B34 LTD** (New) between JFK and Central Brooklyn via Church Avenue.
- **B33 LTD** (New) between JFK and Central Brooklyn via Glenwood Rd/Foster Ave.
- **B5 LTD** (New) between JFK and Bay Ridge (Southern Brooklyn) via local streets and the Belt Parkway exclusive bus lane on shoulder. Some minor reconstruction on the Belt Parkway may still be required.

### Improved Interborough Connections

- Direct bus access between Greenpoint/Williamsburg and Astoria via a combination of the southern portion of the B24 with the Q104.



- Direct bus access between Greenpoint/Williamsburg and Jackson Heights via an extension of the northern portion of the B24 and combination with the B32.
- Extension of the B14 to Cross Bay Boulevard to connect with the Q52/53 SBS to Queens Center, Woodside and the Rockaways.
- Restoration of the B71 in Park Slope with Lower Manhattan extension, as requested by local elected officials.
- Extension and diversion of the S79 SBS to the 59 Street Express Subway Station for quicker Manhattan access. Would also connect the route with three additional Brooklyn routes providing two-bus access to additional parts of Park Slope, Bensonhurst, Marine Park and Mill Basin via extended B67, revised B9, and extended B2. Extension of Staten Island service to 59 Street was requested 40 years ago.
- New Q45 service between Sheepshead Bay Station and the Rockaways using an exclusive bus lane on the shoulder of the newly reconstructed Belt Parkway, a trip currently requiring three buses for most riders.

### **Night Time Bus Network**

New York is a 24-hour city and needs a 24-hour bus and train network. However, since bus usage is light during overnight hours, it is not necessary that every bus route provide 24-hour service. Transferring between buses is usually impossible, because, at these times, most bus services operate at hourly intervals. At night, potential riders would be willing to walk further in order to have more frequent service, for example, at every 30 minutes. (This would not be true during the day when most are willing to only walk  $\frac{1}{4}$  mile to a local bus route, the planning standard.)

The nighttime network proposed here would be feasible, with more of a grid system for alternate routes with some night time modifications, to operate throughout the night at 30 to 45-minute intervals for approximately the same cost as the current 40 to 70-minute intervals. Routes operating throughout the night would carry an "N" suffix. Examples of routes that would be modified for nighttime service, are the B2N, B14N, B15N, B40N, B46N, and B48N. Unchanged routes operating throughout the night would also carry an N suffix. Routes that operate most of the day and night, e.g., the B49, would continue to do so without the "N" suffix.

Additionally, if holding lights were installed at bus stops that are major bus-subway transfers, such as Utica Avenue and Eastern Parkway, to alert bus operators that a train has just approached the station, buses could wait three minutes for passengers to disembark and catch the bus. This would be especially helpful during overnight hours. This technology has been available for about fifty years but has never been instituted in New York City.

Below is what a night time network could look like. (Individual night time route maps start on Page 83; individual Day time routes start on Page 47.)



### PART 3 - IMPLEMENTATION

#### Community Outreach and MTA Agreement

Implementation of these proposals is contingent with MTA approval based on community input. Of course, there should be compromise and negotiation, and no plan will satisfy everyone. Whatever is finally decided upon should not be dictated by any higher authority. However, communities should also be willing to support plans that are for the greater good and not take a parochial approach. Also, communities that are virtually isolated from others should not block attempts to improve access to their community by wanting to stay isolated and automobile dependent. If that is what they want, they should not complain about poor bus service.

Under the proposal presented here, routes would generally be longer, but service reliability would improve. Fewer trips would service the entire route at the times when traffic and ridership are heaviest, as that more trips would operate shorter distances. Buses delayed at one end of the route would not affect service at the other end; some passengers would wait longer for buses that travel the entire route so as not to require an extra transfer. The short route services are shown in the route descriptions in Appendix 3.

#### The Costs for the Proposed Network Redesign

Gross operating costs would increase but net operating cost would remain about the same due to increased revenue resulting from a projected huge increase in ridership by as much as 30 percent. The current strategy to reduce operating expenses and therefore service levels has resulted in reduced ridership, lower revenue, and higher fares. It is time we change this strategy and make strategic investments in increased operating expenses.

Some may be skeptical that better service could result in such a huge gain in ridership. One should be reminded that the free bus transfer policy started by trolley companies in the late 1800s or early 1900s, and later by bus companies in the 1920s, allowed free transfers only within each private company and through agreements between companies. That policy was maintained in Brooklyn until MetroCard was introduced in the late 1990's. Free transfers in Manhattan and the Bronx were discontinued in 1962. Later, there was the short-lived add-a-ride reduced fare transfer policy throughout the city. The lack of a universal free bus transfers in Brooklyn caused riders to walk extra distances and use indirect routes discouraging ridership.

Yet, this policy was maintained for over fifty years after these private companies were dissolved. Brooklyn & Queens Transit, (BQ &T), Brooklyn Manhattan Transit (BMT), the Board of Transportation (BOT), the few remaining private companies, and the New York City Transit Authority, all of which operated these bus routes during that time all refused to allow transfers between all routes. Each maintained that they could not afford the revenue loss.

Finally, in the mid-1980s, over thirty years after the MTA became the major system operator, a single transfer between most bus routes was allowed; when Metro-Card Gold was introduced in the mid-90s, transfers between buses and subways were added. In my 1972 master's thesis, there was a hypothesis that free transfers would increase ridership by 30 percent. The MTA believed the effect on bus ridership would be negligible. The hypothesis proved to be correct when bus ridership rose to its highest level since World War II after transfers were added. Unfortunately, bus ridership is, once again, on the decline.

Therefore, improving reliability and increasing accessibility (by making most trips possible with one or two buses without a fare penalty for using more than two buses) would increase ridership by another 30 percent. Riders would return to the buses from private vans, taxis, and ridesharing services. Traffic would be reduced, further improving bus reliability, encouraging new trips, and enabling a greater choice of employment options and locations. This would improve the economy, increase the tax base, and provide additional revenue for the MTA. Could we afford to do this? We can't afford not to.

This is how we take back our system instead of continuing the course we are on of raising fares and tolls every two years and continuing to institute service cuts resulting in further reduced bus ridership.

The MTA must decide if the major purpose of a bus network redesign is to lower operating costs or to improve connections between neighborhoods and service reliability with strategic investments in operating cost increases.

### **Phasing in of Proposals**

It would not be feasible to attempt a borough-wide bus route redesign overnight. Therefore, it is recommended that after a new routing system is agreed upon, it be phased in about every three months coinciding with bus operators picking their assignments. The MTA, however, would decide the depot assignments for the bus routes. I urge them to use efficient scheduling techniques that would minimize the number of deadhead miles and to curtail their inefficient practice of operating bus routes as long as halfway across the borough without passengers. NYCT Bus and MTA Bus also should share depots for more efficient operations. The phases are shown in Appendix 2.

Phase 1 would have to be implemented first, then Phase 2, and then Phase 3. Phases 4 through 10 can be implemented in any order. The remaining route changes can be implemented individually and do not depend on any of the other changes. My proposals could still succeed with some modifications. However, some of the proposals are crucial, and modification would make them less successful and/or more expensive.

### **Measuring Effectiveness**

Success is declared by analyzing data and finding something positive to say, ignoring negatives. After one year, [Staten Island express bus service](#) is 1.3 mph faster, and the average dwell time is 23 seconds less. However, complaints that reduced service spans on some routes added 40 minutes to some commutes or that more passengers must now stand are dismissed. Rather than first considering a lower off-peak fare to encourage ridership, the MTA chose to eliminate trips. A good plan requires minimal fine-tuning. The Staten Island Express bus redesign continues to undergo revisions for over one year with many passengers still dissatisfied.

Criteria should be established to measure the effectiveness of a network restructuring. To what extent:

- has reliability has improved?
- have passenger trip times has decreased?
- has ridership increased?
- are the results different from other borough redesigns?

Based on rider feedback, fine tuning of some of the proposals recommended here may be necessary after implementation.

## CONCLUSIONS

1. The MTA has resisted productive bus route changes for fifty years, and has recently attempted to increase service reliability by splitting long routes in half with little or no overlap. Route extensions, path revisions, and new shuttle routes were created in a vacuum without considering these routes as part of a network. In some cases, they have been penny-wise and dollar-foolish.
2. Non-revenue mileage, once considered wasted mileage, greatly increased in the past decade, because the thinking is that most short service is unproductive because non-revenue trips could be made in less time.
3. The MTA has long-insisted that a service increase be offset with a service decrease elsewhere. This has resulted in better service for one community at the expense of another. At least, with these studies, the MTA has shown a willingness to listen by scheduling meetings to hear community concerns before actually designing new systems. This contrasts with SBS, whereby SBS was a predetermined conclusion before community concerns were heard, and many were ignored. NYCDOT was the lead agency for that project, not the MTA.
4. The decades-old policy that service changes should not result in the payment of extra fares was abandoned. When an SBS route does not cover the former LTD route, transferring passengers must either use the slower local or pay an additional fare to use SBS, as that three-legged transfers are mostly disallowed. Those that are allowed are rarely publicized; most riders are unaware of them.
5. The MTA's planning effort has returned to the comprehensive approach after years of ad-hoc planning that has not worked and contributed to today's problems and inefficiencies. The comprehensive approach was abandoned decades ago with the incorrect assumption that comprehensive studies cannot work because they were not able to perform them successfully.
6. If the MTA really wants to take a fresh look at their bus network, they will seriously consider all suggestions made by the public and not dismiss any out of hand. Too often, worthwhile suggestions are ignored with the excuse that the MTA cannot afford to spend more on operating service, except for SBS. I have received assurances from NYCT President Andy Byford and Acting President of Buses, Craig Cipriano, that the proposals presented here will be seriously considered.
7. We must not rely on formulas. Simplistic solutions without adequate study have resulted in some of our traffic and transit congestion problems today.
8. Criteria for evaluating bus network redesigns must be clear and not cite minor improvements to declare success while ignoring major shortcomings, as was done with the Staten Island Express Bus Network Redesign.
9. The solutions advanced here to reversing the decline in bus ridership **do not** include the following solutions proposed by the MTA and NYCDOT:
  - a. Additional, and costlier, SBS service;
  - b. Mass elimination of bus stops to speed service;

- c. Reduce the number of traffic lanes in order to increase traffic congestion, e.g., exclusive bus lanes when service is neither frequent nor in operation;
- d. Increase bus frequency for some services at the expense of reducing network coverage.

These strategies are not be beneficial. Failed solutions will only discourage mass transit trips by diverting more ridership to other modes of travel, such as illegal vans, ridesharing services, and taxis. These increase traffic congestion, and further slows bus service. A state law requiring vehicles to give the right of way to buses pulling out of bus stops would cost virtually nothing and speed buses much more than adding more expensive SBS routes with limited benefits. Several states have such a law.

10. The network redesign studies do not consider other modes of travel or changes to the fare and transfer structure. (Why should SBS receipts be valid only for one hour so that passengers who take long trips are at risk for receiving a summons?)
11. A broader approach is needed for these network redesign studies, one that considers latent demand, other modes of travel, and changes to the fare (i.e. reduced off-peak and student express bus fares, and [a time-based fare](#), rather than a vehicle based fare requiring double fares for short trips).
12. The MTA should work with everyone to determine what is best for us and for our economy. A myopic approach that focuses solely on existing customers with emphasis on minimizing operating cost is doomed to fail.
13. We could reverse the trend of lower bus ridership with a small investment in operating cost to improve service. There needs to be a genuine concern for the passenger that focuses on reducing passenger trip time rather than just in-route bus travel time.
14. Some of the monies from Congestion Pricing should be spent on improving bus routes and service. Current plans call for all the funding to go toward, capital improvements, more-expensive-to-operate SBS service with minimal benefits, and exclusive bus lanes even if they are not warranted. Without additional funding, there will be little choice but to continue to cut bus service as the deficit increases.
15. The proposed Brooklyn Bus Network Redesign my staff and I completed in 1982 as Director of the Brooklyn Transit Service Sufficiency Study for MTA New York City Transit, was never made public. The study did not result in any network modifications because it made no recommendations. We could have had a more efficient and reliable Brooklyn bus system, just as successful as the Southwest Brooklyn, 37 years ago. We cannot afford to lose more time. We need a better functioning bus system now.

## APPENDIX 1 – MY QUALIFICATIONS

- Master's Degree in Urban Planning with a Transportation Concentration from Columbia University, 1973.
- Master's Thesis featured a redesigned entire Brooklyn bus network. Many of the ideas from the thesis were coincidentally adopted by MTA as long as 37 years after they were initially proposed, e.g, the B38 extension to Metropolitan Ave; the B43 route merger of the old B47 and old B62, the B47 merger of the old B40 and old B78, the B57 absorbing the old B75, splitting the old B61 into a new B61 and new B62, and the new B61 absorbing the old B77.
- Responsible for the successful 1978 Southwest Brooklyn re-routings as a transportation planner with the NYC Department of City Planning. See page 24 [here](#).
- Appointed Director of Bus Planning for MTA NYCT, 1981; and Director of Brooklyn Bus Planning 1981-1982 due to my successful Southwest Brooklyn Plan.
- As Director of the Brooklyn Transit Service Sufficiency Study for the MTA, wrote contract to apply and receive an additional \$300,000 in federal funding because two-thirds of the previous funding had been expended with only one-third of the work-scope completed due to prior mismanagement.
- As Director, the data collection effort which had been sabotaged by temporary employees was salvaged. The sabotage was done as retaliation for being terminated on a Friday after six months and then rehired the following Monday so that the MTA would not have to convert them from temporary to provisional employees which would make them eligible for vacation, sick, and health benefits.
- As Director, began a community involvement effort to ascertain problems with existing bus service and surveyed bus operators, before proposing a redesign of the entire local bus network.
- Although the proposed network was completed in three months with the exception of depot assignments and scheduling, my supervisor directed me to rework the redesign five times to present five different alternatives for every proposal stretching the effort to 15 months. The proposals were never presented to the communities for their consideration because I could not support the final product that I was required to create. The final report completed in the mid-1980s, after my transfer to another department, consisted of several hundred pages of tables and charts showing ridership and other statistics with a five, or ten-page introduction. It was submitted to the Urban Mass Transit Administration for reimbursement of the \$6 million funds that were expended but made no recommendations using the budget situation as an excuse.
- Employed by the MTA for nearly 25 years in various capacities.
- Proposed the short B83 extension to the Gateway Center Mall which the MTA studied for three years prior to implementation.

- Developed the 2003 [Committee for Better Transit website](#) detailing comprehensive bus route redesign for southwest Brooklyn.
- Wrote weekly transportation column for a [local blog](#) from 2011 to 2015 and am continuing to write transportation letters and articles, since retiring in 2005, for local newspapers such as the [Queens Chronicle](#) and [Rockaway Wave](#) (where I proposed a new fare structure) and the [Gotham Gazette](#) blog.
- Fought [against expansion of Select Bus Service](#) as a panacea for improving bus service. The MTA finally agreed to place a moratorium on new SBS routes for three years.



## APPENDIX 2 –

### PHASE DESCRIPTIONS

#### Phase 1 – Southwest Brooklyn

- **B1** extended to Shore Rd/4 Ave.
- **B2** extended via Ave P and 65 St to Shore Road/Bay Ridge Ave.
- **B9** extended on Shore Rd/101 St to replace B16.
- **B16** cutback to 4 Ave and rerouted from 13/14 Ave to Ft Hamilton Pkwy.
- **B23** instituted from 62 St to Remsen Ave with B8 schedule modified.
- **B64** rerouted to 92 St via Bath and Cropsey Ave (and from Harway Ave to Bath Ave, optional)

#### Phase 2 – Central Brooklyn

- **B16** rerouted off Ocean Ave and extended along Clarkson Avenue to northern B7 terminus.
- **B7** eliminated.
- **B82** schedule revised to add service east of E 16 Street replacing loss of B7.
- **B47** rerouted to Kings Highway north of Tilden Ave.
- **B12** western terminus moved to Clarkson/NY Ave.
- **B49** rerouted along Ocean Ave and along Empire Blvd to Utica Ave.
- **B43** rerouted to Kings County Hospital.
- **B44** rerouted to coincide with B44 SBS.
- **B40** (New) instituted from Knapp Street to Kings County Hospital to fill service gap and replace **B44** local on New York Avenue.

#### Phase 3 – Ocean Hill

- **B12** discontinued.
- **B40** extended to Rockaway Ave and East NY Ave via B12 route to partially replace B12.
- **B65** extended to Alabama Avenue to replace the remainder of the B12.

#### Phase 4 – Ridgewood

- **B13** rerouted from Wyckoff Ave to Fresh Pond Road/Metropolitan Ave.
- **B26** extended to Wyckoff/Flushing.
- **B38** Seneca Ave branch extended to Myrtle/Fresh Pond Rd.
- **B52** extended east on Gates to Fresh Pond Rd.
- **B54** extended to Fresh Pond Rd/Central.

#### Phase 5 – Union St/St Johns Pl/Pitkin Ave

- **B45** combined with **B14**.

- **B71** (New) instituted.

#### **Phase 6 – Eastern Brooklyn**

- **B83** extended to Ridgewood to replace northern end of B20.
- **B20** discontinued.
- **B83** rerouted from Van Siclen to Pennsylvania.
- **B85** (New) instituted on Van Siclen to replace B83.
- **B60** rerouted and extended east on Cozine Ave to New Lots Station to partially replace B6.
- **B6** rerouted from Flatlands Av to Avenue L.
- **B80** instituted to partially replace B6 eastern end.
- **B14** rerouted and extended to Cross Bay Blvd.
- **B84** headways are decreased to every 20 minutes; route is extended to Cleveland St station on the north and rerouted to better serve Gateway Center Mall.

#### **Phase 7 – Greenpoint/Williamsburg**

- **B24** split into two routes by extending Q104 south to cover southern portion.
- **B24** northern portion extended to Jackson Heights.
- **B32** absorbed into northern portion of B24.

#### **Phase 8 – B82 / Gerritsen Beach**

- **B82** split into B81 and B82.
- **B81** combined with B31.
- **B82** extended to Gateway Center Mall.

#### **Phase 9 – Bergen Beach**

- **B9** rerouted from Kings Plaza to Ave N and Veterans Ave.
- **B41** Bergen Beach branch discontinued.
- **B10** (New) to Flatbush/Nostrand replaces B41 Bergen Beach branch during rush hours and overnight.

#### **Phase 10 – B62/B67/B69**

- **B67** cutback to Court/Livingston.
- **B62** rerouted in Dumbo and Vinegar Hill replacing B67.
- **B69** rerouted back to former route along 8 Ave and Prospect Park W.
- **B69** rerouted from Downtown Brooklyn through Brooklyn Navy Yard to Williamsburg Br Plaza replacing B67.
- **B67** and **B70** combined.

**Optional Phase – B3/B4**

After the New **Q45** and **Phase 1** are instituted, the following changes could be made:

- Combine the western portion of the B4 with the B3 operating as the B3.
- Extend the B64, operating as the B4, along Neptune Avenue, Shell Road, Avenue Z and present routing to Sheepshead Bay Station. Route would be further extended along Avenue Z to Knapp/Voorhies during rush hours to provide additional service. Under this option, a B36 short route service from Sheepshead Bay Station to Avenue U would not be needed.

**The following route changes are not dependent on other changes and can be made at any time.**

- **B2** rerouting to replace B100.
- **B3** Bergen Beach service restoration.
- **B5 LTD** (New) instituted to JFK.
- **B11** extended to Avenue K and E 72 St.
- **B17** rush hour branch renamed B19.
- **B33** (New) Limited instituted to JFK.
- **B35** split into B34 LTD and B35 with B34 LTD terminating at JFK.
- **B36** rerouted at Sheepshead Bay Station.
- **B42** extension to E 108 St/ Seaview via branch during rush hours and loop other times.
- **B44** branch instituted to serve Kingsborough Community College when school is in session.
- **B47** extended to Flushing Ave.
- **B103** rerouted from Ave M to Ave L.
- **Q24** extended to DeKalb Ave.
- **S79 SBS** extended to 59 St Station.

There are 42 modified routes, 9 new routes, 4 discontinued routes, and 25 routes remaining unchanged. Six routes are changed more than once.

Phases by Routes					
<b>B1</b>	<b>Phase 1</b>	<b>B35</b>	<i>Unchanged route</i>	<b>B70</b>	<b>Phase 10</b>
<b>B2</b>	<b>Phase 1*</b>	<b>B36</b>	<b>Anytime</b>	<b>B71</b>	<b>Phase 5</b>
<b>B3</b>	<b>Anytime**</b>	<b>B37</b>	<i>Unchanged</i>	<b>B74</b>	<i>Unchanged</i>
<b>B4</b>	<i>Unchanged</i> †	<b>B38 and LTD</b>	<b>Phase 4</b>	<b>B80 (new)</b>	<b>Phase 6</b>
<b>B5 (new)</b>	<b>Anytime</b>	<b>B39</b>	<i>Unchanged</i>	<b>B81 (new)</b>	<b>Phase 8</b>
<b>B6</b>	<b>Phase 6</b>	<b>B40 (new)</b>	<b>Phases 2, 3</b>	<b>B82</b>	<b>Phase 8</b>
<b>B7</b>	<b>Phase 2</b>	<b>B41</b>	<b>Phase 9</b>	<b>B83</b>	<b>Phase 1, 6</b>
<b>B8</b>	<i>Unchanged</i>	<b>B42</b>	<b>Anytime</b>	<b>B84</b>	<b>Phase 4</b>
<b>B9</b>	<b>Phases 1, 9</b>	<b>B43</b>	<b>Phase 2</b>	<b>B85 (new)</b>	<b>Phase 6</b>
<b>B10 (new)</b>	<b>Phase 9</b>	<b>B44 and SBS</b>	<b>Phase 1 ‡</b>	<b>B100</b>	<i>Anytime*</i>
<b>B11</b>	<b>Anytime</b>	<b>B45</b>	<b>Phase 5</b>	<b>B103</b>	<b>Anytime</b>
<b>B12</b>	<b>Phases 2 ,3</b>	<b>B46</b>	<i>Unchanged</i>	<b>B110</b>	<i>Not Considered</i>
<b>B13</b>	<b>Phase 4</b>	<b>B47</b>	<b>Anytime</b>	<b>Q7</b>	<i>Unchanged</i>

<b>B14</b>	<b>Phase 5, 6</b>	<b>B48</b>	<b><i>Unchanged</i></b>	<b>Q8</b>	<b><i>Unchanged</i></b>
<b>B15</b>	<b><i>Unchanged</i></b>	<b>B49</b>	<b>Phase 3</b>	<b>Q24</b>	<b>Anytime</b>
<b>B16</b>	<b>Phase 2</b>	<b>B52</b>	<b>Phase 4</b>	<b>Q35</b>	<b><i>Unchanged</i></b>
<b>B17</b>	<b>Anytime</b>	<b>B54</b>	<b>Phase 4</b>	<b>Q45 (new)</b>	<b>Anytime</b>
<b>B19</b>	<b>Anytime</b>	<b>B57</b>	<b><i>Unchanged</i></b>	<b>Q54</b>	<b><i>Unchanged</i></b>
<b>B20</b>	<b>Phases 3, 6</b>	<b>B60</b>	<b>Phase 6</b>	<b>Q55</b>	<b><i>Unchanged</i></b>
<b>B23</b>	<b>Phase 1</b>	<b>B61</b>	<b><i>Unchanged</i></b>	<b>Q56</b>	<b><i>Unchanged</i></b>
<b>B24</b>	<b>Phase 7</b>	<b>B62</b>	<b>Phase 10</b>	<b>Q58</b>	<b><i>Unchanged</i></b>
<b>B25</b>	<b><i>Unchanged</i></b>	<b>B63</b>	<b><i>Unchanged</i></b>	<b>Q59</b>	<b><i>Unchanged</i></b>
<b>B26</b>	<b>Phase 4</b>	<b>B64</b>	<b>Phase 1**</b>	<b>Q104</b>	<b>Phase 7</b>
<b>B31</b>	<b>Phase 8</b>	<b>B65</b>	<b>Phase 3</b>	<b>s53</b>	<b><i>Unchanged</i></b>
<b>B32</b>	<b>Phase 7</b>	<b>B67</b>	<b>Phase 10</b>	<b>s79 SBS</b>	<b>Phase 1</b>
<b>B33</b>	<b>(new) Anytime</b>	<b>B68</b>	<b><i>Unchanged</i></b>	<b>s93</b>	<b><i>Unchanged</i></b>
<b>B34 LTD</b>	<b>(new) Anytime</b>	<b>B69</b>	<b>Phase 10</b>		

\* B100 discontinued along with B2 rerouting on eastern end.

\*\* Route further modified under Option.

† Route modified under Option.

‡ KCC branch can be implemented any time.

## APPENDIX 3 –

### BUS ROUTE DESCRIPTIONS

Route descriptions are color coded as explained. These colors do not coincide with the colors on the maps.

#### COLOR CODES –

**CHANGED ROUTE – MAJOR CHANGE OR EXTENSION – UNCHANGED ROUTE – NEW ROUTE OR NEW ROUTE NUMBER – ROUTE ELIMINATED OR REPLACED – RESTORED ROUTE WITH EXTENSION -**

**B1** - Shore Road/86 St to Kingsborough College via 86 St and Brighton Beach Ave.

#### SHORT ROUTE SERVICES –

- B1 - 13 Ave to Kingsborough College.
- B1- 25 Ave to Kingsborough College.
- B1 - Ocean Pky to Kingsborough College.

**B2** - Bay Ridge Ave/Shore Rd to Kings Plaza via 65 St and Aves P/R to Kings Plz.

- Stops at even numbered avenues only along 65 St.

**B3** - 25 Ave/Harway to E 73 St/Ave X via Ave U.

- An optional phase would combine the western portion of the B4 with the B3.

**B4** - Unchanged.

- An optional phase would extend the B64, operating as the B4, along Neptune Avenue, Shell Road, Avenue Z and present routing to Sheepshead Bay Station. Route would be further extended along Avenue Z to Knapp/Voorhies during rush hours to provide additional service. Under this option, a B36 short line service from Sheepshead Bay Station to Avenue U would not be needed. It also assumes the new Q45 to the Rockaways would replace the portion of the B4 on or near Emmons Avenue east of Sheepshead Bay Station.

**B5 LTD** - 4 Ave/86 St to JFK via Bath Ave, local streets and Belt Pkwy using shoulder as a bus only lane east of Knapp St, and Conduit Blvd and Nassau Expwy eastbound.

- Makes additional stops at 86 St/ 7 Ave, on Bath Ave at 14 Ave, 18 Ave and Bay Pkwy, 26 Ave at Cropsey westbound and Shore Pkwy Service Rd eastbound, on Shore Pkwy at Ocean Pkwy and Ocean Ave, on Emmons Ave at Nostrand and Knapp St, Canarsie Pier, Erskine St and Gateway Dr and at Cross Bay/ Pitkin to connect with Q52/53 SBS.

**B6** and **B6 LTD** - Cropsey/25 Ave to Seaview/ E 108 St via Bay Pkwy, Ave J, Glenwood Rd, E 80 St and Ave L.

- Flatlands Ave and New Lots subway service provided by B82, B80, or B84.

**B7 – Discontinued.**

- Northern portion replaced with B16 extension. Mid-portion replaced with B47 rerouting.
- B82 service to Brighton Station is increased.

**B8 – Unchanged.**

**B9** - Shore Rd/101 St to Veterans Ave/ E71 St via Shore Rd, 60 St, Aves N, M, L and N.

- Replaces B41 Bergen Beach branch during non-rush hours except overnight.

**SHORT ROUTE SERVICES –**

- Shore Rd/101 St to 59 St Sta.
- Brighton Sta to Veterans Ave/ E71 St.

**B10** - Flatbush/Nostrand to Veterans/E 71 St via Flatbush Ave.

- Rush hours and overnight only. Replaces B41 Bergen Beach branch.

**B11** - 1 Ave/58 St to Ave K/E 72 St via 55/52 St and 49/50 St, Ave J, Brooklyn College, and Ave K to E 72 St.

**B12 – Discontinued.**

- Replaced with new B40 and B65 extension.

**B13** – Metropolitan Av/Fresh Pond Rd to New Lots Ave Sta via Fresh Pond Rd, Cypress Hills St, Crescent, Fountain, Erskine, Vandalia and Ashford.

- Wyckoff Ave portion replaced with B26 extension to Flushing Ave.

**SHORT ROUTE SERVICE –**

- Fresh Pond to Vandalia/Elton.

**B14** - Court/Livingston to Sutter/Cross Bay via existing B45 and B14 routes.

- Replaces B45.
- Route extended to Cross Bay Blvd to provide transfer to Q52 SBS and Q53 SBS and rerouted to serve the Euclid Avenue subway station.
- **SHORT ROUTE SERVICE** – Utica Ave to Cross Bay Blvd.

**B15** – Unchanged.

**B16** - 4 Ave/86 St to Saratoga/Broadway via Ft. Hamilton Pkwy, Caton, Clarkson and Saratoga.

- Provides through Ft. Hamilton Parkway service, also filling service gap on Clarkson Ave.
- Replaces western end of B12 and northern end of B7. Rest of B7 is eliminated. New B23 provides 13/14 Ave service.
- B16 school specials are retained to operate off-route.

**SHORT ROUTE SERVICES –**

- 4 Ave to Kings County Hospital
- Parkside Ave Sta to Saratoga/Bway.

**B17** - E 80 St rush hour branch is renumbered to B19.

**B19** - formerly E 80 St branch of B17.

**B20** – Discontinued.

- Northern portion replaced with extended B83.

**B23** - 4 Ave/86 St to Remsen Ave/Foster via 13 and 13/14 Ave, 39 St, Cortelyou, Beverley Rd, Ave D and Foster Ave.

- Replaces B16 13 and 14 Ave service and restores Cortelyou Rd portion of old B23 extending it eastward past Canarsie Plz. 16th Avenue portion of old B23 is replaced by a restored B69.

**B24** - Williamsburg Br Plz to Roosevelt/Broadway via Greenpoint and Roosevelt.

- Incorporates B32. Provides connection with Q70 SBS for access to LGA.
- Southern portion of route is provided by an extended Q104.

**B25** – Unchanged.

**B26** - Tillary/Cadman Plaza W to Wyckoff/Flushing via existing B26 and existing B13 on Wyckoff Ave extended to Flushing Ave.

**B32** – Replaced with extended B24.

**B33 LTD** – Flatbush Junction to JFK via Glenwood, Foster, Flatlands, Linden and Conduit Blvds to JFK.

- Makes stop at Cross Bay/ Pitkin to connect with Q52/53 SBS.

**B34 LTD**- McDonald/Church Ave to JFK via existing B35 LTD and Linden and Conduit Blvds and B15 route on airport property.

- Makes current Limited stops and a stop at Pitkin and Cross Bay Blvd.

**B35** – Route Unchanged.

- Limited is renumbered as B34 and extended to JFK.

**B36** – Eastbound service rerouted to Sheepshead Bay Station via Sheepshead Bay Rd and E 17 St.

**SHORT ROUTE SERVICES** –

- Sheepshead Bay Sta to Ave U/Nostrand

**B37** – Unchanged.

**B38** and **B38 LTD** – Extended south on Seneca and Myrtle to Fresh Pond and Cypress Hills St.

**B39** – Unchanged.

**B40** - Saratoga/Rockaway Aves to Knapp/Voorhies via current B12 and New York Ave, Brooklyn Ave, Albany Ave, Kings Hwy, Flatbush Ave, Ave U and Knapp St.

- Fills a major service gap. Allows B44 local to operate on the same route as the B44 SBS.
- **SHORT ROUTE SERVICE** - Saratoga/Rockaway Aves to Clarkson/NY Ave.



**B41** and **B41 LTD** - Bergen Beach branch replaced with a B9 extension and a B10 shuttle to Flatbush/Nostrand during rush hours and overnight hours.

**SHORT ROUTE SERVICES –**

- Downtown Brooklyn to Foster Ave.
- Empire Blvd to Kings Plaza
- Flatbush/Nostrand to Kings Plz

**B42 –**

- Additional stop added at Canarsie Pier.
- Loop via Seaview Ave to E 108 St to improve access to L train.
- During rush hours, alternate buses would serve E 108 St.

**B43** - Manhattan/Box to Clarkson/NY Aves via existing route continuing to Kings County Hospital.

- Empire Blvd service is provided by a rerouted B49 along Ocean Ave and Empire Blvd filling a service gap.

**B44** - rerouted to same route as the B44 SBS. New B40 route replaces New York Ave service.

**B44 SBS** - New branch to Kingsborough Community College when school is in session along Emmons Ave, West End Ave and Oriental Blvd, making no intermediate stops south of Ave X.

**B45 – Discontinued.**

- Replaced by B14 extension. Also, see B71.

**B46 – Route Unchanged.**

- **SHORT ROUTE SERVICE – Williamsburg Br Plz to Church Ave.**

**B46 SBS – Route Unchanged.**

- **SHORT ROUTE SERVICE – Eastern Pkwy to Kings Plz.**

**B47** - Flushing Ave/Broadway to Kings Plz. via Ralph, Kings Hwy, Tilden Ave and Ralph Ave.

**B48 – Unchanged.**

**B49** - Utica Ave/Empire Blvd to Kingsborough College via Empire Blvd and Ocean Ave.

- Service north of Empire Blvd and Rogers/Bedford service provided by a rerouted B44 local and B44 SBS.
- B49 Limited is eliminated and replaced by a B44 SBS to Kingsborough Community College.

**B52** - Cadman Plaza W/ Tillary to Fresh Pond Road/Putnam via existing route replacing B13 along Gates Ave.

**B54** – Extended east to Fresh Pond Rd /Central Ave.

**B57** – Unchanged.

**B60** – Rerouted and extended east on Cozine and north on Ashford to New Lots Ave Sta replacing B6.

**B61** – Unchanged.

**B62** - Queens Plz to Boerum Pl/Schermerhorn. Rerouted in Dumbo and Vinegar Hill replacing B67.

**B63** – Unchanged.

**B64** - 95 St/ 4 Av to Stillwell/Mermaid via Poly Place, Cropsey, 18 Ave, and Bath Ave.

- Bay Ridge Ave service provided by a B2 extension along 65 St. 13 Ave service provided by a new B23.
- Bath Ave service west of 18th Ave rerouted to Cropsey. Harway Ave service rerouted to Bath Ave.
- The Option combines the B64 with the eastern portion of the B4 and renumbers the route as the B4.

**B65** - Extended eastward along St. Johns Pl and East New York Ave replacing eastern end of B12 filling a service gap created by the elimination of the old B40.

**B67** - Court/Livingston to VA Hospital via existing B67 route, 3 Ave in Greenwood Heights and existing B70 route which it replaces.

- Dumbo and Vinegar Hill service replaced with a rerouted B62. Navy Yard service replaced with a restored and extended B69.

**SHORT ROUTE SERVICES –**

- Court/Livingston to 20 St/7 Ave.
- 36 St/4Ave to VA Hospital.

**B68**– Unchanged.

**B69** - Williamsburg Br Plz to 62 St/New Utrecht Ave via Navy Yard, Vanderbilt Ave, 8 Ave/Prospect Pk W, McDonald and 16 Ave.

**B70**- Discontinued.

- Replaced with B67 extension.

**B71** - Restores old B71 extending it to South Ferry via Carey Tunnel. Extends old B71 eastward over current B45 route.

**B74** – Unchanged.

**B80**- Ditmas and Ralph Avenues via Canarsie Plaza, Rockaway Pky and Flatlands Ave to Gateway Ctr Mall.

- Replaces part of B6 on Flatlands Ave.

**B81** - Mermaid and Stillwell Ave to Gerritsen Beach via existing B82 and B31 routes.

- B82 is shortened on the western end to Coney Island Ave and extended to Gateway Ctr Mall.
- SBS service is eliminated west of Coney Island Ave.

**B82** - Coney Island Ave/Kings Hwy to Pennsylvania/Seaview.

- B82 is shortened on the western end to Coney Island Ave. B81 provides service west of that point.

**B82 SBS** Coney Island Ave/Kings Hwy to Gateway Bus Terminal via existing B82 SBS and B83 routes.

- SBS service is eliminated west of Coney Island Ave.
- B82 SBS SHORT SERVICE - Coney Island Ave/Kings Hwy to Utica Ave to partially replace B7.

**B83** - Extended from Broadway Junction to Putnam/Forest via existing B20 route which is discontinued.

- Rerouted from Van Siclen to Pennsylvania.
- Van Siclen service provided by new B85.

**B84** – Extended north to Cleveland Avenue Station to provide new north south East NY service to fill a service gap, and better serves Gateway Center Mall.

**B85** – Broadway Junction to Seaview/Louisiana.

- Replaces B83 on Van Siclen.

**B100** – Discontinued.

- Replaced with an eastward extension of the B2.

