06

Comparative Evaluation

Overview of Comparative Evaluation

As we look ahead 20 years, our most urgent priority is to secure the survival of our existing system by rebuilding its most imperiled infrastructure, renewing its outdated and broken parts, and implementing improvements that will deliver more inclusive, safe, and reliable service. Unless sufficient resources are made available to address the existing system's most urgent needs, there cannot be investment in expansion projects.

Alongside the foundations of rebuilding and improving our existing infrastructure, targeted investments in the expansion of the MTA network will further support the region's economic growth and prosperity. Our region is forecast to grow by over one million residents and nearly one million jobs in the next 20 years, and travel patterns have, and will continue to, evolve as new business districts and industries emerge. We must prepare our network for new challenges and opportunities in the decades ahead, and we must expand the system in a way that is most beneficial to our riders, and the region.

We must be ready to invest any additional resources into projects that address these challenges most effectively and that will have the greatest regional impact. That is why we have developed the MTA's first-ever Comparative Evaluation, which weighs the costs and benefits of potential expansion projects to help us make smarter, more strategic choices to secure New York's future.

Comparative Evaluation is a framework that can guide smart, strategic investment in expansion over the next 20 years. Many potential expansion projects throughout the MTA region have been proposed over the years. When considered in isolation, virtually every potential expansion project is appealing in some aspect. Our Comparative Evaluation applies a rigorous methodology to fairly assess these projects in comparison to one another and in the context of our limited resources. This helps to ensure that we are ready to direct our limited resources toward the most cost-effective and most transformative projects.

Comparative Evaluation appendix structure

Following industry best practices, all potential expansion projects are evaluated using a consistent set of models and tools, as well as a consistent set of criteria, including ridership, time savings, network resiliency and sustainability, capacity, equity, network leverage, geographic distribution, and cost. This ensures that the analyses of costs and benefits are fair and objective and helps determine which projects are the most promising based on these criteria.

This Appendix describes the overall approach and methodology of Comparative Evaluation, as well as how each proposed expansion project performs against the criteria.

METHODOLOGY

06

Best practices review

We have developed the MTA's first-ever Comparative Evaluation, a rigorous assessment of potential expansion projects that systematically evaluates costs and benefits. To design our methodology, we considered best practices from transit agencies across the country and the world, including:

- National agencies: New Jersey (NJ Transit), Washington DC (WMATA), Boston (MBTA and Boston Metropolitan Planning Organization), Chicago (CTA), and the San Francisco Bay Area (BART and Muni).
- International agencies: Toronto (Metrolinx), Barcelona (ATM and FGC), London (Transport for London) and Sydney (Sydney Trains).

Best practices as outlined by the Transit Cooperative Research Program and Smart Growth America were also considered.

This research provided examples of the methods used by different agencies to prioritize projects, how decisions are made in practice, and the overarching principles used to steer their decisions.

While each agency's approach to prioritizing investments was unique, the four-step process, as listed below, was commonly used by all of them:

1. Definition of agency goals, principles, and desired outcomes.
2. Selection of prioritization criteria, generally 10 or fewer.
3. Selection of metrics nested within the prioritization criteria, qualitative and quantitative, to assess the performance of projects towards the desired outcomes and goals.
4. Definition of scoring of both metrics and prioritization criteria, often by normalizing or using a point system.

Evaluation criteria and metrics

All projects are evaluated against a consistent set of criteria, including ridership, time savings, network resiliency and sustainability, capacity, equity, network leverage, geographic distribution, and cost.

Ridership

How many people will actually use the service is obviously a critical question in evaluating its benefit. We quantify ridership two different ways: Total Riders and New Riders. Total Riders represents any riders that use the project, boarding or alighting at its station or stops. This includes riders who already use MTA services and would switch to use this project instead of their current route. It also includes riders who would be new to the MTA system, switching their trip from one that's currently served by car, walking, or another, non-MTA transit service. The New Riders calculation looks only at that group.

Total Riders is a measure of the overall project usage, while New Riders is a measure of how many new riders would use the project. It can also serve as a proxy for potential new revenue for the MTA, as well as other potential benefits, such as environmental sustainability. Both total and new riders are calculated using the Regional Transit Forecasting Model (RTFM), projecting out to the year 2045 scenario.

Travel time savings

Travel time savings is often the principal benefit of a project, and in this case, is measured by the total door-to-door travel time saved by all the project riders. It accounts for the time to get to and from transit modes, as well as wait, transfer, and in-vehicle travel times. Door-to-door travel time can be reduced by extending an existing line, increasing frequency and/or speed, and creating better connections between services.

This metric is the sum of the total door-to-door travel time saved by the project riders diverted from of MTA's modes, derived from the RTFM, 2045 scenario plus the door-to-door travel time saved by new riders also from the RTFM. Projects that have significant travel time savings benefit a lot of people (high ridership), save a lot of time per trip, or a combination of both. Because it takes into account both the number of riders and the extent to which they benefit, it is a very powerful metric for considering the transportation benefit of a project.

Cost

Cost is an important piece of information needed for project evaluation. However, cost in isolation does not tell the whole story. It must be looked at in terms of how it relates to the project benefits as well. While some projects may be very costly, they may also benefit millions of riders in a significant way and are therefore deserving of consideration. On the other hand, a less costly project that fails to deliver significant benefits may not be a good investment despite its lower cost.

The Comparative Evaluation looks at both the Capital cost of constructing the project and purchasing the appropriate fleet as well as the Operating & Maintenance cost to run the service once it is completed. These are high-level estimates based on the conceptual level of project development—not the type of rigorous cost estimation done based on a precise scope once a project has been further developed. As a project advances, the cost estimates will be revised based on the additional details available. As such, the costs outlined in this document should not be taken as definitive, but rather preliminary estimates for comparison purposes only.

While these are not final, detailed cost estimates, what they do allow is the comparison of project costs to one another on a level playing field, based on similar assumptions and considerations.

Capital

Capital costs, which include construction and fleet costs, were calculated by aggregating the unit costs for projects with previous cost estimating efforts, which were then normalized to ensure a consistent set of unit costs were applied uniformly across each project. For projects in which no level of analysis or cost estimating had previously been performed, the appropriate MTA project teams were consulted to determine project scope and unit quantities that comprise each project. Once these projects were defined, consistent unit costs were then applied to determine the cost of the project. All project costs were then inflated to the common analysis year of 2027 by applying a future escalation rate of 3.5% per year. Final capital costs for all projects have been prepared in the Federal Transit Administration (FTA) Standard Cost Category format for uniformity, and to facilitate comparison across projects.

Operations and maintenance costs

Annual operating and maintenance (O&M) costs were estimated utilizing each project's conceptual infrastructure and service plans as well as mode specific unit costs prepared by MTA based on past project experience. O&M cost estimation approaches varied by mode consistent with the availability of unit cost data. For subway projects, infrastructure O&M costs including station, track, signals, revenue collection, car equipment, substations, and other costs were estimated utilizing per station, per car, and per track mile unit costs. Service Delivery costs including the cost of crews and power were estimated based on car-mile and pay-hour unit costs. For commuter rail projects, fleet operating costs (propulsion, materials), staffing costs (transportation, maintenance of equipment, customer service, security, system safety, etc.) and facilities were estimated using per car-mile and per station unit costs. Light rail transit O&M costs reflect a cost per guideway mile, cost per vehicle required in maximum service, cost per revenue mile, and cost per revenue hour. Bus and Bus Rapid Transit O&M costs were updated from consultant studies and reflect several approaches. All O&M costs were escalated to the common analysis year of 2027 consistent with the capital cost estimates.

Cost Effectiveness

Cost effectiveness is how we consider the relationship between the cost and the benefit of a project. It is measured as ratio between the forecasted costs and travel time savings benefits over a 30-year period.

The costs include the total Capital Costs (construction and fleet costs) for the year 2027, and the annual O&M costs over 30 years. To allow for the aggregation of one-time Capital costs and ongoing O&M costs, annual O&M costs were added up over 30 years, assuming inflation of 3.5% annually, and then discounted to the net present value using a 4.5% discount rate.

Total time savings was chosen as the proxy for the project benefit, as it takes into account both how many riders will use the service, and how much they will benefit compared to the status quo. The total door-to-door time saved by project riders over the same 30-year period isn't just the annual estimate multiplied by 30. However, since newly-opened projects typically take some time to fully realize their ridership, these figures assume that the benefit ramps up in the first three years (from 30% to 50% to 70% of the 2045 figure from the RTFM model) and then gradually approaches the 2045 figure from there. After 2045, this calculation assumes a cumulative 4% percent growth from 2046 to 2057, the end of the 30 year period. This growth rate is based on the NYMTC 2055 Socioeconomic and Demographic projections.

The calculation of this ratio is relatively complex in order to capture the promise of a project over a long time period. The end result, however, is intuitive. Projects with lower ratios (costs per time saved) are indicative of good investments, as they provide significant benefits relative to the costs to operate and construct. Higher ratios indicate that a project provides relatively low benefits compared to the costs to operate and construct.

Projects that do not save travel time overall, such as some infill stations that can delay some existing riders, tend to have the highest ratios, and are the least cost-effective projects. On the other end, projects that save operating costs in relation to a scenario without the project, tend to be the most cost-effective projects.

Cost effectiveness is not the only measure of a project, of course. Other factors, including the other metrics evaluated below, are also critical to consider, especially factors like equity that underpin all the investments we make in the transit system. Cost effectiveness can also change over time, as the region changes and either the cost or benefits shift, whether through intentional action by public policymakers or as a result of broader societal shifts. But knowing whether a project delivers a high ratio of benefits to cost is a critical factor, one that shapes how the MTA considers potential investments.

Equity

Projects that facilitate social and economic opportunities by providing affordable and reliable transportation options based on the needs of the populations being served, particularly populations that are traditionally underserved and vulnerable, are considered to be more equitable. Equity is measured with two metrics: the absolute number or the percentage of project riders that travel to or from an Equity Area. Equity Areas are places where high concentration of low-income, minority, and transit-dependent populations live. Projects with a high percentage, or total number of riders, from these areas will most likely provide the greatest benefits in terms of better access to opportunities for those living or traveling there.

See the description below for more detail on Equity Areas and a map showing their location throughout the New York region.

Sustainability

Sustainability is measured by the reduction of miles traveled by car modes and reflects a project's ability to reduce harmful emissions and pollutants.

The reduction of miles traveled by car is calculated by multiplying the New Riders diverted from car by the distance that they traveled in the scenario without the project. This provides a measure of the reduction of vehicle trips and the distance they would have traveled, which is directly proportional to the potential reduction of Greenhouse Gas (GHG) emissions. The higher the reduction of miles traveled by car, the higher the reduction of GHG emissions.

Resiliency

Resiliency looks at the impact on the project on the resilience of our transit network providing alternate paths of travel in case of a disruption on any one given line. This metric is based on the number of connections to other nearby rail and subway services near the project.

