



# ROUTE 110 ALTERNATIVES ANALYSIS

Executive Summary | October 2015



**PARSONS  
BRINCKERHOFF**

# ACKNOWLEDGEMENTS

## STUDY SPONSOR



### Office of Downtown Revitalization

Jonathan Keyes, Director  
Eric Zamft, AICP, Project Manager

## FUNDING PARTNER



## PROJECT TEAM

**PARSONS  
BRINCKERHOFF**

## IN ASSOCIATION WITH



## TECHNICAL ADVISORY COMMITTEE

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Nassau Inter-County Express Bus  
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# Town of Babylon

200 E. Sunrise Highway  
Lindenhurst, New York 11757-2597  
(631) 957-3072



RICH SCHAFFER  
SUPERVISOR

October 2015

## A MESSAGE FROM TOWN OF BABYLON SUPERVISOR RICH SCHAFFER

It gives me great pleasure to present to you the Final Report for the Route 110 Alternatives Analysis. With this document in your hands, we are one step closer to realizing our dream of a premium north-south transit system along the Route 110 corridor, designed to improve mobility and access to jobs and housing for all of our residents. The following pages detail the findings of a multi-year study to determine the best transportation alternative to address the existing and future congestion that constrains our travels through Amityville, North Amityville, East Farmingdale, Melville, and Huntington.

A north-south BRT system along Route 110—from the LIRR Amityville station to the Walt Whitman Shops—has the potential to be a driving force strengthening the Route 110 corridor as Long Island's "High Tech Main Street". It will help to create new jobs, retain existing jobs, provide a range of housing options for all members of our community, and improve access to employment, housing, and entertainment in other parts of Long Island. The BRT system will allow residents and commuters to rely less on their cars, pay less in gas, and shorten their commutes.

The study was guided by the goals of our 2010 BRT Feasibility Study, Suffolk County's Connect Long Island plan, and the County's 2015 Suffolk County BRT Study and was completed in partnership with the County. For the past few years, we have been working alongside the Village of Amityville and the Town of Huntington to develop economic development, infrastructural, and transportation strategies that will benefit us all. A new BRT service along Route 110 may be one of the most important and far reaching projects ever contemplated by the Town and its benefits will be felt far beyond our borders. I am confident that it has the potential of reshaping the entire Route 110 corridor and spark job creation and help reverse the "brain drain" in western Suffolk County, while meeting our goals of sustainable development, reduced carbon emissions, and a path to prosperity for all.

I would like to voice the Town's thanks to both the Federal Transit Administration and New York State Department of Transportation in serving as the sponsors and partners in this effort. I would also like to thank all of the consulting team members who helped create this study. A very heartfelt thanks has to be given to the agencies, organizations, and individuals that served on the technical advisory committee who guided the study, as well the general public's participation at two public meetings. The opinions of local property owners, civic groups, and constituents are of the utmost importance to ensure that this process and project achieves all that we know that it can. I can assure you that as we continue to refine the project, the stakeholders and public will be an integral part of that process.

As you review this document, you will see that a new BRT system along Route 110 will play a key role in elevating the Town of Babylon and Suffolk County as a center of economic development and ingenuity. I look forward to working with you all to make this vision a reality.

Sincerely,

Rich Schaffer, Supervisor  
Town of Babylon

# STUDY OVERVIEW

The Route 110 Corridor (“the Corridor”)—located in the Towns of Babylon and Huntington in Suffolk County, New York, and running from Route 27A (Montauk Highway) in the Village of Amityville to Halesite in the Town of Huntington—is one of the key economic engines on Long Island. Also known as Long Island’s “High Tech Main Street,” the Route 110 Corridor employs approximately 10% of the Island’s workforce and is home to corporate headquarters, major technology firms, educational institutions, research facilities, and retail centers. However, the Corridor’s future success is currently at risk as traffic volumes and congestion continue to increase, sprawling auto-centered development patterns become less attractive to employers and residents, and competition from other business centers and corridors in the region continues to grow.

As envisioned in Suffolk County Executive Steven Bellone’s *Connect Long Island* plan, the introduction of a premium transit service to the Route 110 Corridor will:

- » Provide an attractive transit option to employers, residents, and visitors
- » Assist in mitigating increases in traffic congestion associated with future development
- » Improve environmental conditions and quality of life
- » Support and stimulate smart growth and sustainable economic development
- » Complement the potential reopening of the Long Island Rail Road (LIRR) Republic Station and a major mixed-use redevelopment near the intersection of Route 110 and Conklin Street in East Farmingdale

The Route 110 Alternatives Analysis (AA) provides the process (**Figure ES 2**) and framework for advancing the Route 110 component of the *Connect Long Island* plan by evaluating a range of route and modal alternatives for a new, high-quality transit service. The grand vision for Route 110 features a multi-modal, pedestrian-friendly Corridor anchored by transit-oriented development (TOD).



FIGURE ES 1  
source: ESRI basemaps, Parsons Brinckerhoff (2015)

The outcome of the AA was the selection of a Locally Preferred Alternative (LPA) to advance to Project Development and National Environmental Policy Act (NEPA) review with the Federal Transit Administration (FTA). The LPA comprises a 10.5-mile bus rapid transit (BRT) trunk route between the LIRR Amityville Station and the Walt Whitman Shops, complemented by off-Corridor shuttle bus feeder routes that will be finalized in Project Development following this AA (**Figure ES 1**).

## STUDY PROCESS



### PUBLIC OUTREACH & STAKEHOLDER ENGAGEMENT

**PUBLIC MEETINGS:**  
DECEMBER 15, 2014  
APRIL 27, 2015

**TECHNICAL ADVISORY COMMITTEE (TAC) MEETINGS/WEBINARS:**  
DECEMBER 15, 2014  
APRIL 1, 2015  
JULY 1, 2015



FIGURE ES 2  
source: Parsons Brinckerhoff (2014-2015)

The stakeholder and public engagement effort enabled the project team to identify and address concerns early in the planning process, inform interested groups and individuals about project status, and get feedback at key milestones.