**B103** - Rerouted from Ave M to Ave L to increase accessibility.

**B110** - Continues to be privately operated and is not considered in this proposal so it is not mapped.

**Q7** – Unchanged.

**Q8** – Unchanged.

**Q24** - Extended on north end to Dekalb Ave.

**Q45** - Sheepshead Bay Sta to Newport Ave/B116 St via Emmons Ave, Belt Pkwy and existing Q35 route.

**Q54** – Unchanged.

**Q56** – Unchanged.

**Q58** and **Q58 LTD** – Unchanged.

**Q59**– Unchanged.

**Q104** - Vernon Blvd/Bway to Williamsburg Br Plz via existing route and combined with southern portion of B24.

**S53** – Unchanged.

**S79 SBS** –Rerouted from 86 St Station to 59 St Sta via 7 Ave providing:

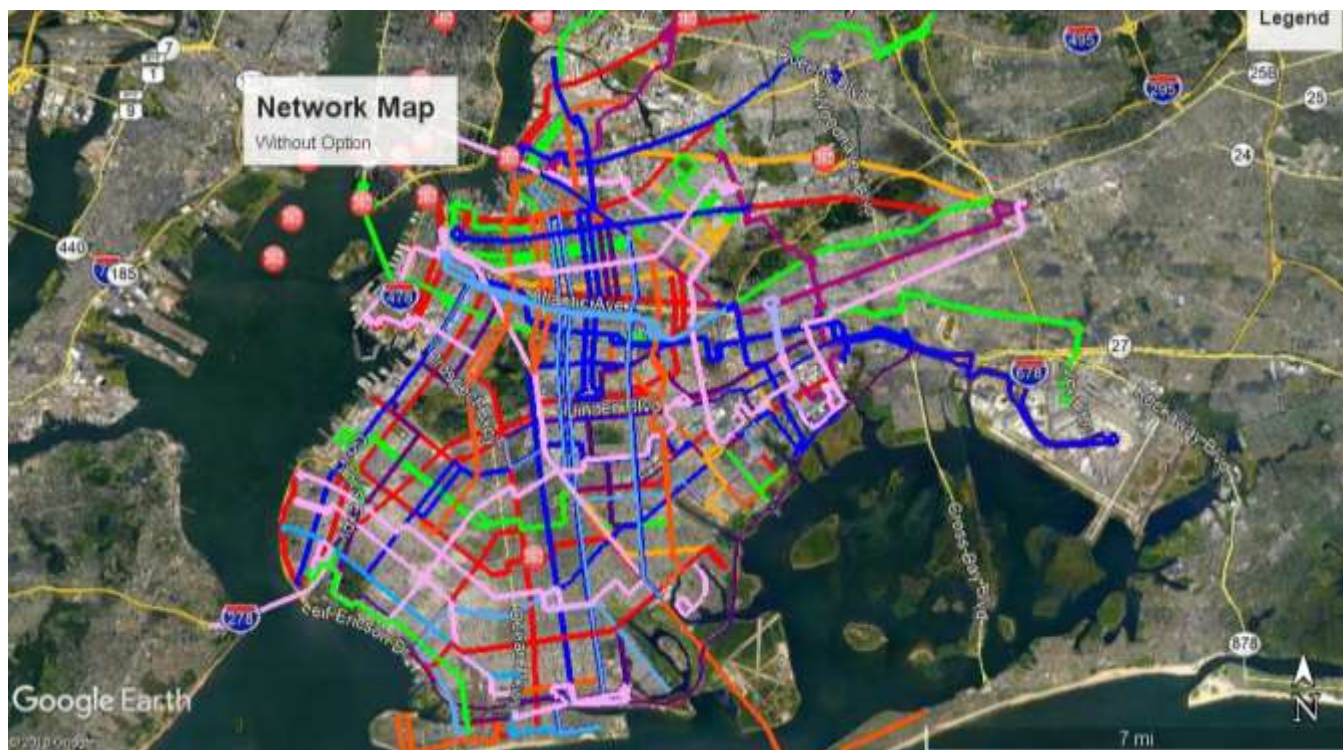
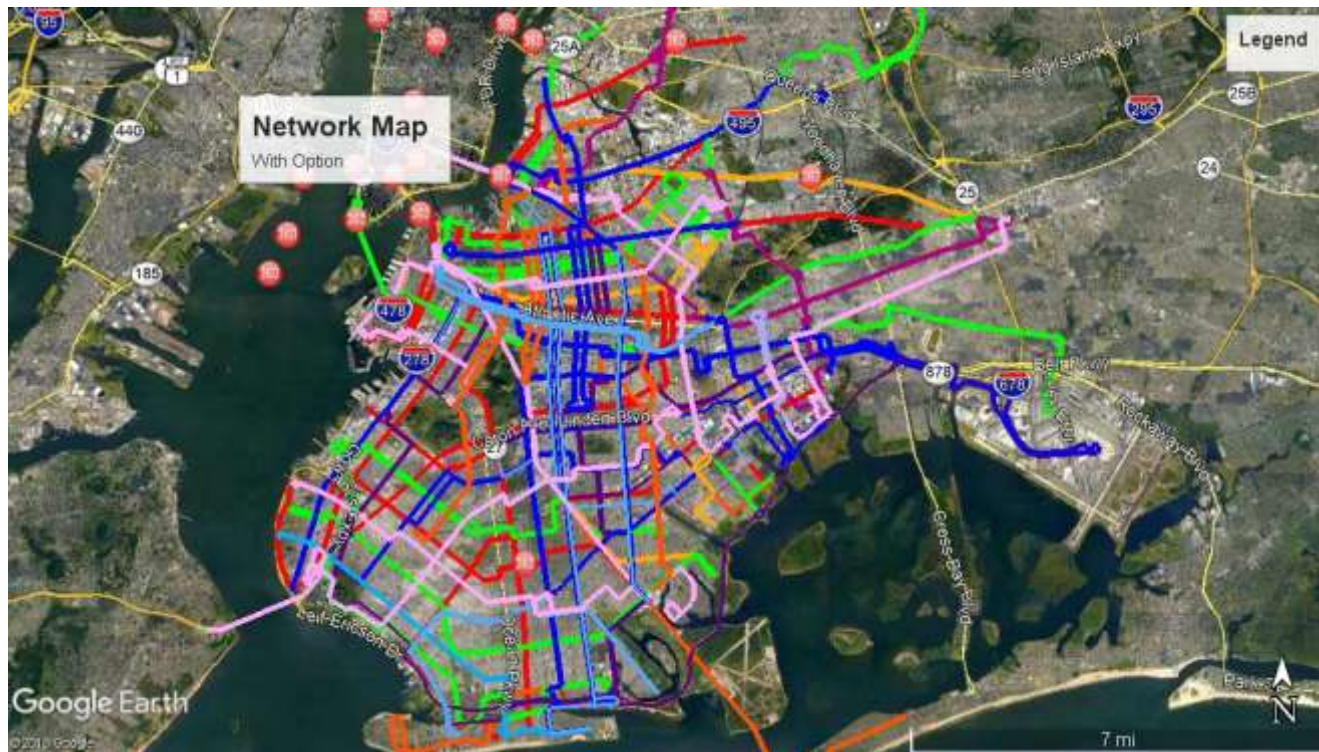
- Connection to an express station to shorten travel times.
- Stops at 86 St to connection with B1.
- Stops at 65 St for a connection with extended B2 to Mill Basin, providing two bus access to the Staten Island Mall, a trip presently requiring four buses.
- Stops at 60 St for a connection with the rerouted B9 also improving Staten Island access.

**S93** – Unchanged.

# APPENDIX 4 –

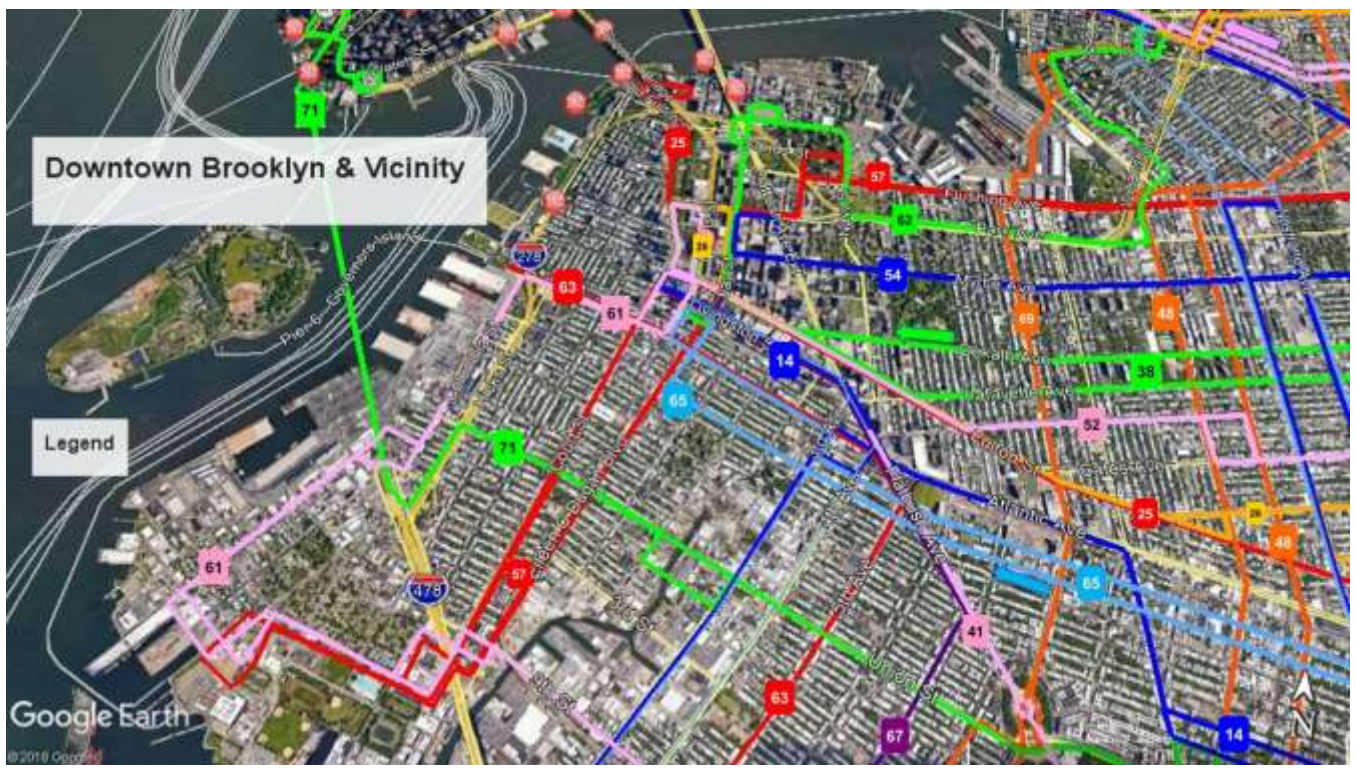
## MAPS

### Borough Maps

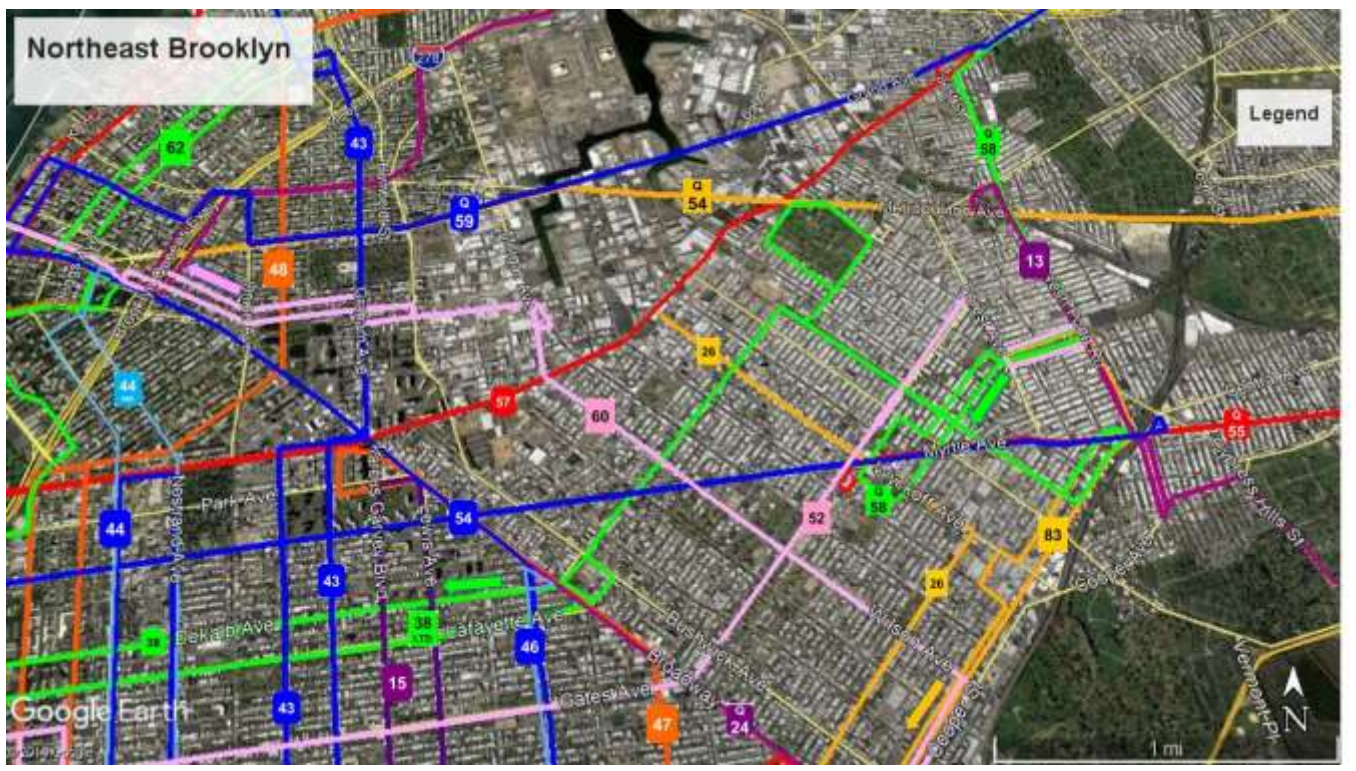


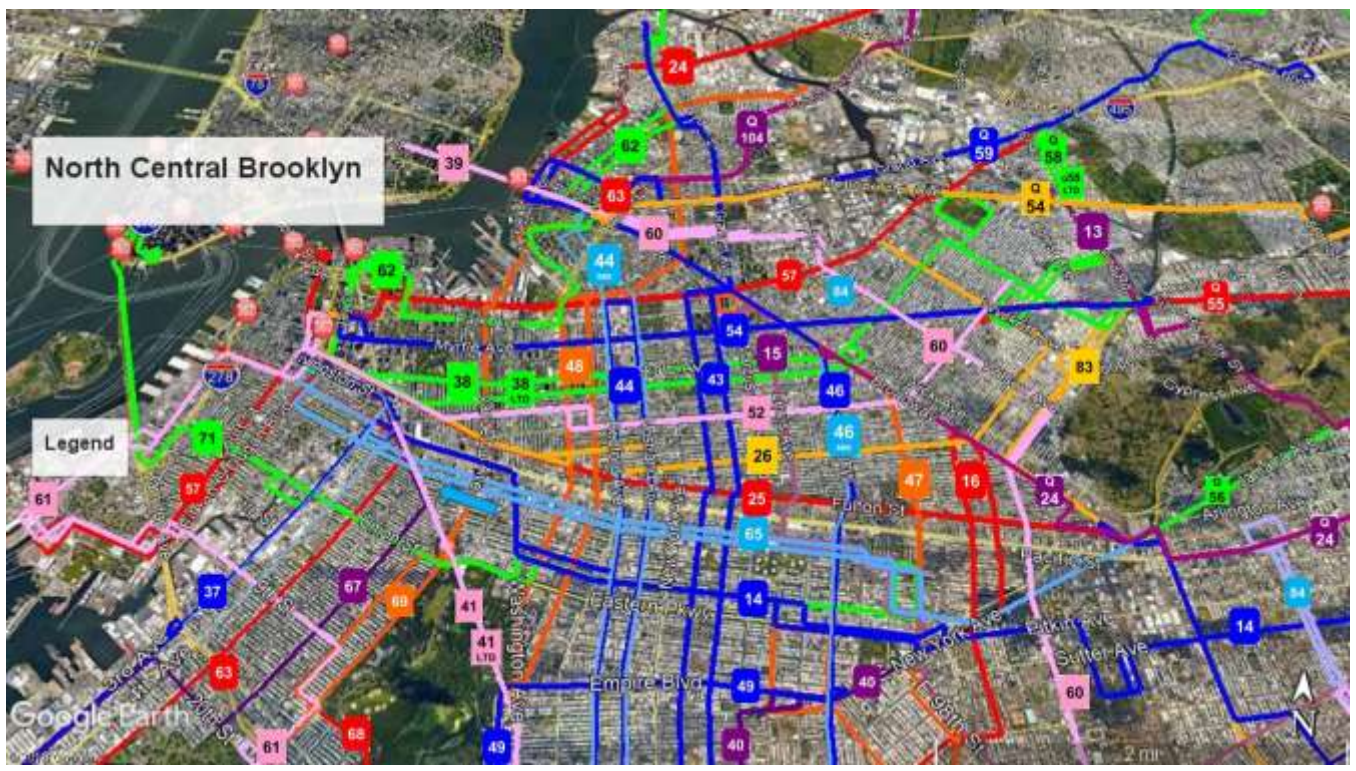
### Section Maps



















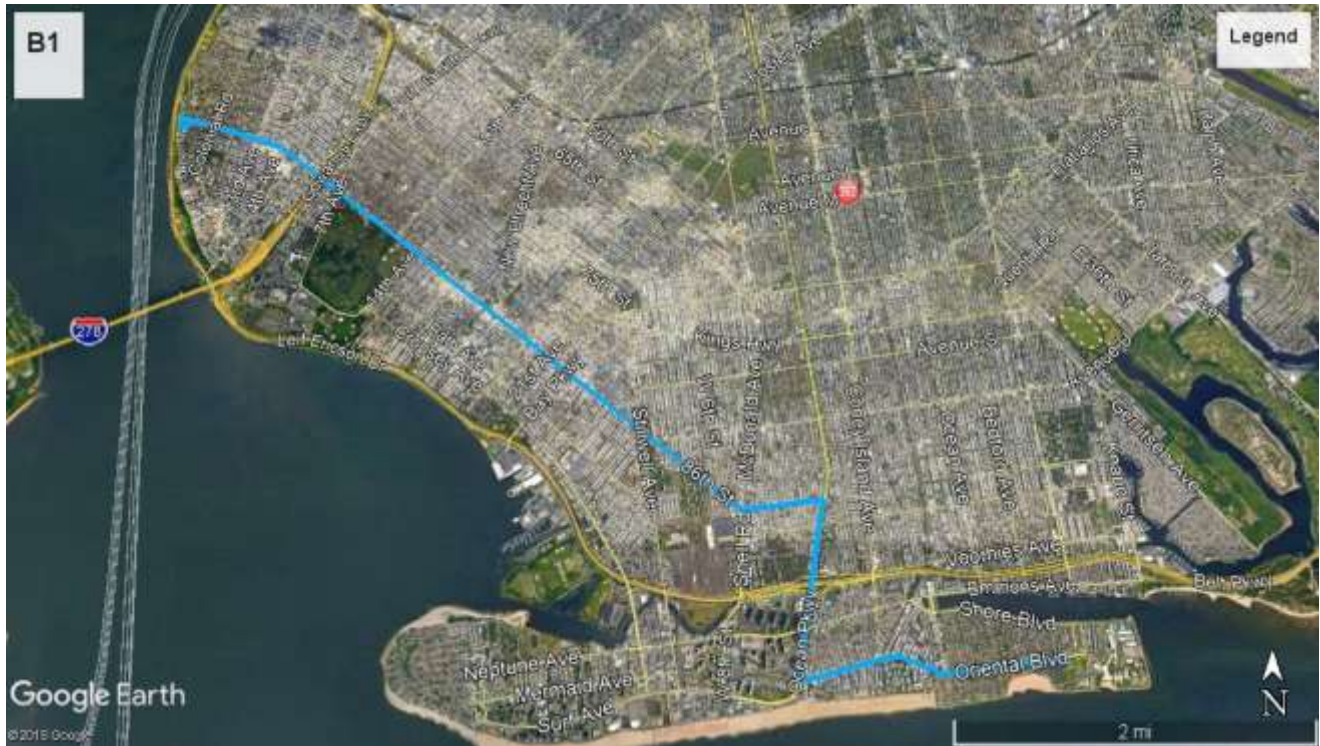


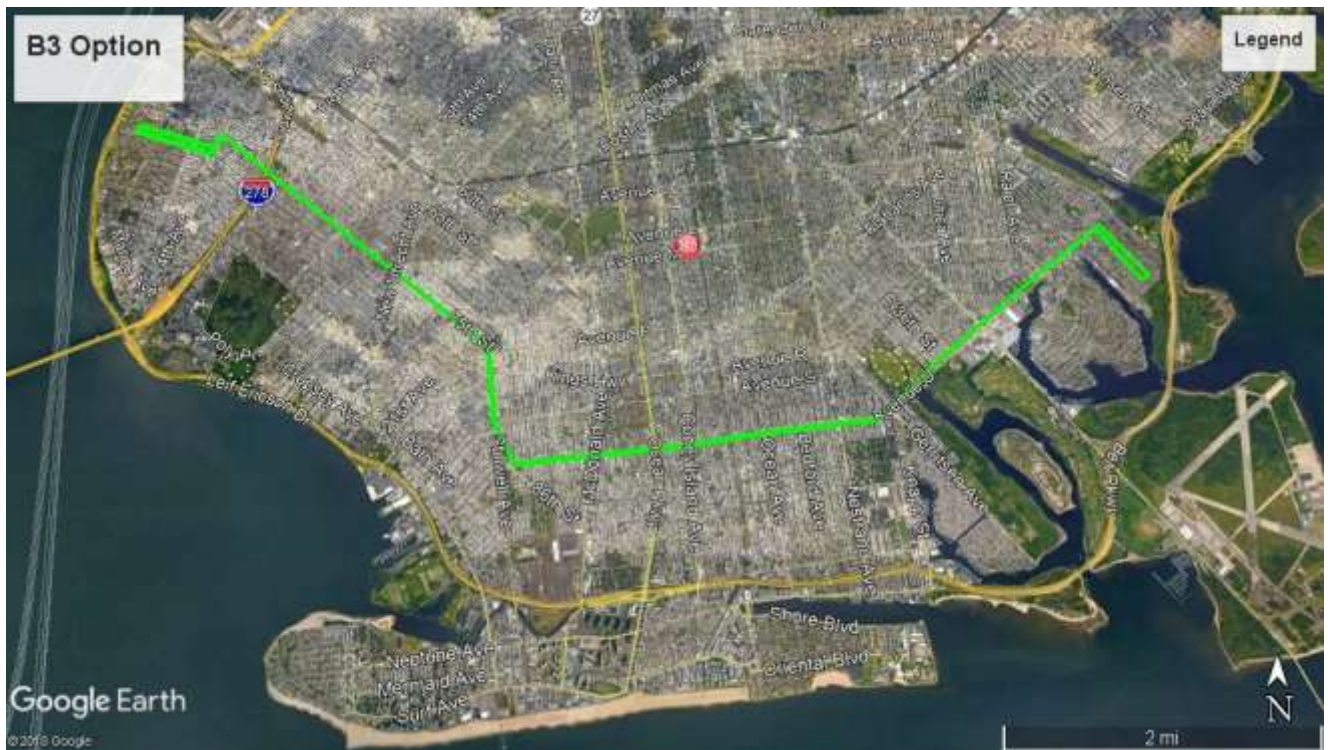
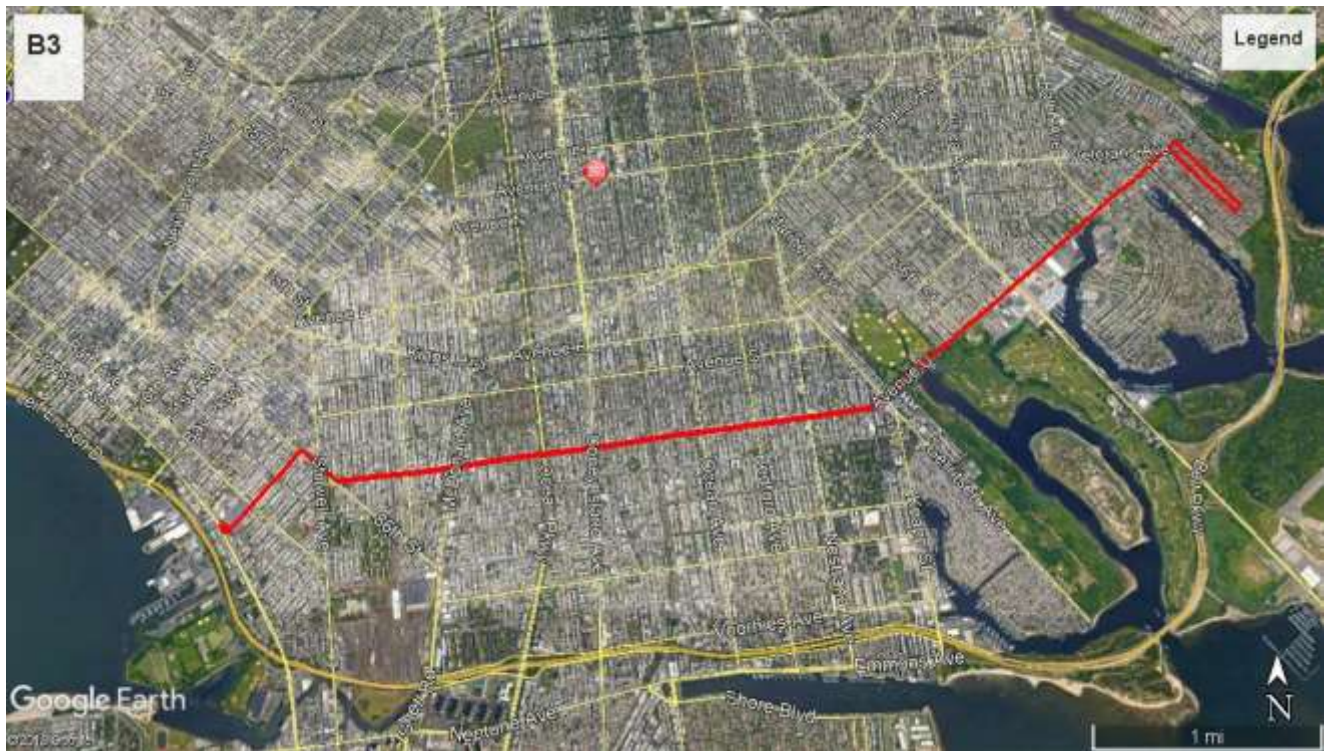
### 24-hour Night Time Service Maps



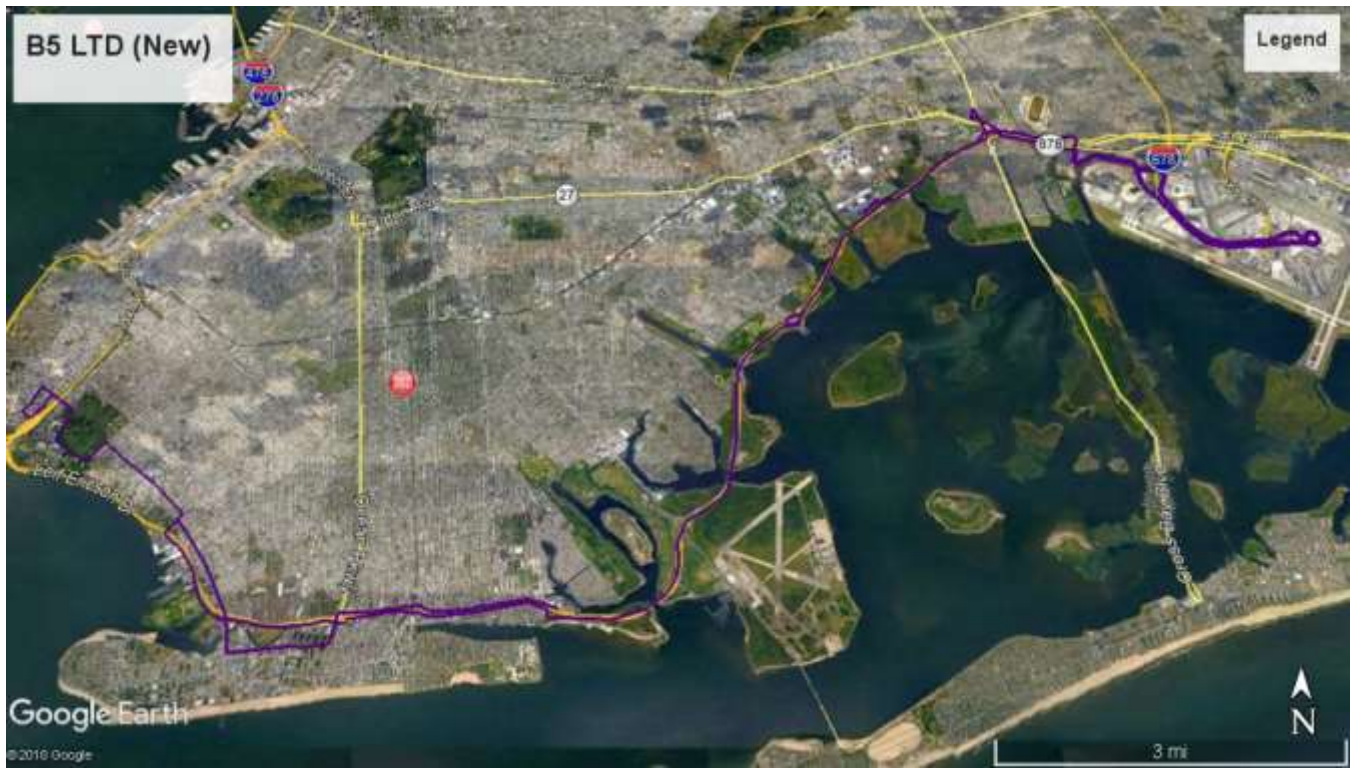


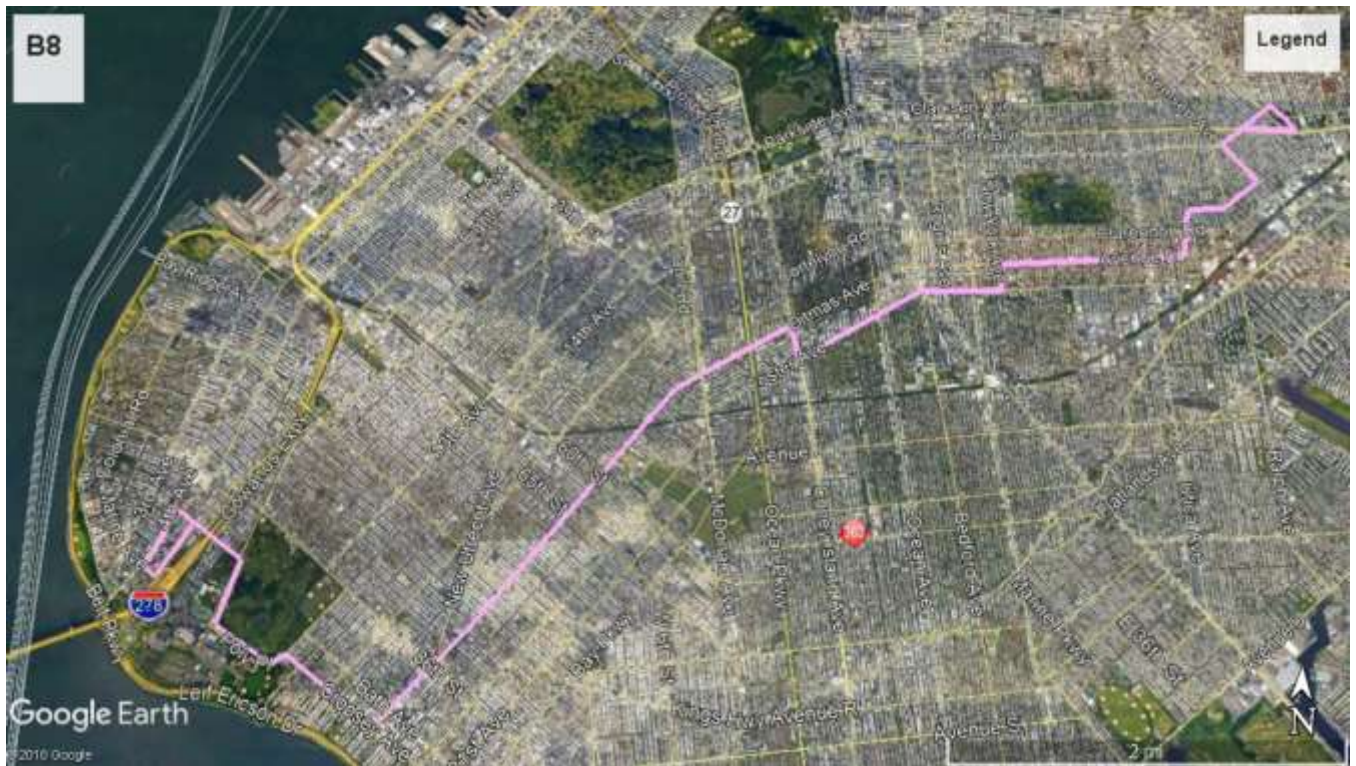
### Individual Route Maps (Day Time Service)

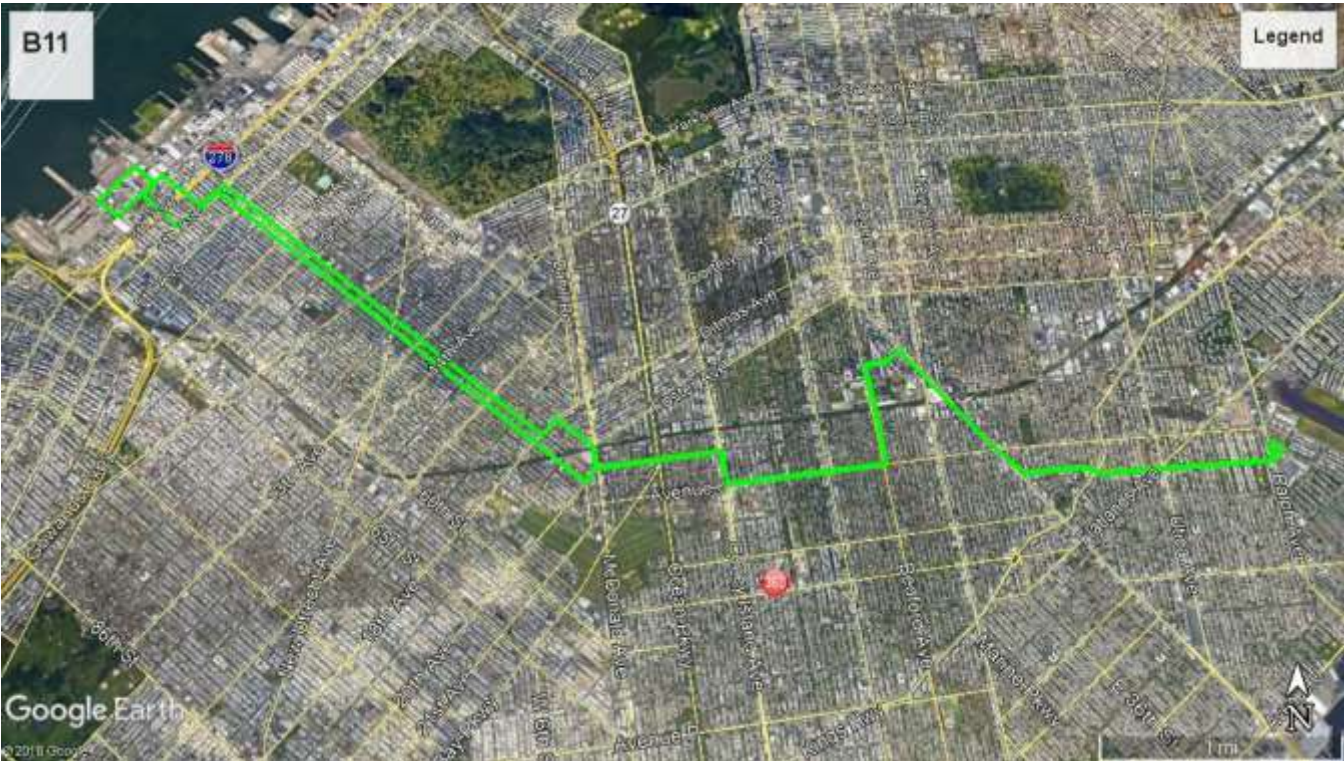
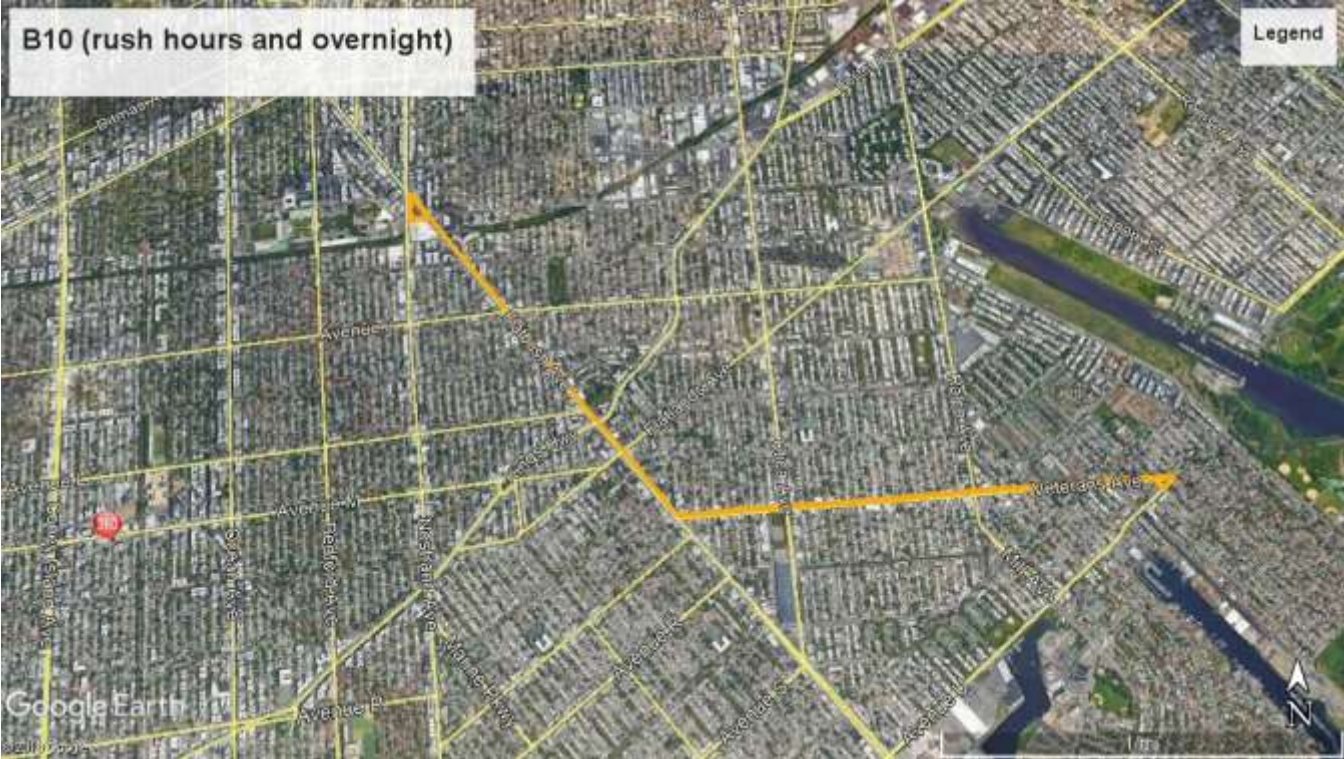