Specifically, this is calculated by aggregating the number of rail or subway stops within ½ from the proposed project's stops in New York City, or within 5 miles in suburban areas. This captures the project's ability to provide or increase connections to other transit options, thereby providing riders with more alternatives, addressing connectivity needs, and increasing access to the region's integrated transit network.

Capacity

Capacity speaks to the ability of our system to meet demand without overcrowding our riders. For purposes of this evaluation, capacity was measured by evaluating how much a potential project would reduce crowding systemwide. This is done by looking at the reduction of passenger-hours in crowded segments systemwide. Crowded segments are those where Volume to Capacity (V/C) ratio is higher than 0.95 during the AM peak period of a weekday. It is calculated by taking the difference between the passenger-hours in crowded conditions in the 2045 Baseline scenario with the project and the 2045 Baseline scenario without the project, derived from the RTFM.

Some projects might decrease crowding in their vicinity but increase crowding in other segments of the transit system. On the other hand, some projects may not increase capacity directly, but they may still help to alleviate capacity issues elsewhere in the system. Projects that run parallel to existing crowded segments, increase service frequency, or distribute riders across the system, tend to alleviate capacity issues. Other projects, such infill stations, might create additional crowding.

Geographic distribution

Geographic distribution is a measure of how well a project connects different areas of the region. It is evaluated using the Regional Accessibility metric, which indicates how a project could change travel time in the MTA service area. It is calculated by aggregating the travel time from any transportation area in the region to all other transportation areas (door-to-door travel time) and compares the times obtained in the 2045 Baseline scenario with and without a project. The point-to-point travel times in the region are obtained using the RTFM.

Projects that connect with more services, or improve the commuter rail system, will tend to save more time to travel across the region than projects located in areas that are already well-served by transit. Improvements in the regional accessibility also translate into better access to remote places and opportunities for development.

Network leverage

The MTA transit system is a vast network with opportunities to enhance and expand service while maximizing use of existing infrastructure and right-of-way. Network Leverage measures how the MTA is using what it already owns. It is calculated as a weighted average of the percentage of a potential project's alignment on MTA-owned right-of-way (ROW), other publicly owned ROW (i.e. City or State), and privately owned ROW. The percentage of alignment owned by the MTA has the highest weight, followed by the percentage of ROW owned by other public agencies. The percentage of privately-owned ROW has the lowest weight. Projects that are entirely within the MTA-owned ROW leverage the network to the greatest extent.

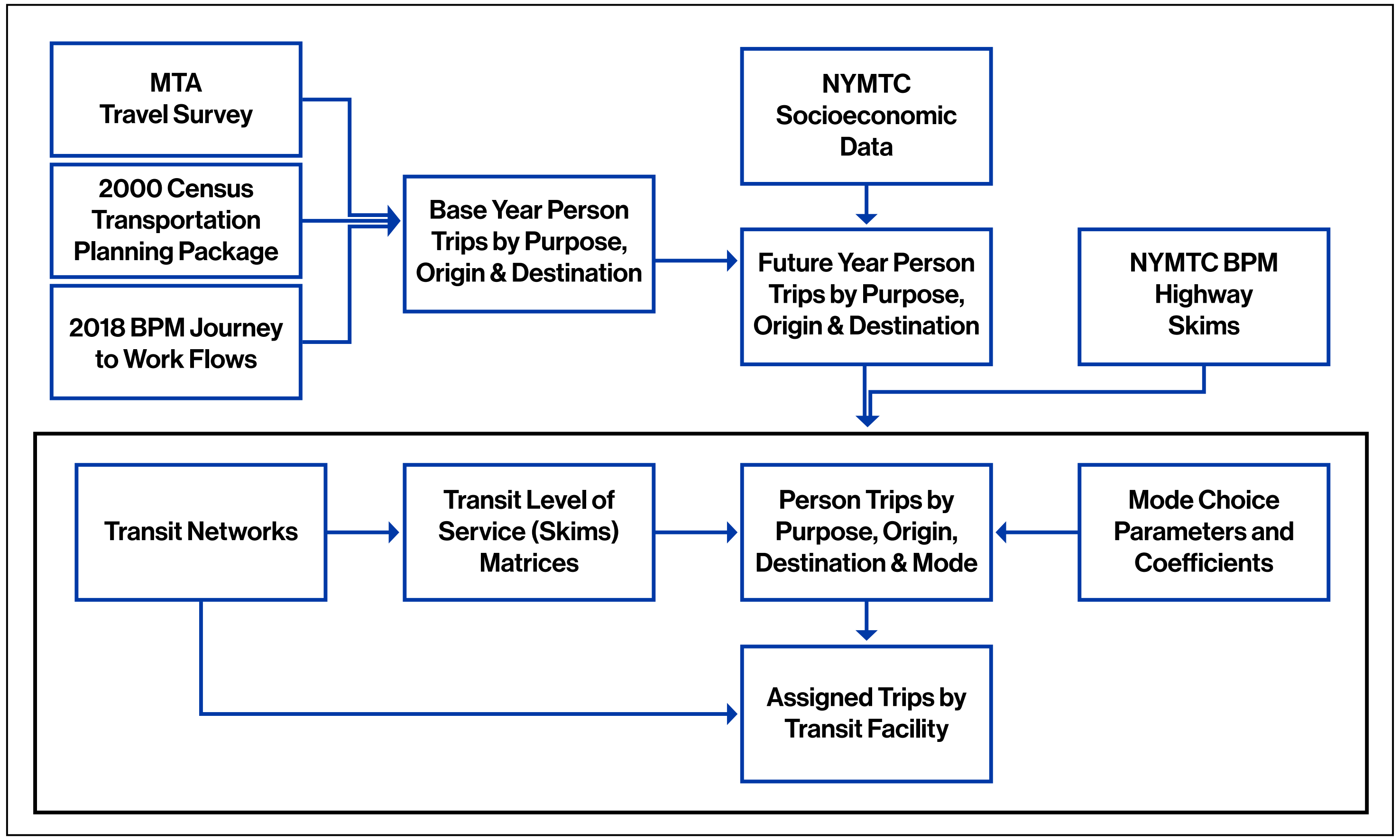
This metric shows how the MTA is getting the most out of what it already owns and can also be a proxy for project control during construction and operation.

To calculate these metrics, we relied on a trusted forecasting model. The MTA's Regional Transit Forecasting Model (RTFM) estimates changes in ridership and travel time on various modes resulting from changes in population and employment, as well as changes in the transportation network and service.

Models

Regional Transit Forecasting Model

The MTA's Regional Transit Forecasting Model (RTFM), which is built on Caliper's TransCAD platform, is a variant of the 4-step ridership forecasting methodology of trip generation, distribution, mode choice and assignment. It is used to forecast changes in ridership on the various modes, resulting from changes in population, employment, and other socioeconomic factors, as well as changes in the transportation network. The figure below details the structure of the model.



Above, structure of the RTFM. BPM: New York Metropolitan Transportation Council (NYMTC) Best Practice Model (Forecasting Model)

The model estimates travel by mode and route during the AM peak period of a weekday within 3,586 Travel Analysis Zones (TAZs) in a 28-county area covering New York City and its suburbs, northern New Jersey and southeastern Connecticut.

The RTFM was calibrated for the year 2019 using data from a variety of sources to replicate how people moved through the region and how transit customers used the transit system for that year. After calibration, a future Baseline scenario (2045) was built reflecting the transit service changes and socioeconomic and demographic growth projected in the region for this horizon year. The estimated changes in transit ridership resulting from these changes are then assigned to individual transit routes and stops based on detailed region-wide transit schedules and the most convenient routing to travel from each trip's origin to destination, considering travel time and out-of-pocket costs.

The 2019 calibration year was chosen as the last full year before the onset of the COVID-19 pandemic, which obviously has had a significant impact in travel patterns over the course of the subsequent years. The regional Metropolitan Planning Organization (NYMTC) adjusted their socioeconomic and demographic projections, which are inputs to the model, to account for the impact of the pandemic on population and employment growth in the region, and this is reflected in the model outputs.

The transportation network in the RTFM 2019 Baseline scenario reflects the 2019 service plans during the AM peak period of a weekday. The transportation network coded in the RTFM 2045 Baseline scenario also includes the major transportation projects planned in the region that are assumed to be in place by this horizon year for the same period of a weekday.

Cost Estimating Tool

In addition to the forecasting model to help define the benefits, Comparative Evaluation also relies on a Cost Estimating Tool to help understand potential costs on a level playing field between projects.

The Cost Estimating Tool was developed to prepare order-of-magnitude capital cost estimates for individual system enhancement and expansion projects (including several with multiple modal/infrastructure options). It utilizes planning-level project data and conceptual infrastructure plans (where available) provided by the MTA and it is consistent with the Federal Transit Administration (FTA) Standard Cost Categories (SCC) for Capital Projects and FTA's SCC Cost Estimation Workbook for MTA's use in preparing capital cost estimates.

The cost estimating process followed these steps: define project scope and limits for each project and alternative, develop and evaluate unit cost data for each project and alternative, assess each project's specific risk factors, apply consistent soft costs, contingency, escalation, and finalize capital cost estimates.

The cost tool is grouped in three elements:

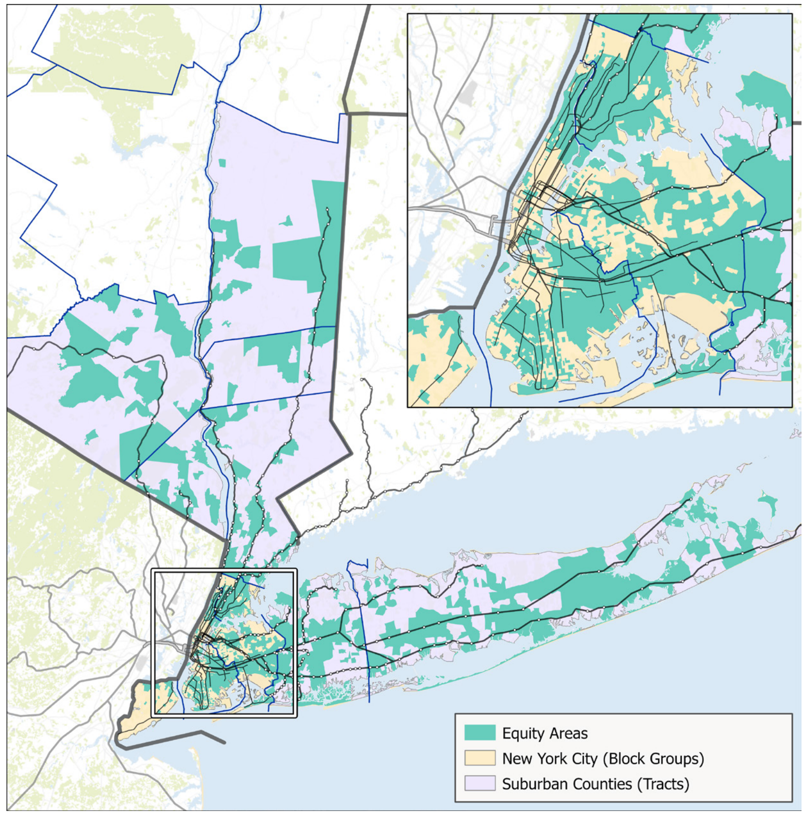
1. Project Information: Infrastructure, and right-of-way, and vehicles
2. Soft Costs: Professional Services, contingencies, consistent by operator
3. Escalation: Historic inflation data through 2022, and growth to mid-year 2027

Equity Areas

Understanding that there are historically disadvantaged populations helps ensure that resources are invested, either through allocation or reallocation, and protected within these communities to reduce obstacles to transit access.