# STUDY AREA AND EXISTING CONDITIONS

# NO-BUILD ALTERNATIVE

The study area for the Route 110 AA includes the areas directly affected by the potential construction and operation of transit improvements (**Figure ES 3**). The study area is defined to encompass the portion of the Route 110 Corridor where trip generators and attractors are most concentrated and where the existing right-of-way could best accommodate the introduction of a new premium transit service. The study area also includes areas to the east and west of Route 110 to capture major activity centers that are beyond a reasonable walking distance from the Corridor.

The Route 110 AA included an assessment of existing conditions in the study area, which featured an evaluation of:

- » socioeconomic and demographic indicators
- » land use and zoning
- » active development projects
- » population and employment trends
- » transit service
- » traffic conditions
- » roadway characteristics and safety
- » pedestrian and bicycle accommodations
- » travel trends

The existing conditions assessment provided the background data to support the premise that the introduction of a premium transit service along Route 110—with seamless “last-mile” connections to nearby major activity centers—will result in a wide range of mutually-supportive outcomes for Suffolk County and the surrounding region.

A No-Build Alternative was defined to include the existing and committed transportation facilities and services expected to exist in the future horizon year (2040), including LIRR Double Track, East Side Access, and construction of the planned LIRR Republic Station. The No-Build Alternative served as a baseline for comparing the anticipated environmental, transportation, social, and economic benefits and impacts of the project alternatives. This alternative will get carried through to the environmental phase after the AA.

## STUDY AREA

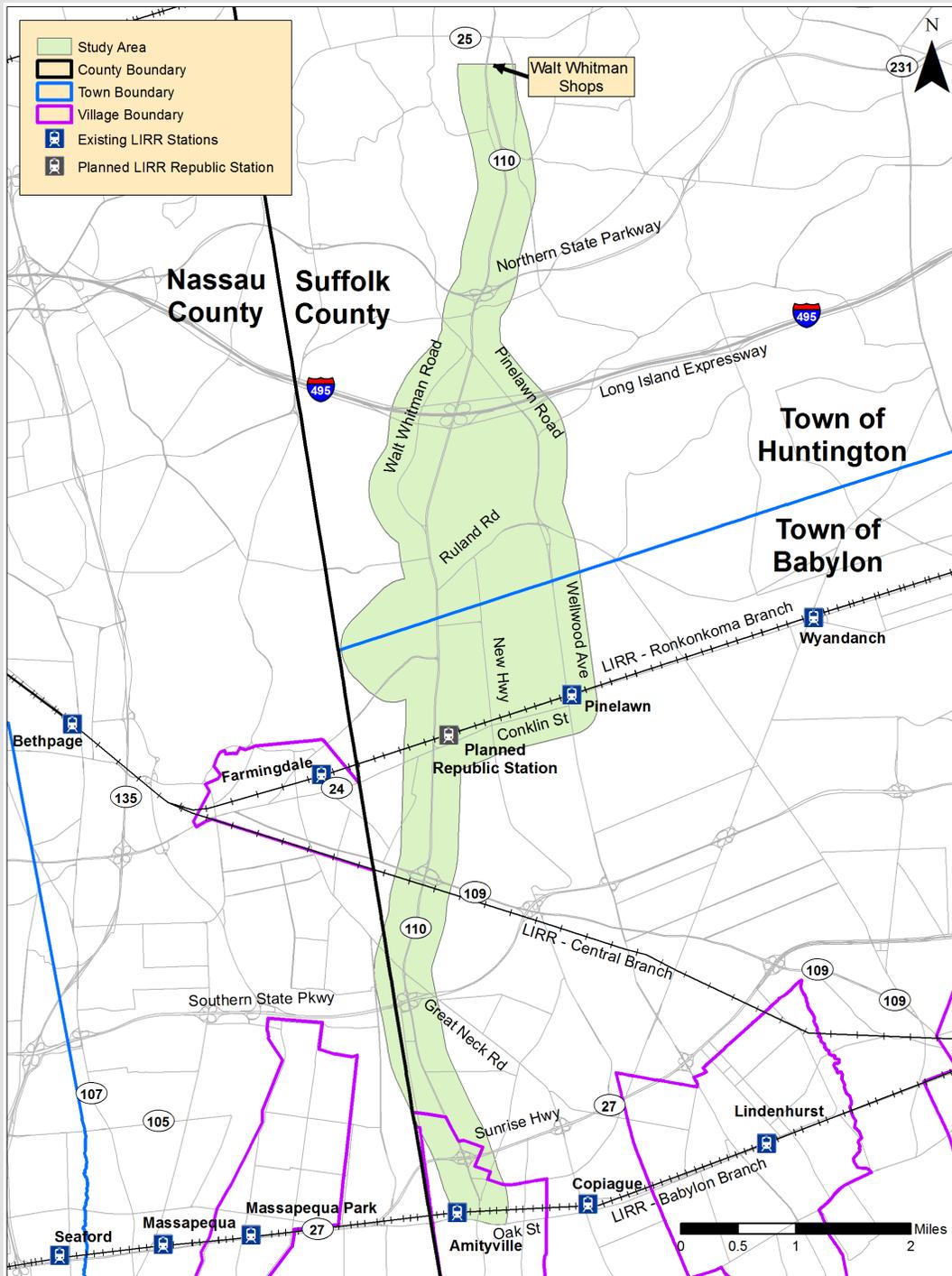


FIGURE ES 3  
Source: NYS GIS Program Office, Parsons Brinckerhoff (2015)

The approximately 10.5-mile stretch of the Route 110 Corridor in the study area is located between Oak Street in the Village of Amityville at the southern end and the Walt Whitman Shops in the Town of Huntington at the northern end.

# ISSUES AND OPPORTUNITIES, PURPOSE AND NEED, GOALS AND OBJECTIVES

The identification of existing and future issues and opportunities facing the study area served as the basis for establishing the Purpose and Need.