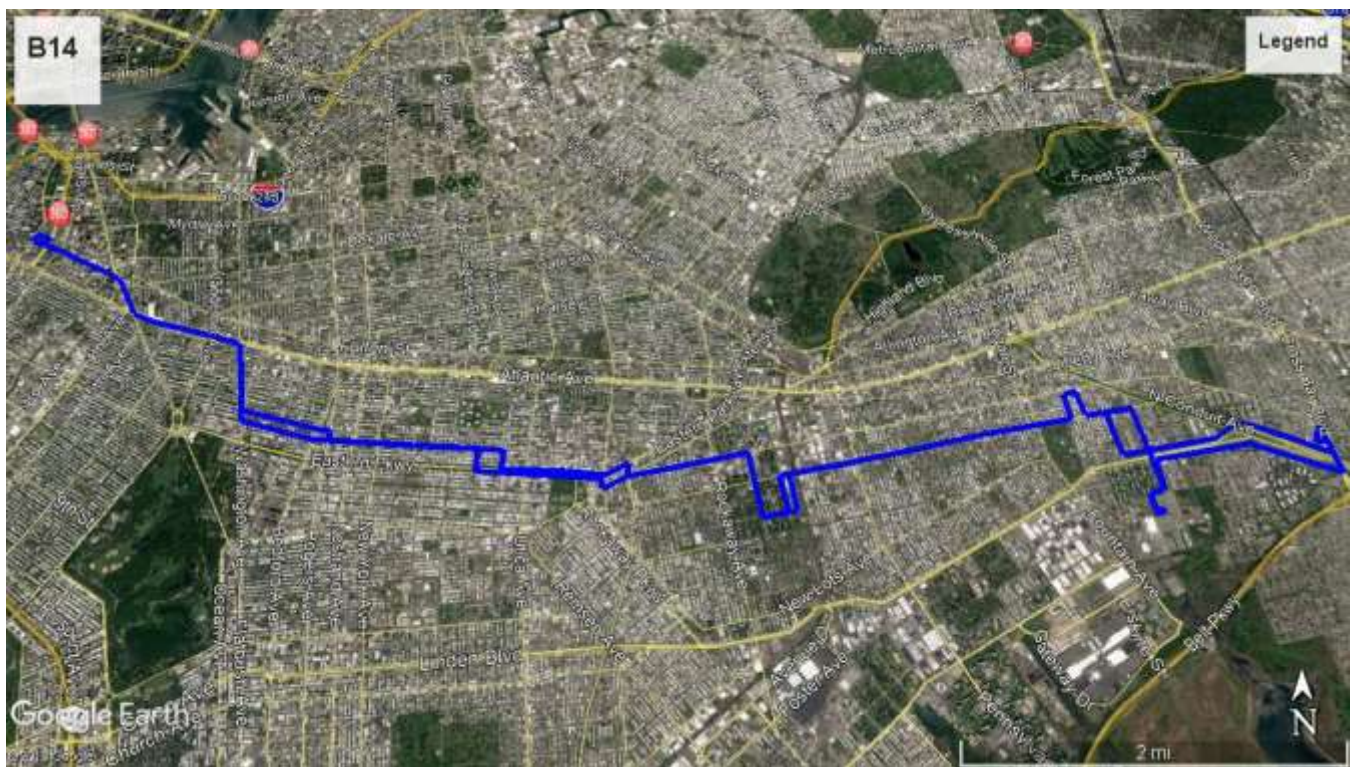
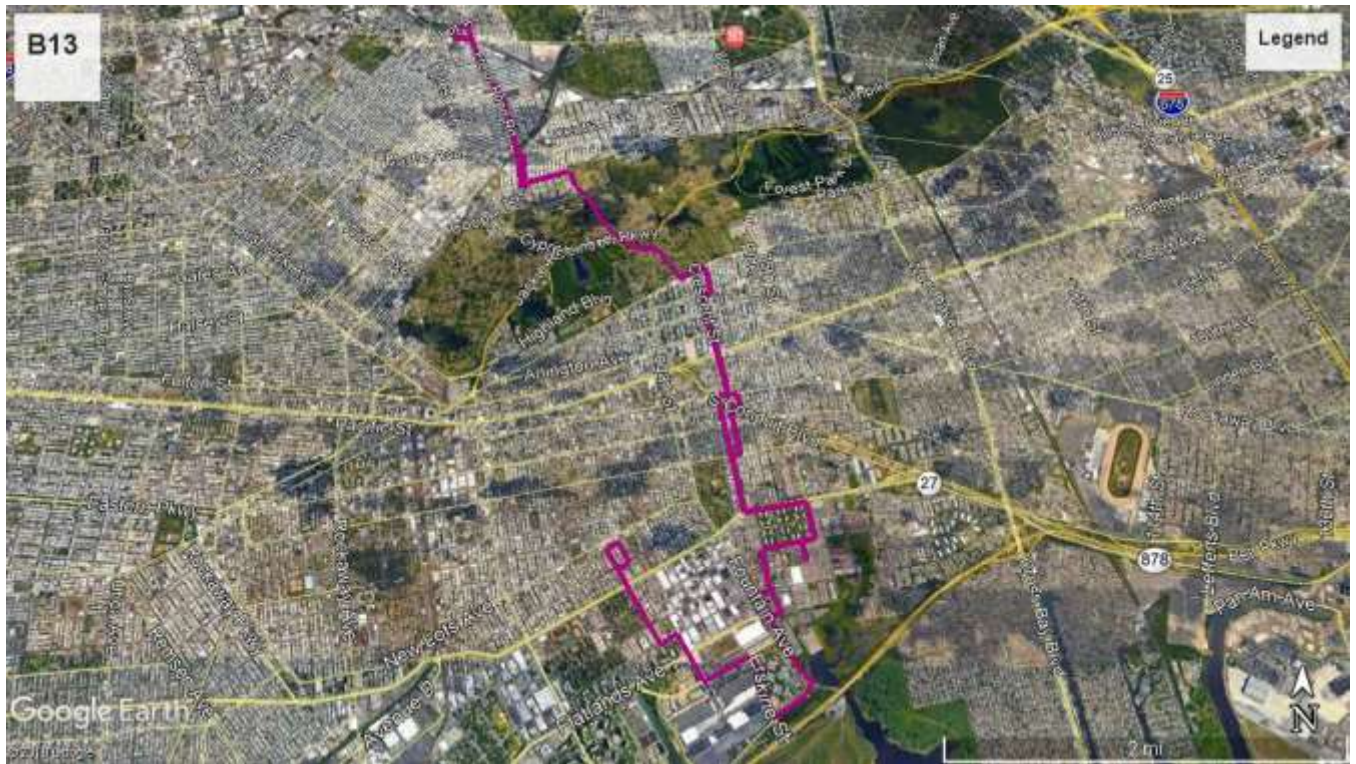


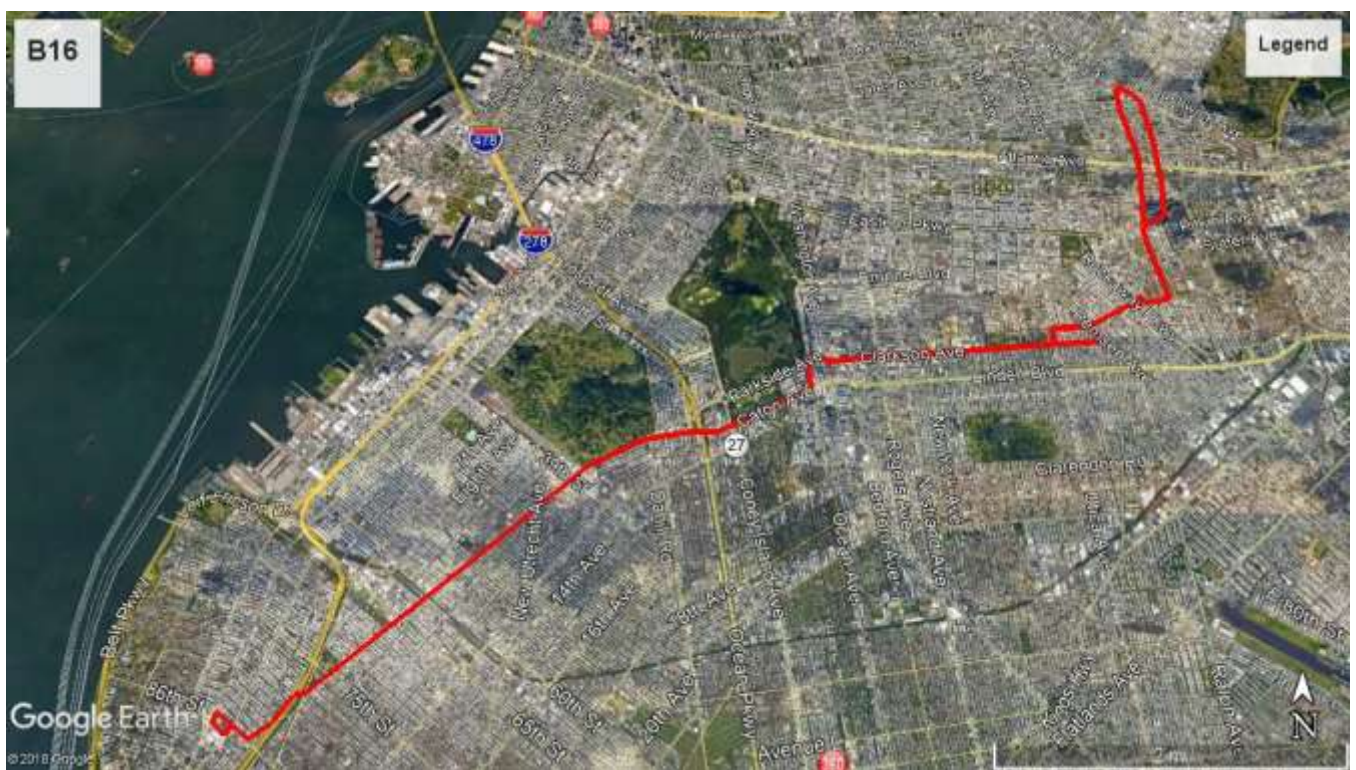
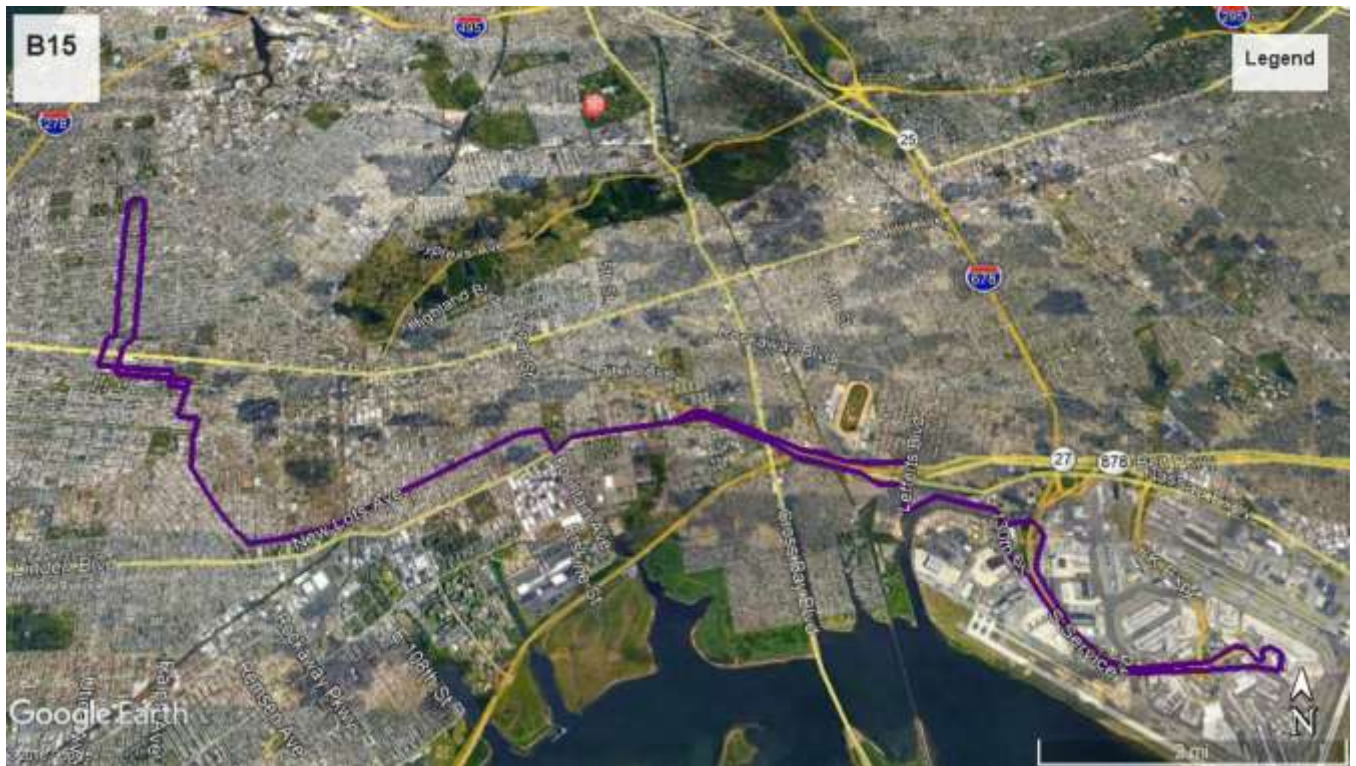




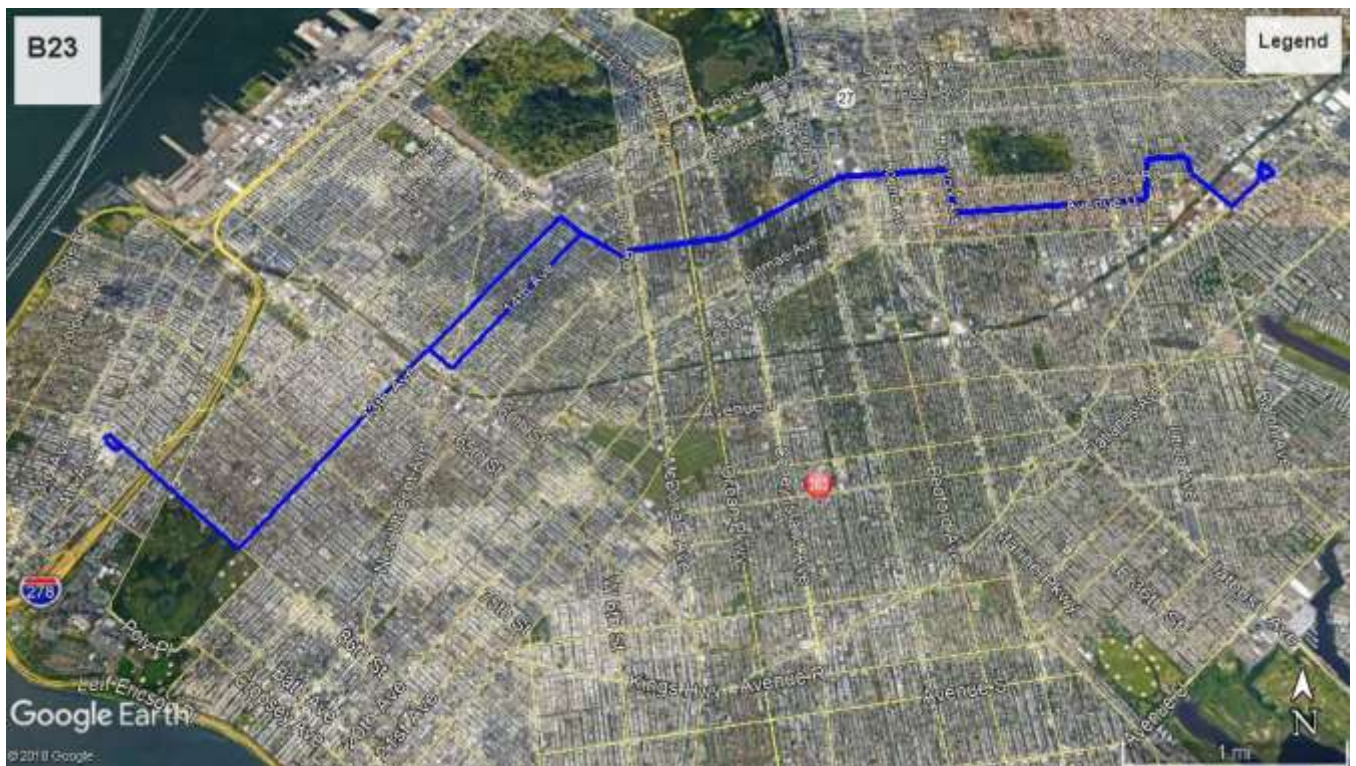
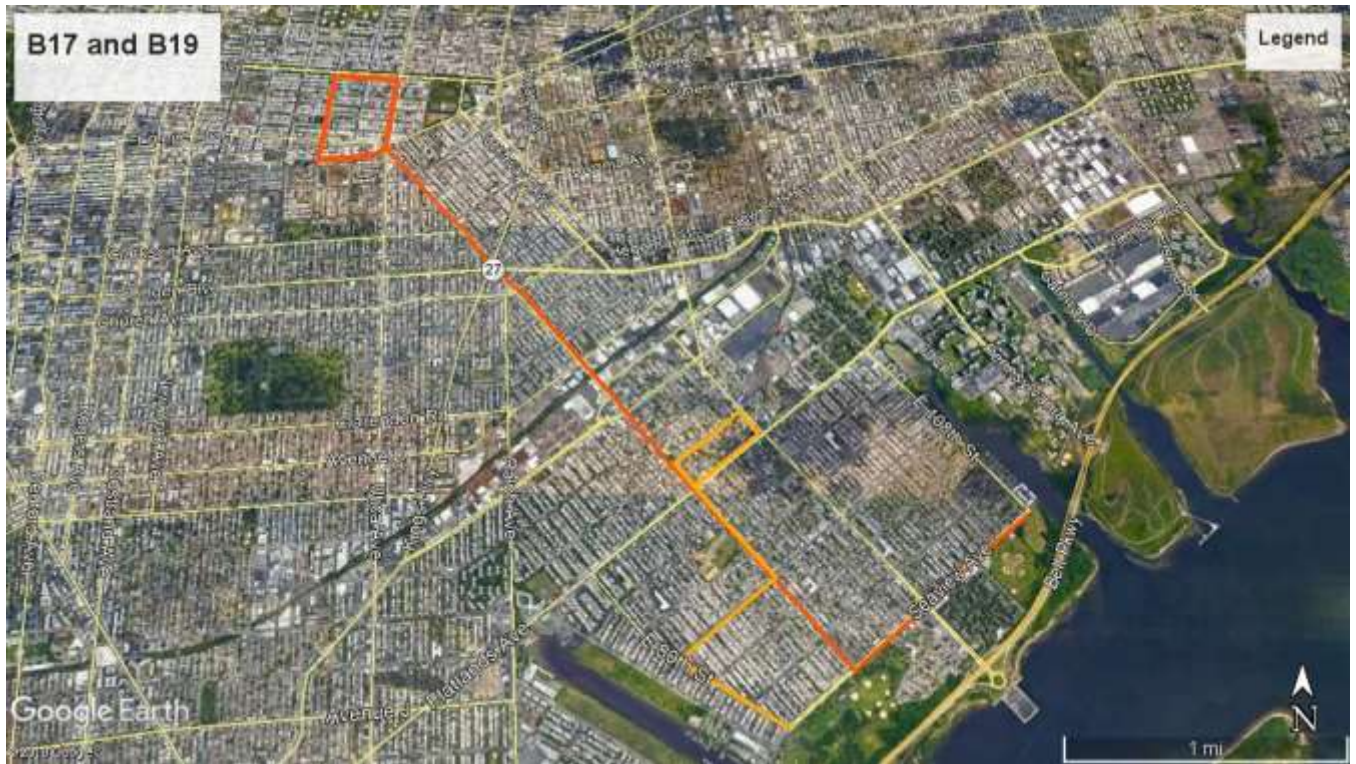


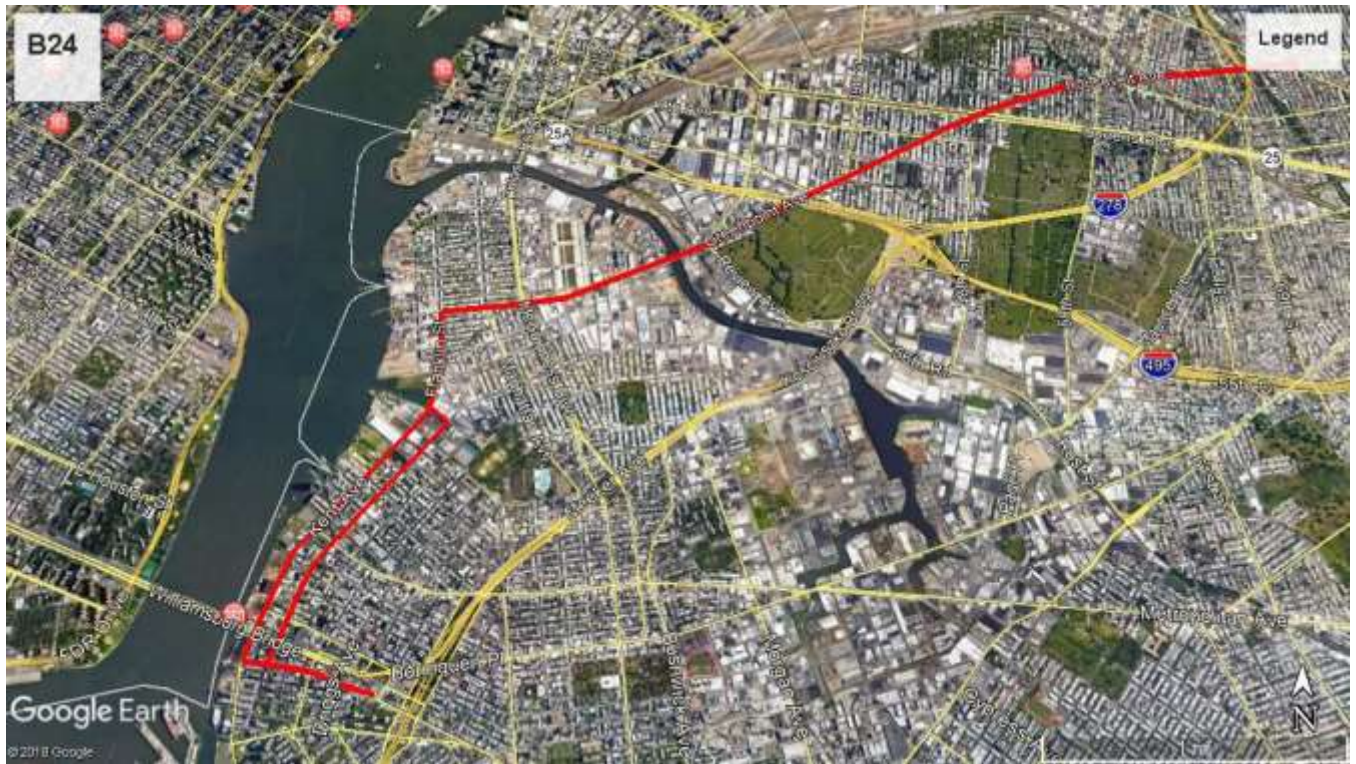


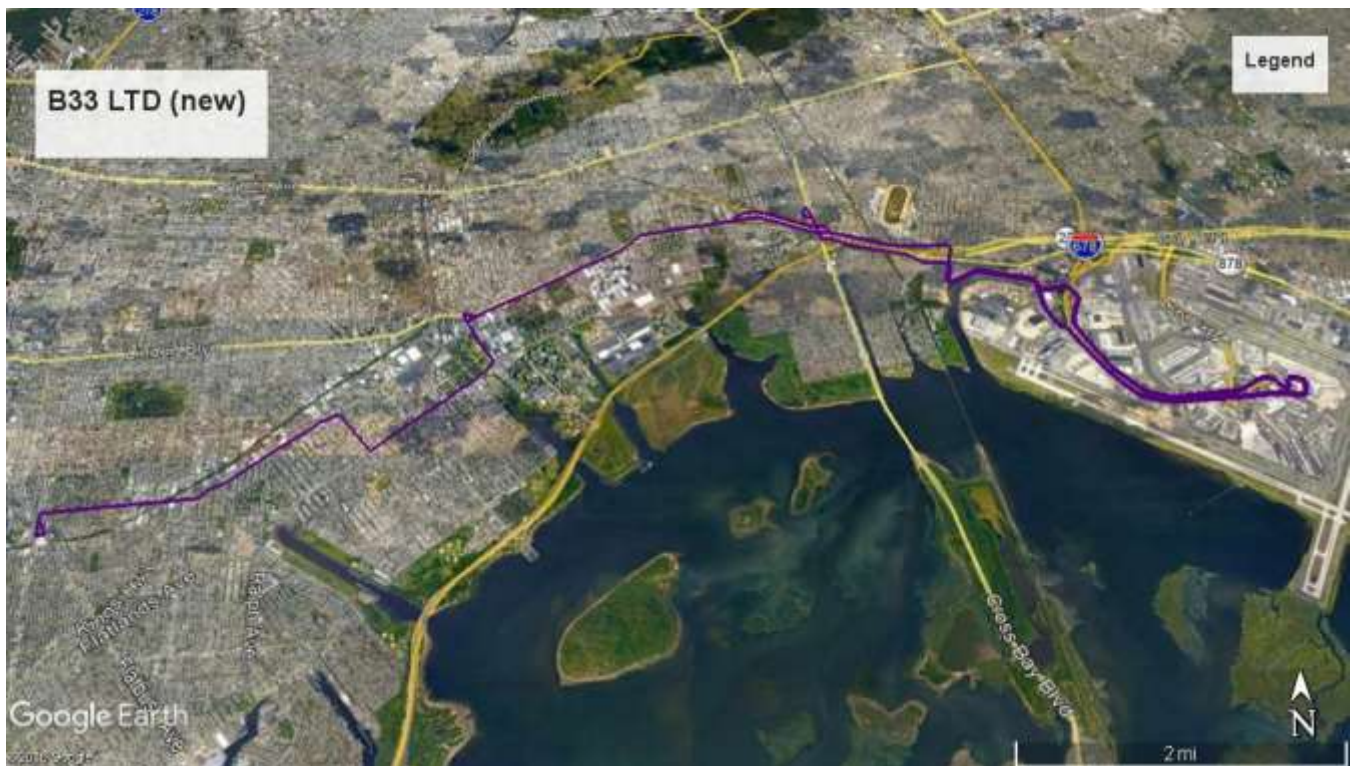
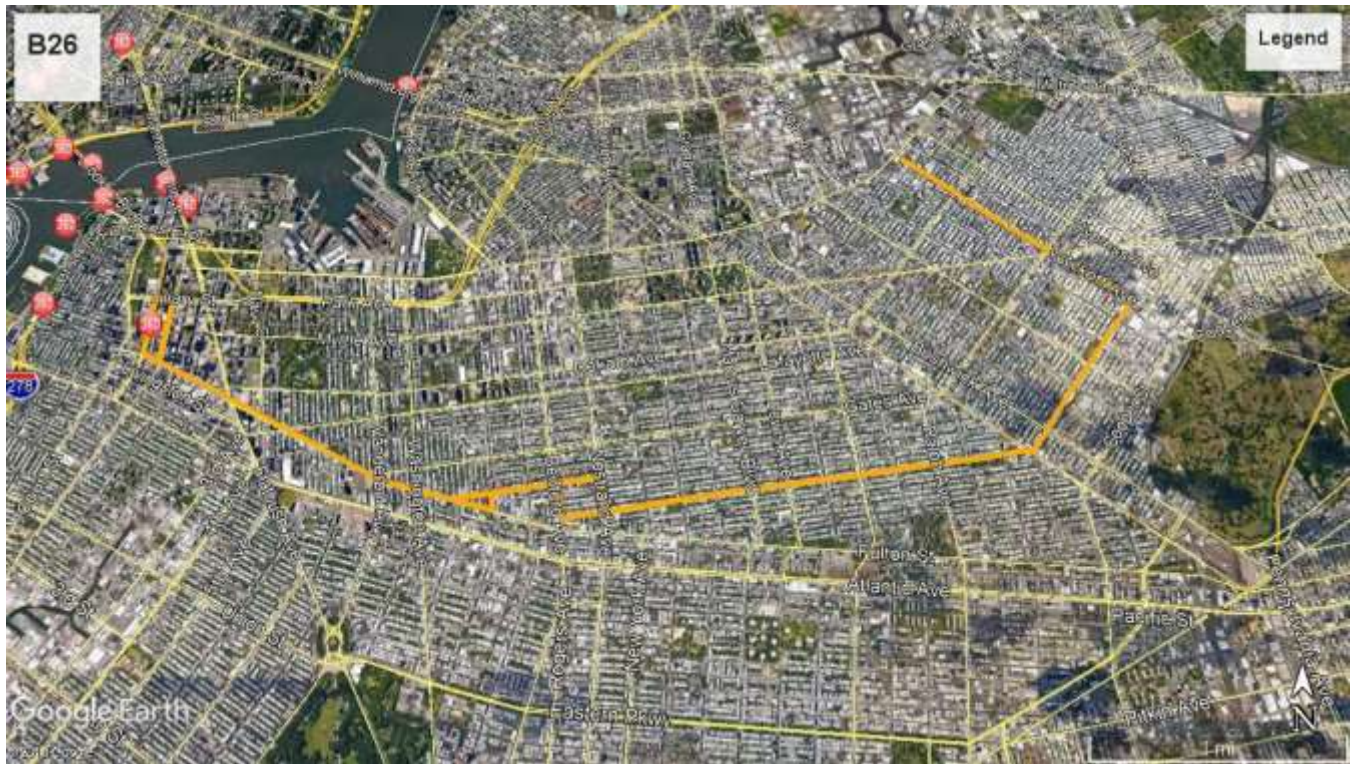