Equity Areas, or places where vulnerable and historically disadvantaged populations live, are defined as the union of Title VI areas (already defined by each MTA operator), and Areas of Concentrated Need in the MTA service area. Title VI Areas are those with a high concentration of low-income or minority populations in each of the MTA's operator service area, and Areas of Concentrated Need consider a variety of socioeconomic indicators such as poverty level, education, language proficiency, vehicle ownership, and commute time, in addition to poverty level and race.

Overall, 61% of the MTA's service region's residents live in these areas: 67% of residents who live in New York City and 48% of residents in New York State-MTA counties outside New York City (Nassau, Suffolk, Westchester, Putnam, Dutchess, Orange, and Rockland counties).



Above, Equity Areas

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[2] 2055 SED Forecasts (nymtc.org)

RESULTS 06

Above, LIRR Third Track Construction Photo

Analysis results

Based on the rigorous modeling described above, each project was evaluated on a level playing field. The results of that evaluation are summarized in the chart below and details of each project are explored in more detail on individual projects pages that follow.

The first metric shown on the summary table and a key metric in understanding a project is cost effectiveness. This figure looks at both the Capital and Operating & Maintenance costs of a project and puts them in the context of their benefits, using Travel Time Savings to account for both the number of riders and the extent to which they benefit from the project compared to the status quo. By putting cost and benefit in relation to one another, it gives us a good sense of how a project fares as an investment of limited public dollars.

While cost effectiveness is important, other measures are also critical to evaluate the potential impact of a project. Equity benefits are greatest when projects serve a greater share of riders from designated Equity Areas. Projects located in areas that are not as well served by transit have the biggest Regional Accessibility improvements, while Sustainability is enhanced by projects that have the biggest reductions in Vehicle Miles Traveled. Resilience is improved by projects that provide connections to other transit options. Systemwide Capacity is most improved by projects that reduce crowding by increasing service frequency and distributing ridership across the system. Network Leverage is greatest for those projects that fall entirely within the MTA's right-of-way. All of these metrics are important, helping to gauge how projects perform relative to each other, as well as the benefits they provide to the region and to riders.

Inclusion in this analysis does not mean that the MTA will be pursuing a project. Decisions about which of these projects, if any, will be included in subsequent MTA Capital Programs, will be made in the context of those future programs, including the amount of funding available to Rebuild and Improve the existing MTA system, which will need to be prioritized before any expansion projects can be considered. Similarly, the cost estimates included in this report are based on known factors today and without extensive site conditions or engineering analysis. While these estimates are based on a consistent set of assumptions for comparison purposes, projects selected for advancement will require additional engineering and planning that will certainly lead to changes in the cost estimate. This analysis is intended to help inform those conversations and decisions, not replace them.

For the purposes of this summary table and to make comparison easier throughout the document, all metrics have been converted to a scale of 0 to 100, where 0 indicates the least favorable value, and 100 indicates the highest favorable value.

The project profiles on the following pages will include both these comparative values as well as the underlying data on which they are based.

Due to additional quality control, minor calculation errors in the scores have been corrected in this version.

Comparative Evaluation summary table

Score	Icon
<20	○
20-39	◔
40-59	◑
60-79	◕
>=80	●

	Cost Effectiveness	Ridership	Equity		Geographic Distribution	Sustain-ability	Resiliency	Capacity	Network Leverage		
Projects	**Cost/Time Saved** (30 yrs) ($/min)	**Total Riders**	**Total Riders from Equity Areas**	**% Riders from Equity Areas**	**Regional Accessibility**	**Change in Vehicular Miles Traveled**	**Subway/Rail Services < 0.5 miles** (NYC) **< 5 miles** (suburbs)	**System Crowding - Passenger Hours in Crowded Conditions**	**% of Project ROW on MTA, Public or Private Land**	**Total Riders** (Daily 2045)	**Construction Cost** ($M 2027)
Danbury-Southeast Connection	$6.35	○	○	○	◕	◕	○	○	◑	2,600	$820
Elmhurst Station (LIRR)	*No Time Saved**	○	○	●	○	◔	○	○	●	3,100	$210
Harlem Line Capacity Improvements	$2.46	◕	◔	◑	◔	◔	◕	○	●	83,700	$1000
Hudson Line to Penn Station	$4.54	○	○	◕	◔	◕	●	◑	●	18,900	$750
Inner New Haven Line Yard	$5.07	○	○	◔	○	◔	○	○	●	6,000	$390
Interborough Express LRT (IBX)	$1.29	●	●	●	●	●	●	◔	●	118,700	$5,540
Lower Montauk Branch Reactivation	$62.41	○	○	◕	○	◕	◑	○	●	9,200	$4,230
New Lots Ave No 3 Line to Flatlands	$8.64	○	○	●	○	◔	○	○	◕	8,600	$1,780
Port Jefferson Branch Capacity Improvements	$6.18	◔	○	◔	●	◑	○	◔	●	27,900	$3,120
Port Jervis Line Capacity Improvements (MP Yard)	$40.46	○	○	◕	○	◔	○	○	○	11,000	$360
Ridgewood Busway	$0.0**	○	○	●	○	◔	○	○	◔	8,900	$30
Rockaway Beach Branch (NYCT)	$6.72	◔	◔	●	○	◑	◔	○	◑	39,200	$5,940
Second Ave Subway South to Houston	$4.47	●	●	◑	○	◔	●	◔	◔	230,400	$13,500
Second Ave Subway West to 125th/Bdwy	$1.43	●	●	●	○	◑	◕	●	◔	239,700	$7,540
Speonk-Montauk Capacity Improvements	$13.66	○	○	○	○	◔	○	○	●	1,500	$260
Staten Island North Shore BRT	$1.46	◔	○	◕	◑	◔	○	○	◔	32,000	$1,300
Staten Island West Shore BRT via Korean War Vet Pkwy	$1.95	○	○	○	●	◑	○	○	◔	16,900	$1,870
Stewart Airport Commuter Rail	$10.65	○	○	◕	○	●	○	○	○	4,300	$1,400
Sunnyside Station (LIRR)	*No Time Saved**	○	○	◑	●	◔	◔	○	○	7,900	$490
Tenth Ave Station on No 7 Line	$81.29	◑	○	◔	○	◔	○	○	●	55,000	$1,900
Utica - Nostrand Junction Capacity Improvements	$0.28	●	●	●	●	●	○	●	●	319,900	$410
Utica Alt A - BRT	$0.36	◕	◑	●	◔	◔	◔	○	◑	71,900	$300
Utica Alt B - Subway to Kings Plaza	$4.82	◑	◔	●	◑	◑	○	◑	◑	55,600	$15,790
Utica Alt C - Subway to Church Ave + BRT	$1.73	◕	◑	●	◑	◕	◔	◑	◑	81,200	$6,860
W Line to Red Hook	$90.46	○	○	○	○	◔	○	●	◑	7,600	$11,210

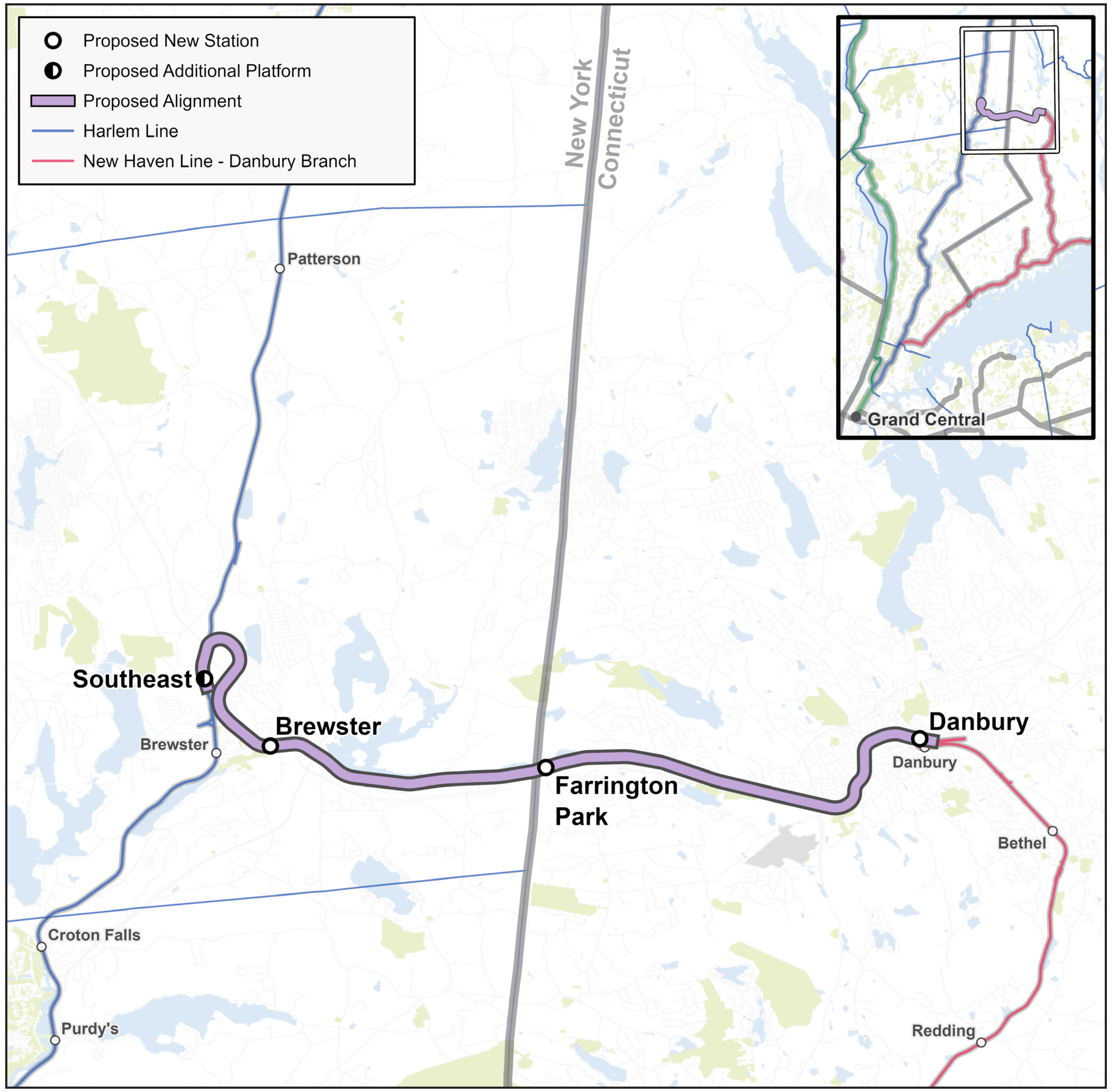
Notes: *Elmhurst and Sunnyside have no overall time savings due to increased travel time for existing customers.