## **Transportation issues within the study area include:**

- » Constrained travel choices
- » Inadequate multi-modal connectivity
- » Existing and projected future traffic congestion
- » Long travel times by bus (disincentive for transit use)
- » Auto-centric land use and building development patterns
- » Limited walkability and bicycle accommodations

## **Key transportation opportunities include:**

- » Large employers as a source of existing/potential future transit ridership
- » Relatively high existing bus ridership, and opportunities to integrate with multiple service providers, including Suffolk County Transit, Nassau Inter County Express (NICE), and Huntington Area Rapid Transit (HART)
- » Multiple branches of the LIRR crossed by the study area
- » Multiple travel markets to be served
- » Potential reopening of LIRR Republic Station and East Farmingdale master development
- » LIRR East Side Access, Double Track, and Third Track projects

A well-crafted Purpose and Need was critical to achieving a successful AA, as it served as a roadmap to clearly define why the project was necessary and what the project intended to accomplish.

## **PURPOSE AND NEED**

The purpose of the Route 110 AA is to plan a transit service that:

- » Improves north-south mobility
- » Increases transit access to and from employment and other activity centers
- » Enhances multi-modal connectivity with the LIRR and existing bus service
- » Promotes increased transit use
- » Supports TOD along Route 110 and in the study area

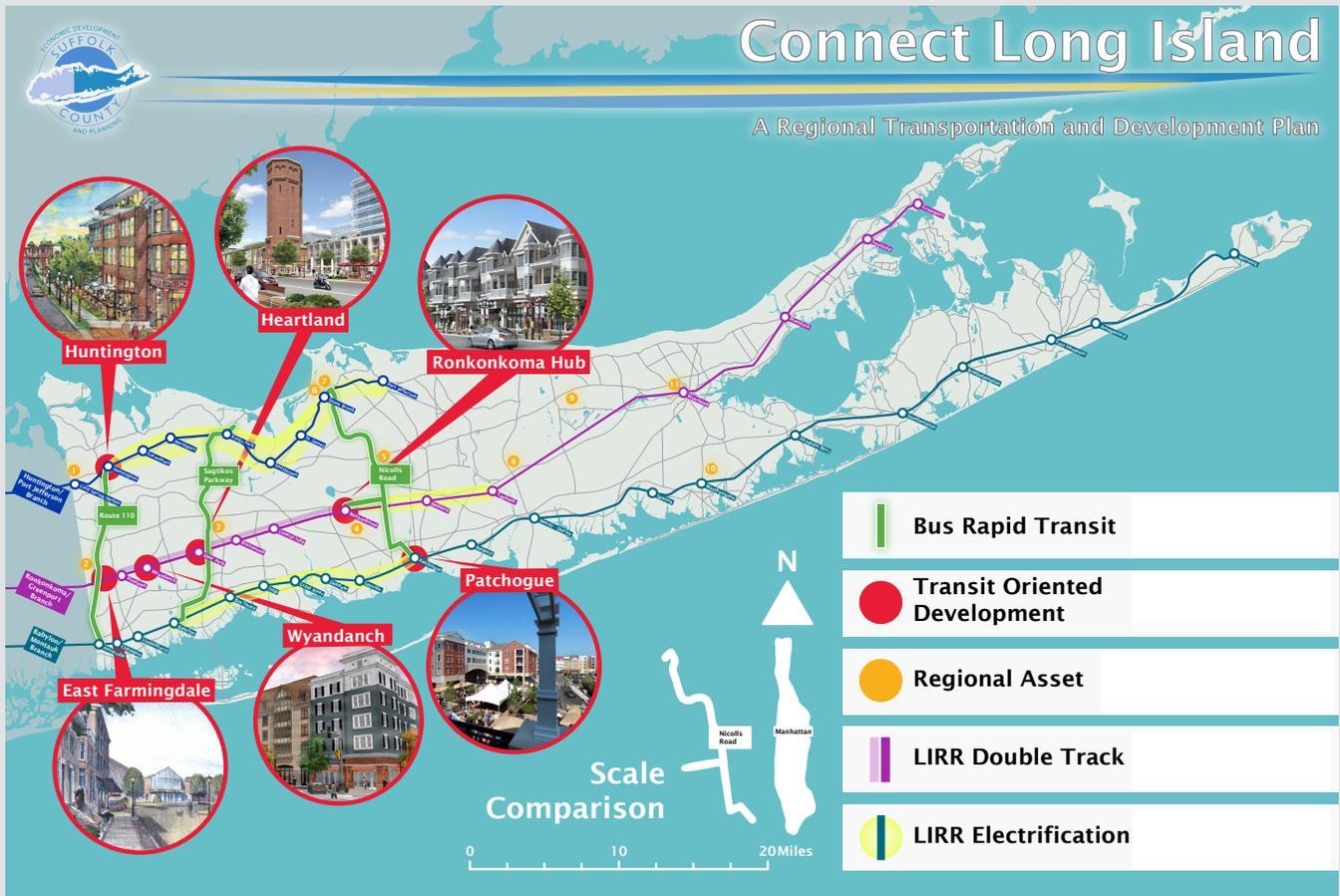
The Purpose and Need provided a foundation for the development of project goals and objectives as well as the subsequent identification of evaluation criteria and measures that were used to screen alternatives. The following four goals for the project were tied directly to the Purpose and Need, and specific objectives were defined for each broad goal:

- GOAL 1** IMPROVE MOBILITY AND CONNECTIVITY
- GOAL 2** ENHANCE ECONOMIC COMPETITIVENESS AND PROMOTE ECONOMIC GROWTH
- GOAL 3** MAXIMIZE COST AND OPERATIONAL EFFECTIVENESS
- GOAL 4** MINIMIZE ADVERSE ENVIRONMENTAL IMPACTS



The Route 110 AA provides the framework for creating a robust multi-modal transit network that enhances connectivity with existing local bus and commuter rail service (**Figure ES 4**)

Source: Route 110 BRT Study (2010)



An integrated approach to land use policy and transportation improvements can ensure sustainable economic growth **FIGURE ES 4**

Source: Suffolk County (2015)