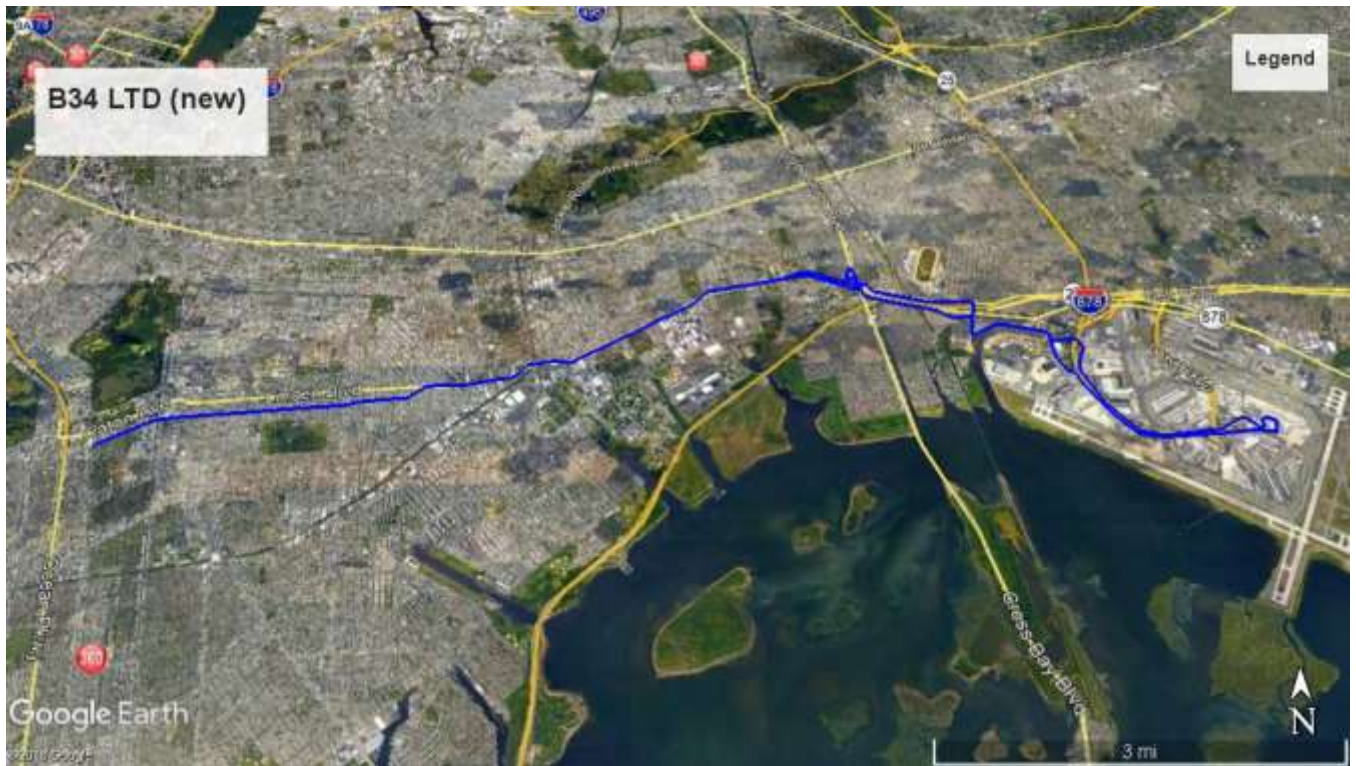


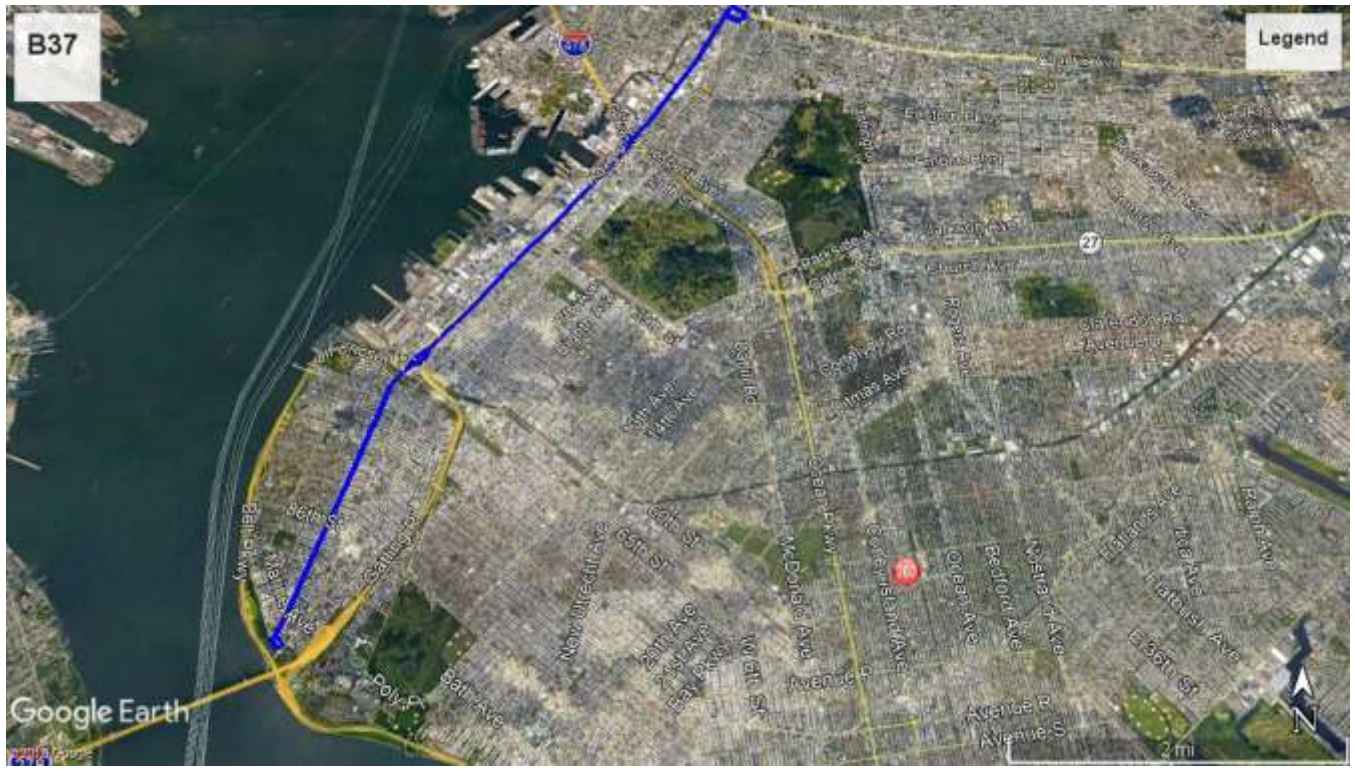


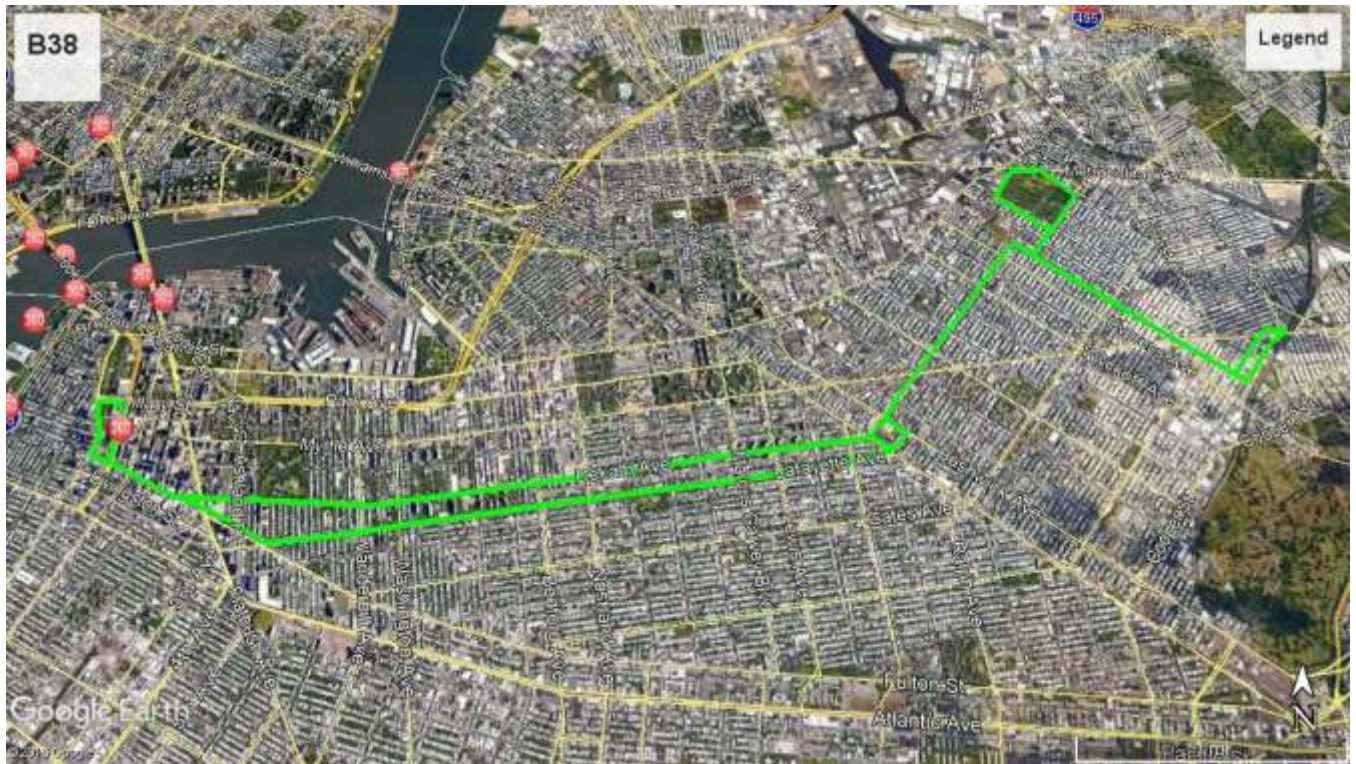


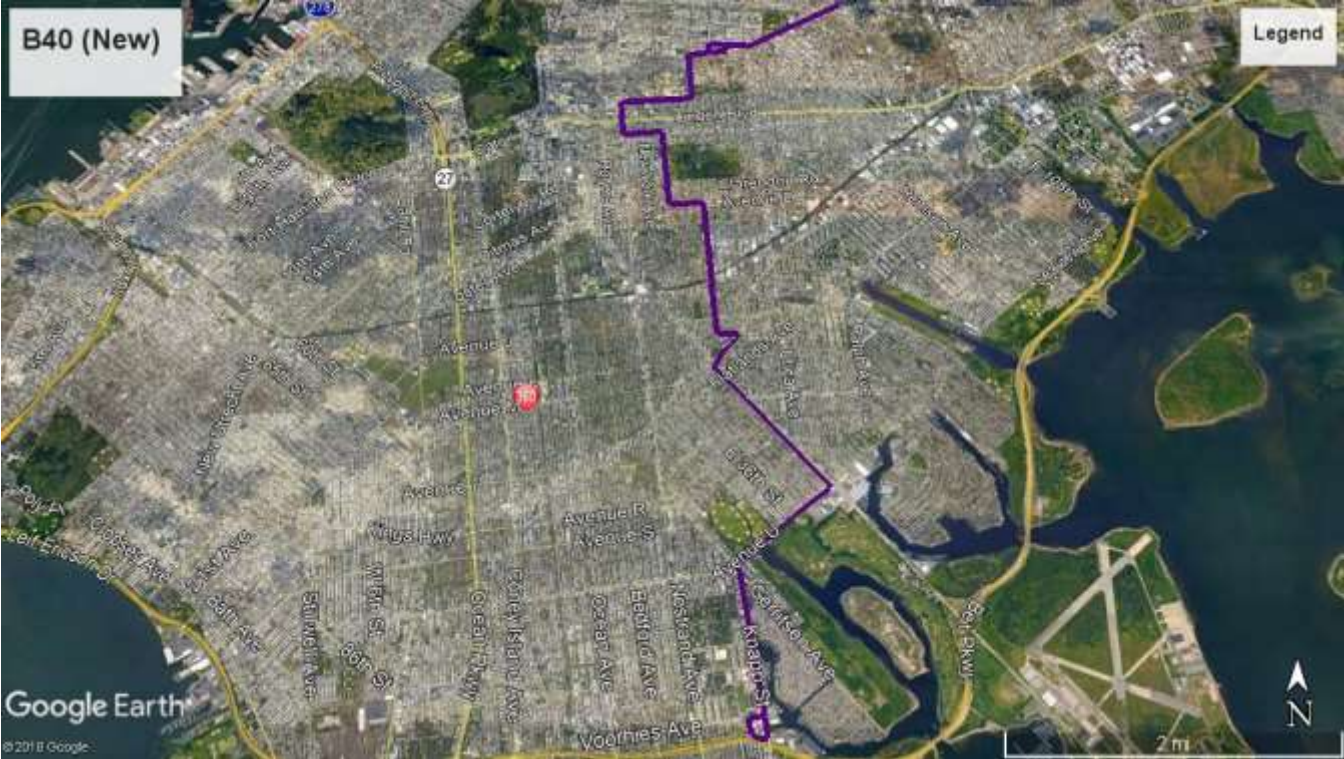


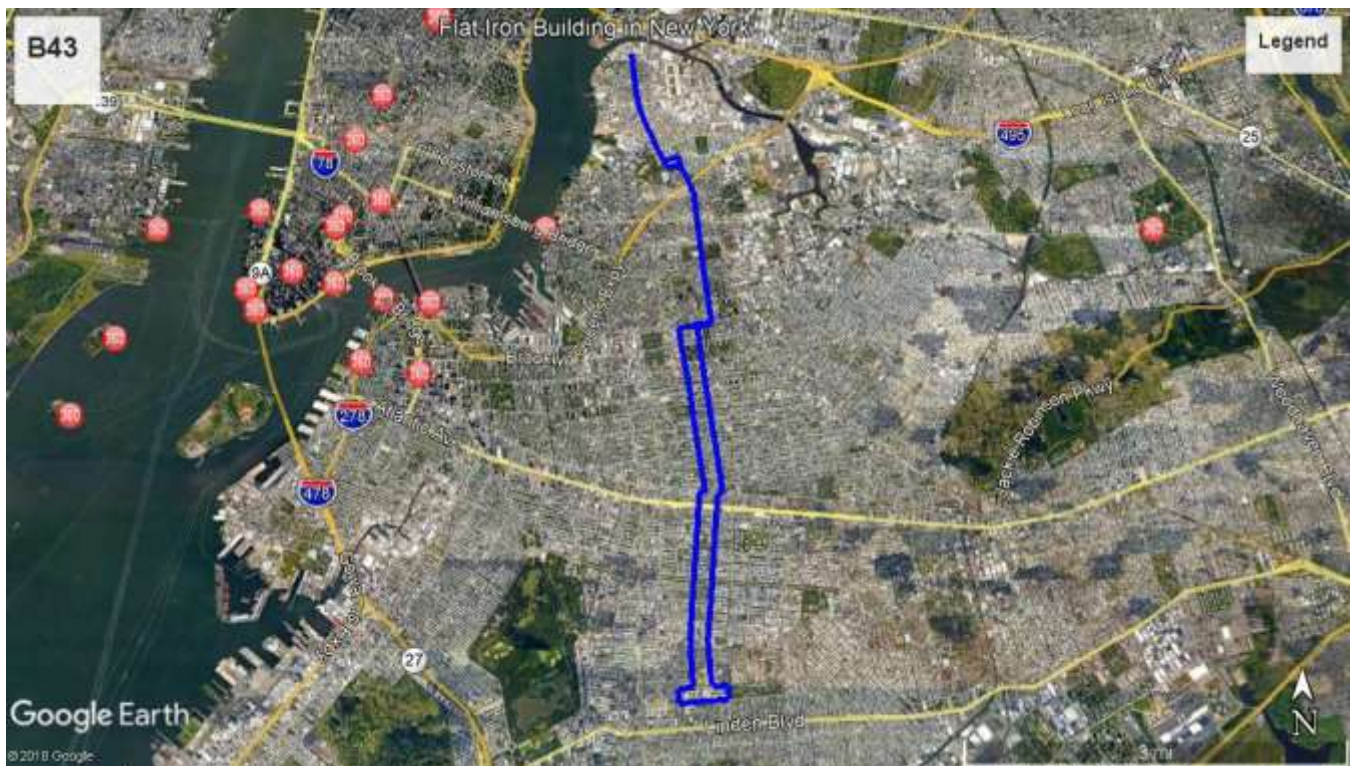
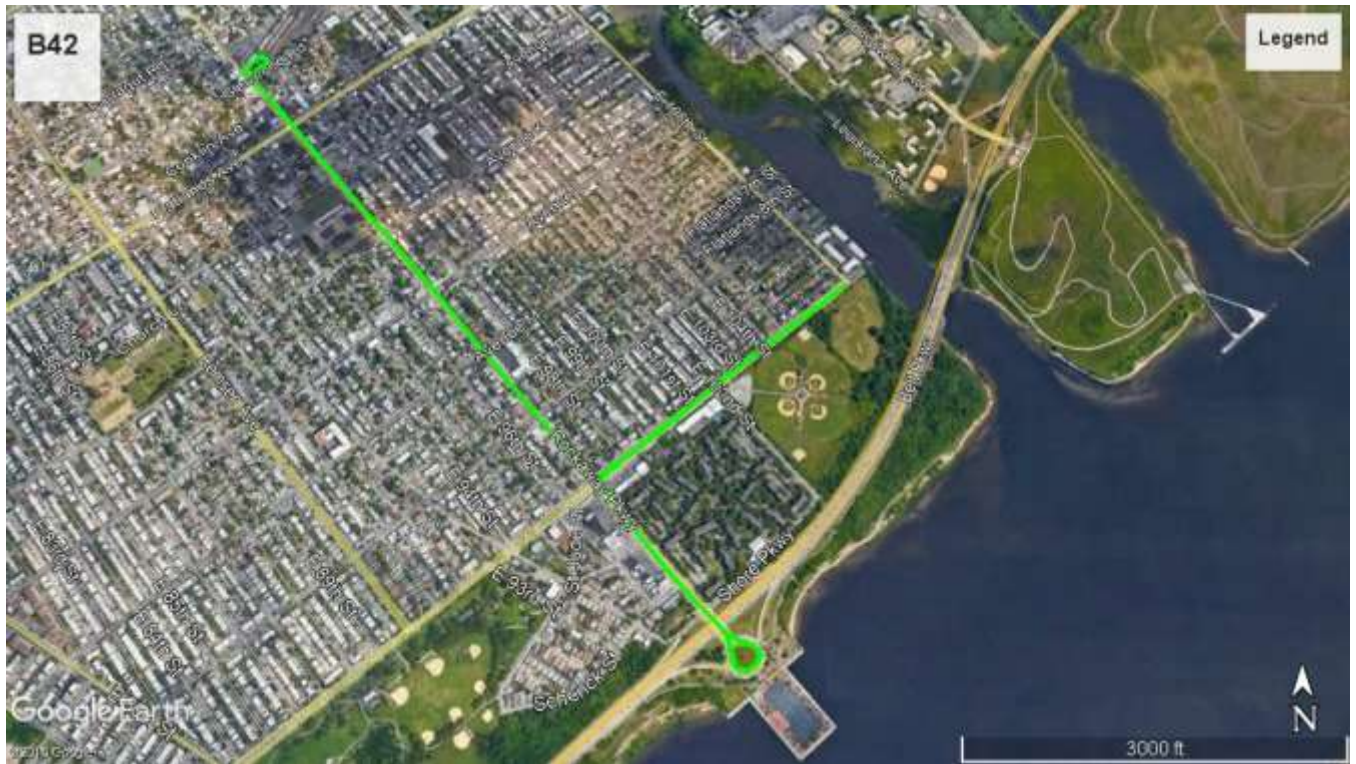




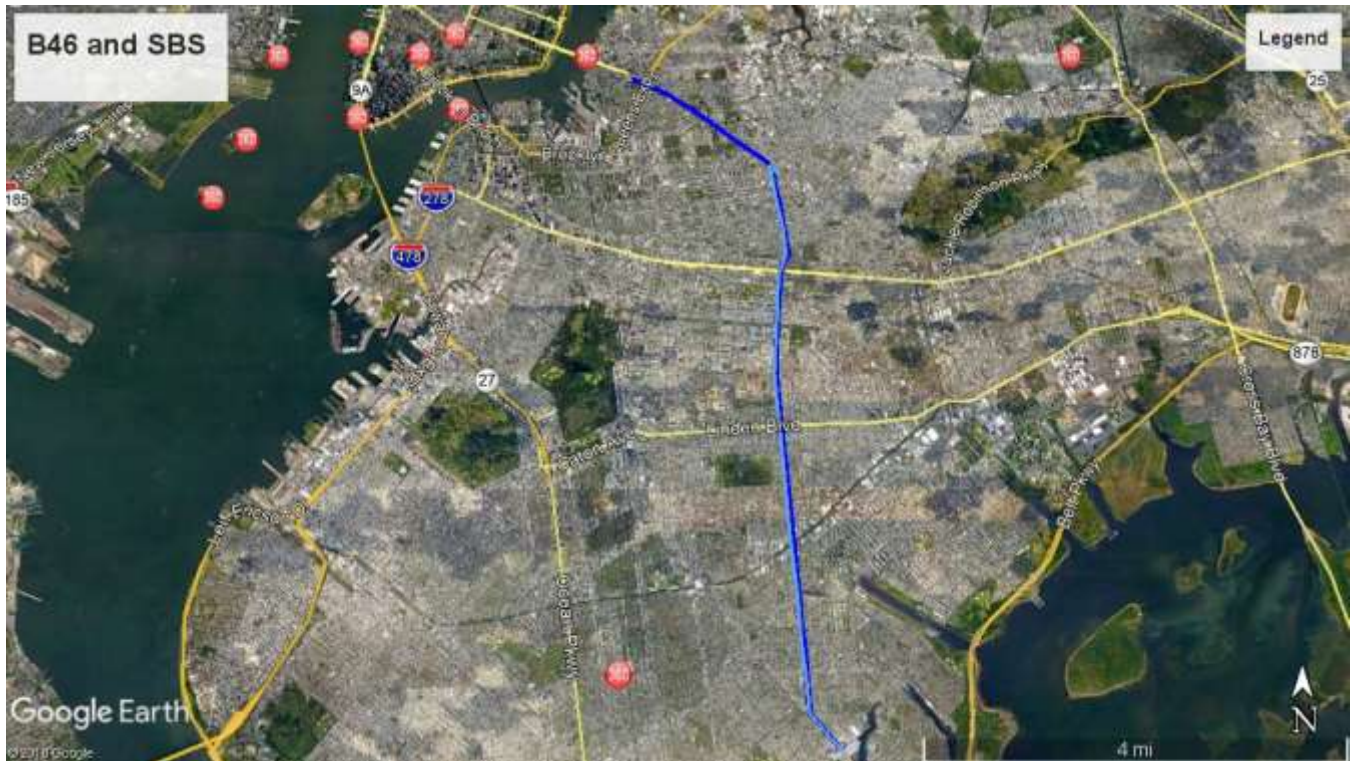
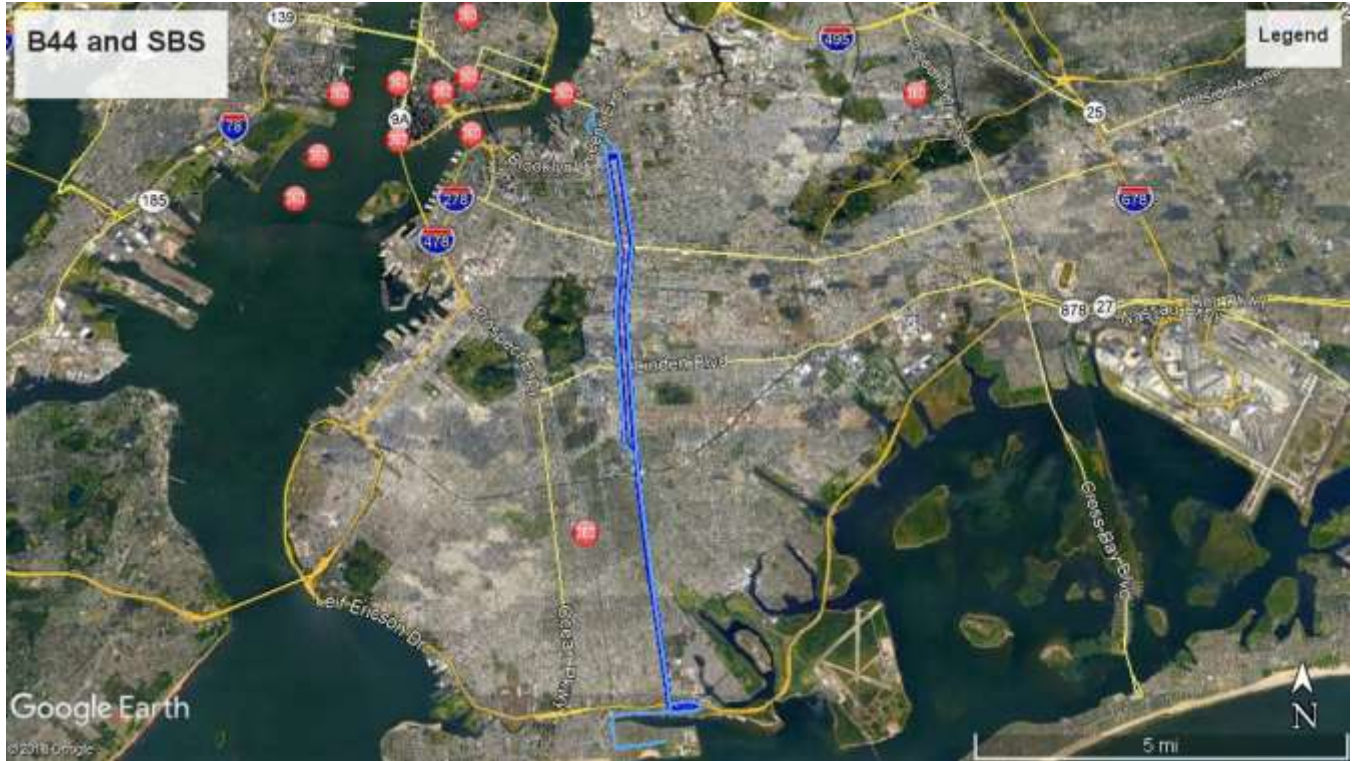


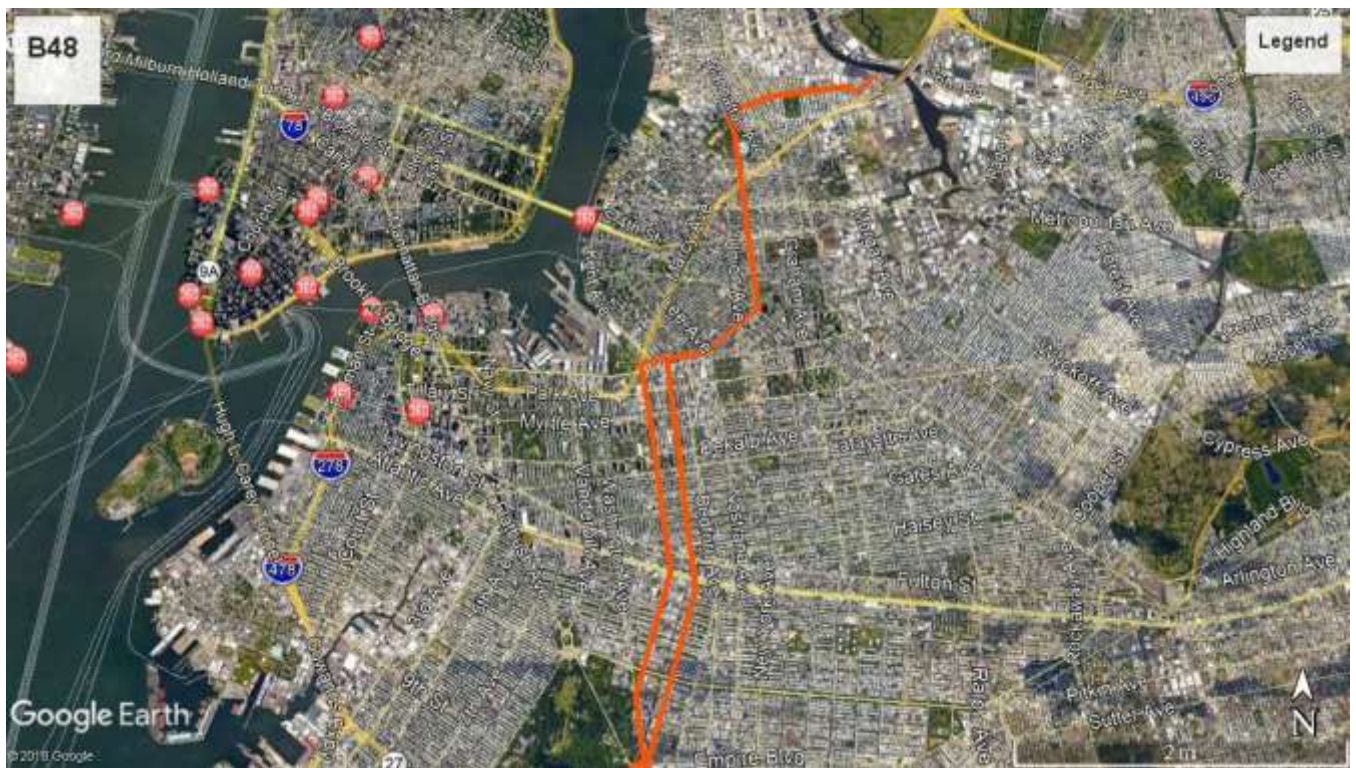
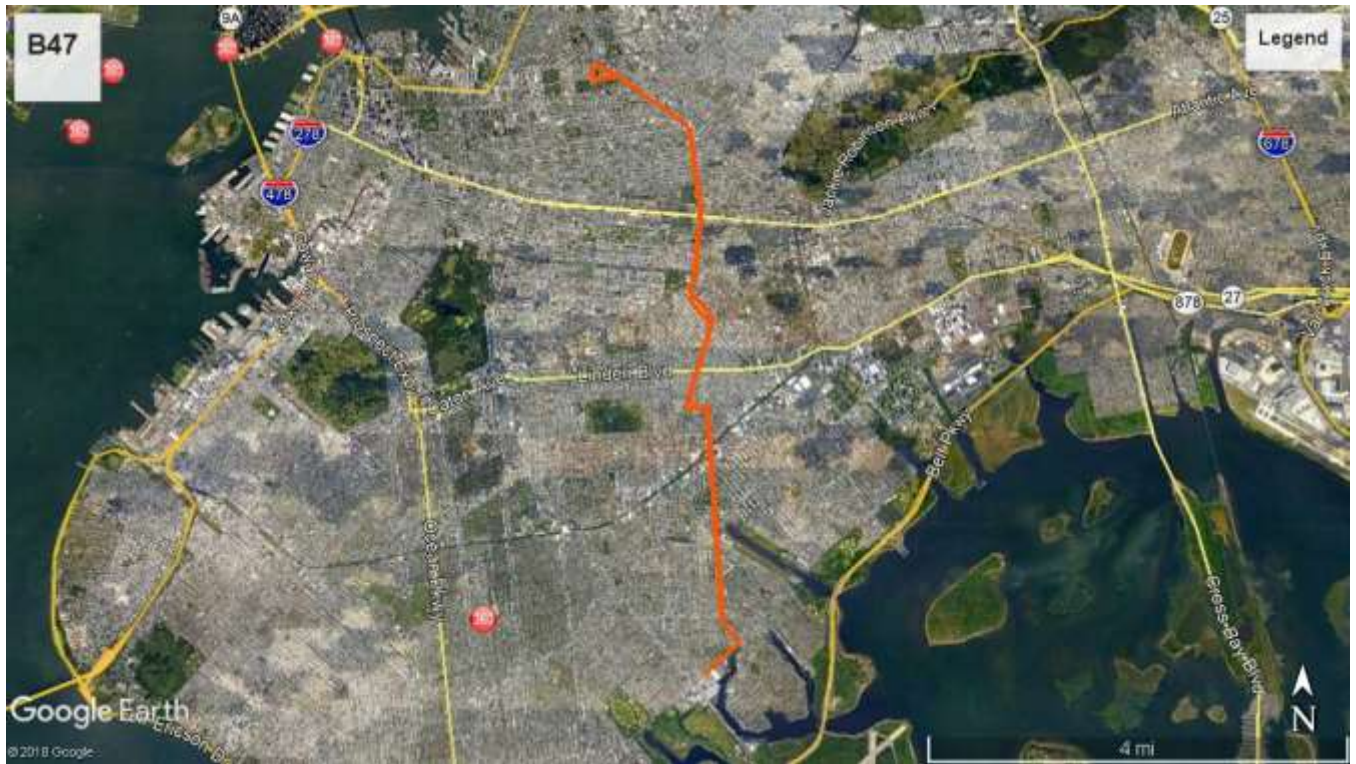


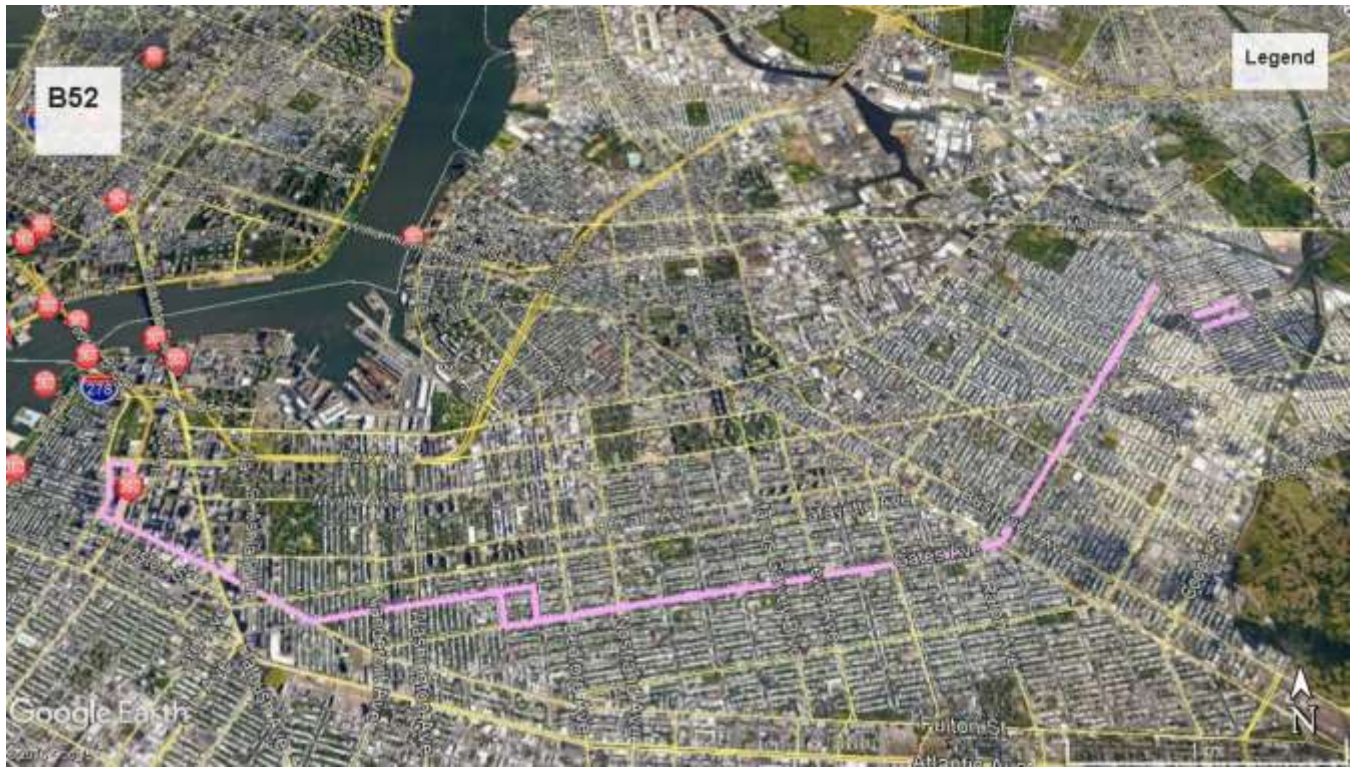


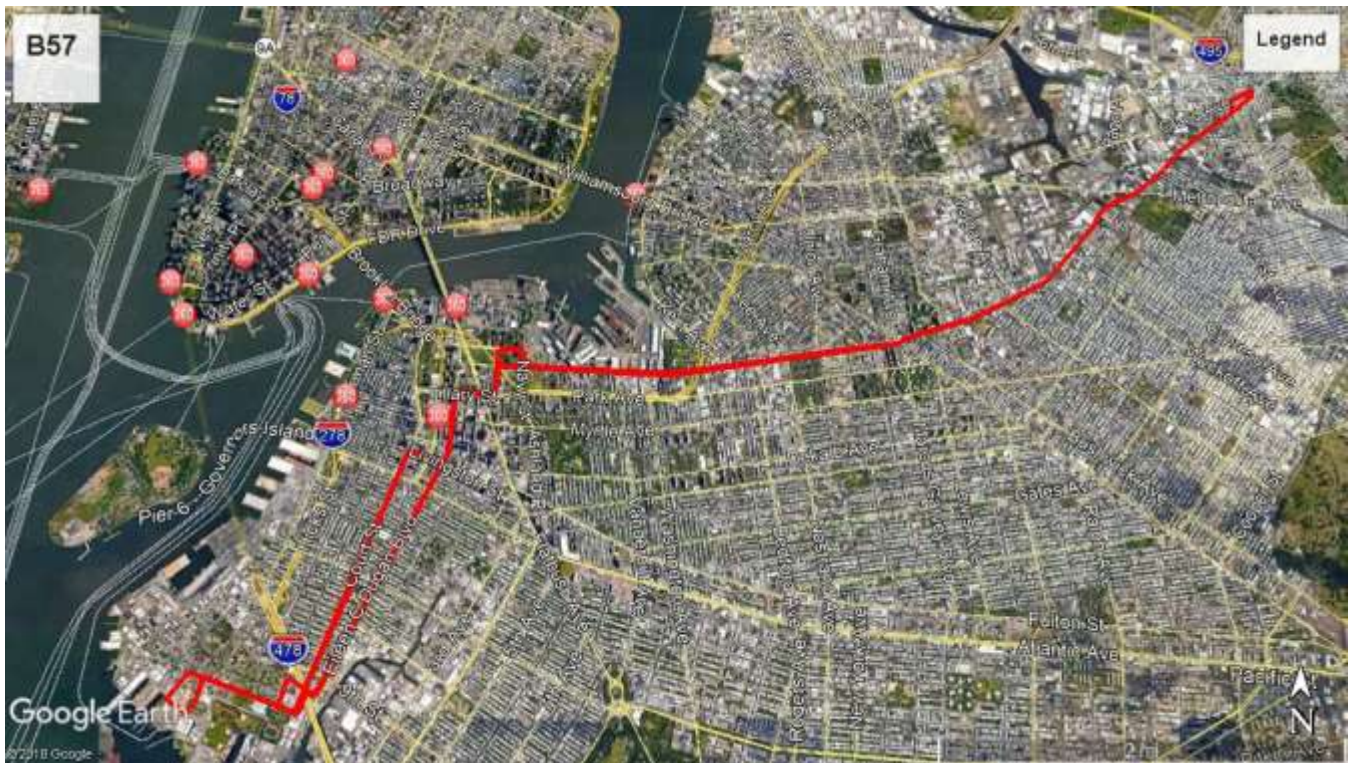
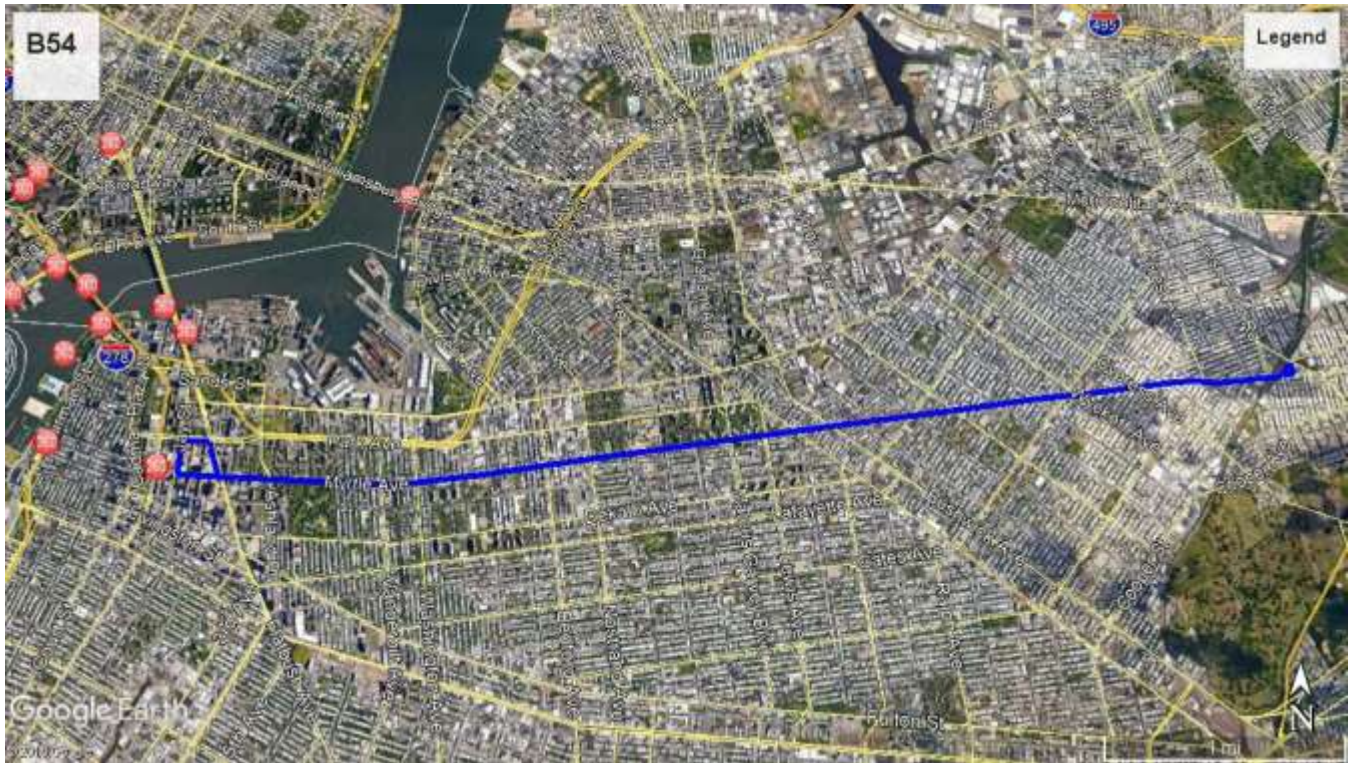