**Ridgewood Busway operational savings over project lifetime exceed capital costs

Danbury-Southeast Connection

Description: Reactivation of a 11-mile portion of the Beacon Line between Southeast New York and Danbury, CT, for passenger service.

Project objectives: Provide a rail connection from Danbury, CT, to the Metro-North Railroad Harlem Line for improved travel time and eased parking demands at Harlem Line stations and I-84/I-684 congestion.



Above, Danbury-Southeast Connection

Evaluation results

Construction Cost (2027): $820 million

Fleet Cost (2027): $52 million

Annual O&M Cost (2027): $29 million

Daily Ridership (2045): 2,600

New Daily Riders (2045): 900

Riders from Equity Areas (2045): 590

Travel Time Saved Per Trip (minutes): 12.2

Special Considerations:
Connecting to Harlem Line at Southeast Station requires construction through wetland areas.

Construction of a new, second station at Danbury is required because of the existing track geometry.

Housatonic Railroad owns corridor in Connecticut.

<20
20-39
40-59
60-79
>=80

Scorecard

Criteria	Metrics	Result	Score (0-100)
Cost, Ridership & Time Savings	Cost/Time saved (30 years)	$6.35/min	59
Equity	Percent of riders from Equity Areas	23%	0
Sustainability	Change in daily vehicle miles traveled	-51,655	77
Resiliency	Rail connections within ½ mile (NYC) or 5 miles (suburbs)	3	17
Capacity	Change in passenger hours of crowding systemwide *(AM peak period)*	-1,423 hours	17
Geographic Distribution	Change in regional accessibility	-16,653 hours	64
Network Leverage	Weighted sum of MTA, Public and Private ROW	55%	40

Findings

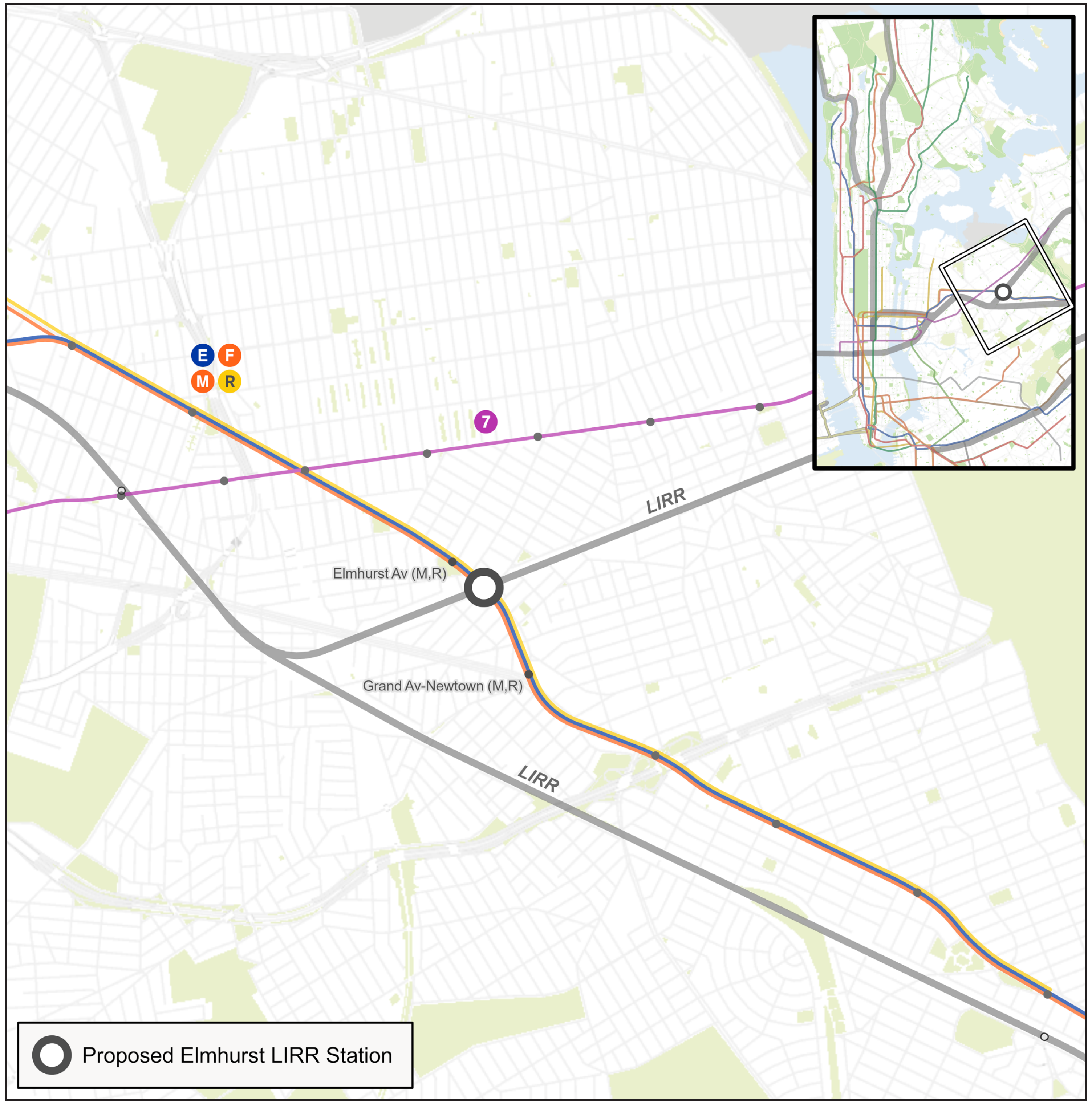
While this project would have a significant time savings for those who ride it, it would serve a very small number of riders in relation to the capital and operating costs.

Reactivating the Beacon Line between Danbury, Connecticut and Southeast, New York would result in significant travel time savings, but for a small number of riders and at a high cost ($800+M), relative to the benefits. Although it would expand regional access by connecting two Metro-North lines and generate sustainability benefits as a result of reduced vehicle travel, it does not benefit equity areas or reduce crowding capacity significantly on the system. Further, the right-of-way is only partially owned by MTA, with the portion in Connecticut owned by Housatonic Railroad, which results in a midrange score for network leverage.

Elmhurst Station (LIRR)

Description: Restoration of Long Island Rail Road service at the former Elmhurst Station on the Port Washington Branch in Queens.

Project objectives: Provide additional access to employment and commercial centers near station.



Above, Elmhurst Station

Evaluation results

Construction Cost (2027): $210 million

Fleet Cost (2027): N/A

Annual O&M Cost (2027): $1 million

Daily Ridership (2045): 3,100

New Daily Riders (2045): 1,200

Riders from Equity Areas (2045): 3,040

Travel Time Saved Per Trip (minutes): 0.6

<20
20-39
40-59
60-79
>=80

Scorecard

Criteria	Metrics	Result	Score (0-100)
Cost, Ridership & Time Savings	Cost/Time saved (30 years)	No Time Saved*	0
Equity	Percent of riders from Equity Areas	97%	97
Sustainability	Change in daily vehicle miles traveled	-5,982	28
Resiliency	Rail connections within ½ mile (NYC) or 5 miles (suburbs)	3	17
Capacity	Change in passenger hours of crowding systemwide *(AM peak period)*	+1,212 hours	0
Geographic Distribution	Change in regional accessibility	+3,944 hours	0
Network Leverage	Weighted sum of MTA, Public and Private ROW	99%	99

** No overall time savings due to increased travel time for existing users.*

Findings

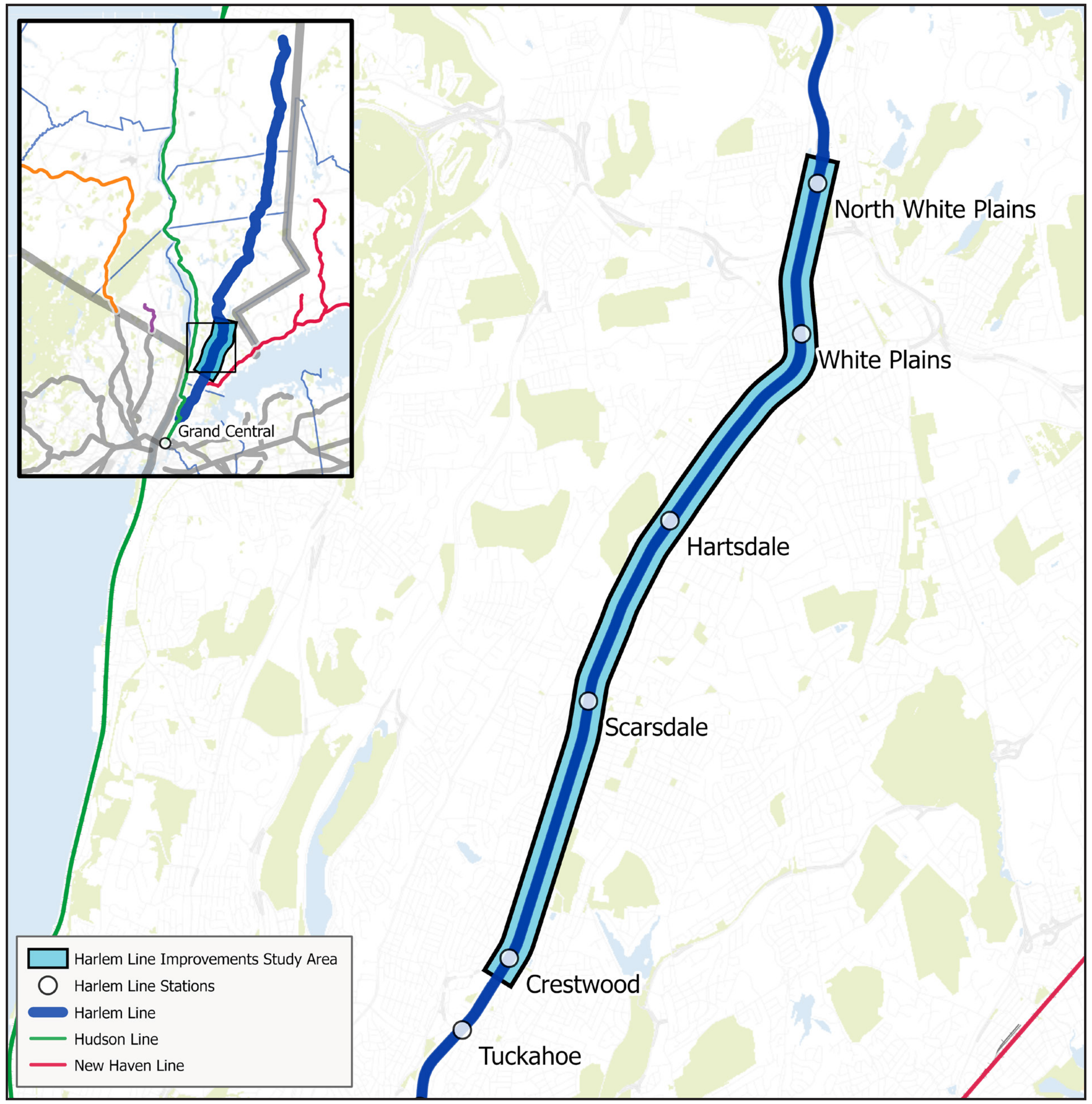
This project provides marginal benefits in an area already well served by transit. It would save travel time for new riders but create additional travel time for existing LIRR customers, resulting in no net time savings.