# ALTERNATIVES DEVELOPMENT & SCREENING

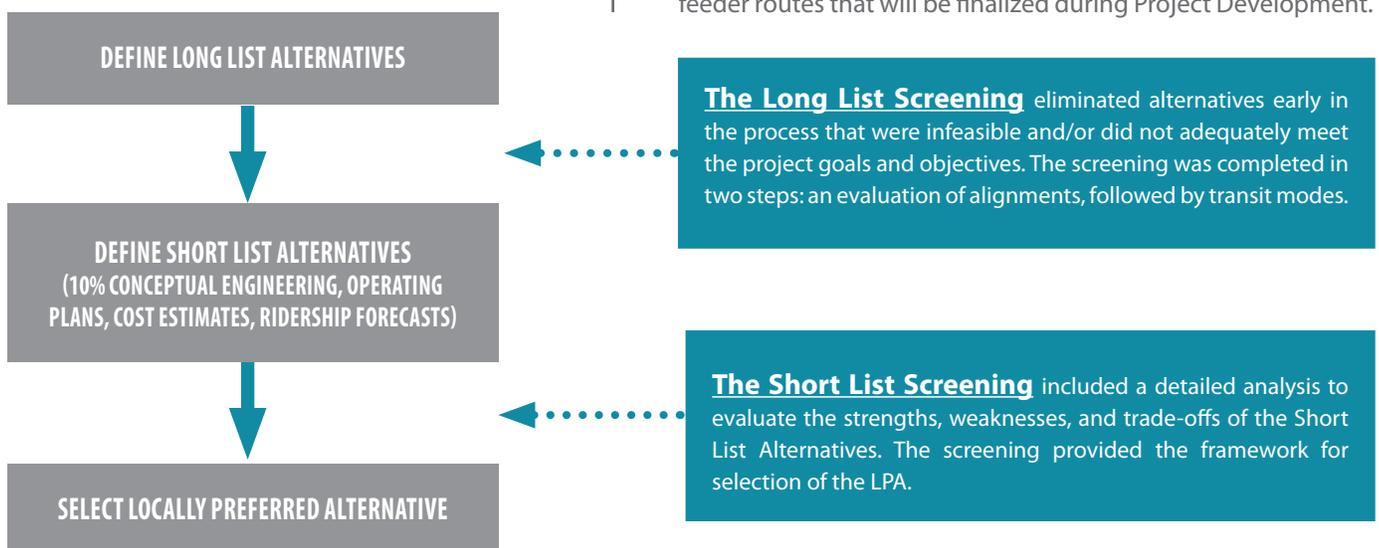


FIGURE ES 5

Source: Parsons Brinckerhoff (2015)

The alternatives development process started with the definition of a number of alignment concepts that were subsequently paired with transit modes. The alternatives under consideration were narrowed down in multiple tiers of screening (**Figure ES 5**) to identify the most feasible and promising alternatives that best achieved the project goals and objectives.

Based on the results of the Long List Screening, two mode-specific alignment concepts were advanced for further development and evaluation as the Short List Alternatives:

**Alternative D:** BRT trunk route along Route 110 with circular feeder routes

**Alternative E:** BRT trunk route along Route 110 with transit center nodes and connecting feeder routes

Alternatives D and E share the same trunk route alignment and service characteristics, differing only with respect to the feeder routes that would complement the trunk route by providing service off Route 110 (**Figure ES 6**).

The results of the Short List Screening demonstrated that both Alternatives D and E would achieve the project goals and objectives, and neither alternative emerged as the unequivocal best option. Each alternative performed marginally better than the other alternative in at least one category of evaluation (i.e., multi-modal connectivity and economic development potential for Alternative E, and cost for Alternative D), but the considerable similarities between the two alternatives overshadowed the slight differences.

Moving forward, the LPA will include the BRT trunk route and feeder routes that will be finalized during Project Development.