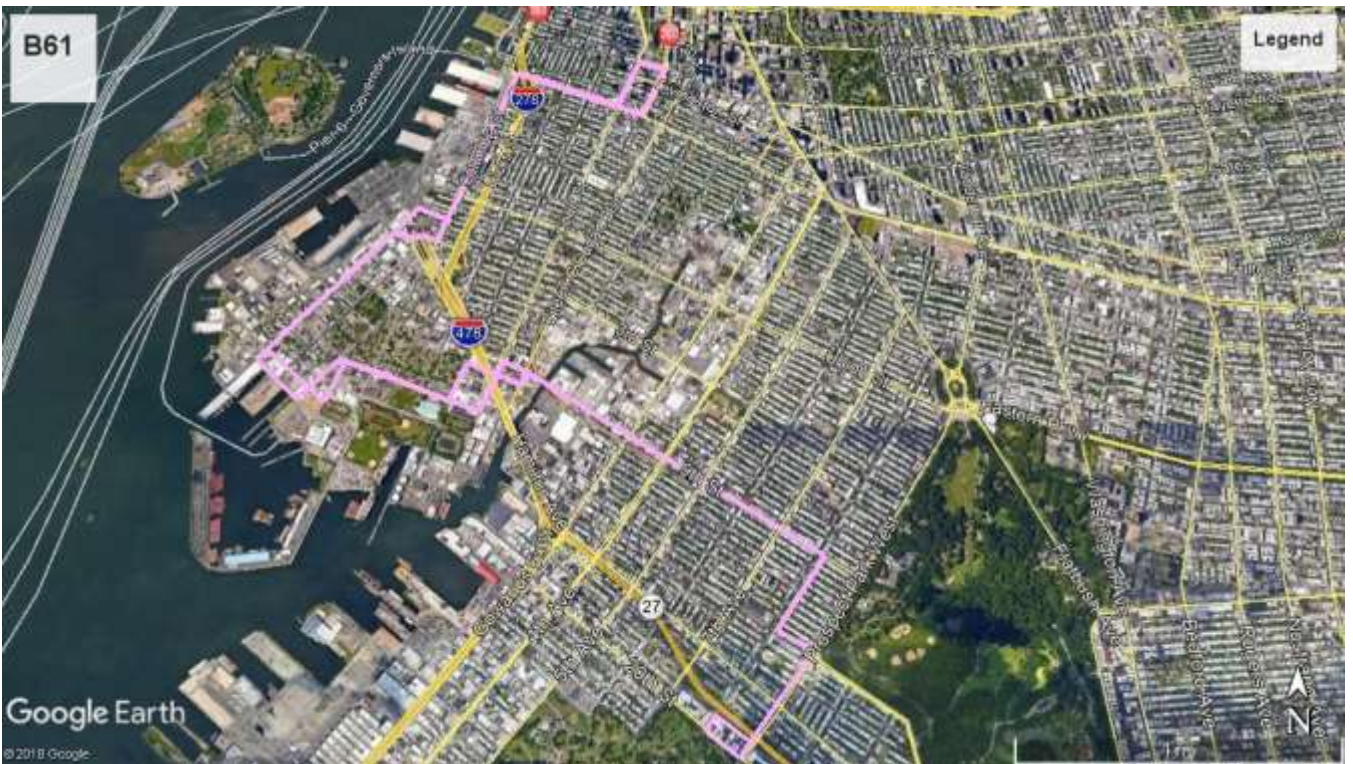


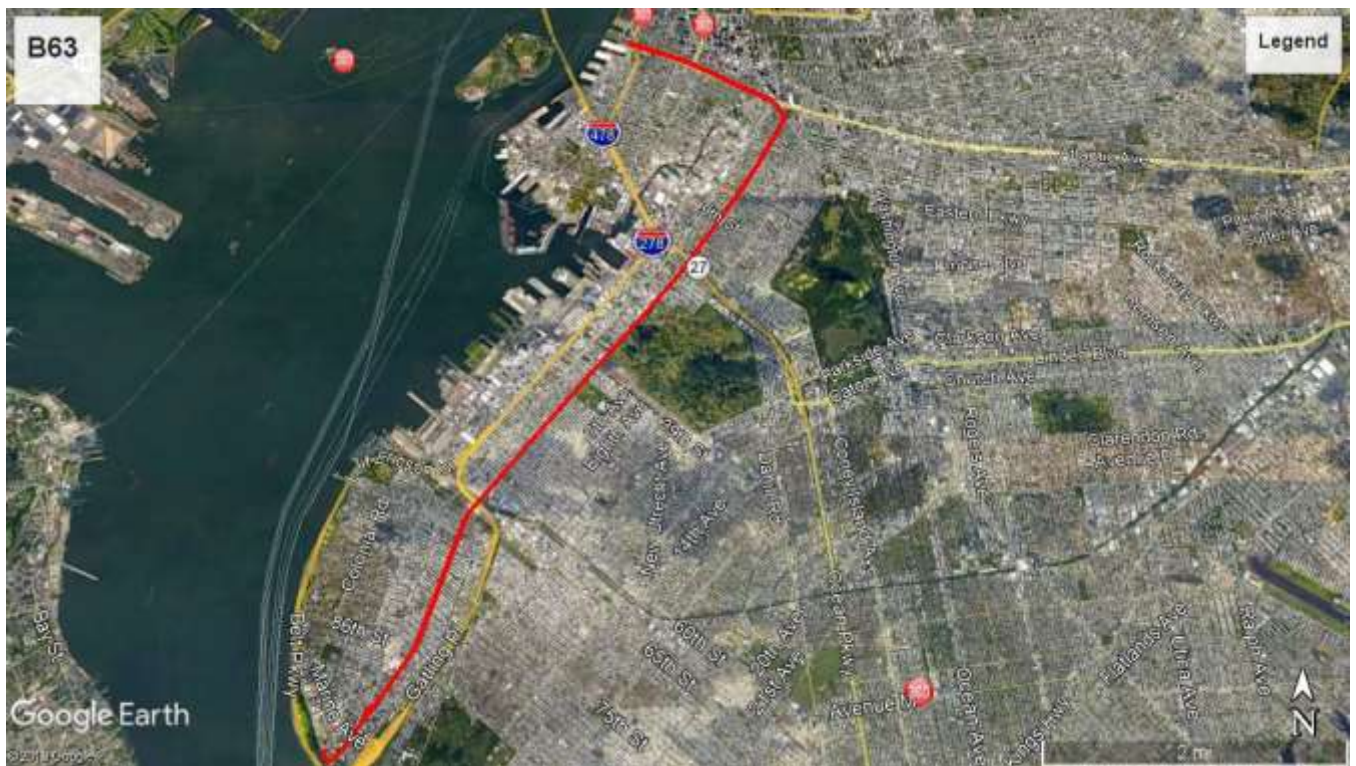
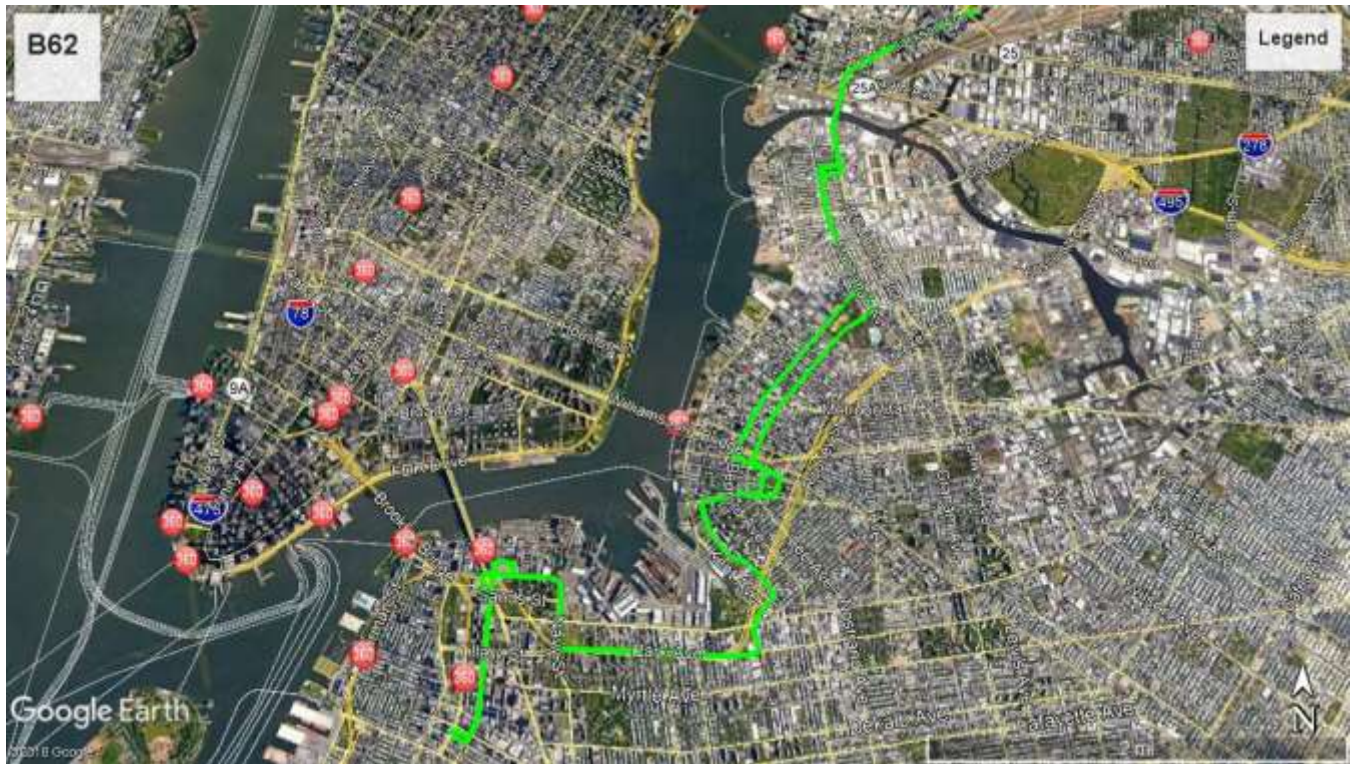


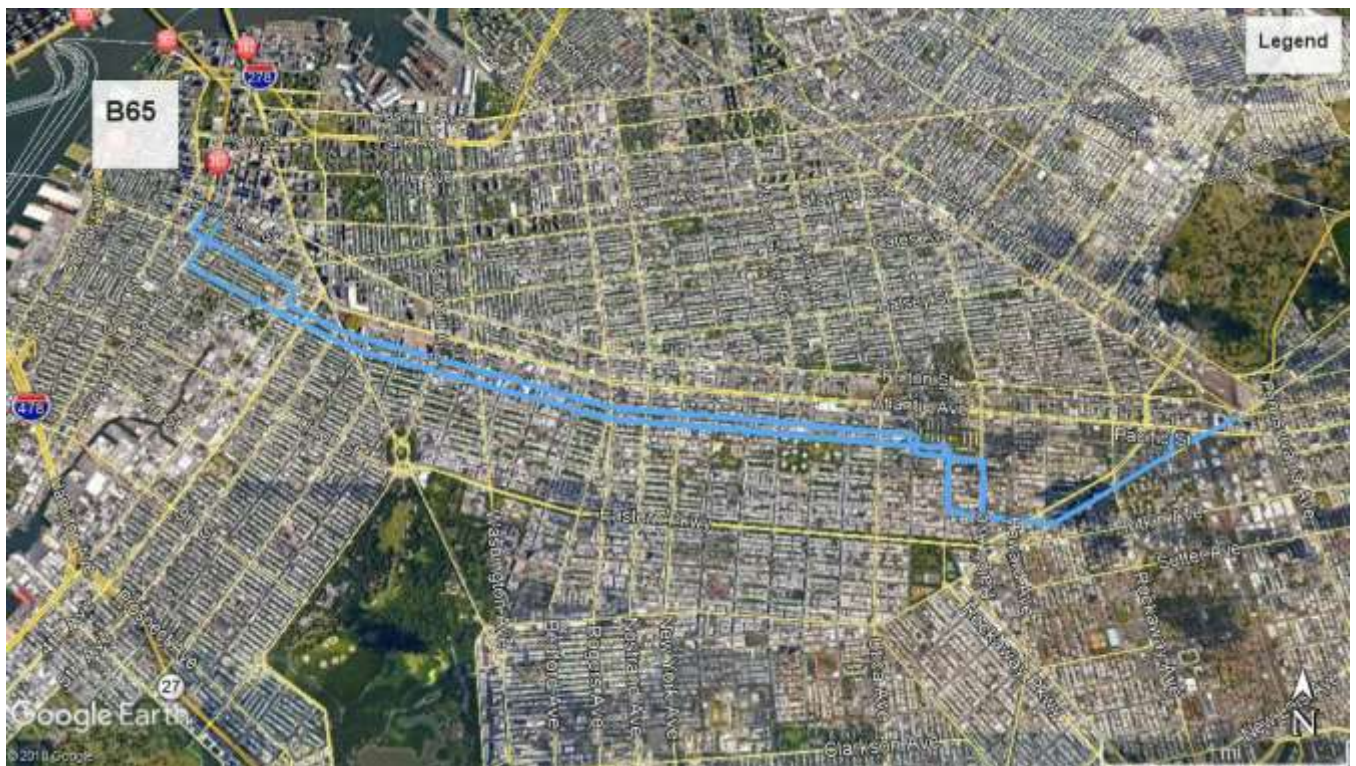


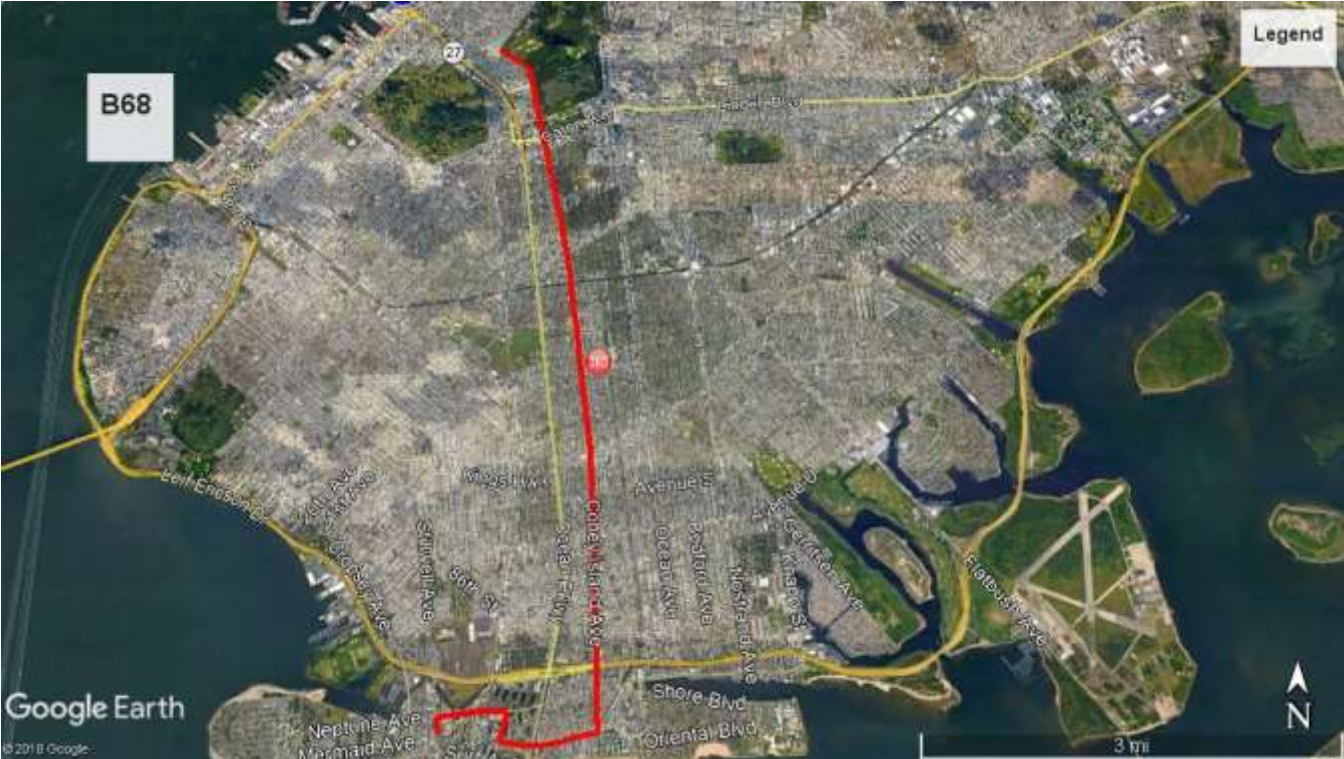
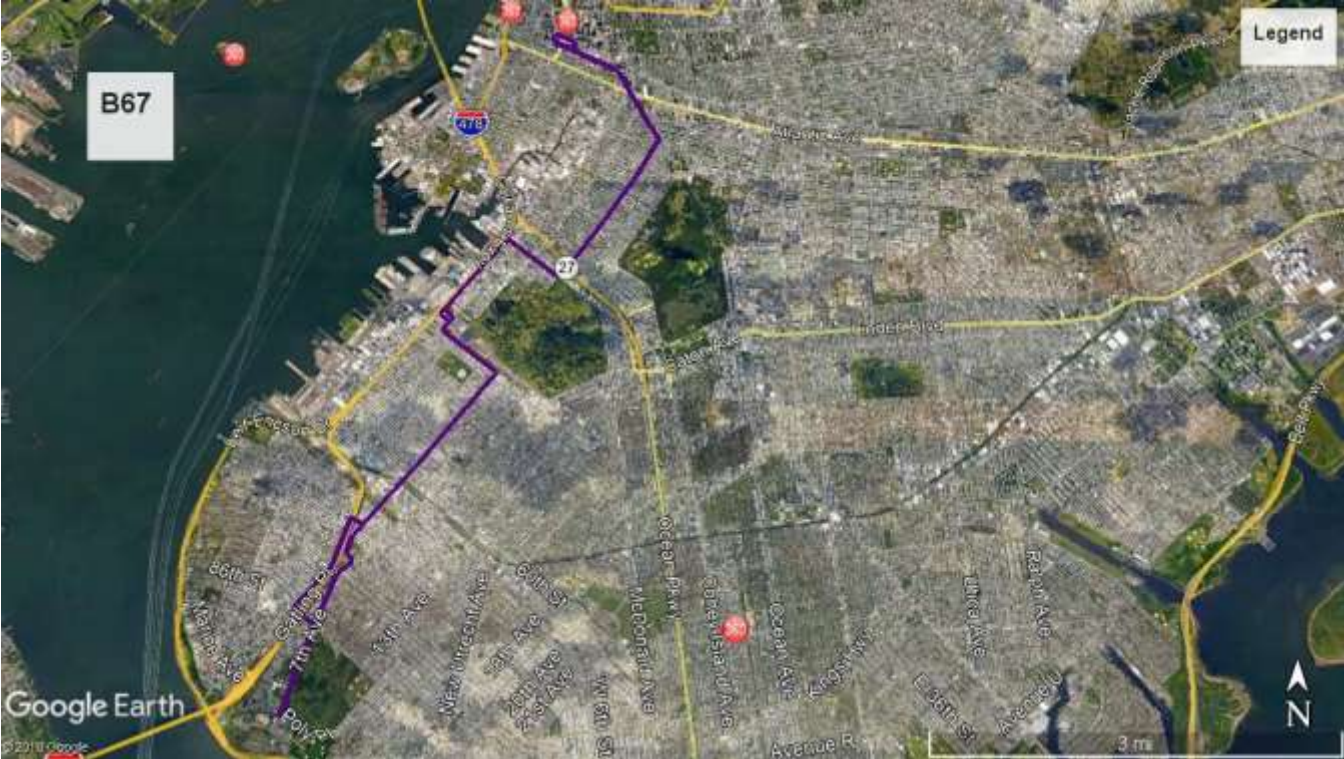






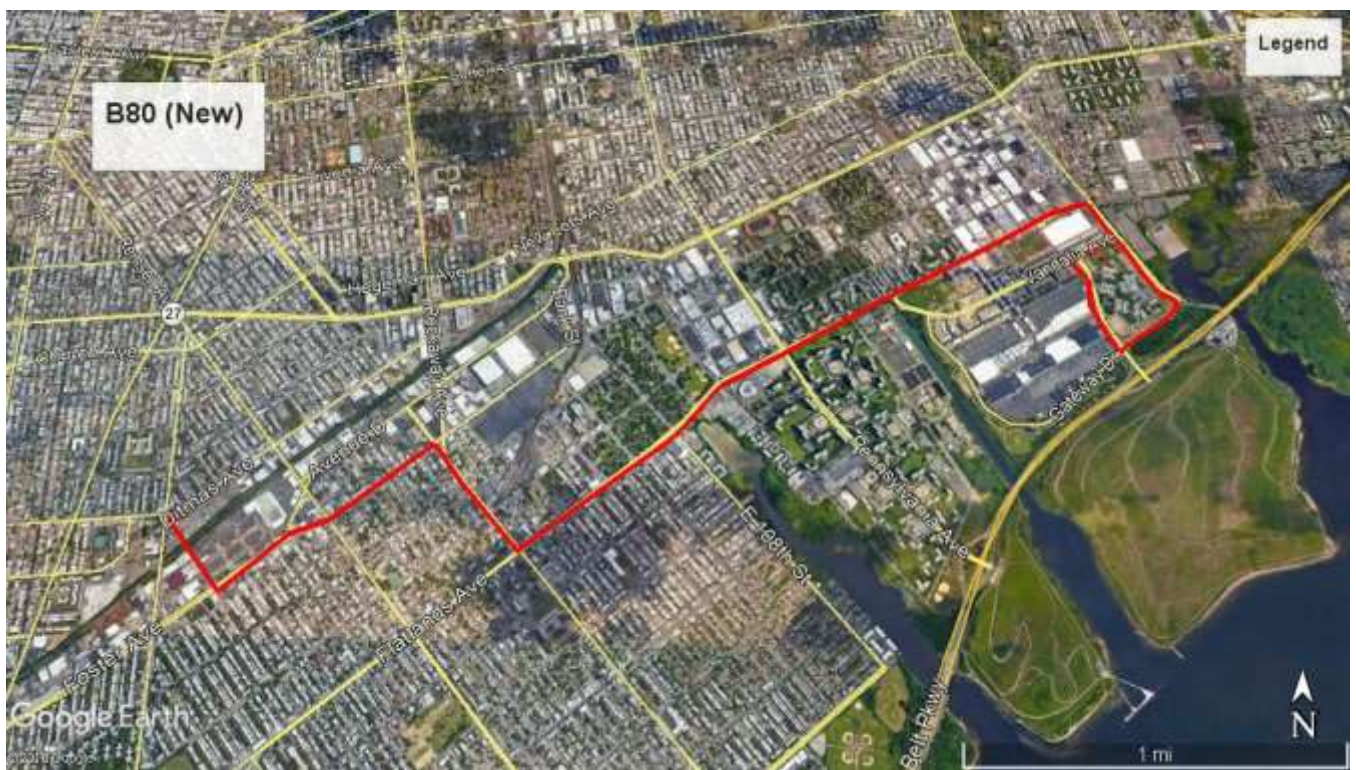


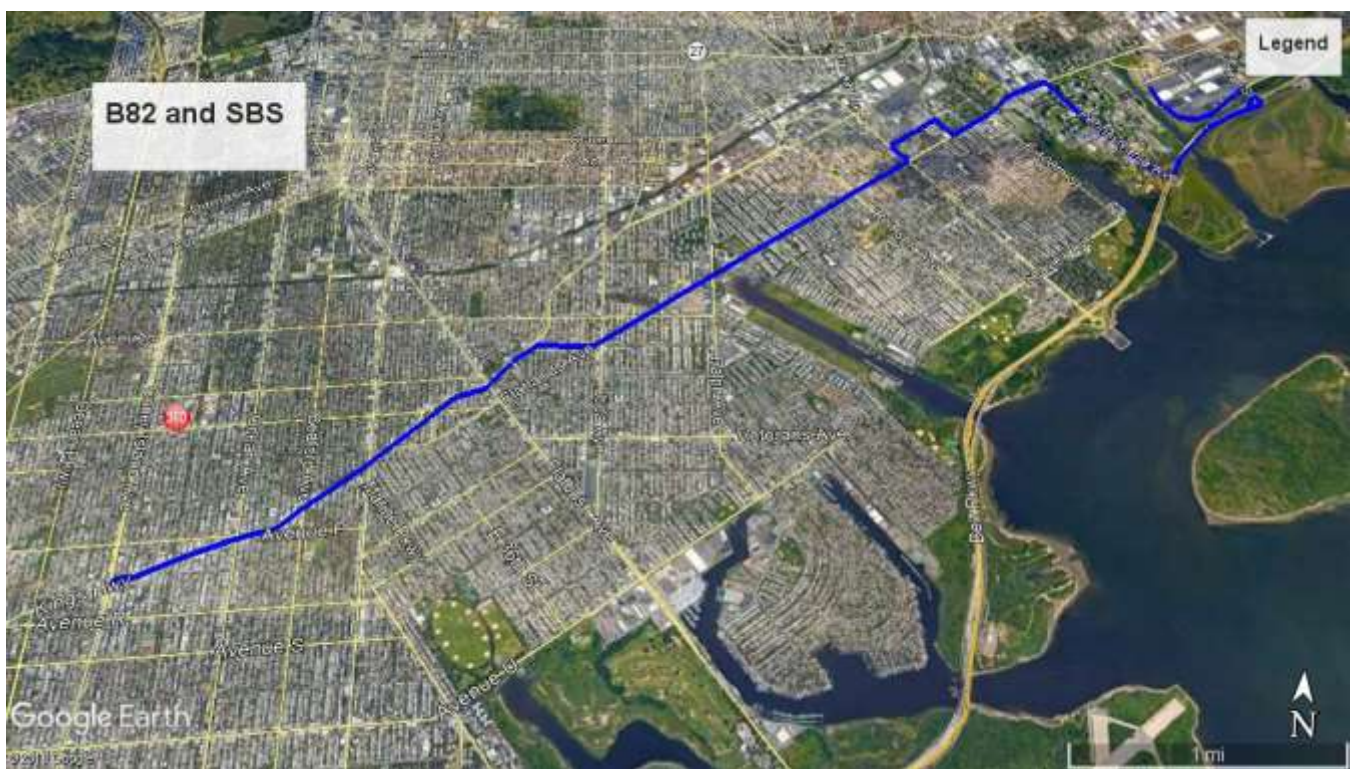
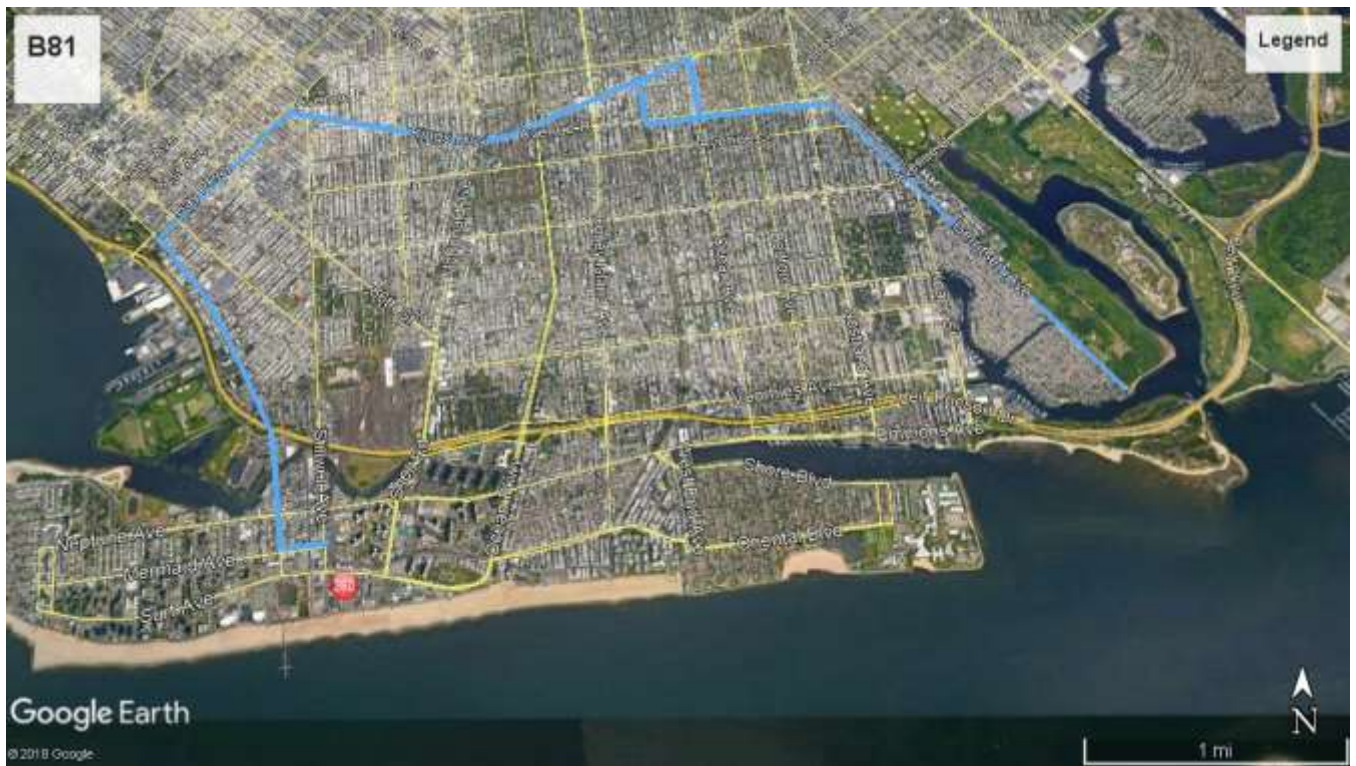




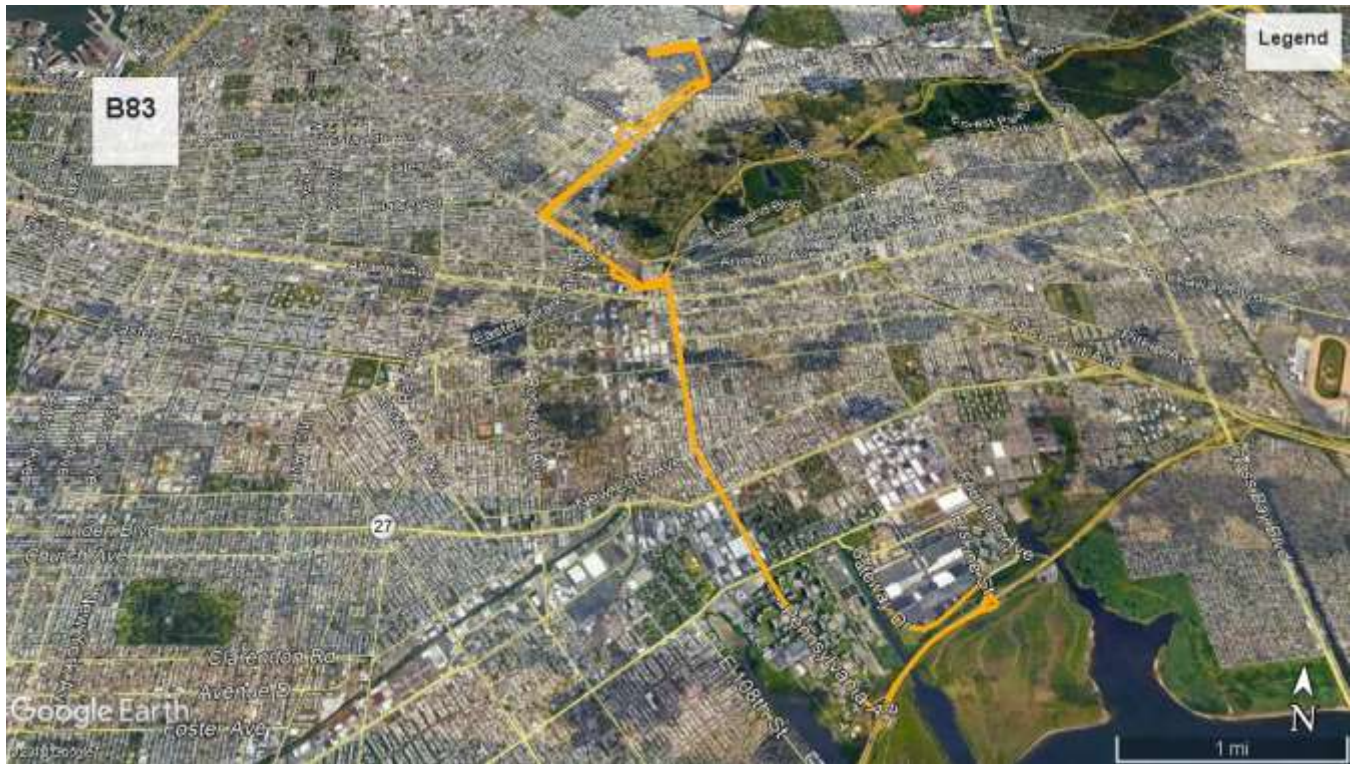


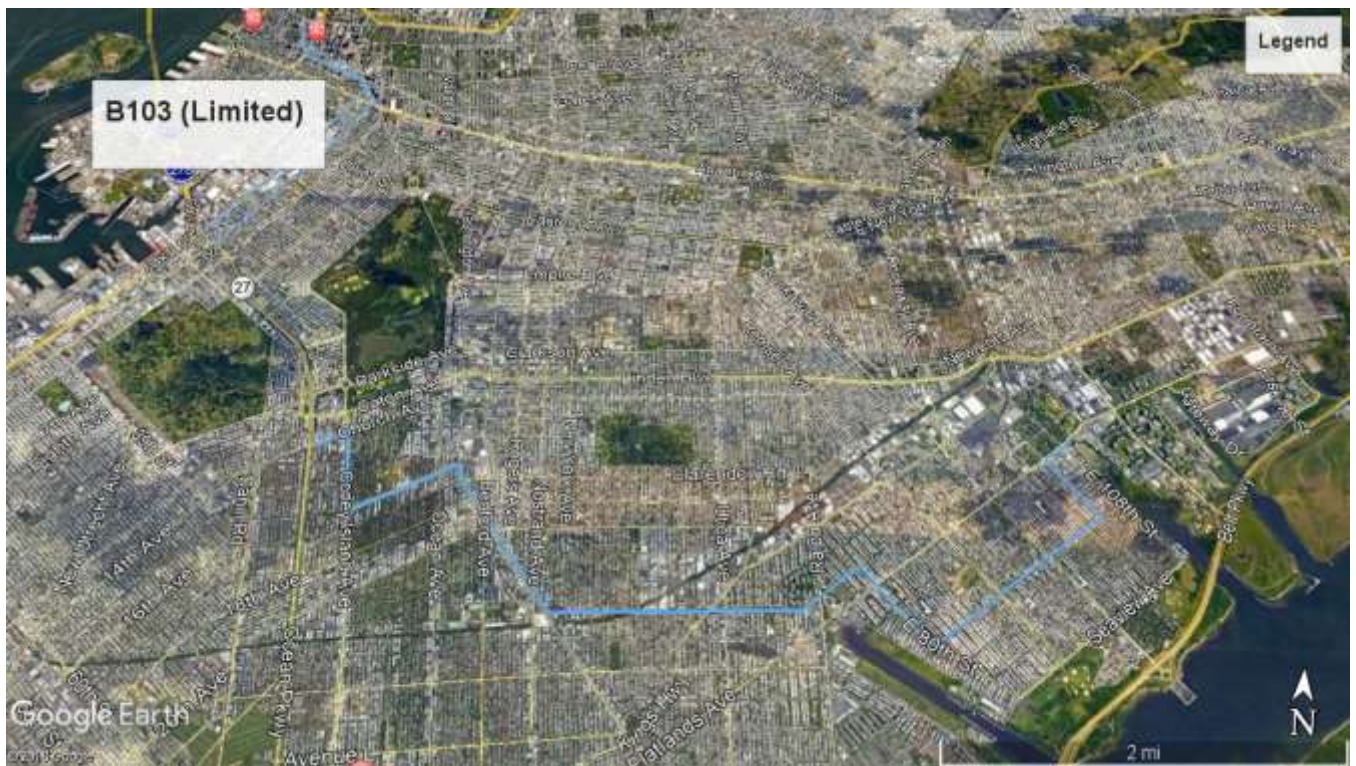


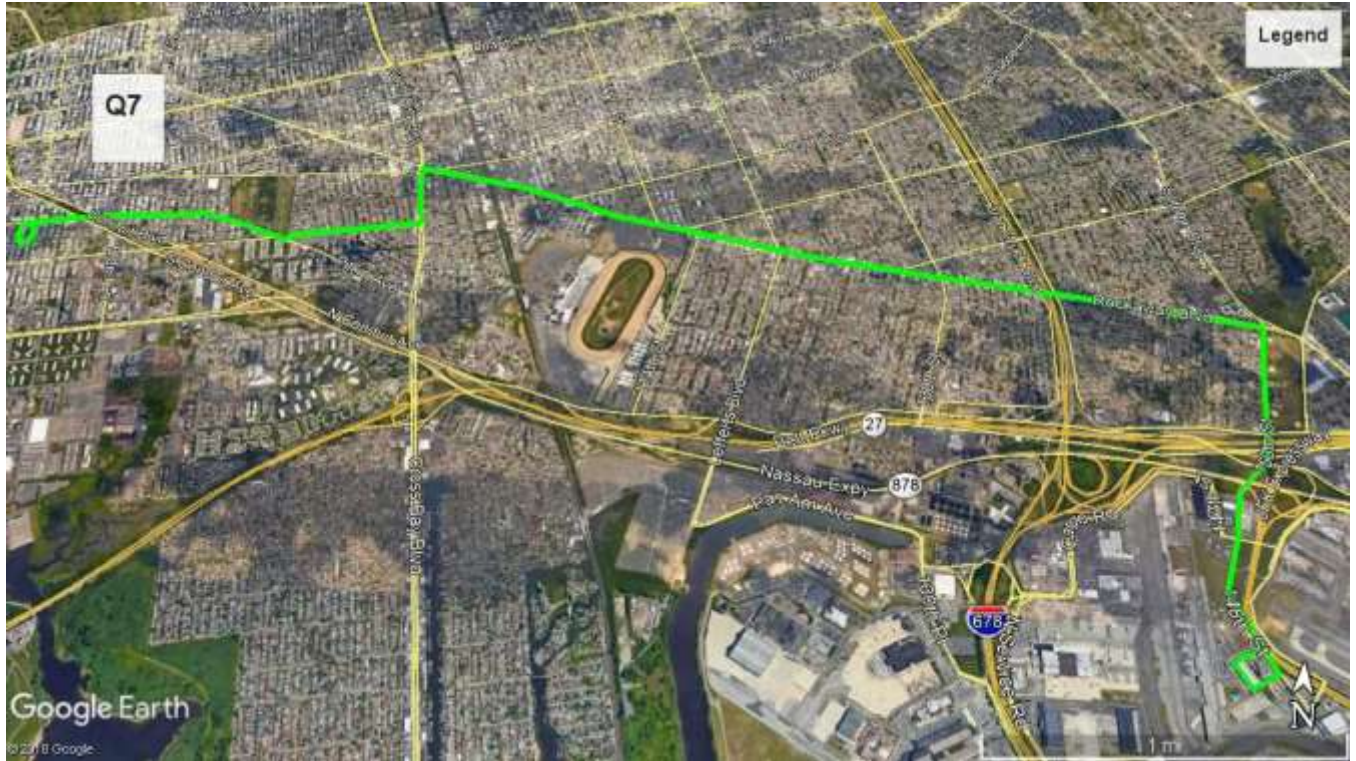


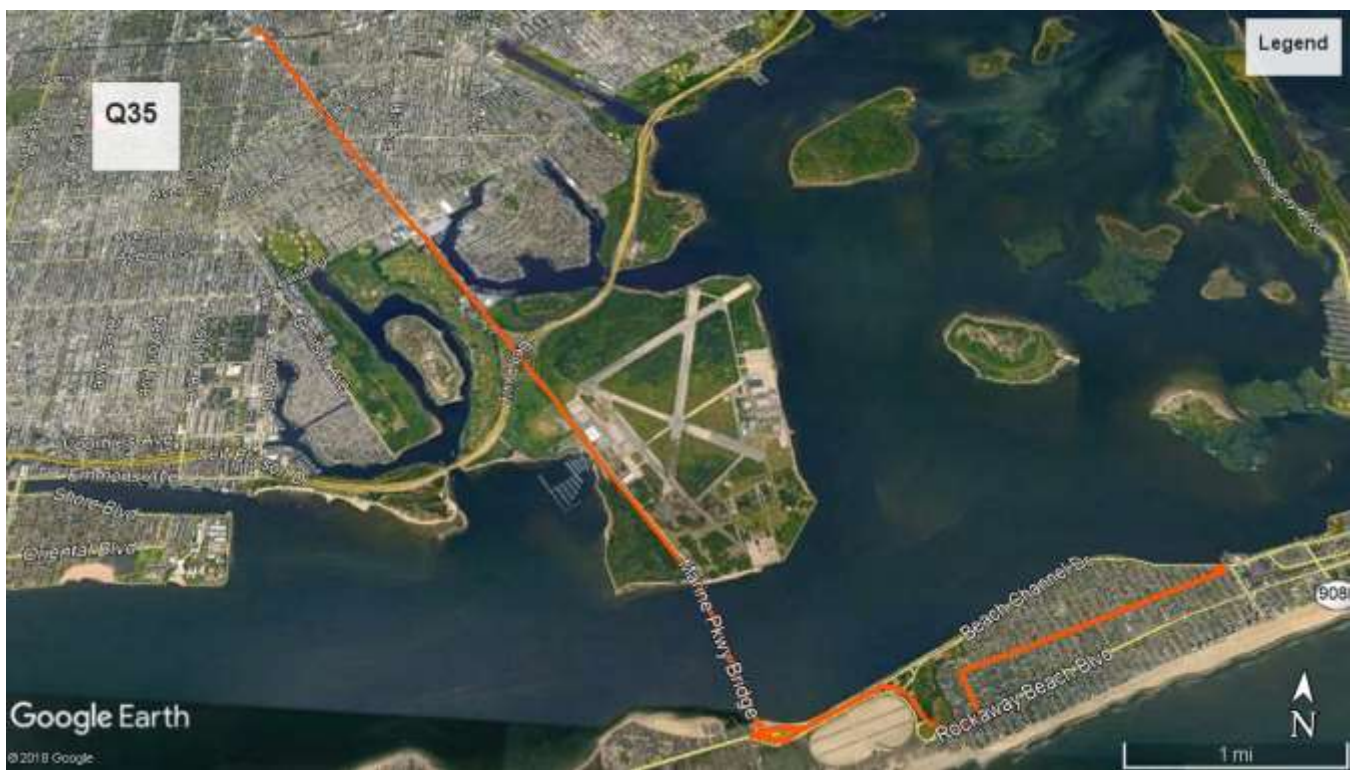
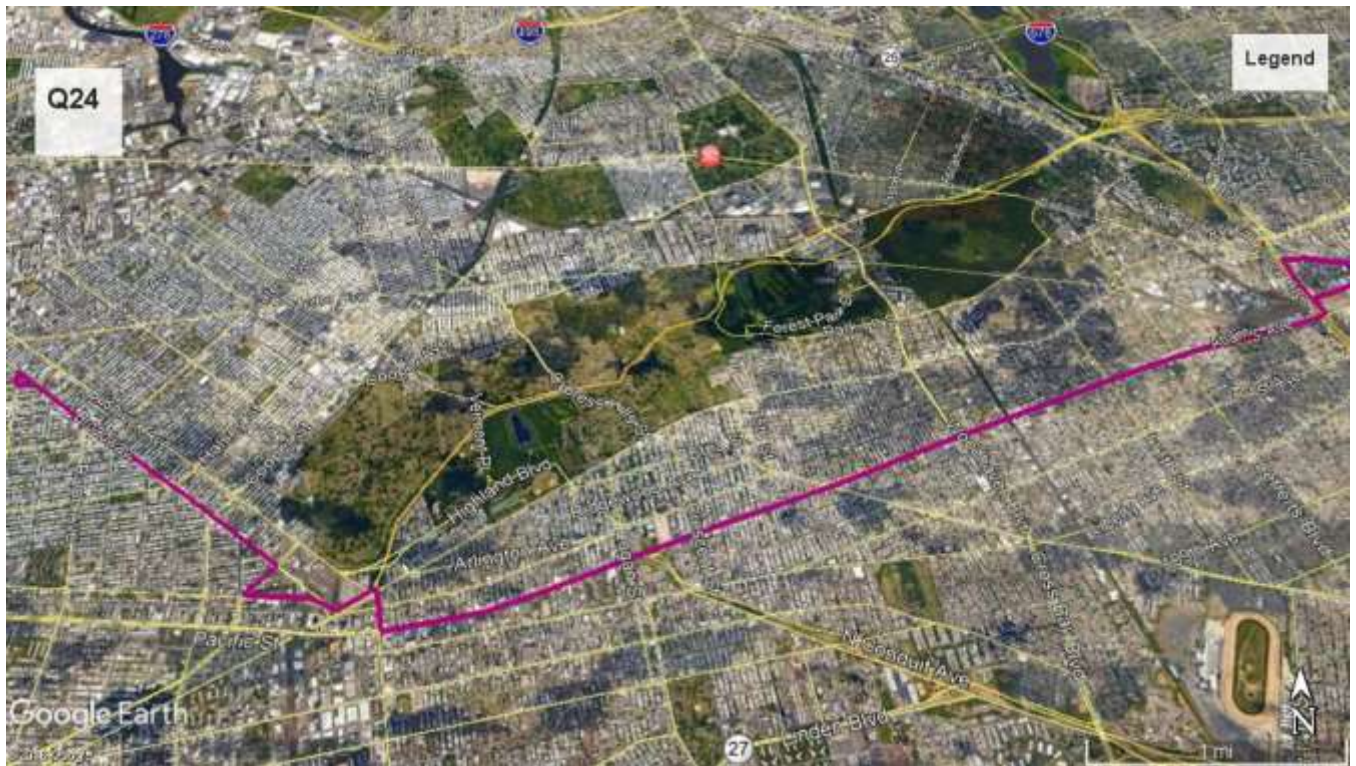