Despite its low-cost relative to other projects, reopening the Elmhurst station on LIRR scores poorly because of low ridership and no net travel time savings due to added travel time for existing customers going through the station. This project would not increase capacity, nor would it improve regional access, since the area is already well served by transit. The station does well in serving a high percentage of riders from equity areas and in leveraging an MTA asset since the new station would be built in the same location as the old station.

Harlem Line Capacity Improvements

Description: Construction of a third mainline track on the Metro-North Railroad Harlem Line between Crestwood and North White Plains, along with capital investments in power, signals, and communications, and capacity improvements and associated investments at Brewster Yard.

Project objectives: Provide more service during peak periods to accommodate future growth and reduces crowding, improves operational flexibility and service reliability, enhances opportunity for improved reverse peak service, allows for track maintenance without reducing capacity or limiting reverse peak service, and adds additional train service at Scarsdale, Hartsdale, and White Plains.



Above, Harlem Line Capacity Improvements

Evaluation results

Construction Cost (2027): $1 billion

Fleet Cost (2027): $330 million

Annual O&M Cost (2027): $65 million

Daily Ridership (2045): 83,700

New Daily Riders (2045): 500

Riders from Equity Areas (2045): 47,530

Travel Time Saved Per Trip (minutes): 1.8

Special Considerations:
Requires prior investments of:

- A new North Yard at Brewster/Southeast within the original parking facility location, and reconfiguration and upgrade of the existing South Yard.
- New substations, station improvements and communication/signal upgrades.

<20
20-39
40-59
60-79
>=80

Scorecard

Criteria	Metrics	Result	Score (0-100)
Cost, Ridership & Time Savings	Cost/Time saved (30 years)	$2.46 /min	89
Equity	Percent of riders from Equity Areas	57%	45
Sustainability	Change in daily vehicle miles traveled	-13,500	36
Resiliency	Rail connections within ½ mile (NYC) or 5 miles (suburbs)	12	67
Capacity	Change in passenger hours of crowding systemwide *(AM peak period)*	-453 hours	5
Geographic Distribution	Change in regional accessibility	-6,520 hours	25
Network Leverage	Weighted sum of MTA, Public and Private ROW	100%	100

Findings

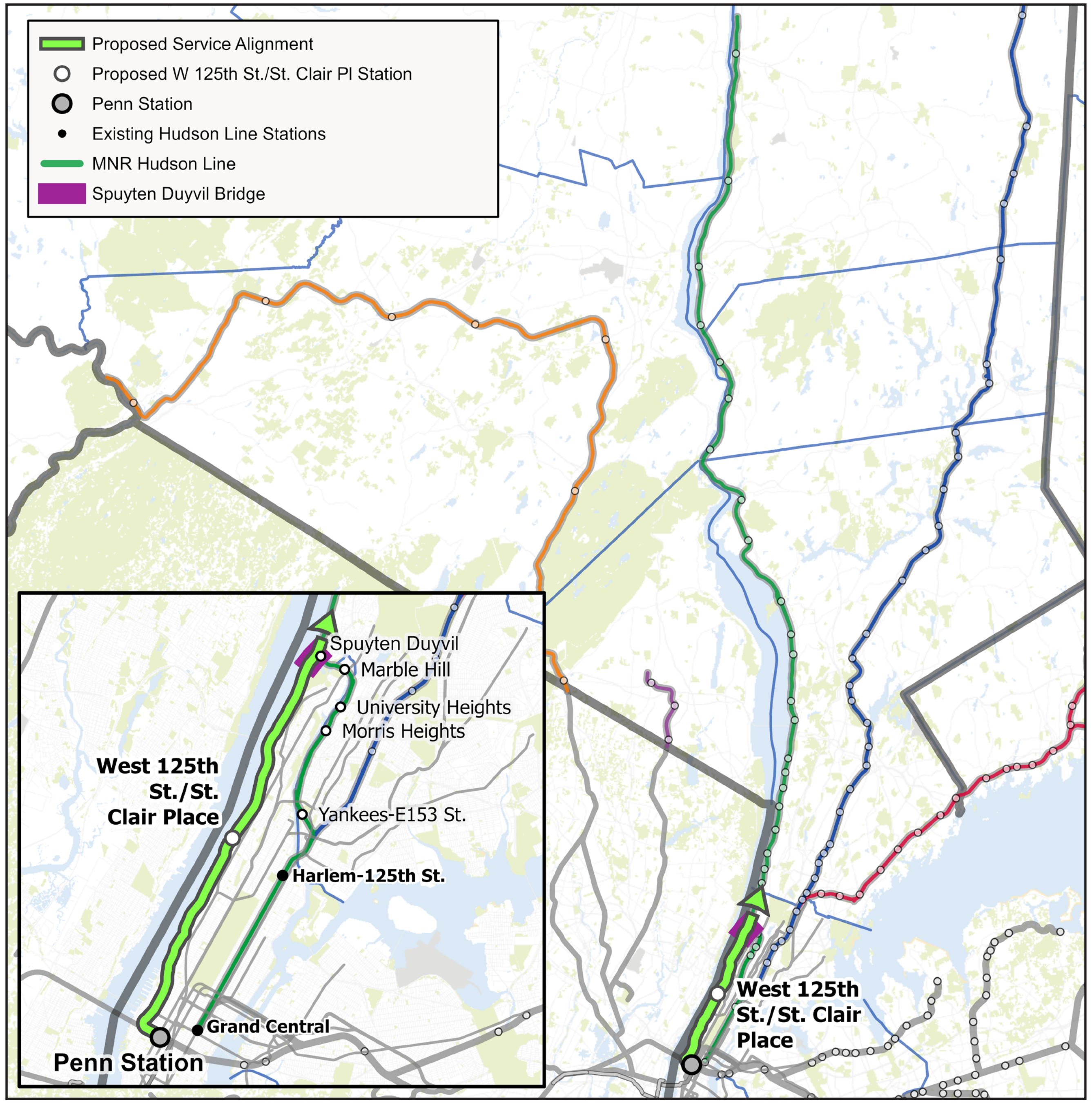
This project would enable additional passenger service and increase operational efficiency and flexibility. It is cost effective due to reduced travel times for many riders.

Providing a third mainline track between Crestwood and North White Plans is cost-effective because it would reduce travel time for a large number of riders for a relative low cost, in relation to other projects. It also scores well in resiliency, with many other rail connections nearby, and in network leverage, as it is on Metro-North's existing right-of-way. It reduces vehicle usage, but that reduction is low in relation to other projects, so it does not score well in sustainability. The additional passenger service as a result of this project reduces crowding slightly and improves regional access, but the improvements are small in relation to other projects and it does not score well in capacity or geographic distribution.

Hudson Line to Penn Station

Description: Provision of Metro-North Railroad Hudson Line commuter rail service between Poughkeepsie and Penn Station via Amtrak's Empire Connection, with one potential new station in Harlem (125th Street and Broadway) and additional fleet storage in Poughkeepsie.

Project objectives: Provide additional transit options and one-seat rides for commuters traveling to/from Manhattan's West Side.



Above, Hudson Line to Penn Station

Evaluation results

Construction Cost (2027): $750 million

Fleet Cost (2027): $766 million

Annual O&M Cost (2027): $141 million

Daily Ridership (2045): 18,900

New Daily Riders (2045): 1,900

Riders from Equity Areas (2045): 14,770

Travel Time Saved Per Trip (minutes): 7.3

Special Considerations:
Will require negotiations with Amtrak regarding Metro-North operations on the Amtrak Empire Line, and the reassignment of trains on Penn Station platforms to accommodate Hudson Line trains.

<20
20-39
40-59
60-79
>=80

Scorecard

Criteria	Metrics	Result	Score (0-100)
Cost, Ridership & Time Savings	Cost/Time saved (30 years)	$4.54/min	73
Equity	Percent of riders from Equity Areas	78%	73
Sustainability	Change in daily vehicle miles traveled	-45,911	71
Resiliency	Rail connections within ½ mile (NYC) or 5 miles (suburbs)	18	100
Capacity	Change in passenger hours of crowding systemwide *(AM peak period)*	-2,526 hours	31
Geographic Distribution	Change in regional accessibility	-9,891 hours	38
Network Leverage	Weighted sum of MTA, Public and Private ROW	93%	90

Findings

This project would provide time savings for a modest number of riders and at a high cost. It would increase resiliency by providing an alternative direct service to Penn Station for Hudson Line customers.

Providing service to Penn Station on the Hudson line scores above average in cost effectiveness because of the significant travel time savings it provides, albeit at a high cost and to a relatively low number of riders. It also does well in equity since many of the riders are from equity areas. It does well in sustainability and resiliency by reducing vehicle usage and providing many alternative rail connections. It also scores well in network leverage since it uses Metro-North's existing rail right-of-way for most of the alignment. Even though it does improve capacity and geographic distribution, it does not score as well relative to other projects.

Inner New Haven Line Yard

(Port Chester)

Description: Construction of a new fleet storage yard located between the Rye and Port Chester Stations on the Metro-North Railroad New Haven Line in New York.

Project objectives: Support the storage needs for additional fleet needed to meet ridership demand and increased service levels on the Inner New Haven Line. Improve operational efficiency, flexibility, and service reliability, and provide opportunity for enhanced reverse peak service.

Above, Inner New Haven Line Yard (Port Chester)

Evaluation results

Construction Cost (2027): $390 million

Fleet Cost (2027): N/A

Annual O&M Cost (2027): $5 million

Daily Ridership (2045): 6,000

New Daily Riders (2045): 30

Riders from Equity Areas (2045): 2,860

Travel Time Saved Per Trip (minutes): 2.1

Special Considerations:
Requires coordination with CTDOT and local utility providers for yard power needs.