## ALTERNATIVE D & E FEEDER ROUTE COMPARISON

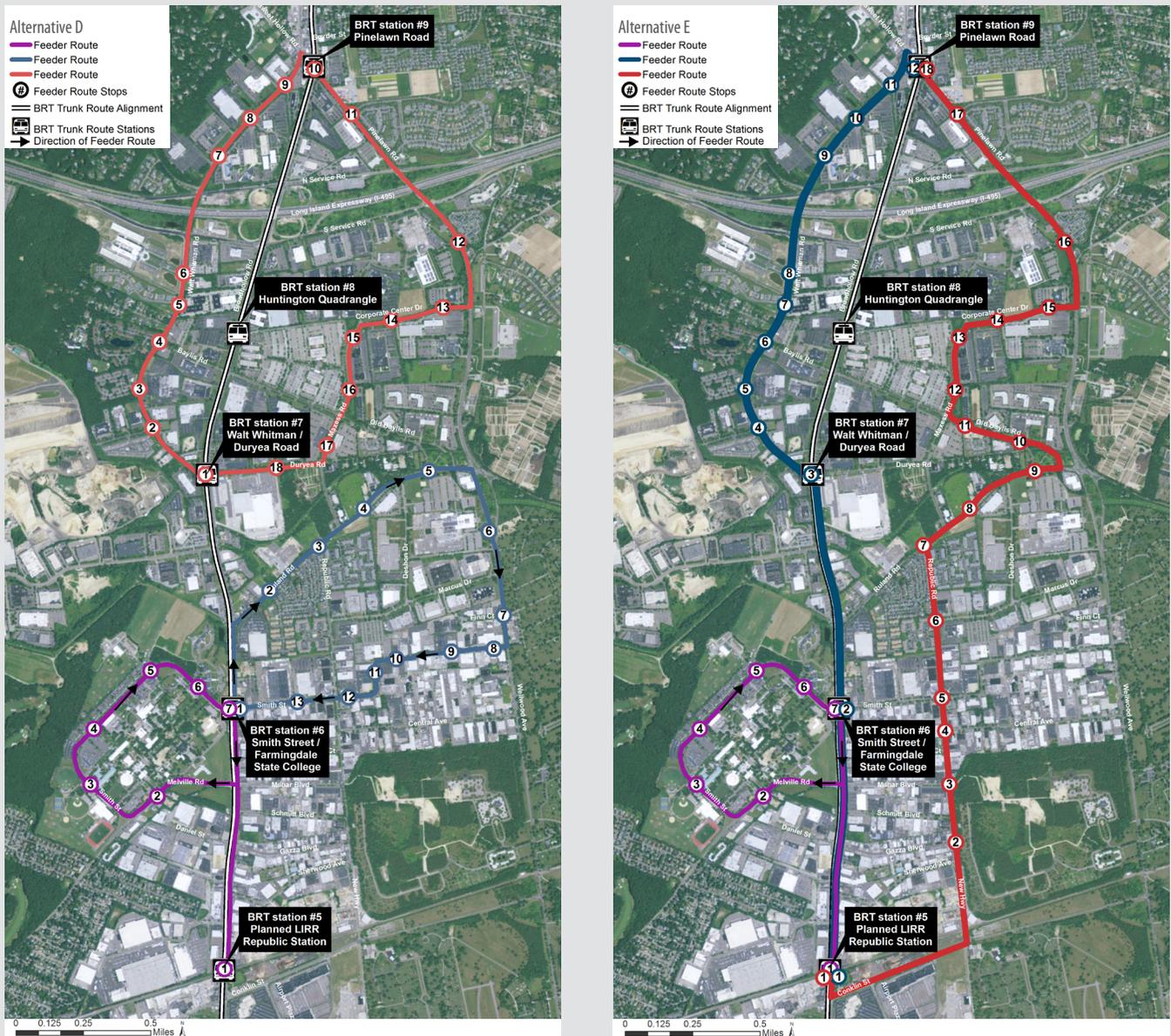


FIGURE ES 6

Source: ESRI basemaps, Parsons Brinckerhoff, Nelson\Nygaard (2015)

For both alternatives, the feeder routes cover a service area from Conklin Street in the south to Pinelawn Road/Route 110 in the north within the project study area. This service area was defined to comprise the area with the largest concentration of activity centers off the main spine of the Route 110 Corridor that would likely derive the greatest benefit from improved transit service.

Based on the results of the Short List Screening, it was decided that the feeder routes will be finalized during Project Development that will follow this AA, including consideration for mixing and matching feeder routes from the two alternatives.

# LOCALLY PREFERRED ALTERNATIVE (LPA)

**10.5** MILE BRT TRUNK ROUTE BETWEEN LIRR  
AMITYVILLE STATION AND WALT WHITMAN  
SHOPS (**FIGURE ES 8**)

**11** STATIONS  
(AVERAGE 0.9 MILES BETWEEN STATIONS)

**\$28.0** CAPITAL COST (2015 MILLION \$)

**\$3.5** ANNUAL OPERATING AND MAINTENANCE  
(O&M) COST (2015 MILLION \$)

**3,820** WEEKDAY BRT BOARDINGS (1,490 NEW  
TRANSIT BOARDINGS, COMPARED TO NO-BUILD  
CONDITION)

- » Overlay to existing Suffolk County Transit S1 route, with faster, more frequent service and longer hours of operation (**Table ES 1**)
- » Multi-modal connectivity: LIRR, Suffolk County Transit, HART, NICE, Republic Airport
- » Premium transit service (**Figure ES 7 & Figure ES 9**), with additional BRT elements to be considered in the future (i.e., off-board fare collection, level boarding, and pedestrian improvements at station-area intersections)
- » To be complemented by off-Corridor feeder routes that will be finalized in Project Development

## SAMPLE PERSPECTIVE OF PROPOSED ROUTE 110 BRT STATION



FIGURE ES 7  
source: B Thayer Associates (2015)

## PROPOSED BRT ALIGNMENT & FEEDER ROUTE AREA

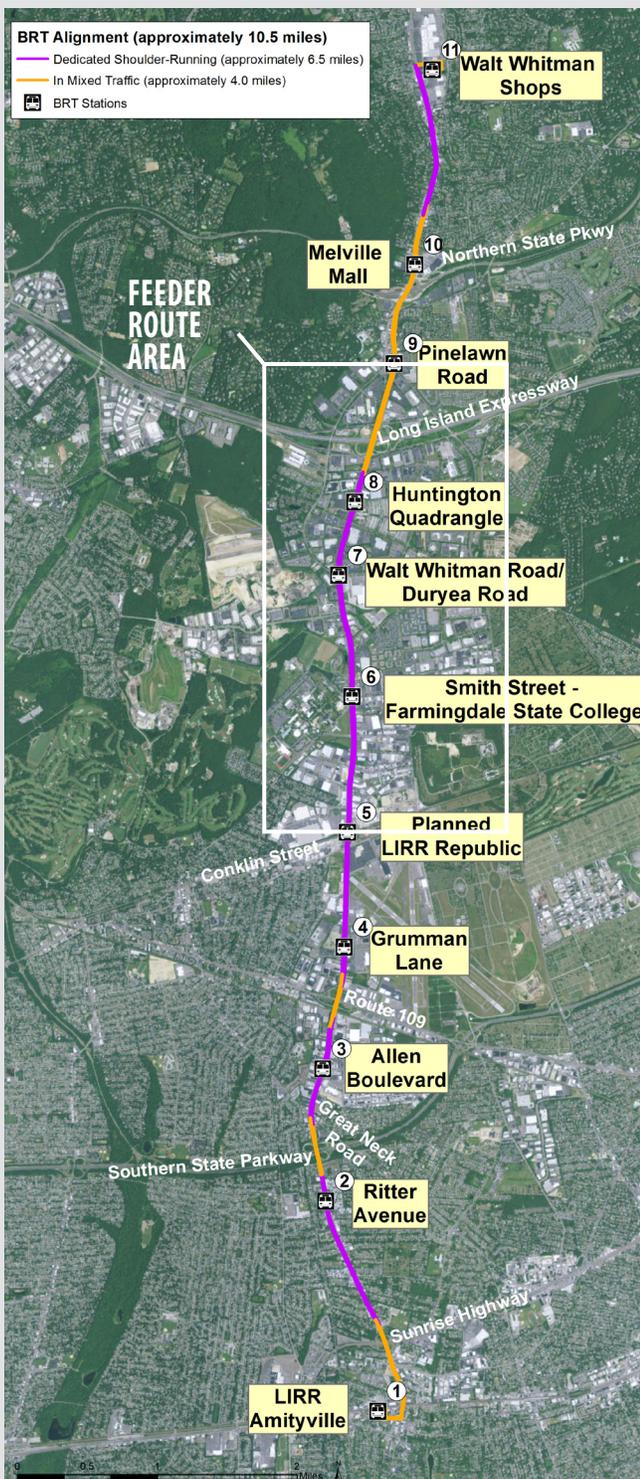


FIGURE ES 8  
source: ESRI basemaps, Parsons Brinckerhoff (2015)