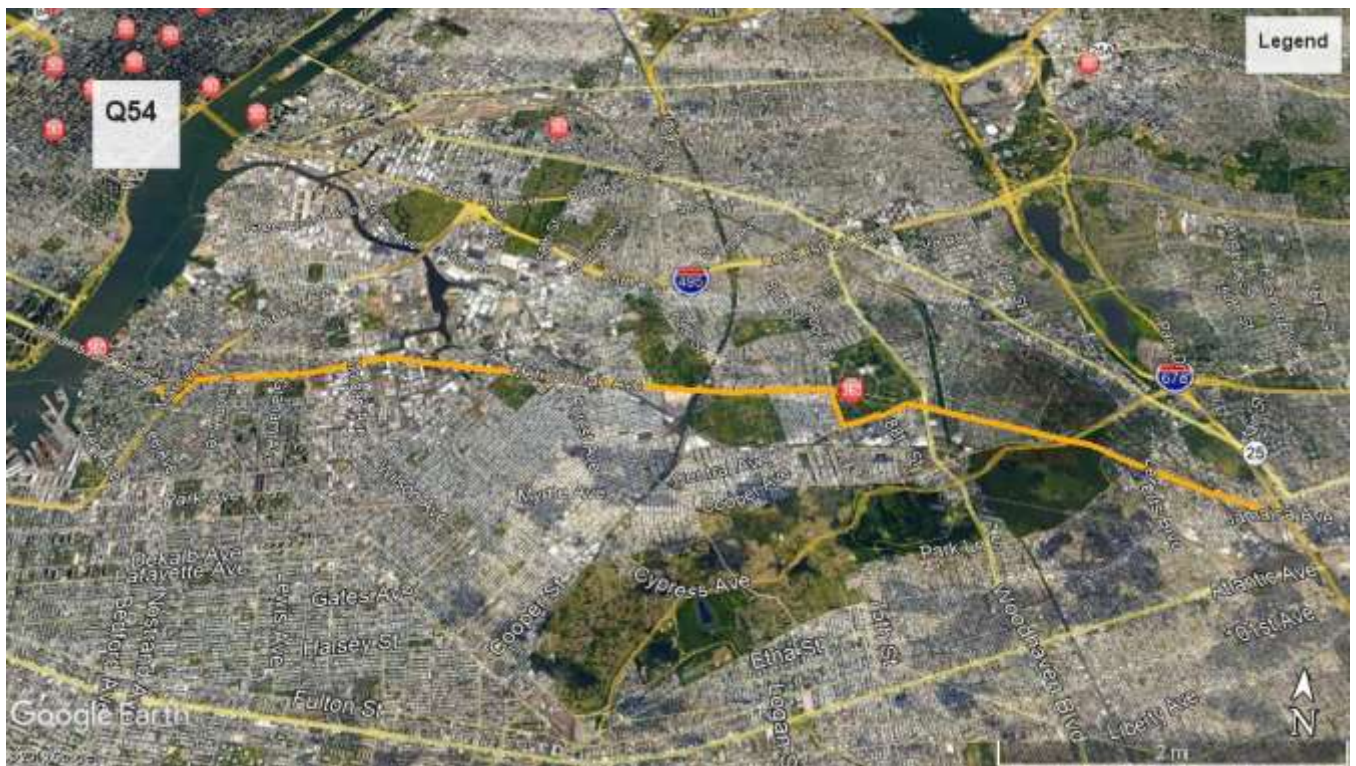
B82 terminates at Seaview and Pennsylvania Aves.



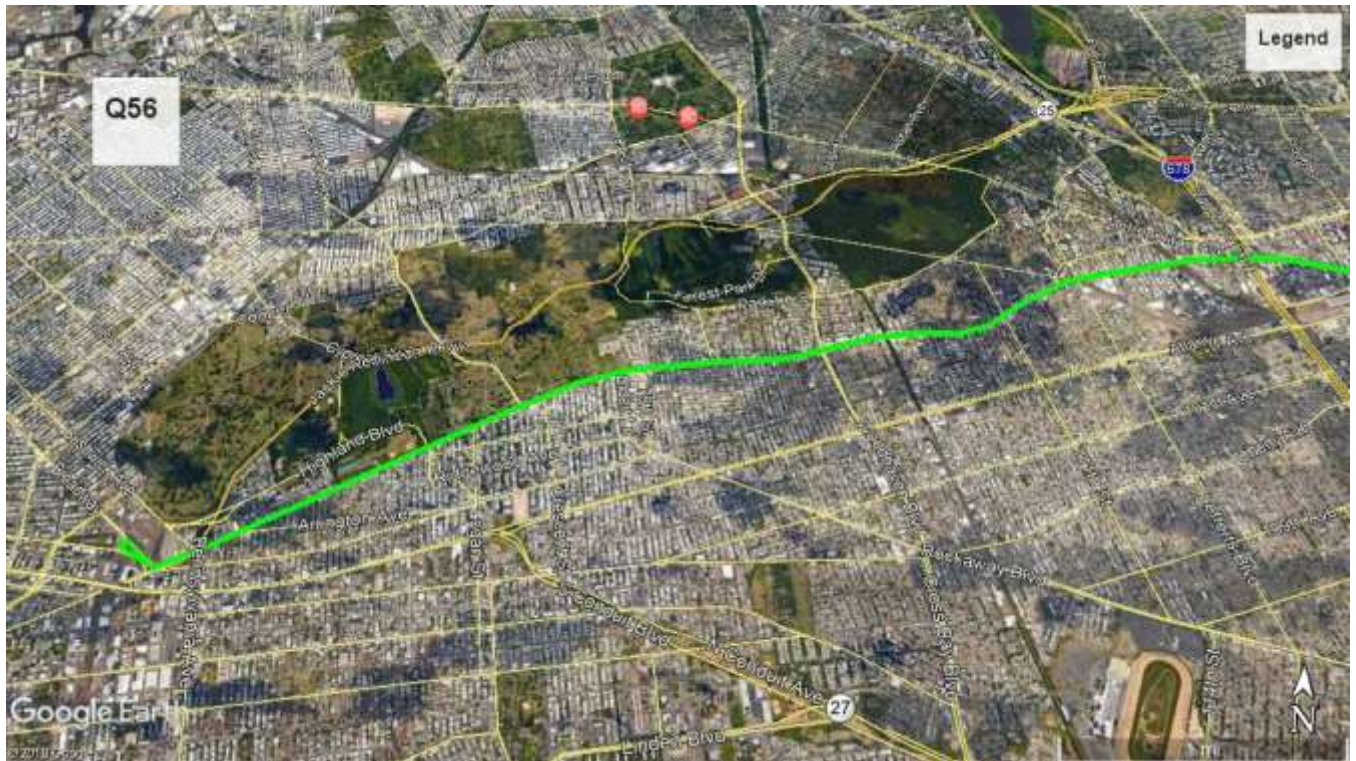
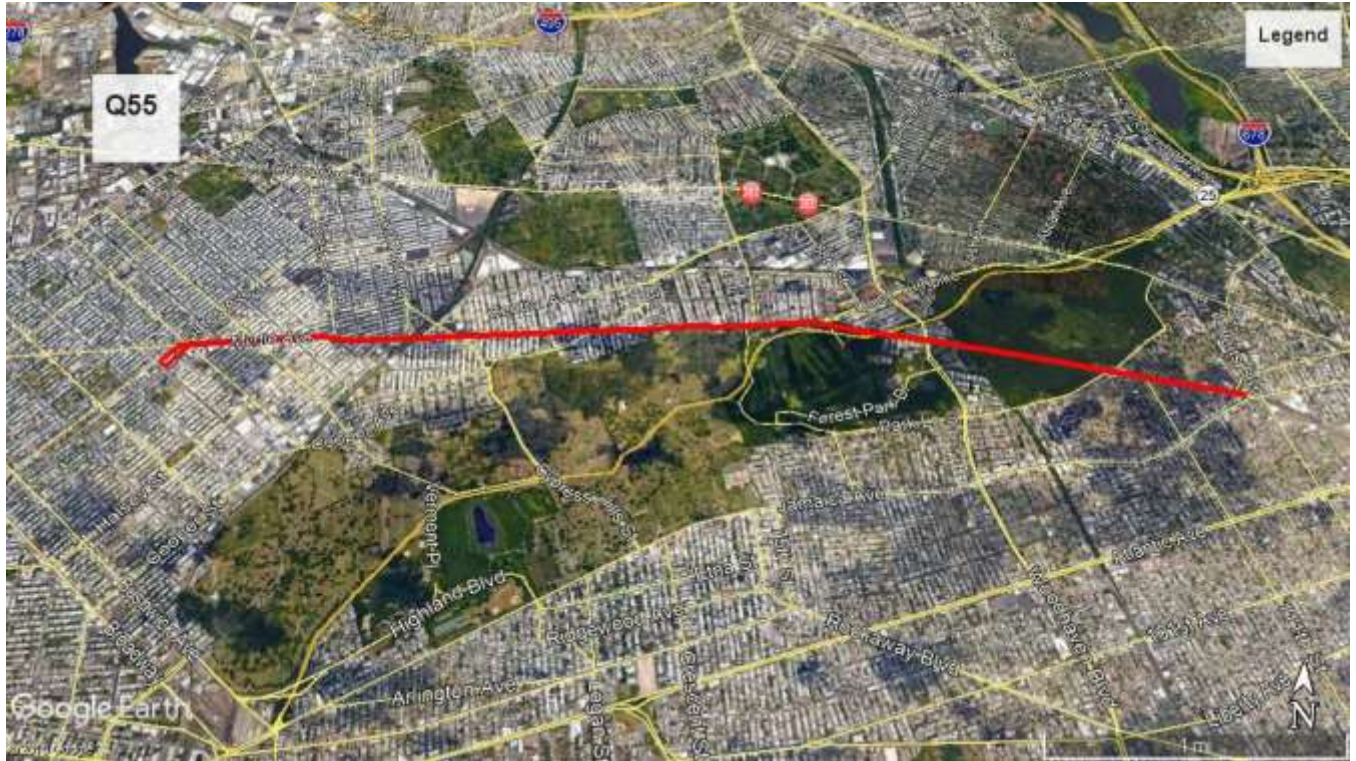


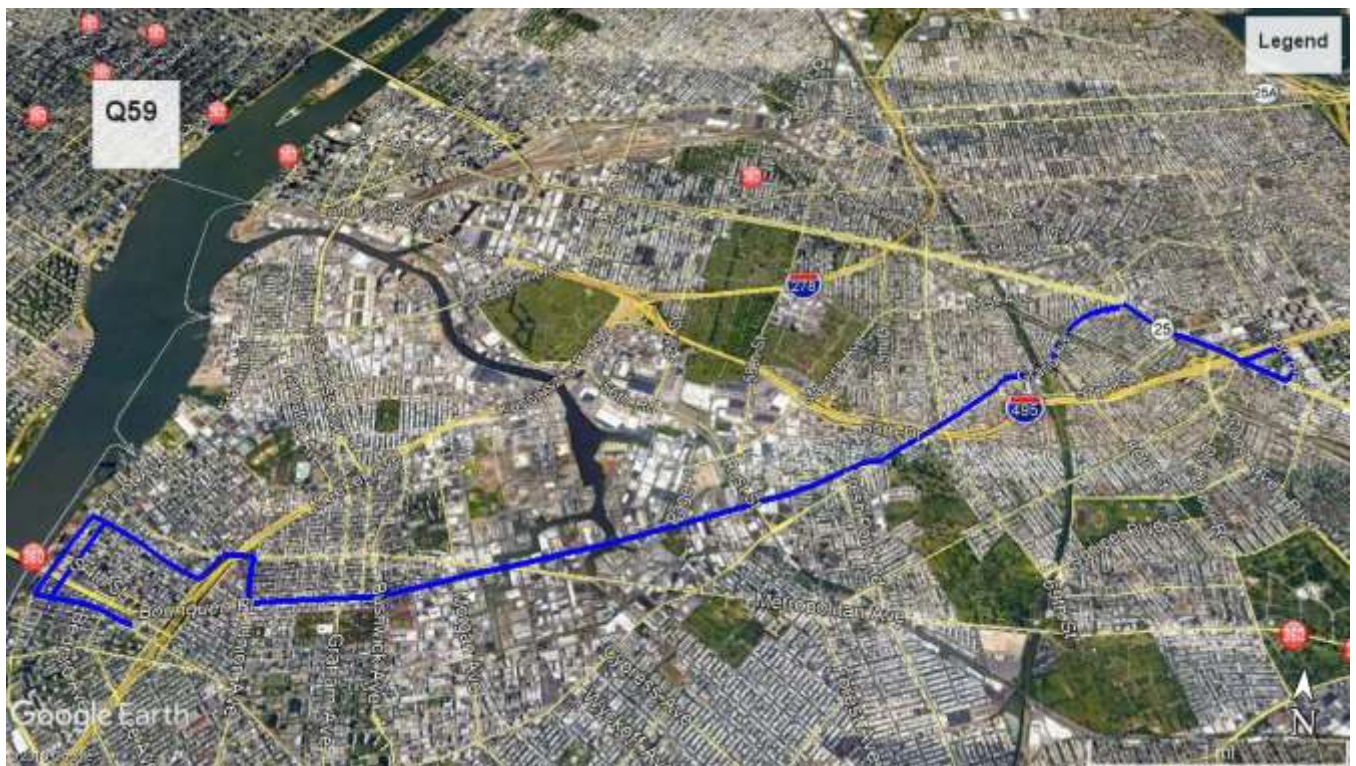
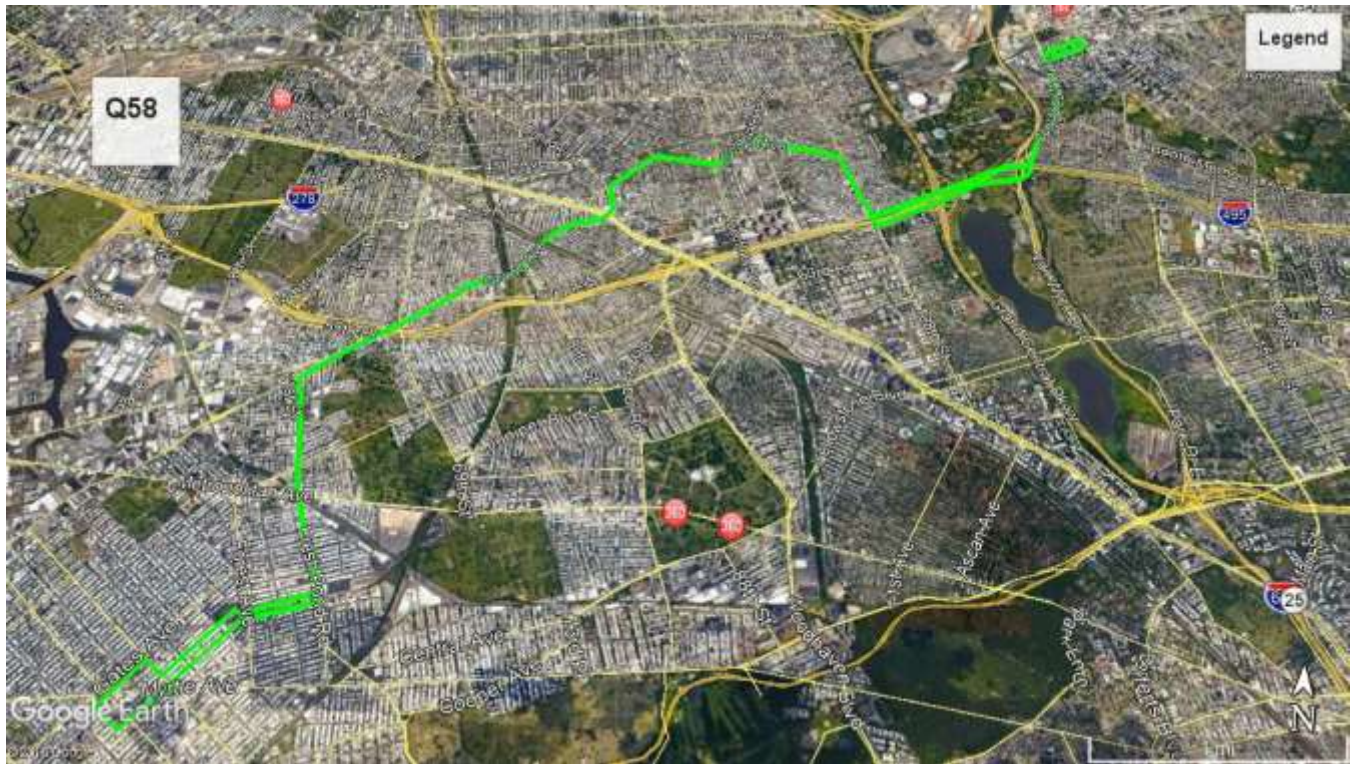


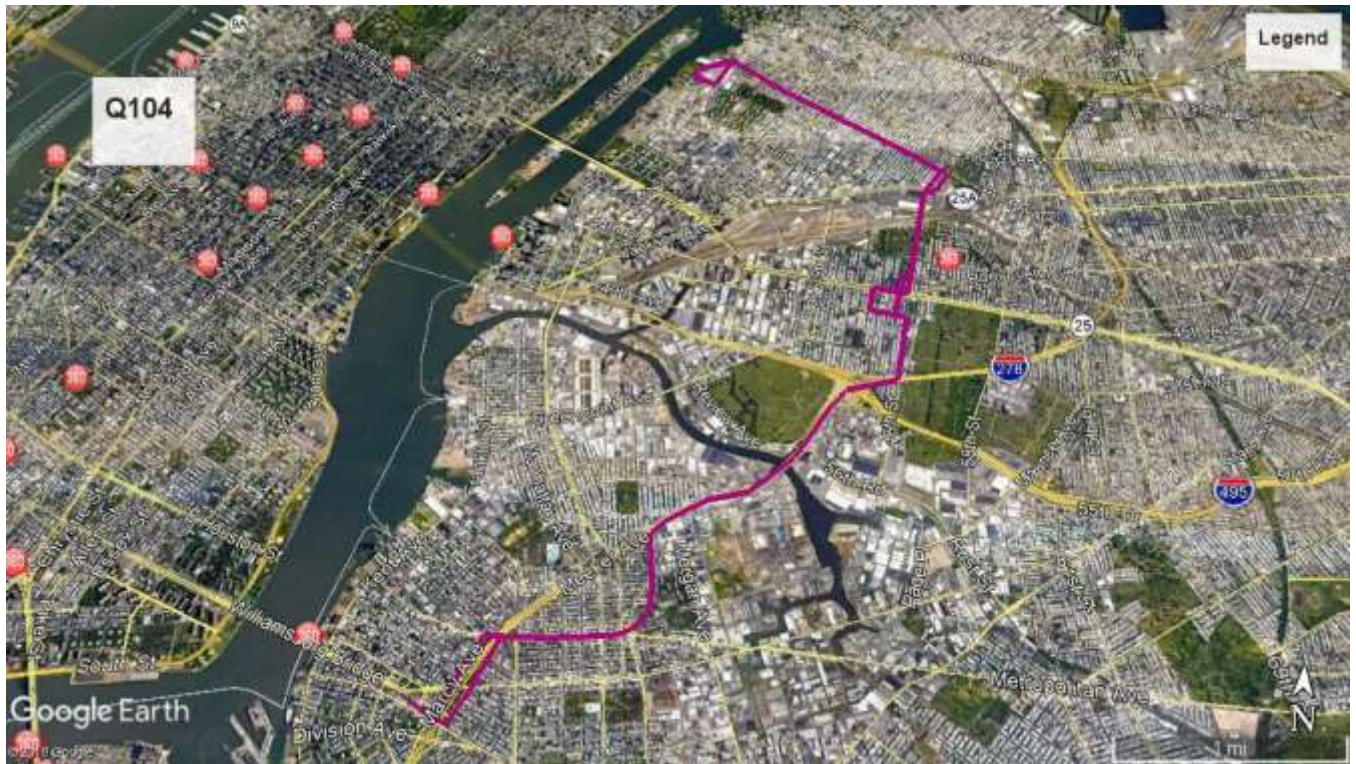


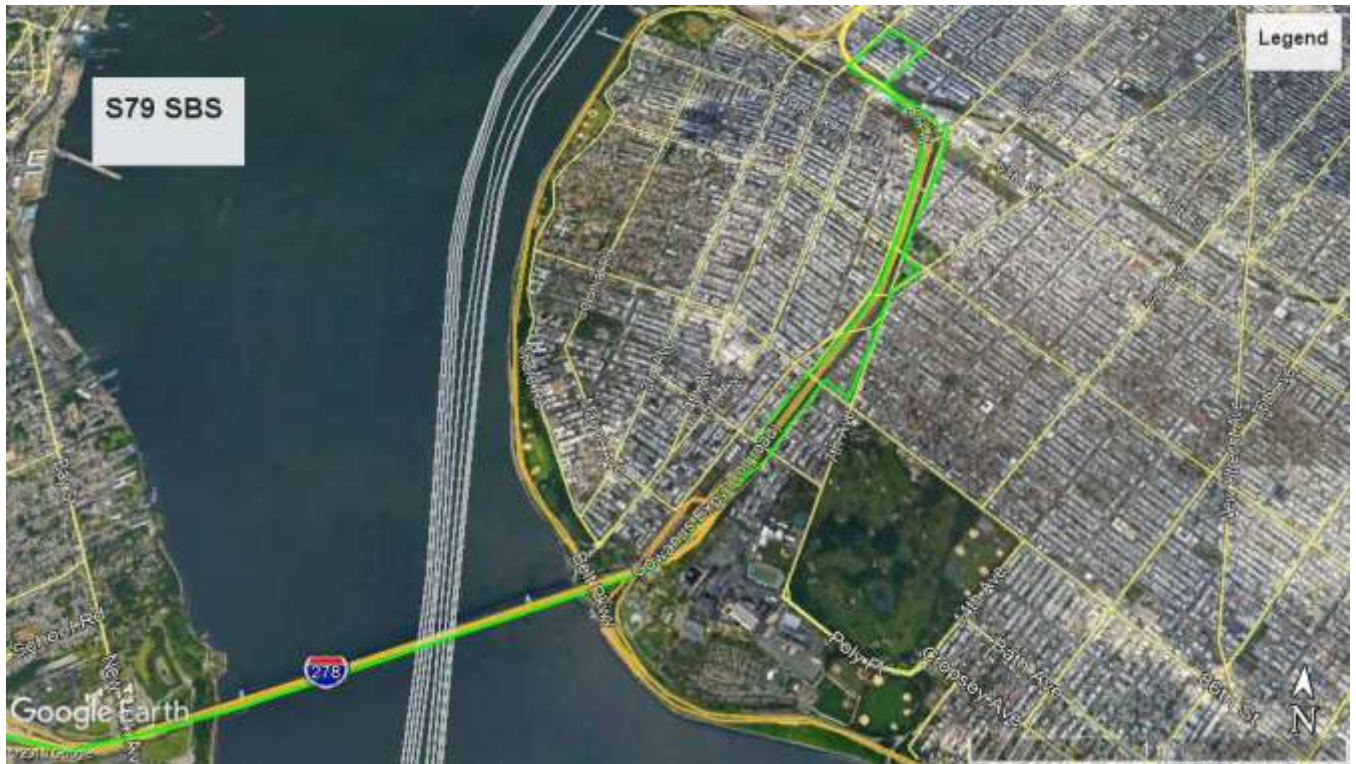




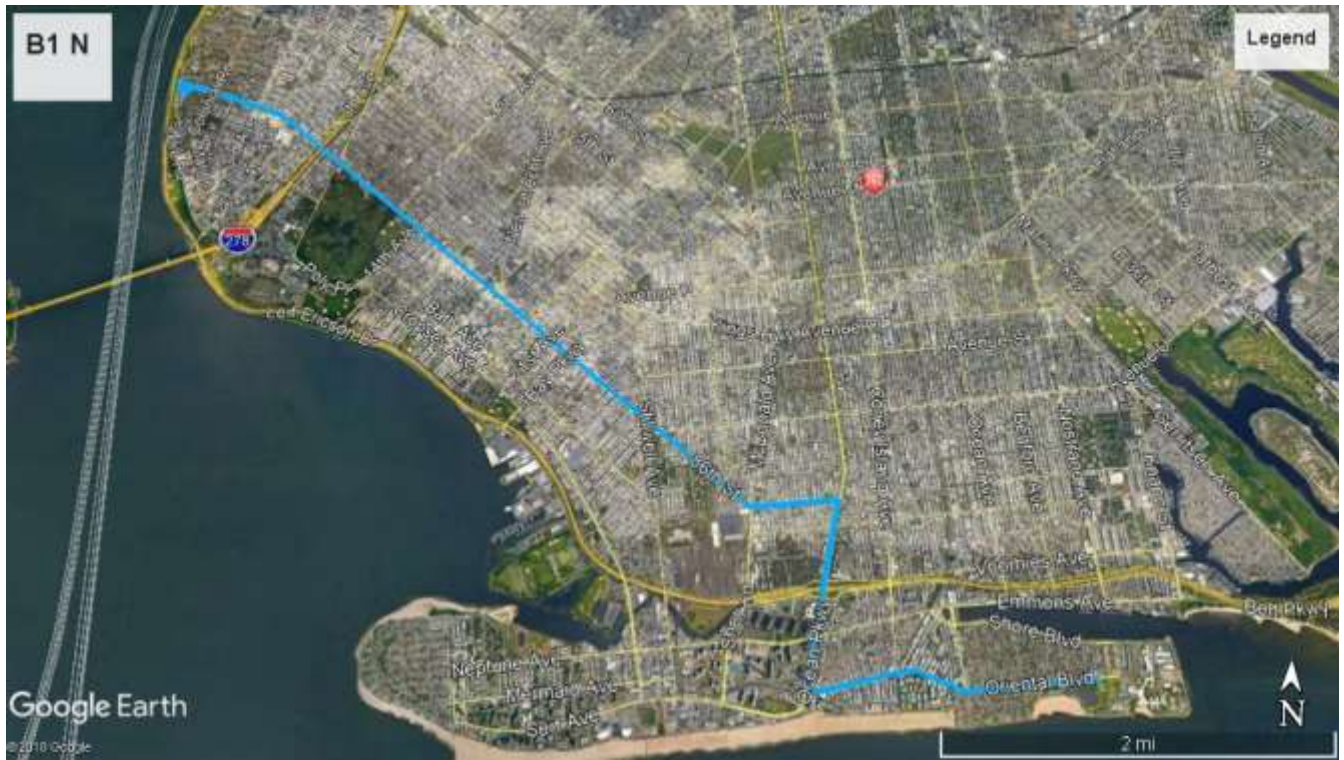




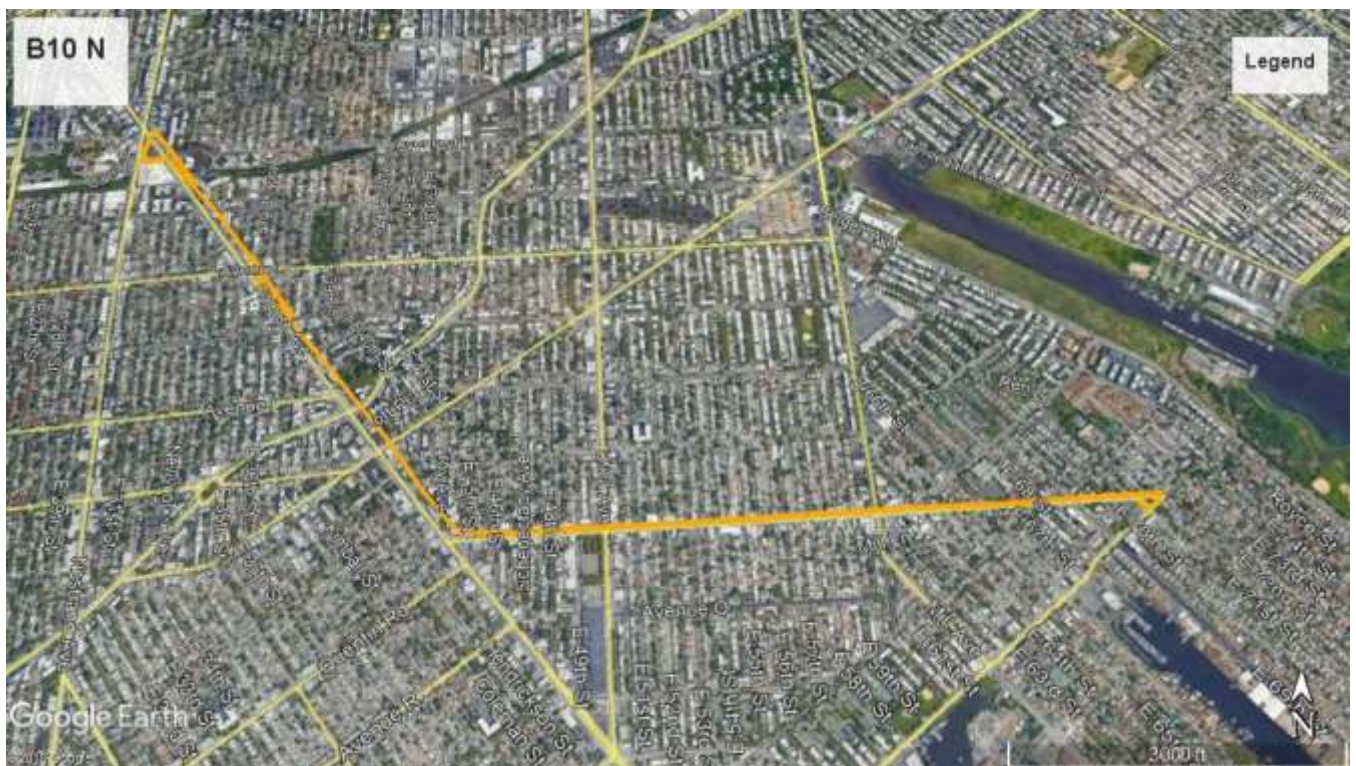
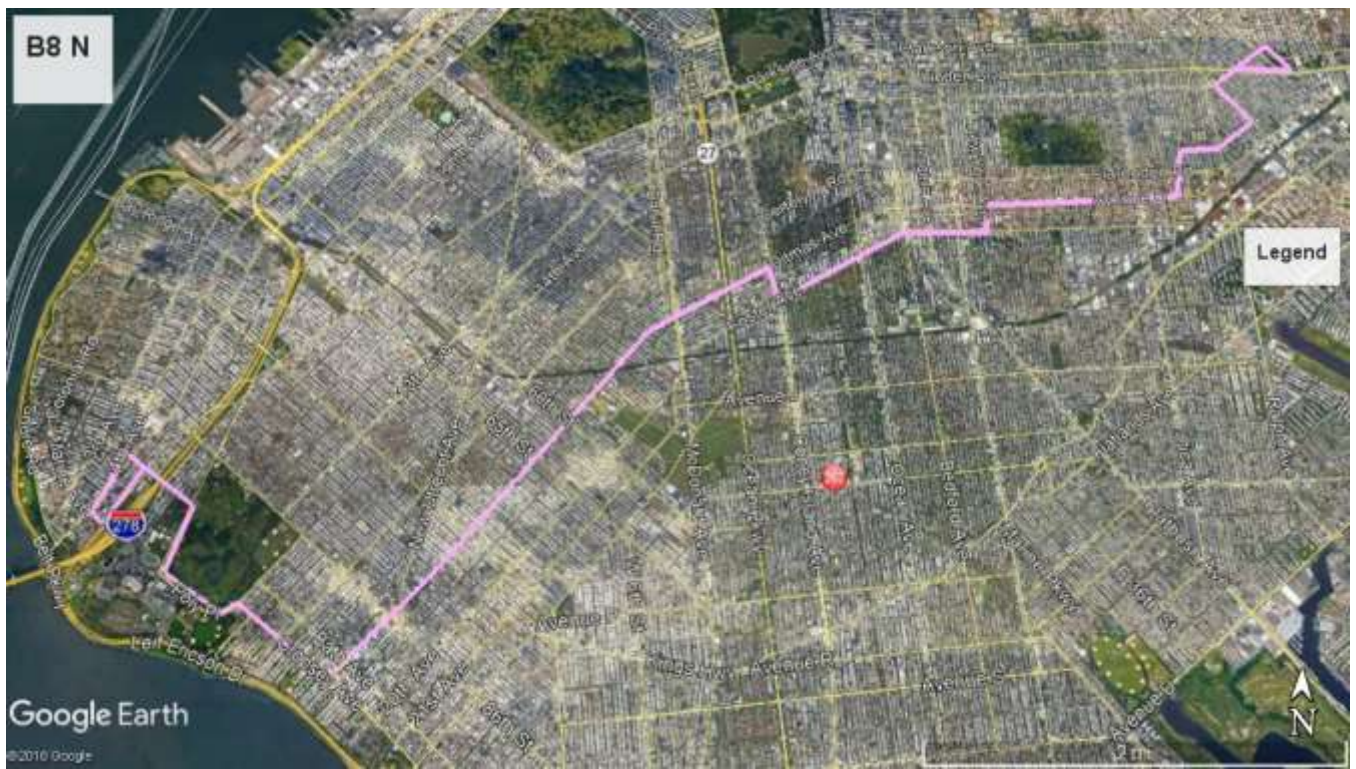