<20
20-39
40-59
60-79
>=80

Scorecard			
Criteria	**Metrics**	**Result**	**Score** (0-100)
Cost, Ridership & Time Savings	Cost/Time saved (30 years)	$5.07/min	**69**
Equity	Percent of riders from Equity Areas	48%	**33**
Sustainability	Change in daily vehicle miles traveled	-315	**22**
Resiliency	Rail connections within ½ mile (NYC) or 5 miles (suburbs)	0	**0**
Capacity	Change in passenger hours of crowding systemwide *(AM peak period)*	-212 hours	**2**
Geographic Distribution	Change in regional accessibility	+61 hours	**0**
Network Leverage	Weighted sum of MTA, Public and Private ROW	85%	**80**

Findings

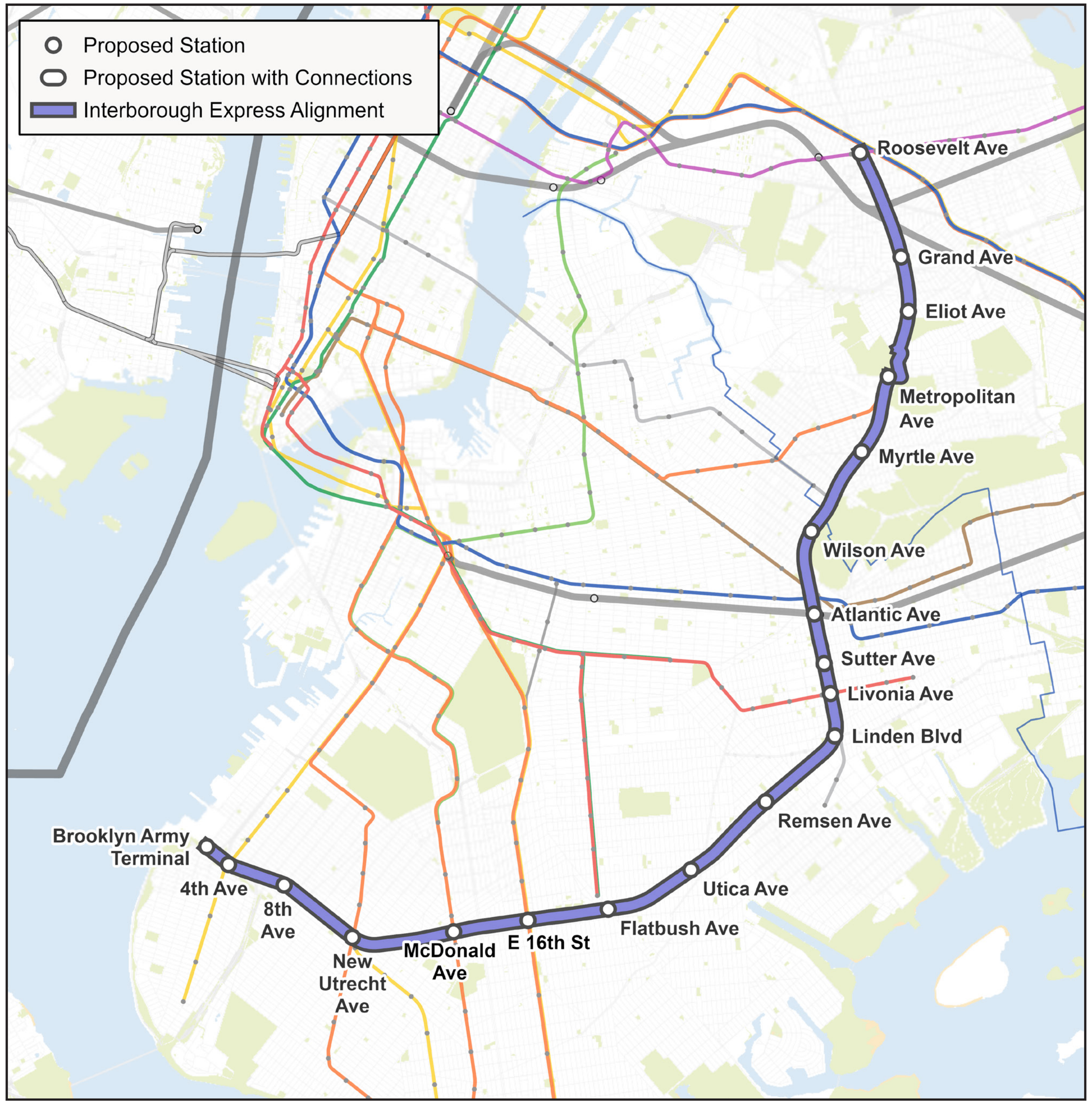
This project would enable some additional service at the Rye station, but its main benefit is operational efficiency and flexibility. Relatively low ridership, as well as cost, result in average cost effectiveness.

A new rail storage yard for the New Haven Line in New York State receives an above average cost effectiveness score since it saves some time for riders at a relatively low cost. It does not have a big impact on ridership because the only difference in the service plan is an additional stop at Rye station for some trains, but no increase in frequency. It does not perform well in equity since it does not have a large share of its riders from equity areas. Similarly, it does not score well in resiliency and sustainability because it does not reduce vehicle usage significantly or provide any new rail connections. The project performs poorly in geographic distribution since a new yard does not improve regional access. The capacity score is low because of how capacity is measured: by reduction in crowding systemwide. However, it would increase capacity in the operational sense of providing more space to store additional trains on the New Haven Line. The project scores well in network leverage since it would be constructed mainly within existing Metro-North right-of-way.

Interborough Express Light Rail Transit

Description: A new transit line between Queens and Brooklyn along an existing freight corridor, connecting to 17 subway lines (2 3 5 7 A B C D E F J L M N R Q Z), and the Long Island Rail Road (LIRR), serving areas of Brooklyn and Queens.

Project objectives: Reduce travel times on transit between Brooklyn and Queens and divert trips from overburdened Manhattan-bound subway lines.



Above, Interborough Express LRT (IBX)

Evaluation results

Construction Cost (2027): $5.5 billion

Fleet Cost (2027): $432 million

Annual O&M Cost (2027): $83 million

Daily Ridership (2045): 118,700

New Daily Riders (2045): 13,200

Riders from Equity Areas (2045): 112,440

Travel Time Saved Per Trip (minutes): 5.9

Special Considerations:
Light Rail Transit (LRT) would be a new and stand-alone mode for MTA.

Street-running required (<1 mile) in Middle Village, Queens.

Requires coordination and concurrence with the following entities:

- CSX, which owns northern three miles of right-of-way
- PANYNJ for the Cross Harbor Freight Program (CHFP)
- EDC and City Hall, for the maintenance & storage facility (MSF) and terminal station at Brooklyn Army Terminal.

<20
20-39
40-59
60-79
>=80

Scorecard

Criteria	Metrics	Result	Score (0-100)
Cost, Ridership & Time Savings	Cost/Time saved (30 years)	$1.29/min	98
Equity	Percent of riders from Equity Areas	95%	94
Sustainability	Change in daily vehicle miles traveled	-72,687	100
Resiliency	Rail connections within ½ mile (NYC) or 5 miles (suburbs)	18	100
Capacity	Change in passenger hours of crowding systemwide *(AM peak period)*	-2,375 hours	29
Geographic Distribution	Change in regional accessibility	-47,557 hours	100
Network Leverage	Weighted sum of MTA, Public and Private ROW	86%	82

Findings

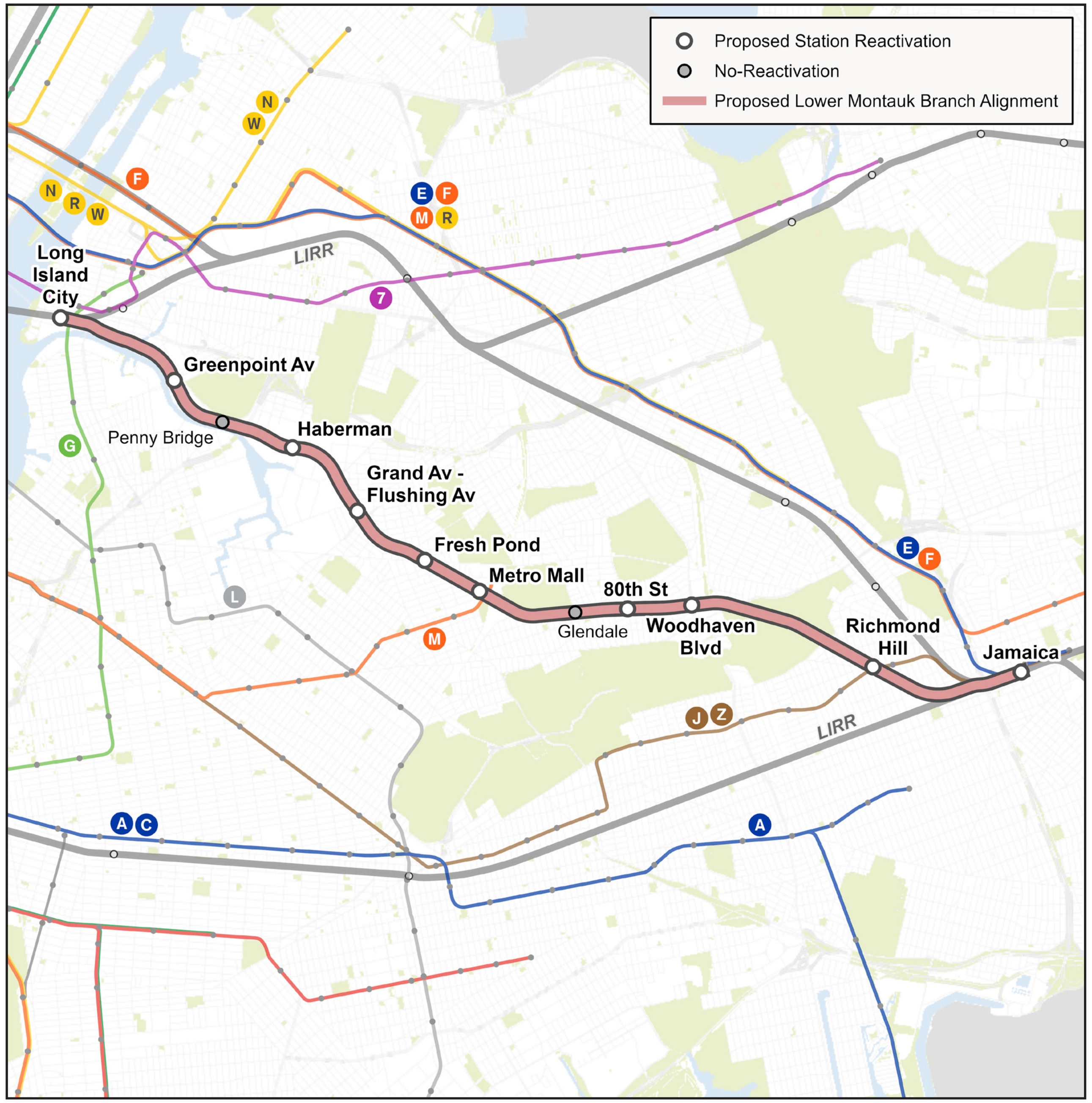
This project scores well in many metrics, including cost effectiveness. It serves a large number of new and total riders, especially from equity areas, and provides connections to many other transit lines, using an existing right-of-way.