## PROPOSED BRT OPERATIONS

SPAN OF SERVICE	Monday-Thursday	5:30am - 10:00pm
	Friday-Saturday	5:30am - 12:00am
	Sunday	6:00am - 10:00pm
SERVICE FREQUENCY	Weekday Peak	Every 10 minutes
	Weekday Off-Peak	Every 15 minutes
	Weekends	Every 20 minutes
FLEET REQUIREMENT	Peak Period, including 20% spare	9 BRT vehicles
TRAVEL TIME & AVERAGE SPEED (BETWEEN LIRR AMITYVILLE STATION & WALT WHITMAN SHOPS, AM PEAK PERIOD)	Northbound	26 minutes (24.2 mph)
	Southbound	20 minutes (31.5 mph)

TABLE ES 1  
Source: Parsons Brinckerhoff, Nelson\Nygaard (2015)

## ELEMENTS OF PROPOSED ROUTE 110 BRT

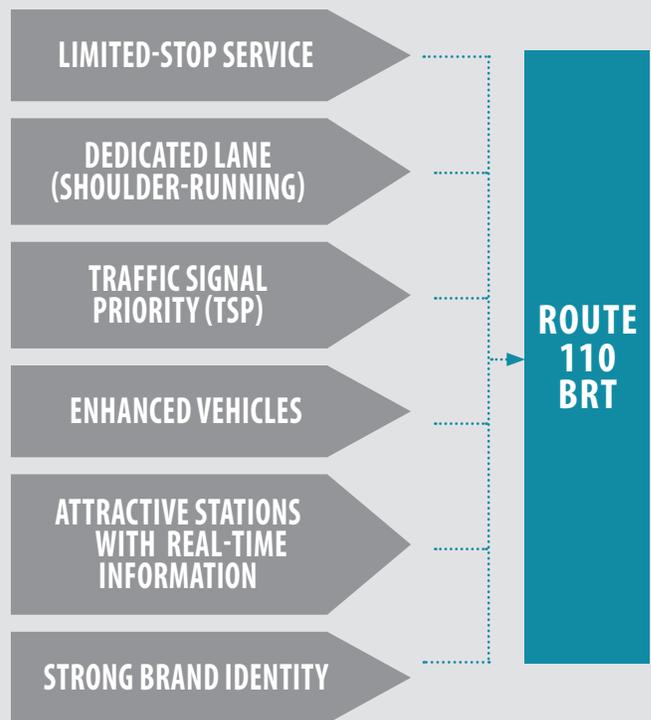


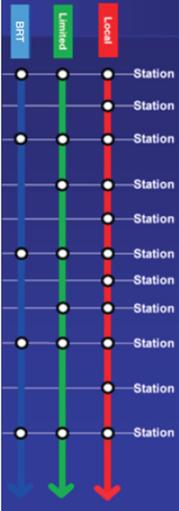
FIGURE ES 9  
source: Parsons Brinckerhoff (2015)

# ELEMENTS OF ROUTE 110 BRT - CURRENTLY PROPOSED

BRT is a term applied to public transportation systems using a series of systematic, integrated improvements to provide faster, more efficient service than an ordinary bus line. A number of BRT elements distinguish the premium service from ordinary bus service.

The elements of BRT that are currently proposed for Route 110 are summarized in **Figure ES 10**. The combination of limited-stop service, shoulder-running, and TSP is projected to result in significant time savings and faster operating speeds for BRT as compared to the existing local bus service, thereby making travel by BRT competitive with travel by automobile.

## BRT ELEMENTS CURRENTLY PROPOSED FOR ROUTE 110



### LIMITED-STOP SERVICE

One of the ways to improve travel time for transit users is to limit the number of stops. Whereas the existing Suffolk County Transit S1 route makes 40 stops (with an average distance of approximately 0.25 miles between each stop) from the LIRR Amityville Station to the Walt Whitman Shops, the proposed BRT service would only make 11 stops (with an average distance of 0.9 miles between each stop). It is anticipated that the Suffolk County Transit S1 route would continue to provide local service, and that BRT would provide more frequent service with fewer stops.



### ENHANCED VEHICLES

The proposed BRT service would operate using low-floor, 35-foot-long, hybrid diesel-electric vehicles with aesthetic enhancements to brand and differentiate BRT as a premium service. The vehicle enhancements may include paint schemes, styling options, and interior amenities. The use of low-floor vehicles would reduce the time for passenger boarding and alighting, and the vehicles would be equipped with emitters to activate TSP at signalized intersections.



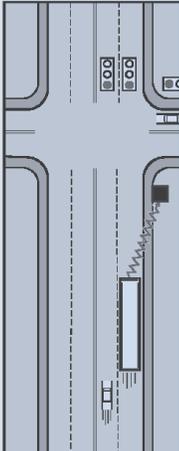
### DEDICATED LANE (SHOULDER-RUNNING)

Dedicated BRT shoulder-running would enable BRT vehicles to bypass traffic congestion along Route 110, resulting in travel time savings for passengers. About 6.5 miles of the 10.5-mile trunk route can accommodate BRT shoulder-running (with two queue jumps where the proposed transition from shoulder-running to mixed traffic occurs at signalized intersections). Along other roadway segments, BRT would operate in mixed traffic with other vehicles.



### ATTRACTIVE STATIONS WITH REAL-TIME INFORMATION

Stations function as the gateway for service. Each BRT station is proposed to include the following elements: an enhanced shelter; comfortable seating; way finding signage; bicycle racks; tinted concrete to highlight the waiting area; and trees and landscaping. Additionally, each station is proposed to include variable message signage, consisting of an electronic message board offering real-time information to alert riders of arriving BRT vehicles.



### TRAFFIC SIGNAL PRIORITY (TSP)

Another way in which BRT results in travel time savings and faster service is through the use of TSP, which limits the waiting time at red lights. TSP can be achieved at signalized intersections through an extension of green time to allow the BRT vehicles to pass the intersection before the signal turns red, or through an earlier start of green time to allow the BRT vehicles to avoid the red light. The BRT trunk route currently includes 44 signalized intersections, and TSP is proposed at each intersection.