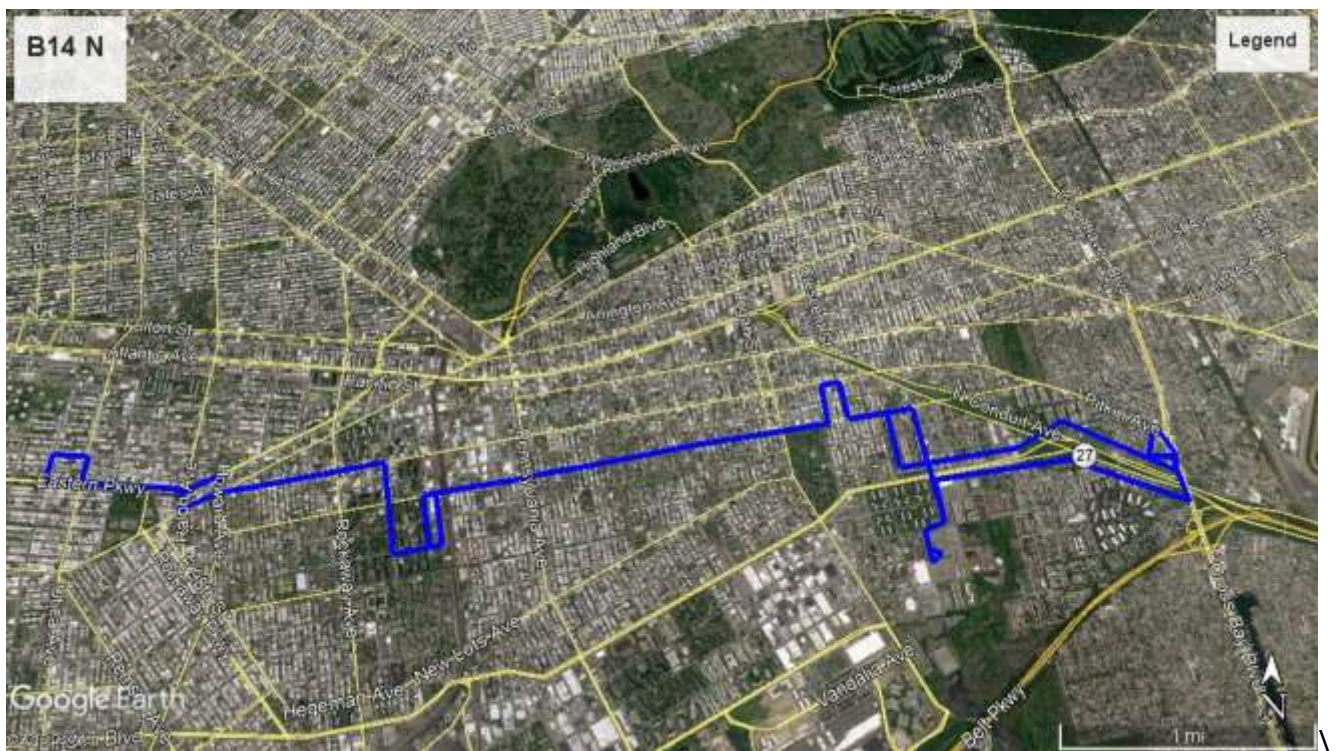


### Individual Route Maps (Night Time Service)

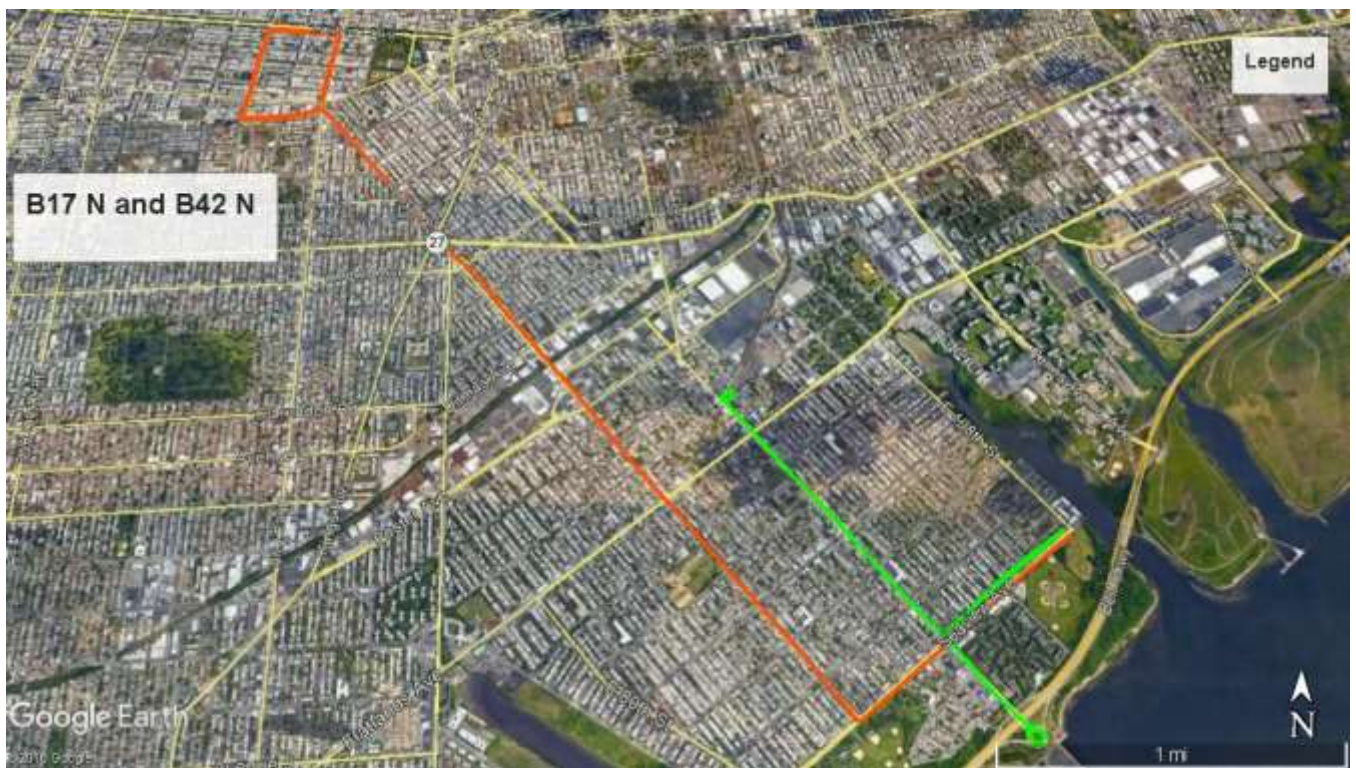
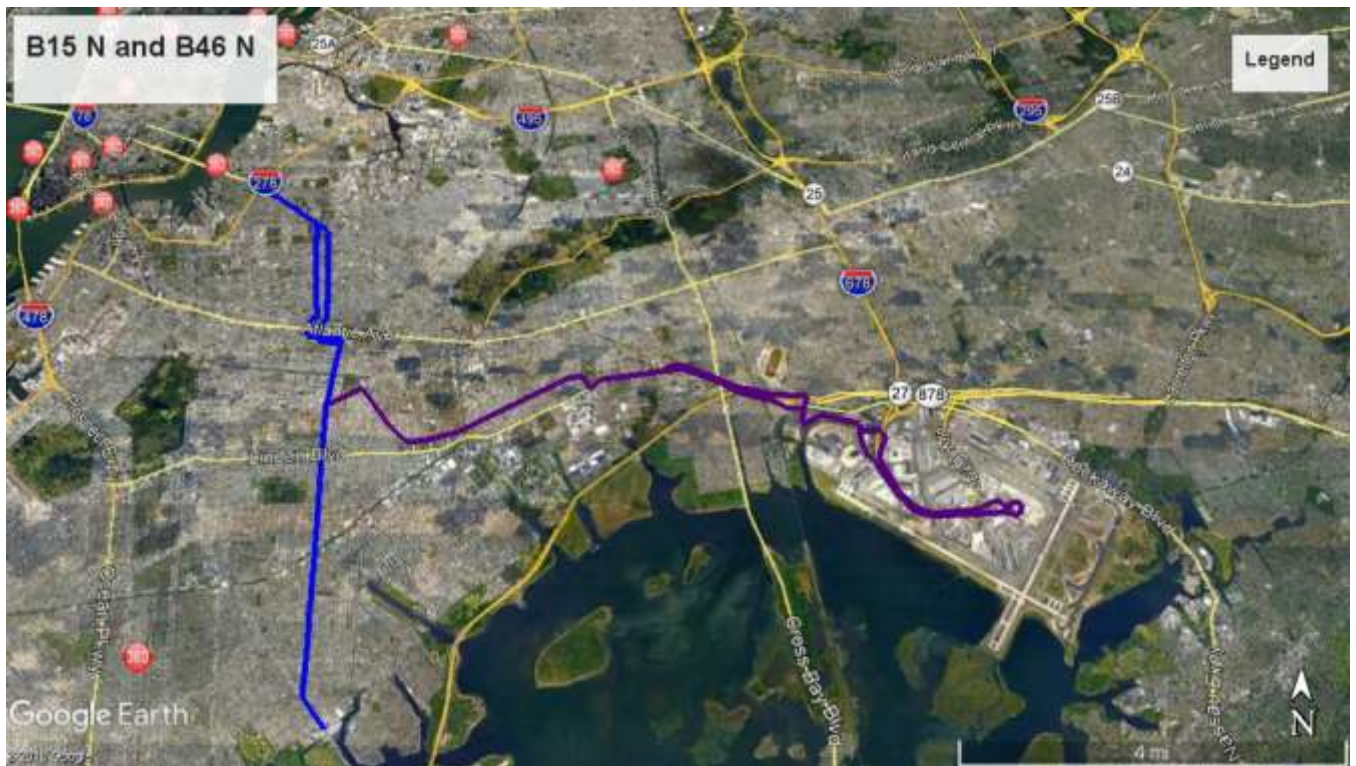


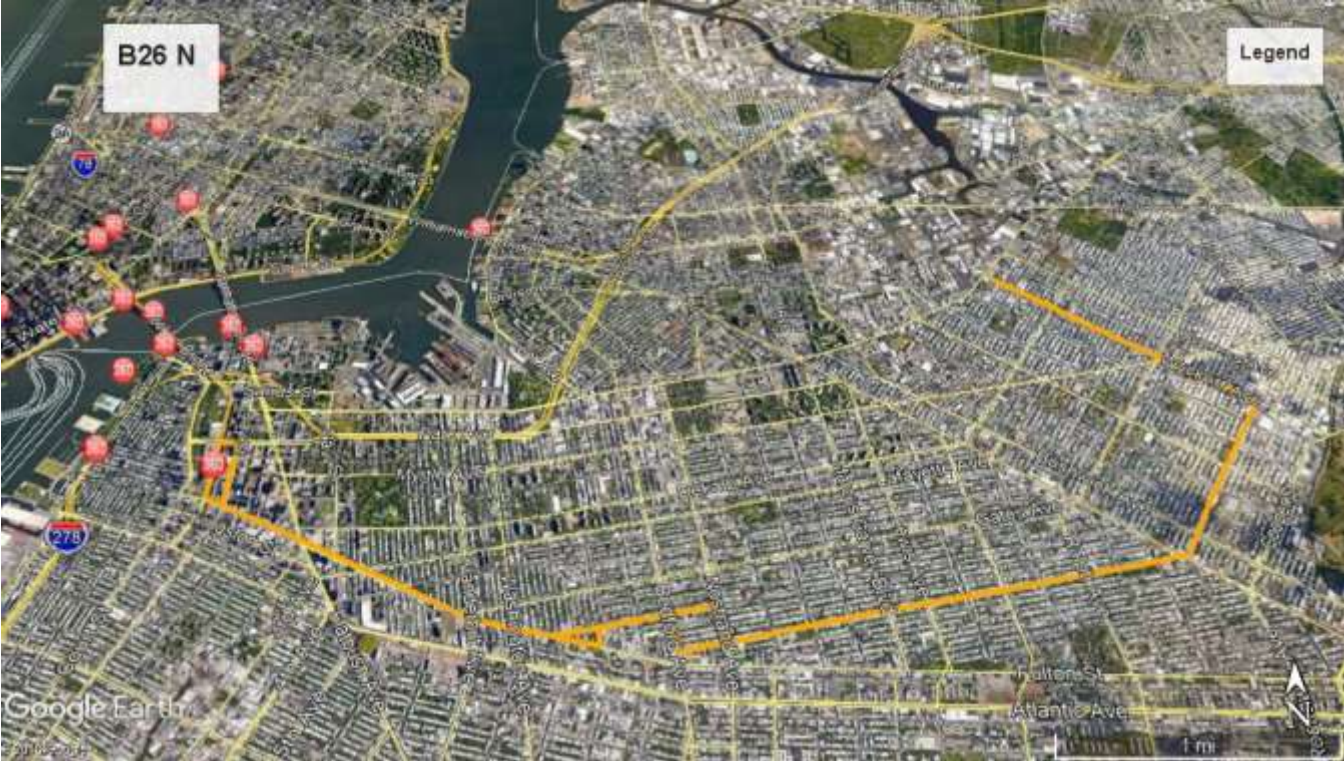


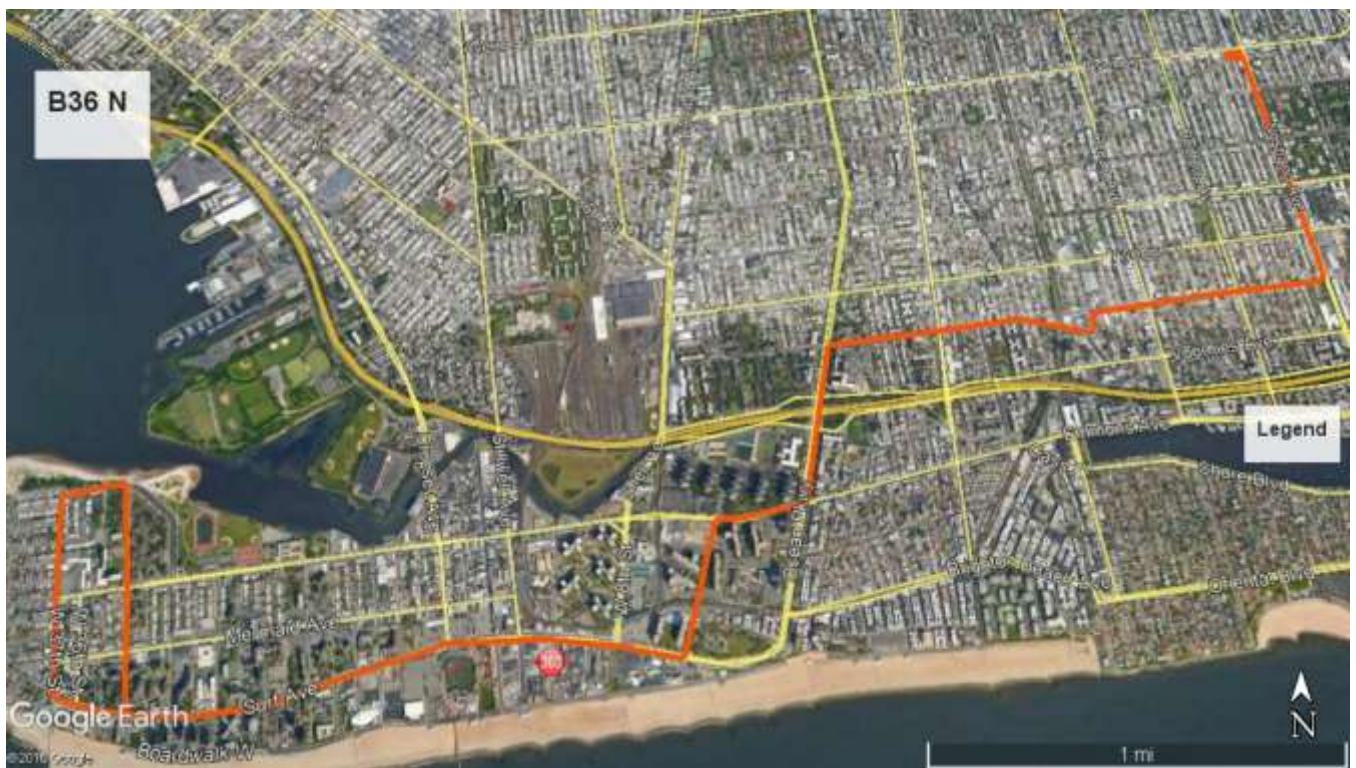
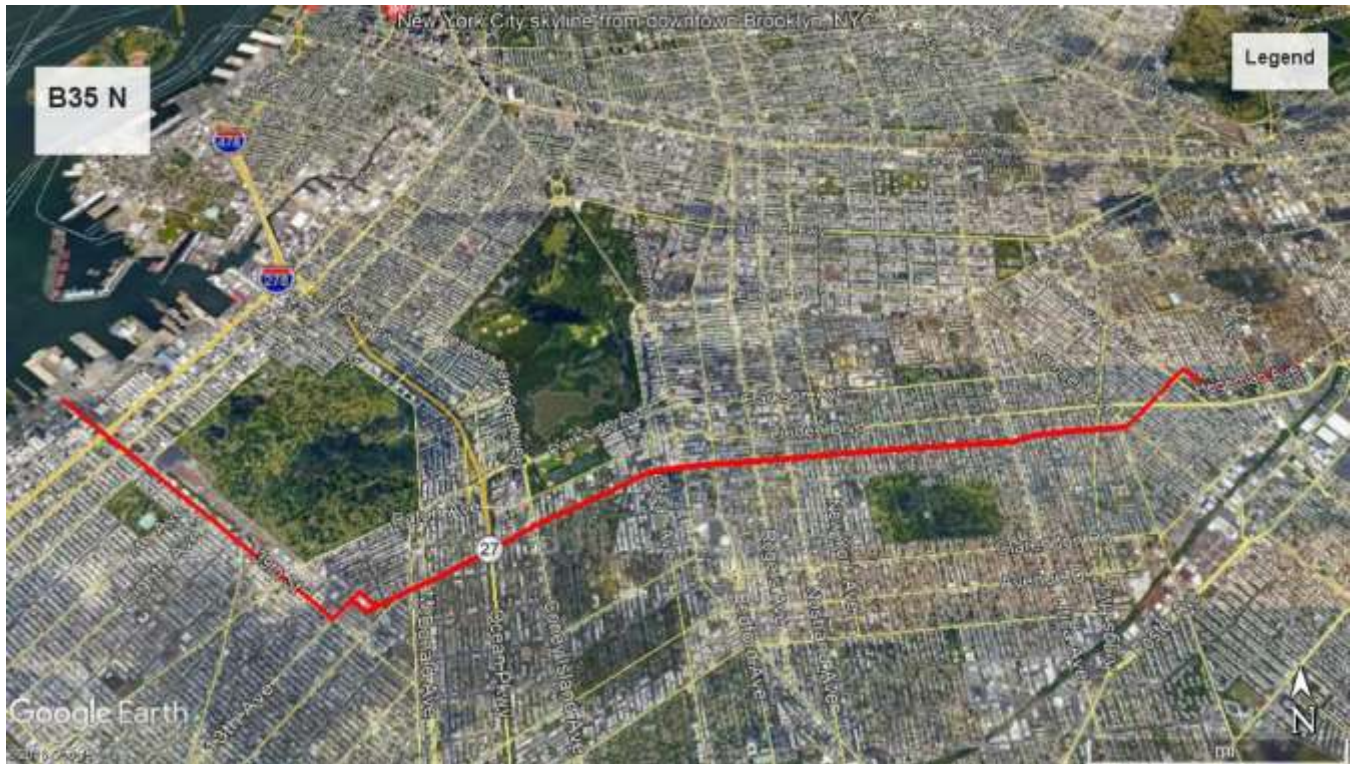


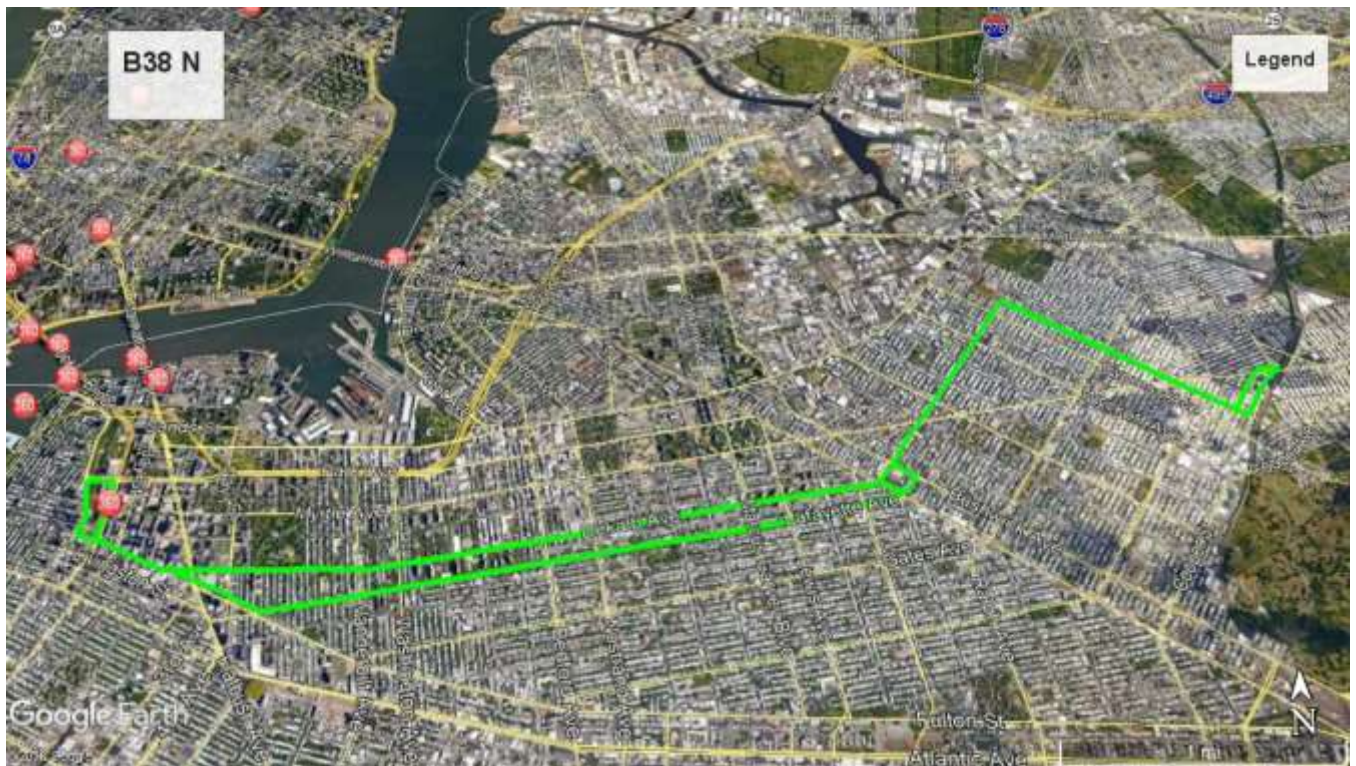


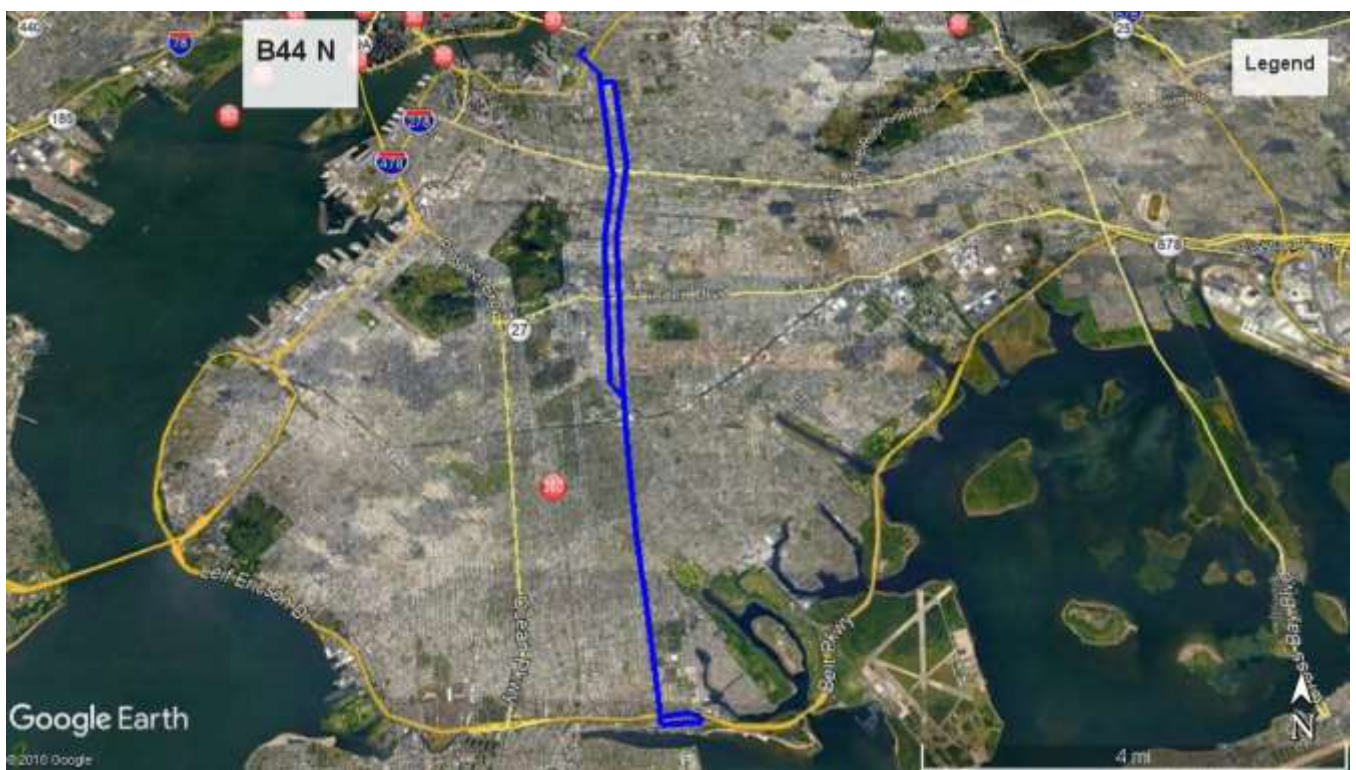
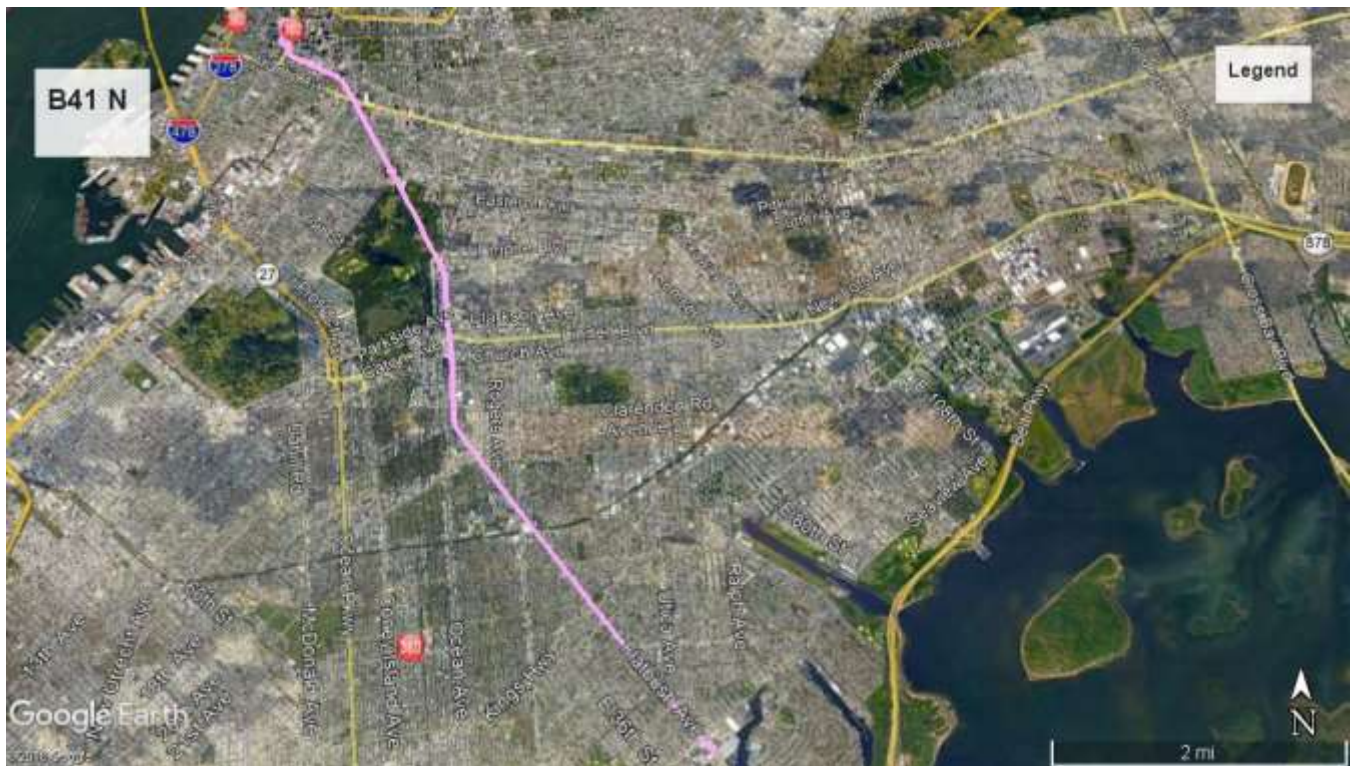


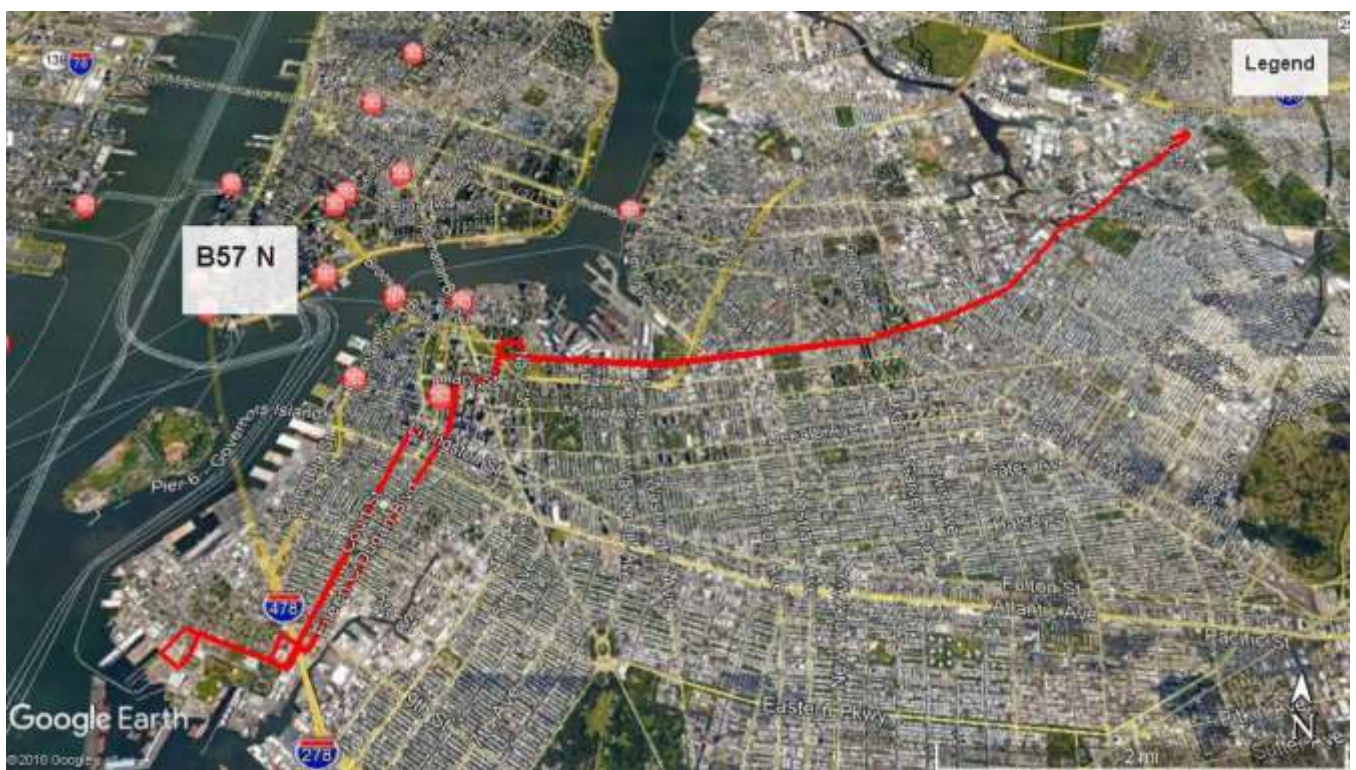
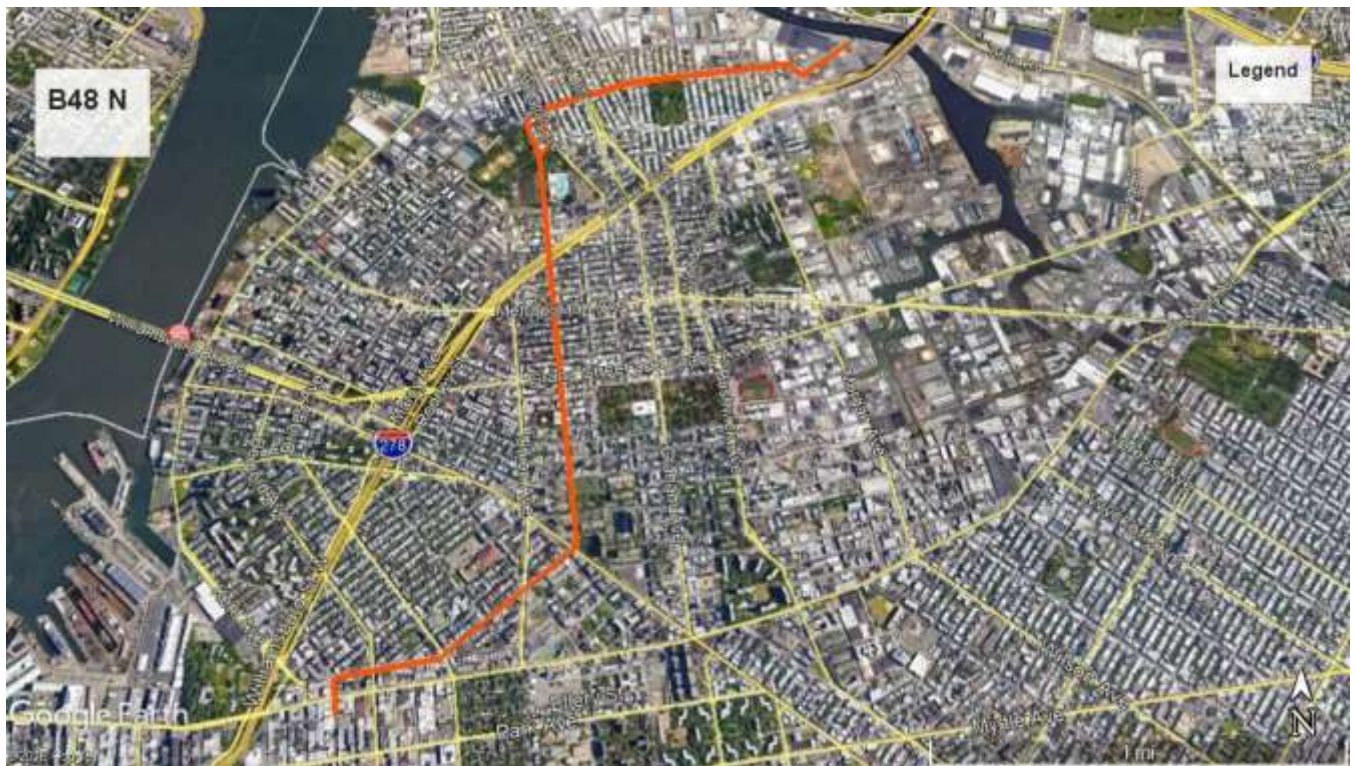


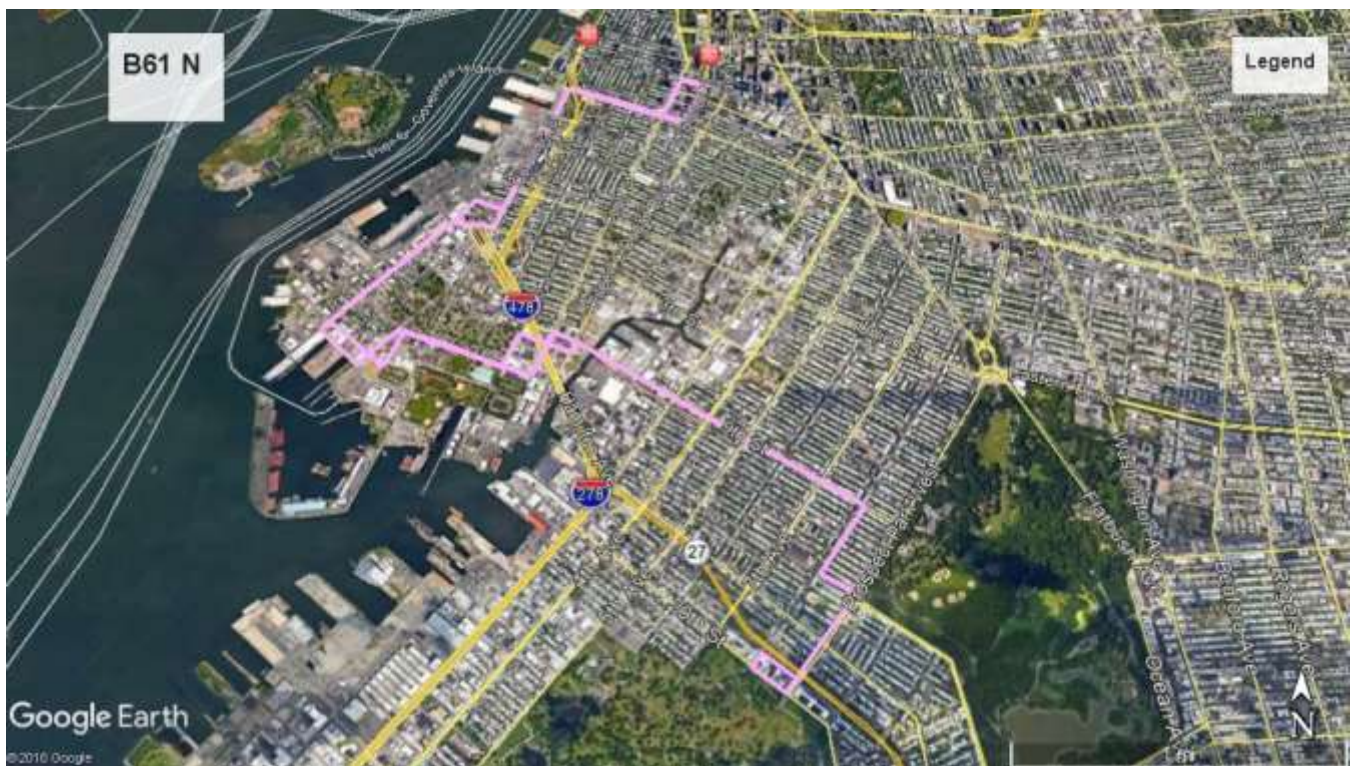
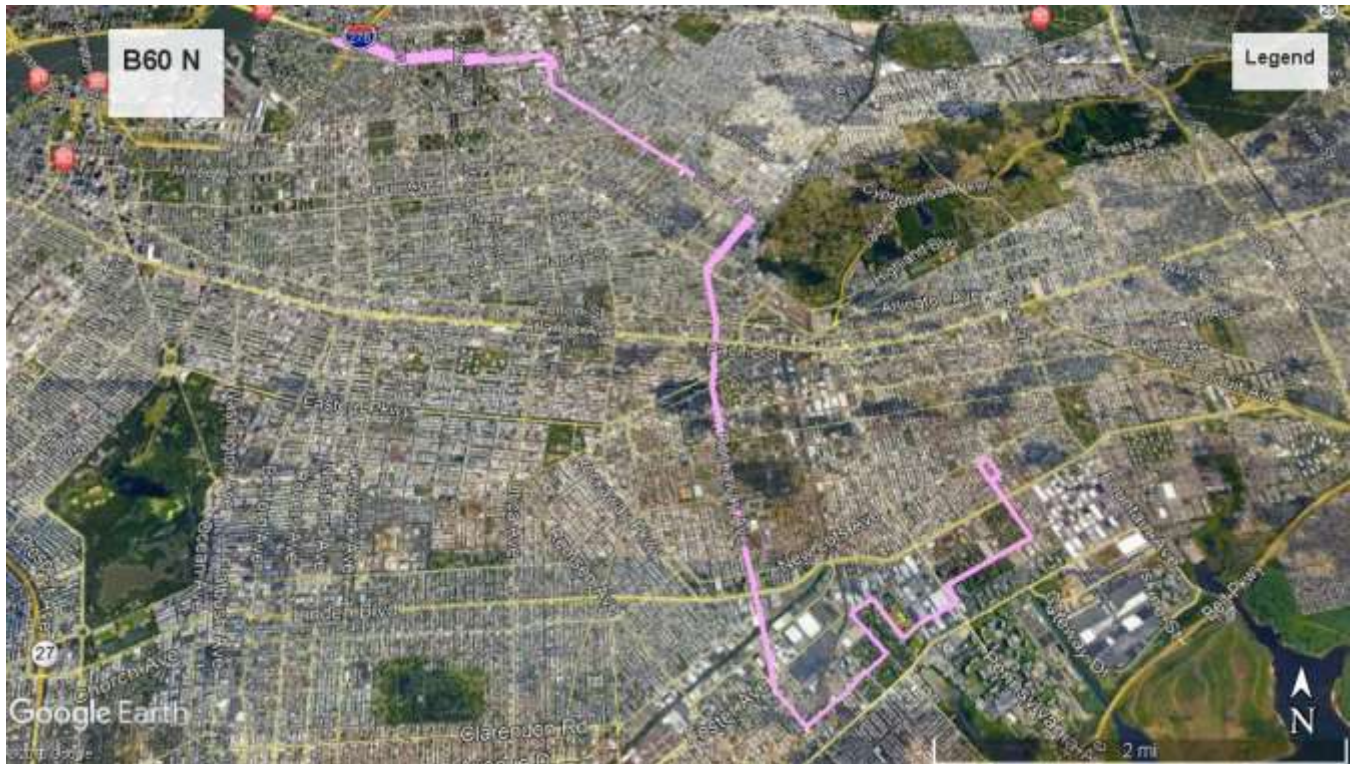