The Interborough Express scores well in almost all metrics. High ridership and significant time savings make it cost effective. It does well in equity because it serves a large number of riders from equity areas. Similarly, it scores well in resiliency and sustainability by greatly reducing vehicle usage and providing multiple connections to the subway (up to 17 lines) and LIRR. It scores well in geographic distribution by improving regional access and it gets a high score for network leverage with 11 of its 14 route miles owned by the MTA. It does not score as well in capacity in relation to other projects because it acts as a feeder to existing subway lines, increasing crowding on some that are at, or close to, capacity (i.e. Queens Blvd Line).

Lower Montauk Branch Reactivation

Description: Reactivation of an approximately nine-mile segment of the Long Island Rail Road Lower Montauk Branch between Jamaica and Long Island City, with new stations at Greenpoint Avenue, Haberman, Grand Avenue, Fresh Pond, Metro Mall, 80th St, Woodhaven Blvd, and Richmond Hill.

Project objectives: Increase transit options for underserved communities and improve network connections for intra- and inter-borough travelers; provide opportunities for development and growth near stations; utilize/leverage existing right-of-way.



Above, Lower Montauk Branch Reactivation

Evaluation results

Construction Cost (2027): $4.2 billion

Fleet Cost (2027): $15 million

Annual O&M Cost (2027): $23 million

Daily Ridership (2045): 9,200

New Daily Riders (2045): 6,400

Riders from Equity Areas (2045): 6,950

Travel Time Saved Per Trip (minutes): 1.1

Special Considerations:
Coordination and additional studies needed to evaluate right-of-way constraints, as well as impacts to the LIRR and existing freight operations.

<20
20-39
40-59
60-79
>=80

Scorecard

Criteria	Metrics	Result	Score (0-100)
Cost, Ridership & Time Savings	Cost/Time saved (30 years)	$62.41 /min	0
Equity	Percent of riders from Equity Areas	76%	70
Sustainability	Change in daily vehicle miles traveled	-38,094	63
Resiliency	Rail connections within ½ mile (NYC) or 5 miles (suburbs)	8	44
Capacity	Change in passenger hours of crowding systemwide *(AM peak period)*	+1,101 hours	0
Geographic Distribution	Change in regional accessibility	-3,947 hours	14
Network Leverage	Weighted sum of MTA, Public and Private ROW	100%	100

Findings

This project performs poorly as it provides low time savings in relation to cost. Although the project would provide rail service to equity areas and make use of an existing MTA right-of-way, there are challenges of sharing the use of the corridor with growing freight operations.

Reactivating this section of the LIRR does not score well in cost effectiveness because costs are high, and ridership and time savings are low. It gets above average scores in equity since a large share of its riders are from equity areas, and it does well in resiliency and sustainability, since it takes many trips away from vehicles and provides new connections to rail. It does not improve capacity, making the system more crowded by adding riders to LIRR services. It improves regional access slightly but gets a lower score relative to other projects. Although it scores well in network leverage because MTA owns the right-of-way, it is narrow with adjacent buildings and roadways, making shared use with growing freight operations challenging and costly.

New Lots Avenue 3 Line Extension

Flatlands

Description: Extension of the New Lots Avenue 3 line on an elevated structure southeast past Livonia Yard to a new terminal at Flatlands Avenue and Linwood Street/Elton Street.

Project objectives: Reduce travel times and increase reliability for residents and workers in underserved communities; provide better connectivity to existing subway network.

Above, New Lots Ave 3 line to Flatlands

Evaluation results

Construction Cost (2027): $1.8 billion

Fleet Cost (2027): $101 million

Annual O&M Cost (2027): $17 million

Daily Ridership (2045): 8,600

New Daily Riders (2045): 300

Riders from Equity Areas (2045): 8,510

Travel Time Saved Per Trip (minutes): 3.9

Special Considerations:
Livonia Yard is planned for re-construction and an extension of the 3 line could provide synergies with yard construction, but coordination is needed with the Livonia redesign to not preclude extension.

A potential separation of passenger service tracks from yard lead tracks could have an impact on yard operations.

<20
20-39
40-59
60-79
>=80

Scorecard

Criteria	Metrics	Result	Score (0-100)
Cost, Ridership & Time Savings	Cost/Time saved (30 years)	$8.64/min	41
Equity	Percent of riders from Equity Areas	99%	100
Sustainability	Change in daily vehicle miles traveled	-1,985	24
Resiliency	Rail connections within ½ mile (NYC) or 5 miles (suburbs)	0	0
Capacity	Change in passenger hours of crowding systemwide *(AM peak period)*	-384 hours	4
Geographic Distribution	Change in regional accessibility	+6,200 hours	0
Network Leverage	Weighted sum of MTA, Public and Private ROW	76%	68

Findings

This project is not cost effective due to the high cost to extend the line with a small increase in ridership and time savings. Its primary benefit is serving equity areas.

Extending the New Lots Ave 3 line to Flatlands Avenue performs poorly due to its high cost and relatively low ridership and time savings. It scores well in equity since the majority of its riders are from equity areas. Although it reduces auto usage slightly, it is small compared to other projects and it does not score well in sustainability. It scores poorly in resiliency because it does not provide any new connections to rail. It does not provide benefits in capacity and actually increases crowding by adding riders to the existing line. Similarly, it does not score well in geographic distribution because it does not improve regional access significantly. It gets an average score in network leverage since a portion of the right-of-way is owned by MTA.

New Lots Avenue 3 Line Extension

Alternative Considered: Spring Creek

Alternative Considered: Extension of the New Lots Avenue 3 line on an elevated structure southeast past Livonia Yard to a new terminal in the vicinity of Spring Creek and Gateway Center Mall.

Above, New Lots Ave 3 line to Spring Creek

Evaluation results

Construction Cost (2027): $2.5 billion

Fleet Cost (2027): $101 million

Annual O&M Cost (2027): $26 million

Daily Ridership (2045): 9,800

New Daily Riders (2045): 400

Riders from Equity Areas (2045): 9,510

Travel Time Saved Per Trip (minutes): 3.6

Special Considerations:
Livonia Yard is planned for re-construction and an extension of the 3 line could provide synergies with yard construction, but coordination is needed with the Livonia redesign to not preclude extension.

A potential separation of passenger service tracks from yard lead tracks could have an impact on yard operations.

<20
20-39
40-59
60-79
>=80

Scorecard

Criteria	Metrics	Result	Score (0-100)
Cost, Ridership & Time Savings	Cost/Time saved (30 years)	$11.74/min	17
Equity	Percent of riders from Equity Areas	97%	97
Sustainability	Change in daily vehicle miles traveled	-3,235	25
Resiliency	Rail connections within ½ mile (NYC) or 5 miles (suburbs)	0	0
Capacity	Change in passenger hours of crowding systemwide *(AM peak period)*	+648 hours	0
Geographic Distribution	Change in regional accessibility	+2,519 hours	0
Network Leverage	Weighted sum of MTA, Public and Private ROW	60%	47

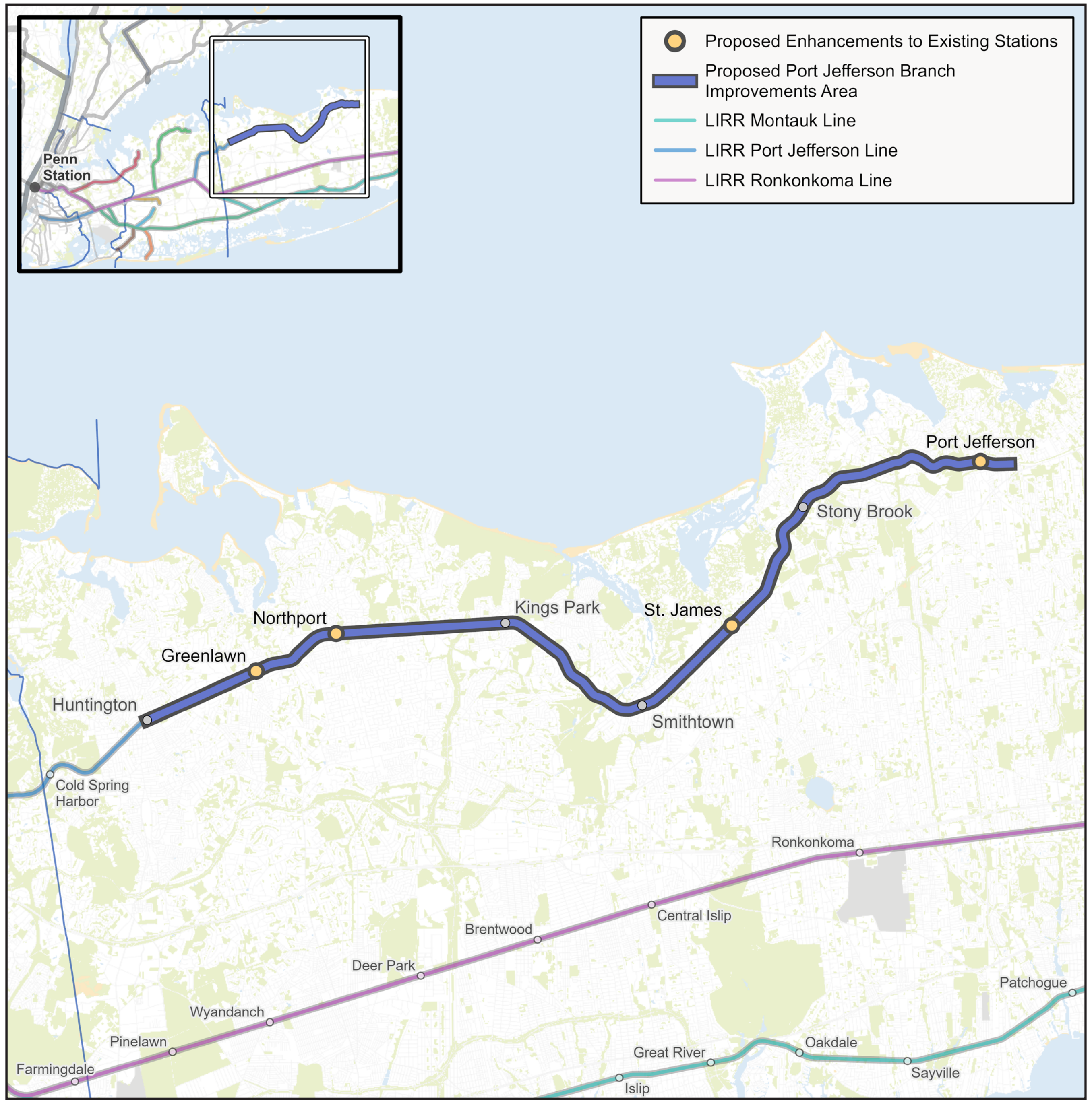
Findings

This alternative is less cost effective than the alternative selected for analysis, with significantly higher construction costs without a corresponding increase in ridership.