### STRONG BRAND IDENTITY

All of the individual elements contribute to the brand identity of BRT as a premium service. In addition to serving the needs of passengers without access to an automobile, a key objective is to attract choice riders to BRT who would otherwise drive. It is anticipated that the Route 110 BRT branding identity will be coordinated with Suffolk County's system-wide BRT branding and strategic marketing campaign.

FIGURE ES 10

source: MTA New York City Transit, New York City Department of Transportation, TCRP Report 118, ITDP, Streetsblog, Trans4M, Urbanindy, Flickr, Parsons Brinckerhoff (2015)

# ELEMENTS OF ROUTE 110 BRT - LONGER TERM

The *Connect Long Island* plan envisions the introduction of a premium transit service that transforms the way residents, workers, and visitors think about traveling to, from, and along Route 110. As noted in the 2009 FTA report, *Characteristics of Bus Rapid Transit for Decision-Making*, “BRT shows great promise for replicating many of the image attributes that attract choice riders to rail.” Therefore, the longer-term plan for BRT on Route 110 includes, among other things, significant station-area enhancements to further bolster the image of BRT and attract more choice riders. These enhancements include off-board fare collection, level boarding, and pedestrian improvements at station-area intersections (**Figure ES 11**). These BRT elements are not currently included in the cost estimates for the LPA, but they can be pursued in the future to fulfill the longer-term plan for BRT along Route 110.

## PROPOSED LONGER-TERM BRT ELEMENTS FOR ROUTE 110



### OFF-BOARD FARE COLLECTION

As ridership demand grows, and as dwell times at the BRT stations increase due to greater numbers of boarding passengers, off-board fare collection could help improve travel time for riders. Off-board fare collection would reduce dwell times by enabling boarding at both the front and rear doors, accomplished through a proof-of-payment system whereby riders purchase tickets before boarding, and personnel would randomly inspect passengers' tickets to enforce the system. Implementation of off-board fare collection would require the provision of ticket vending machines at each BRT station and the necessary hardware and software.



### LEVEL BOARDING

Implementation of level boarding could result in travel time savings by reducing the time for passenger boarding and alighting at BRT stations. Specifically, level boarding would eliminate the gaps between the station-area sidewalk and the vehicle floor, which enables faster boarding and alighting for all passengers, including the disabled and elderly. Level boarding could require a combination of low-floor BRT vehicles, raised curb, and precision vehicle docking to eliminate the horizontal gap between the station and vehicle. As an alternative to level boarding, near-level boarding could be implemented without precision docking, which could still reduce the time required for boarding and alighting (thus reducing dwell time and overall travel time) by decreasing the gaps between the station and vehicle.



### PEDESTRIAN IMPROVEMENTS AT STATION-AREA INTERSECTIONS

An attractive and safe pedestrian environment is a key element of a multi-modal transportation network. As such, targeted pedestrian improvements could further enhance the image of BRT, increase pedestrian safety, and help transform Route 110 into a pedestrian-friendly Corridor as a model for Complete Streets. These improvements could include: enhanced crosswalks (e.g., bricks with white lines on the border to increase visibility); Accessible Pedestrian Signals (APS) with audible walk indications/chirping for the visually impaired; pedestrian push buttons; sidewalk improvements as necessary to ensure that ramps are ADA accessible with tactile warning strips; and mid-block pedestrian refuge islands to improve safety (if feasible given the roadway geometry). NYSDOT is beginning work on a pedestrian safety project along Route 110 that will involve a range of intersection-specific improvements, and ongoing coordination with NYSDOT will be an important next step to promote integration of BRT with targeted pedestrian improvements.

FIGURE ES 11

source: MTA New York City Transit; Context Sensitive Solutions; Star Tribune (2013)

# NEXT STEPS AND CONCLUSION

The purpose of the Route 110 AA was to define and evaluate a range of route and modal alternatives for transit investment in the study area to arrive at a recommendation for an LPA that would best address the project goals and objectives. Through a multi-tiered screening process, the AA resulted in the identification of a BRT trunk route along Route 110, and the detailed evaluation of two alternative sets of off-Corridor feeder routes to complement the trunk route.

The results of the multi-tiered screening process demonstrated that both Short List Alternatives D and E would best achieve the project goals and objectives with a combination of BRT trunk route service and shuttle bus feeder route service. Since neither alternative emerged as the definitive superior option, it was determined that the feeder routes would be finalized during Project Development that will follow this AA.

Project Development is a required step in the federal process to be eligible for the FTA Small Starts discretionary grant program (**Figure ES 12**), which is the recommended federal funding option to be pursued for this project. In conjunction with the final planning and selection of the LPA, Project Development will also include environmental review, documentation of local financial commitment, Preliminary Engineering and Final Design, and ongoing agency coordination and stakeholder/public engagement.

The AA has set the stage for implementation of a fast, frequent, and high-quality BRT service along Route 110 to improve north-south mobility along this traditionally auto-oriented Corridor, complemented with shuttle bus feeder routes to provide last-mile connectivity to and from off-Corridor activity centers.

The guiding principle of this AA was that sustainable economic development requires close coordination and integration of transportation improvements with land use policy, consistent with the fundamental tenet of the *Connect Long Island* plan. This AA complements other ongoing local and regional initiatives to transform the land use character and transportation network of the study area, which can collectively enhance the long-term potential of Route 110, Long Island's "High Tech Main Street."