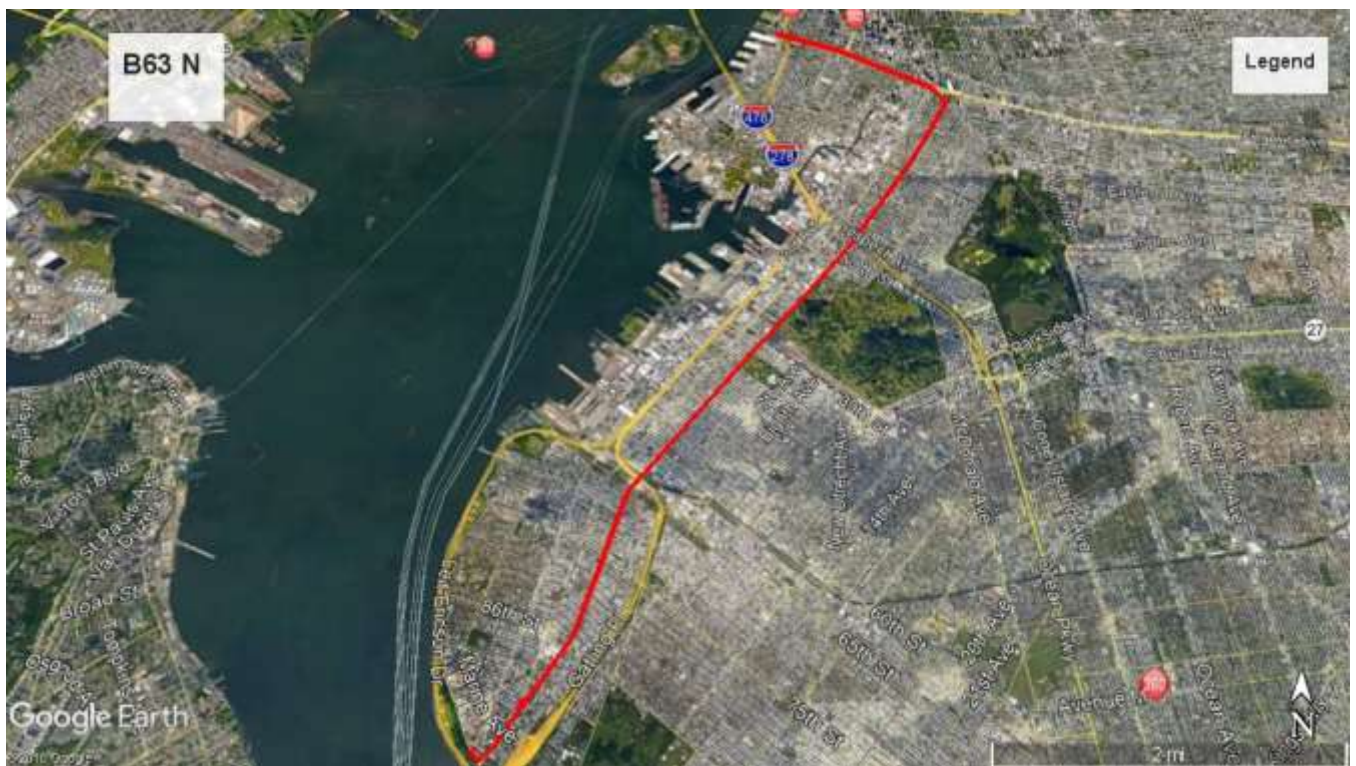
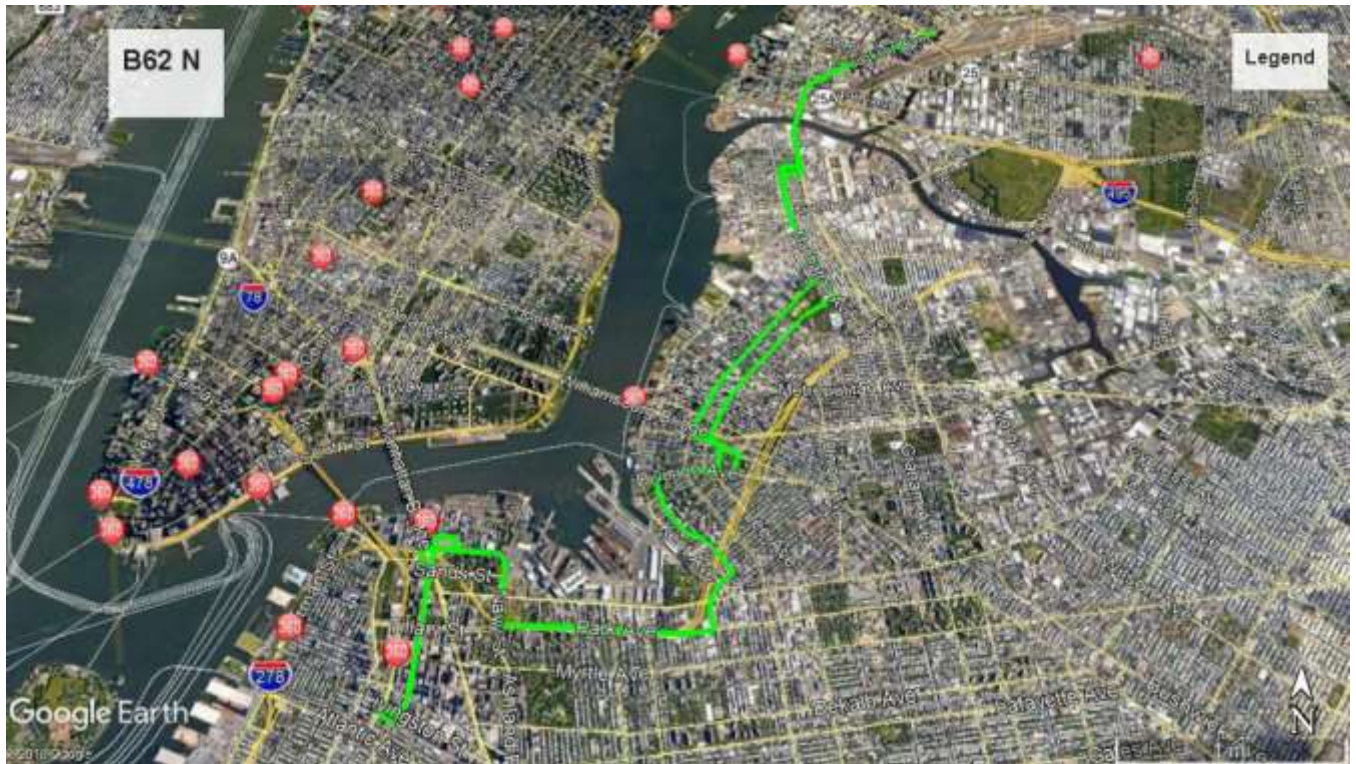




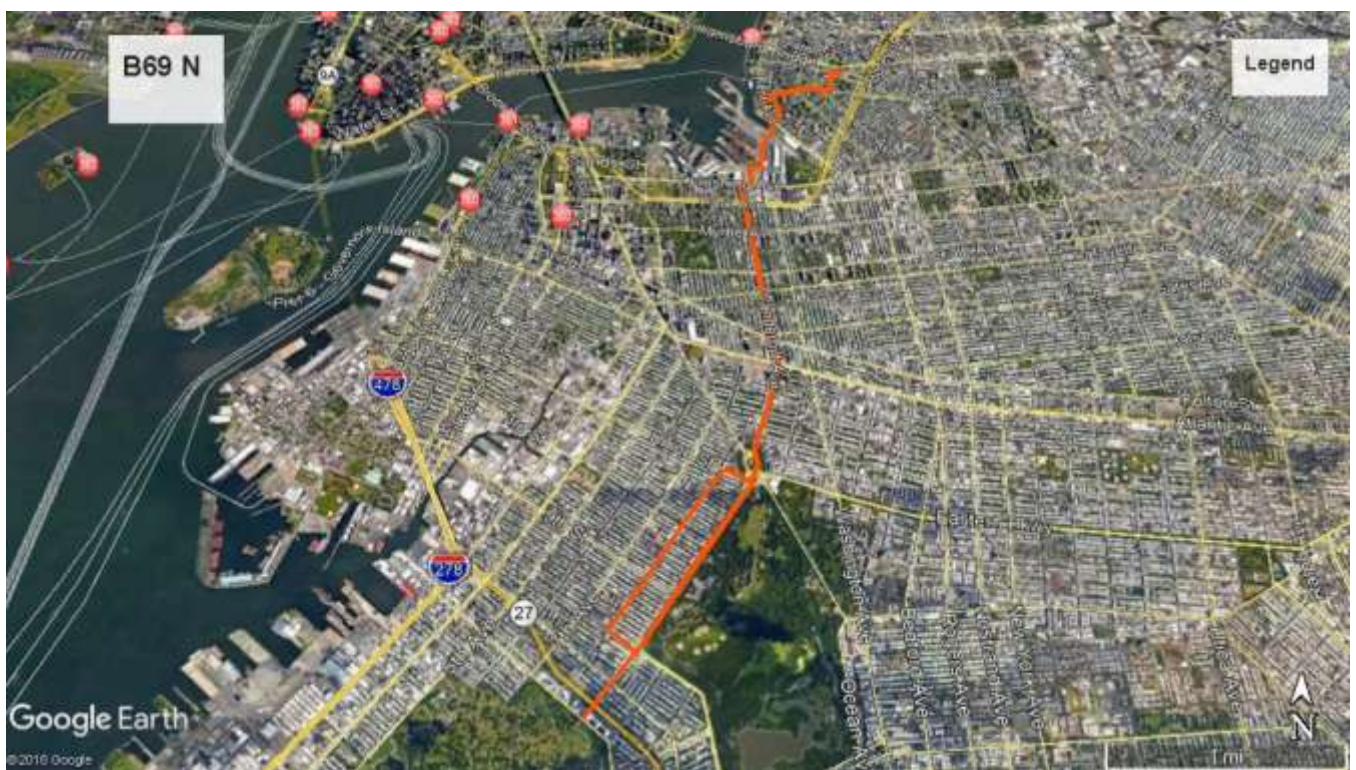


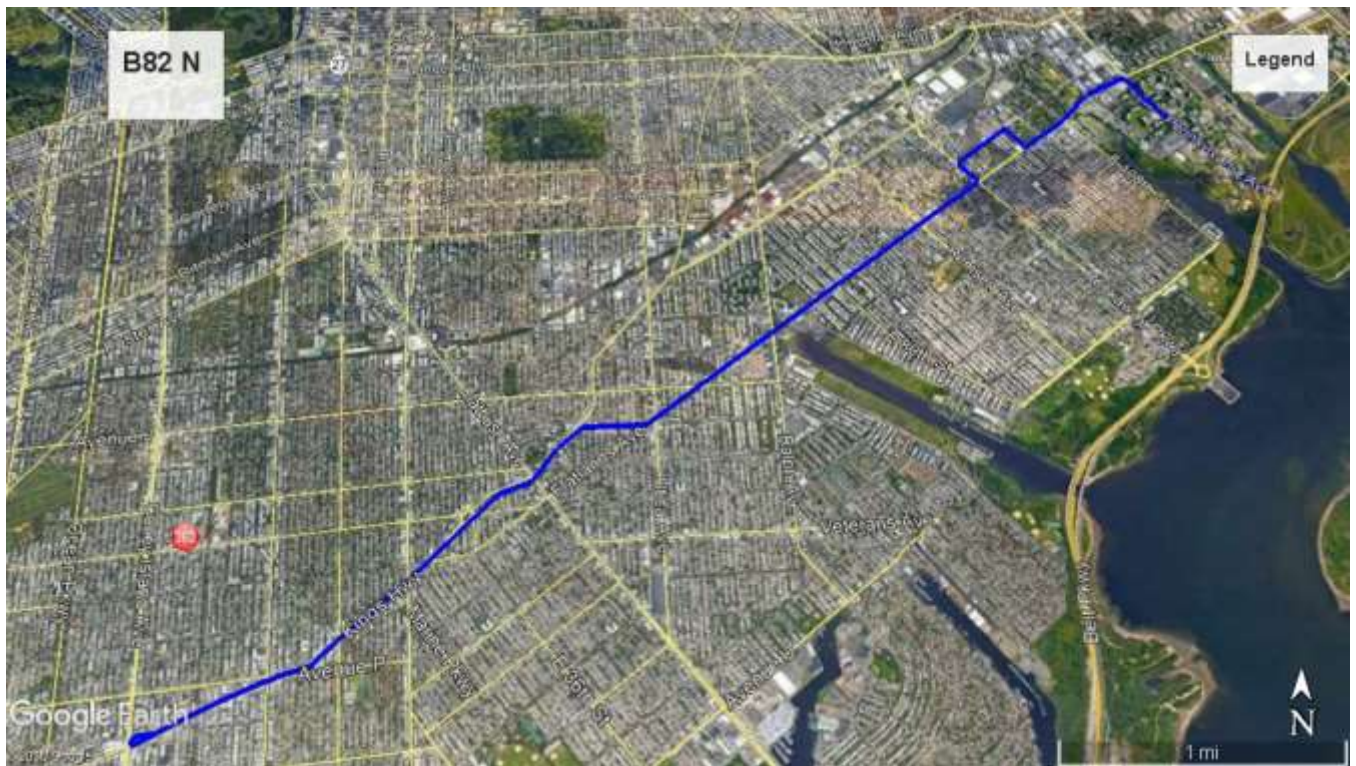


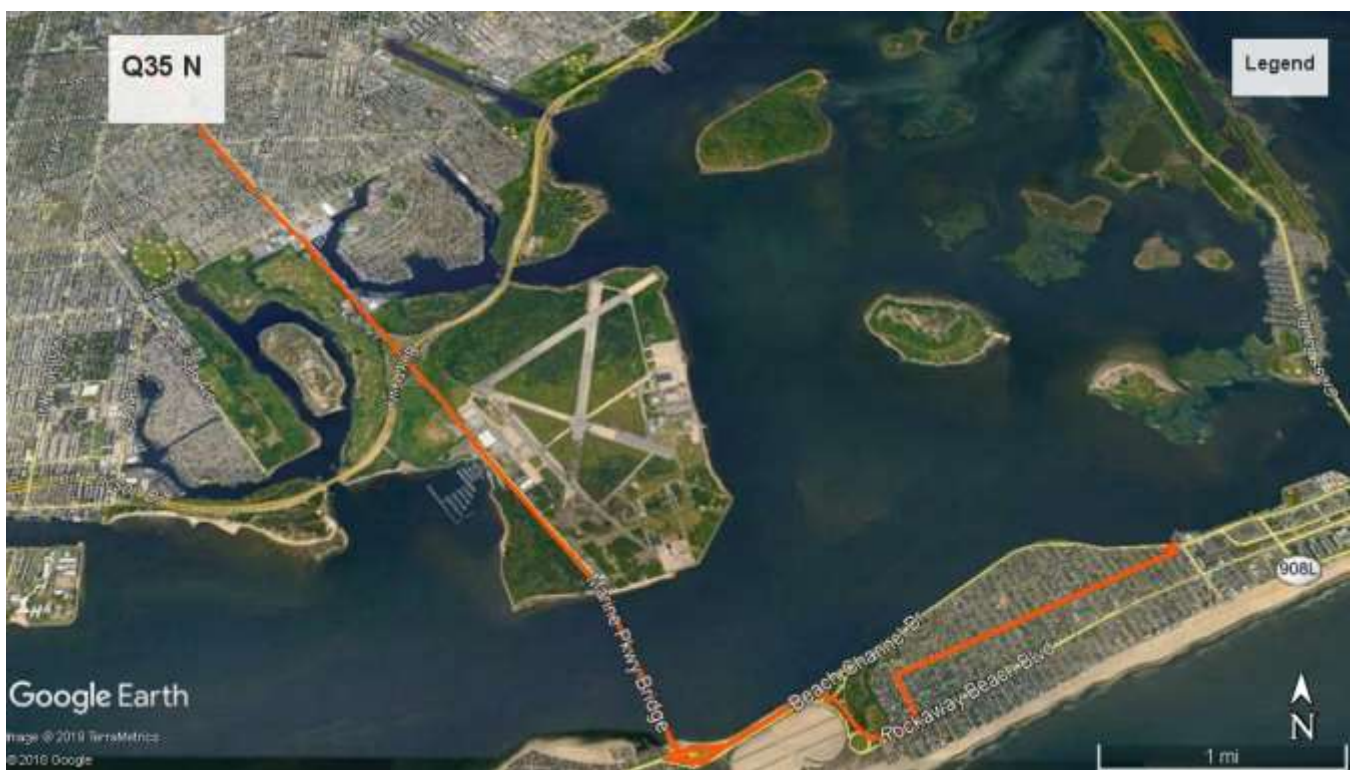
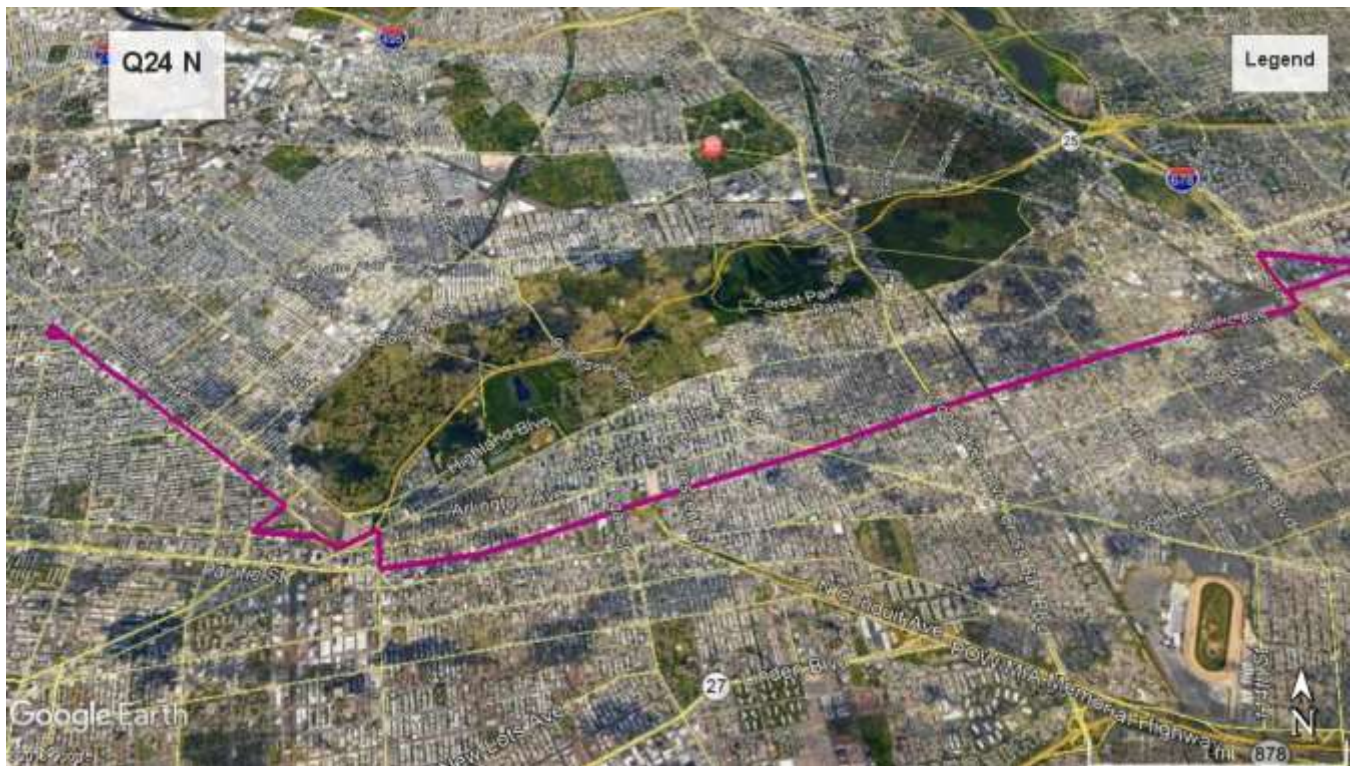


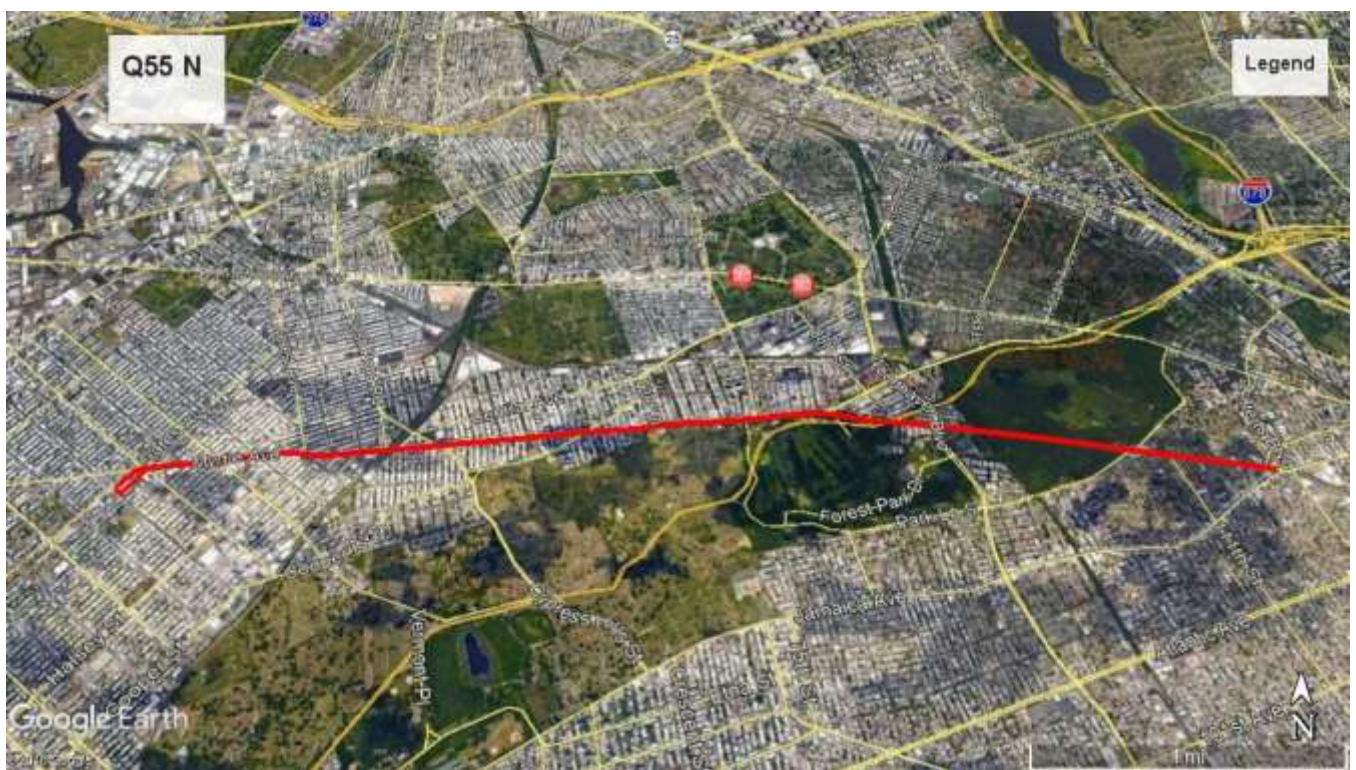
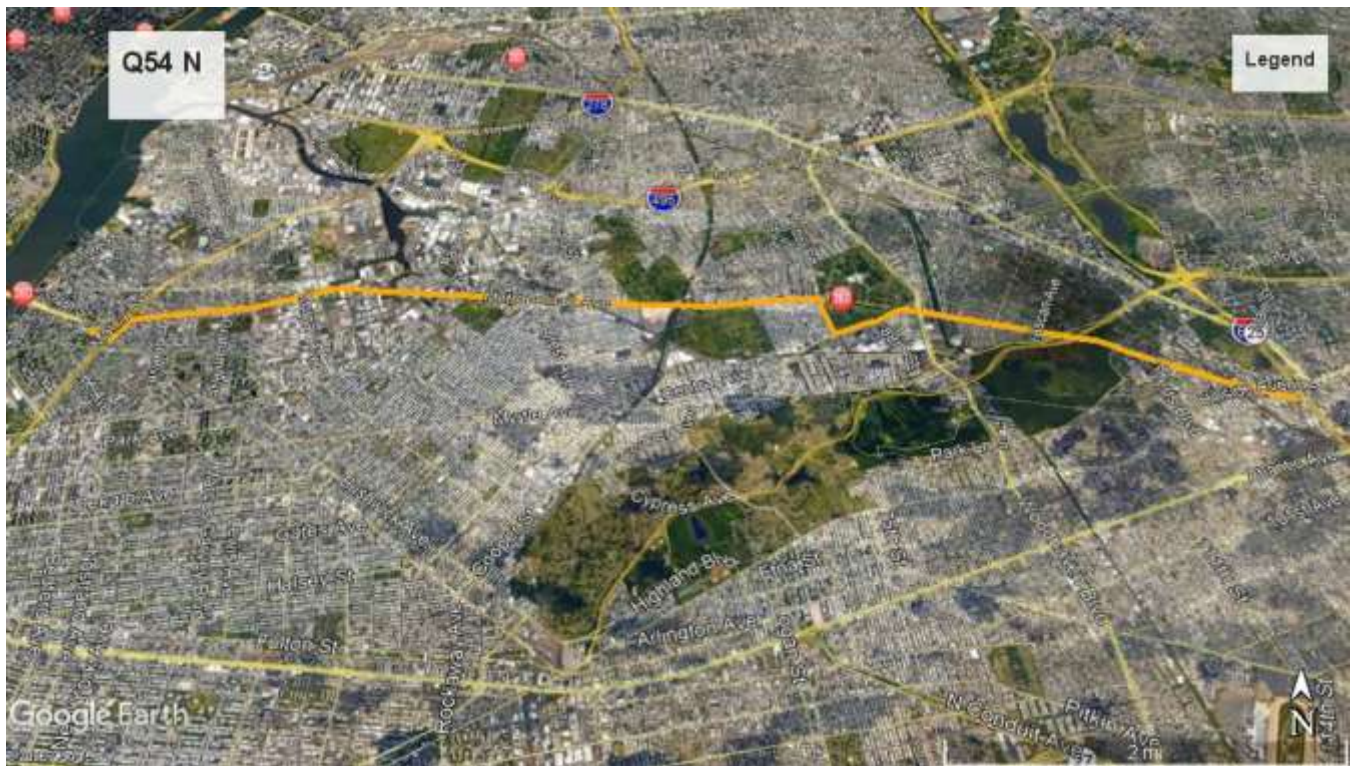


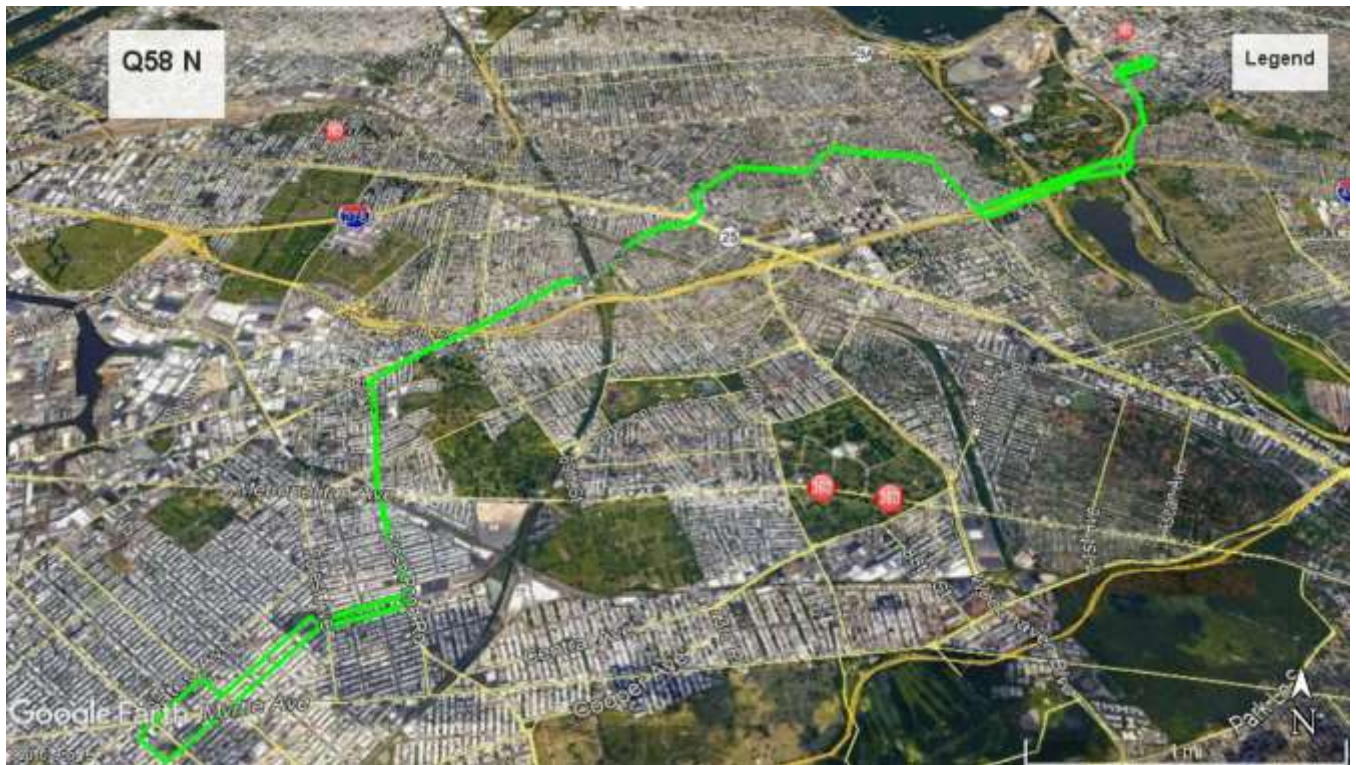
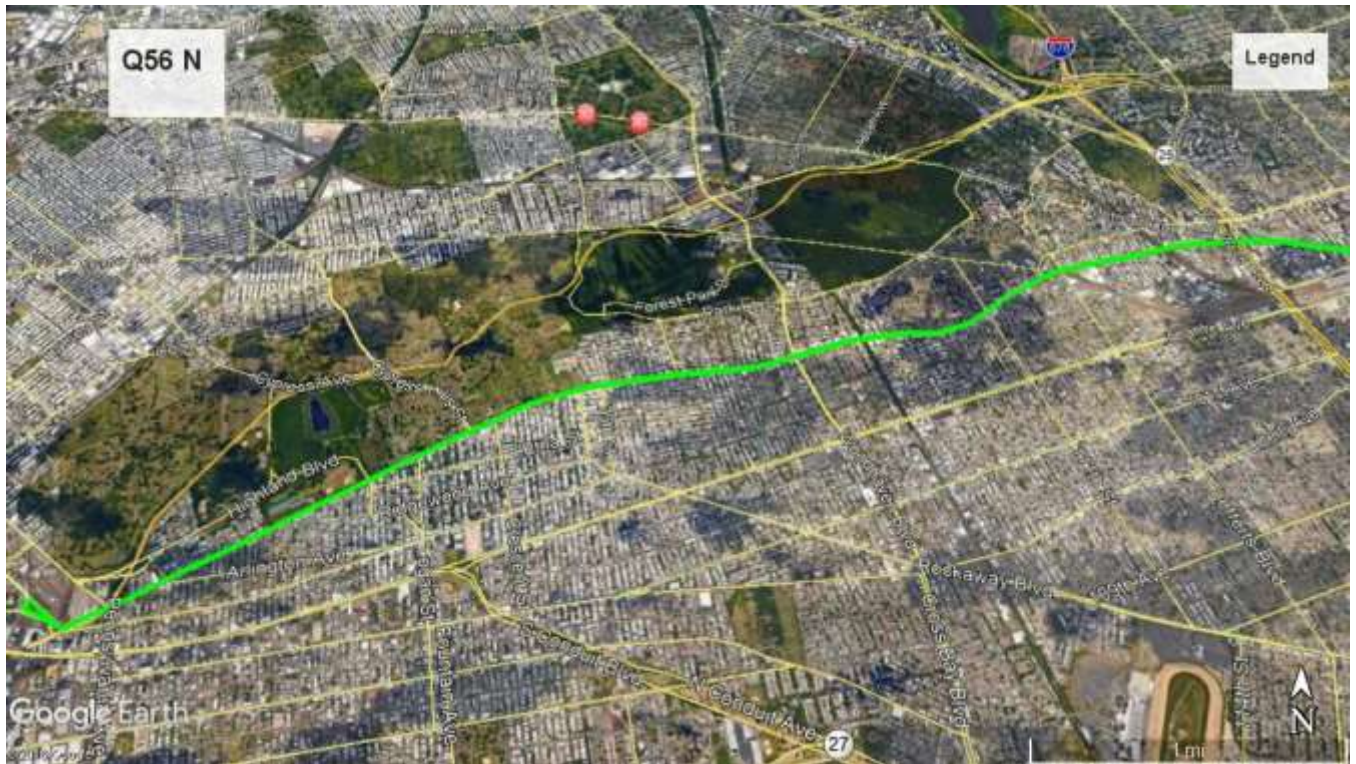


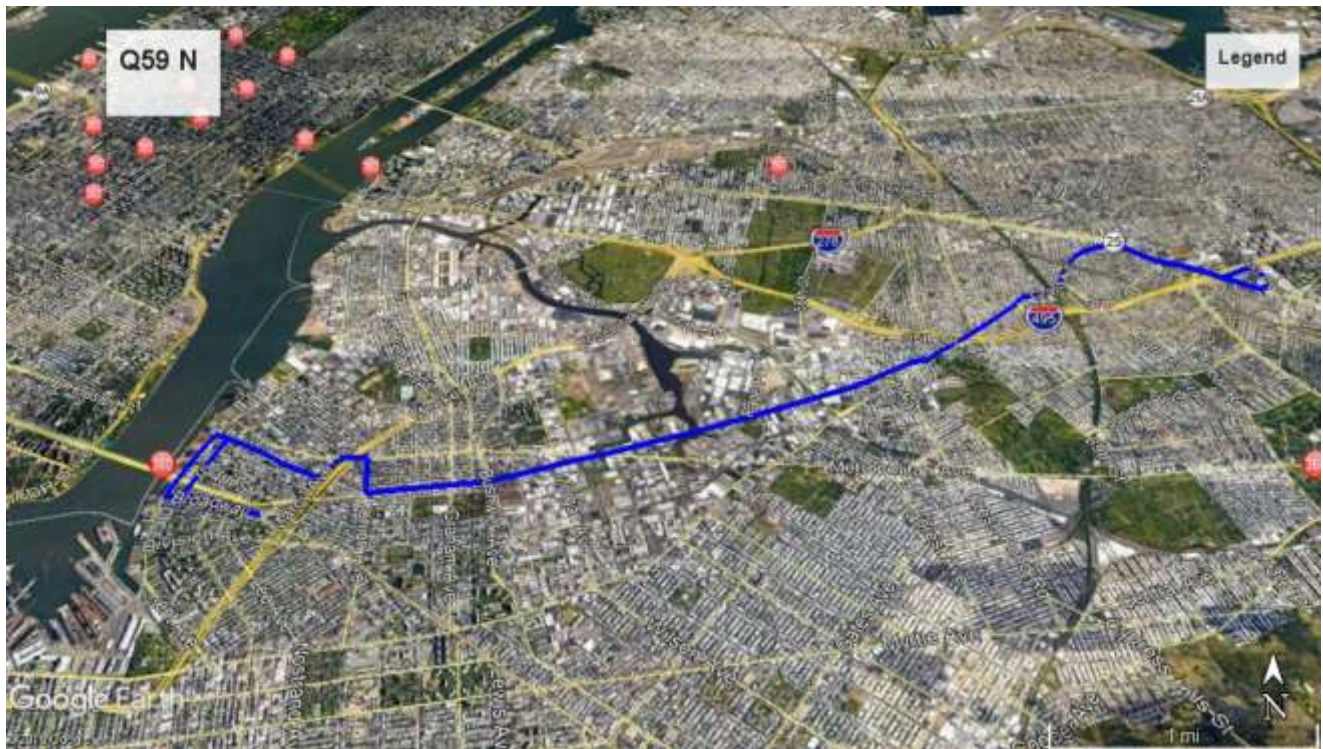












Any questions or corrections can be directed to [BrooklynBus@verizon.net](mailto:BrooklynBus@verizon.net). I thank you for your time and consideration.