## SMALL STARTS PROCESS

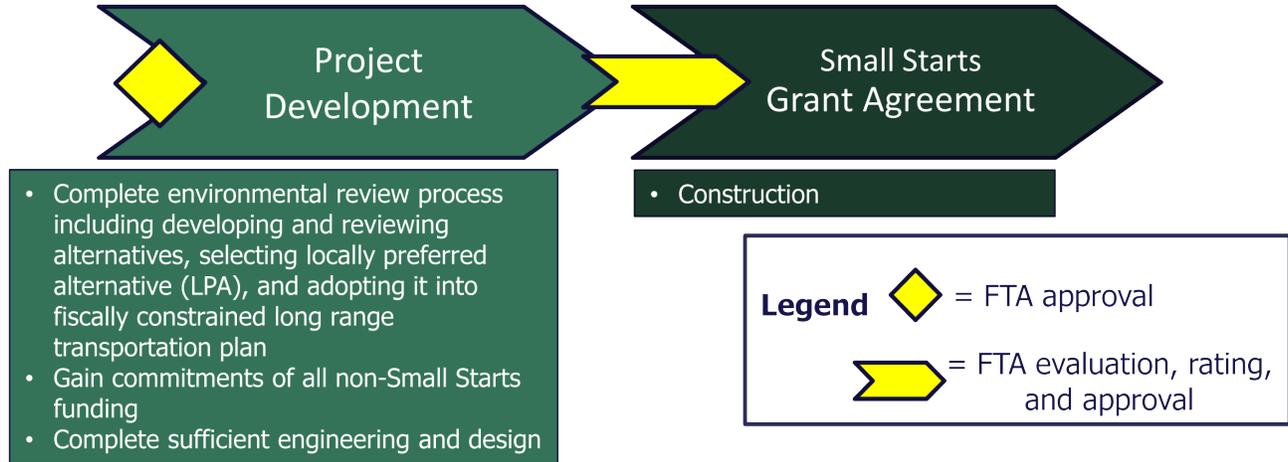


FIGURE ES 12  
source: FTA (2015)

It is anticipated that the proposed project will be advanced in the Project Development process, leading to selection of an LPA to be submitted to the FTA for evaluation, rating, and consideration for approval of a Small Starts Grant Agreement (SSGA). The combination of federal funding with state, local, and/or project-specific funding can provide the necessary resources to move from plan to implementation for this transformative project that has the potential to result in far-reaching benefits for Suffolk County and the surrounding region.

### For more information, contact Town of Babylon Office of Downtown Revitalization

Jonathan Keyes, Director

631-957-7430

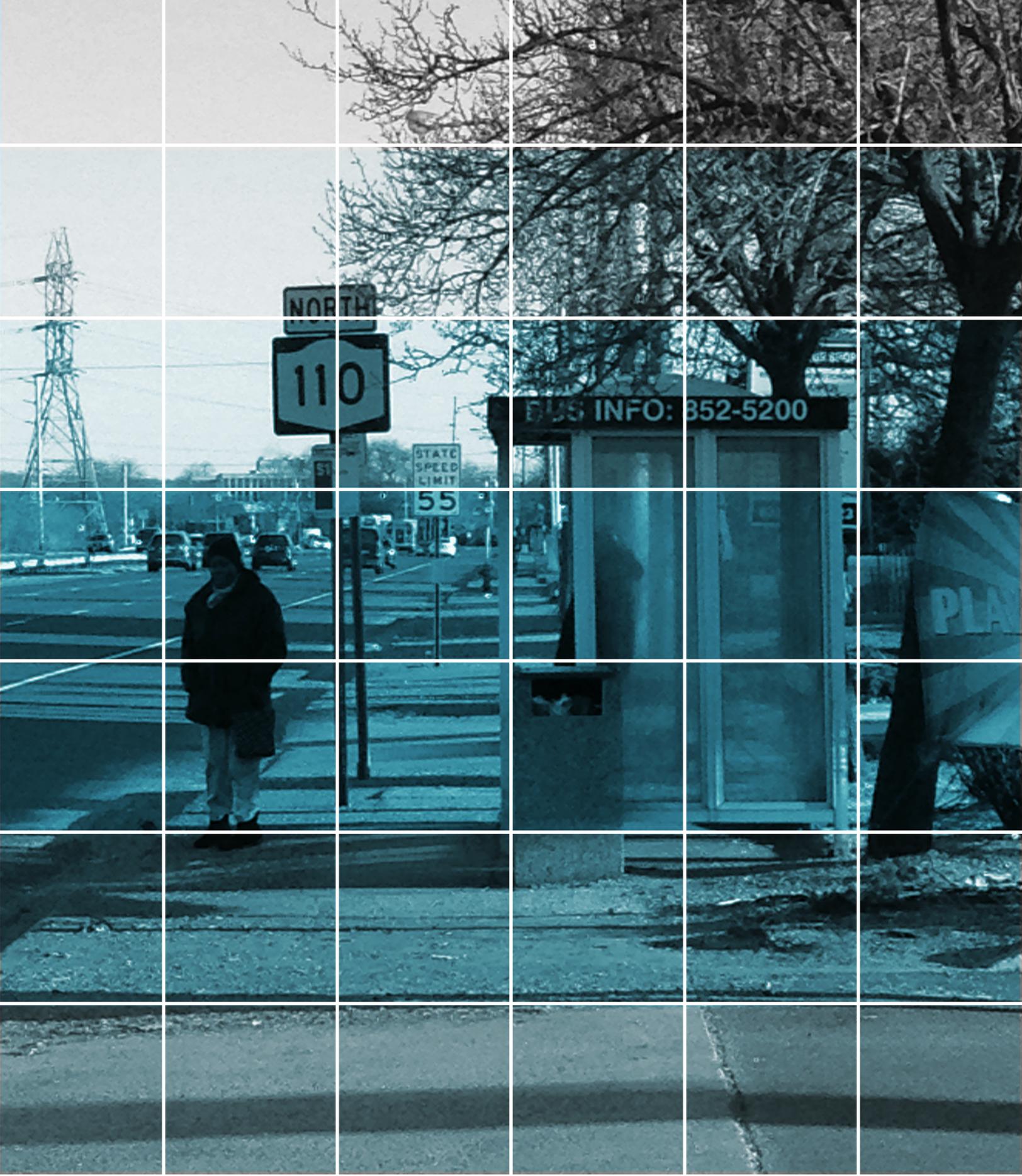
[jkeyes@townofbabylon.com](mailto:jkeyes@townofbabylon.com)

*Or*

Eric Zamft, AICP, Project Manager

631-957-7408

[ezamft@townofbaylon.com](mailto:ezamft@townofbaylon.com)



NORTH  
110

STATE  
SPEED  
LIMIT  
55

BUS INFO: 852-5200

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