Port Jefferson Branch Capacity Improvements

Description: Improvements of the Long Island Rail Road Port Jefferson Branch, including electrification, double tracking, stations, storage yard, and associated infrastructure.

Project objectives: Increase travel speeds and frequency while providing a one-seat ride to Penn Station and Grand Central Madison; reduce demand on the Ronkonkoma Branch.



Above, Port Jefferson Branch Capacity Improvements

Evaluation results

Construction Cost (2027): $3.1 billion

Fleet Cost (2027): N/A

Annual O&M Cost (2027): $74 million

Daily Ridership (2045): 27,900

New Daily Riders (2045): 1,400

Riders from Equity Areas (2045): 10,970

Travel Time Saved Per Trip (minutes): 3.6

Special Considerations:

Electrification of the line requires additional capital improvements to be in place.

Space for a new terminal electric train yard needs to be identified.

Additional studies will need to be conducted to determine right-of-way and fleet needs.

Currently exploring former Lawrence Aviation site in partnership with Suffolk County..

<20
20-39
40-59
60-79
>=80

Scorecard

Criteria	Metrics	Result	Score (0-100)
Cost, Ridership & Time Savings	Cost/Time saved (30 years)	$6.18 /min	60
Equity	Percent of riders from Equity Areas	39%	22
Sustainability	Change in daily vehicle miles traveled	-32,796	57
Resiliency	Rail connections within ½ mile (NYC) or 5 miles (suburbs)	0	0
Capacity	Change in passenger hours of crowding systemwide *(AM peak period)*	-2,018 hours	25
Geographic Distribution	Change in regional accessibility	-20,719 hours	81
Network Leverage	Weighted sum of MTA, Public and Private ROW	96%	95

Findings

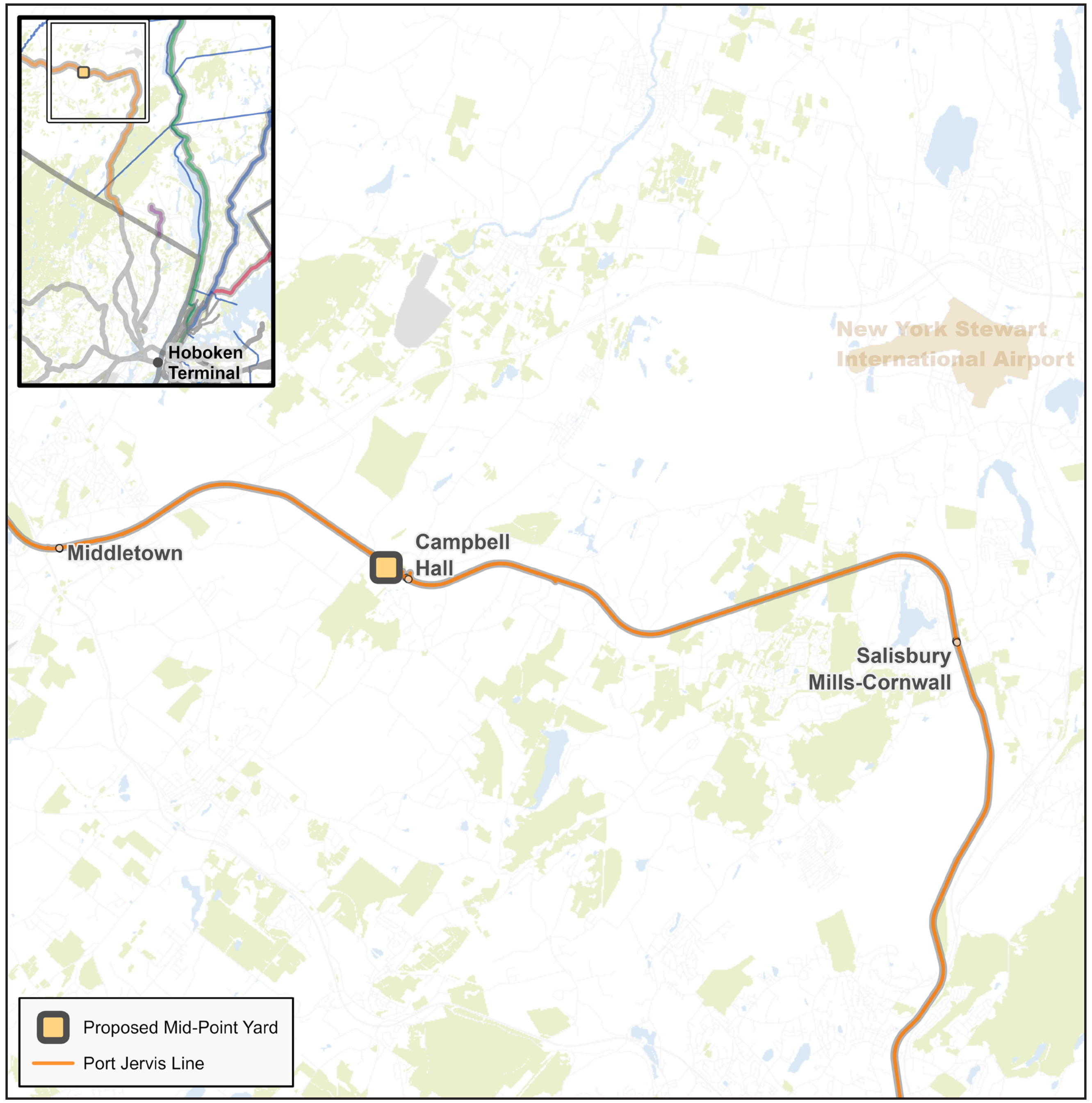
This project has some benefits, but its high cost, coupled with relatively low ridership and time savings, results in an average cost effectiveness.

Improvements on the Port Jefferson Branch get an average cost effectiveness score, mainly due to the high cost and relatively low ridership. Less than half of the riders are from equity areas and so it gets a low score for equity. It does reduce auto usage a fair amount and gets an average score for sustainability, though it does not provide any new rail connections and scores poorly in resiliency. While the project is intended to relieve local crowding in the AM peak, it does not reduce crowding systemwide as much as most other projects. This project gets high scores in geographic distribution, since it improves regional access significantly, as well as network leverage, since it's almost entirely on MTA right-of-way.

Port Jervis Line Capacity Improvements (Midpoint Yard)

Description: Construction of a new rail yard at Metro-North Railroad Campbell Hall station capitalizing on new Port Jervis line track infrastructure.

Project objectives: Improve operational efficiency, flexibility, and service reliability, and introduce reverse peak service.



Above, Port Jervis Line Capacity (Midpoint Yard)

Evaluation results

Construction Cost (2027): $360 million

Fleet Cost (2027): N/A

Annual O&M Cost (2027): $5 million

Daily Ridership (2045): 11,000

New Daily Riders (2045): 40

Riders from Equity Areas (2045): 8,020

Travel Time Saved Per Trip (minutes):0.1

Special Considerations:
Full benefits only realized with direct Manhattan Service via Secaucus Loop, Gateway Program, Penn Station Expansion, and other NJ improvements.

Requires coordination and agreement with Norfolk Southern and New Jersey Transit.

Additional investments on the Port Jervis Line needed including replacement of bridges, viaducts, construction of passing sidings and more fleet.

<20
20-39
40-59
60-79
>=80

Scorecard

Criteria	Metrics	Result	Score (0-100)
Cost, Ridership & Time Savings	Cost/Time saved (30 years)	$40.46/ min	0
Equity	Percent of riders from Equity Areas	73%	66
Sustainability	Change in daily vehicle miles traveled	-1,726	23
Resiliency	Rail connections within ½ mile (NYC) or 5 miles (suburbs)	0	0
Capacity	Change in passenger hours of crowding systemwide *(AM peak period)*	-152 hours	1
Geographic Distribution	Change in regional accessibility *(efficiency of travel time from anywhere tc anywhere by transit)*	-1,537 hours	5
Network Leverage	Weighted sum of MTA, Public and Private ROW	25%	0

Findings

This project would attract relatively few riders at a high cost, and is dependent on additional long-term, high cost regional investments.

Construction of a Mid-Point Yard at Campbell Hall on the Port Jervis Line does not score well in most metrics. Although a new Mid-Point Yard would provide operational flexibility and service improvements, it is not a cost-effective project mainly due to low ridership and negligible increase in travel times savings, capacity and geographic distribution. Network leverage also gets a low score since MTA does not own the property for the construction of the yard. It does scores above average in equity since many of its riders are from equity areas and it reduces vehicle usage significantly, largely because it provides an alternative to bus or driving.

Ridgewood Busway

Description: Conversion of an existing MTA-owned right-of-way into an exclusive busway running approximately half a mile from Palmetto Street near Onderdonk Avenue to Fresh Pond Road. This project has previously been referred to as Myrtle Avenue Busway, as it runs under the Myrtle Avenue Ⓜ line. Since the actual area of the project is not at Myrtle Avenue, however, the project has been renamed.

Project objectives: Improve operations by eliminating difficult turns and traffic issues. Increase bus speeds and service reliability.

Above, Ridgewood Busway

Evaluation results

Construction Cost (2027): $30 million

Fleet Cost (2027): N/A

Annual O&M Cost (2027): -$2 million

Daily Ridership (2045): 8,900

New Daily Riders (2045): 200

Riders from Equity Areas (2045): 8,350

Travel Time Saved Per Trip (minutes): 1.7

Special Considerations:

Significant operational cost savings. Additional benefits not captured in metrics:

- Service Improvements to riders on multiple bus routes; these improvements would extend beyond project area and include improvements such as increased reliability to entire bus routes.
- Street Safety improvements and decrease number of buses on local street network.

<20
20-39
40-59
60-79
>=80

Scorecard

Criteria	Metrics	Result	Score (0-100)
Cost, Ridership & Time Savings	Cost/Time saved (30 years)	$0/min*	100
Equity	Percent of riders from Equity Areas	94%	93
Sustainability	Change in daily vehicle miles traveled	-287	22
Resiliency	Rail connections within ½ mile (NYC) or 5 miles (suburbs)	2	11
Capacity	Change in passenger hours of crowding systemwide *(AM peak period)*	-239 hours	2
Geographic Distribution	Change in regional accessibility	-347 hours	0
Network Leverage	Weighted sum of MTA, Public and Private ROW	50%	33

**Operation and maintenance savings exceed capital costs over project lifetime.*

Findings

This project performs well in cost effectiveness due to operational savings and a relatively low cost to implement. This is a small project, but its positive impacts go beyond the immediate geographic region of the project and benefit riders on multiple bus routes that would become more reliable and operationally efficient.

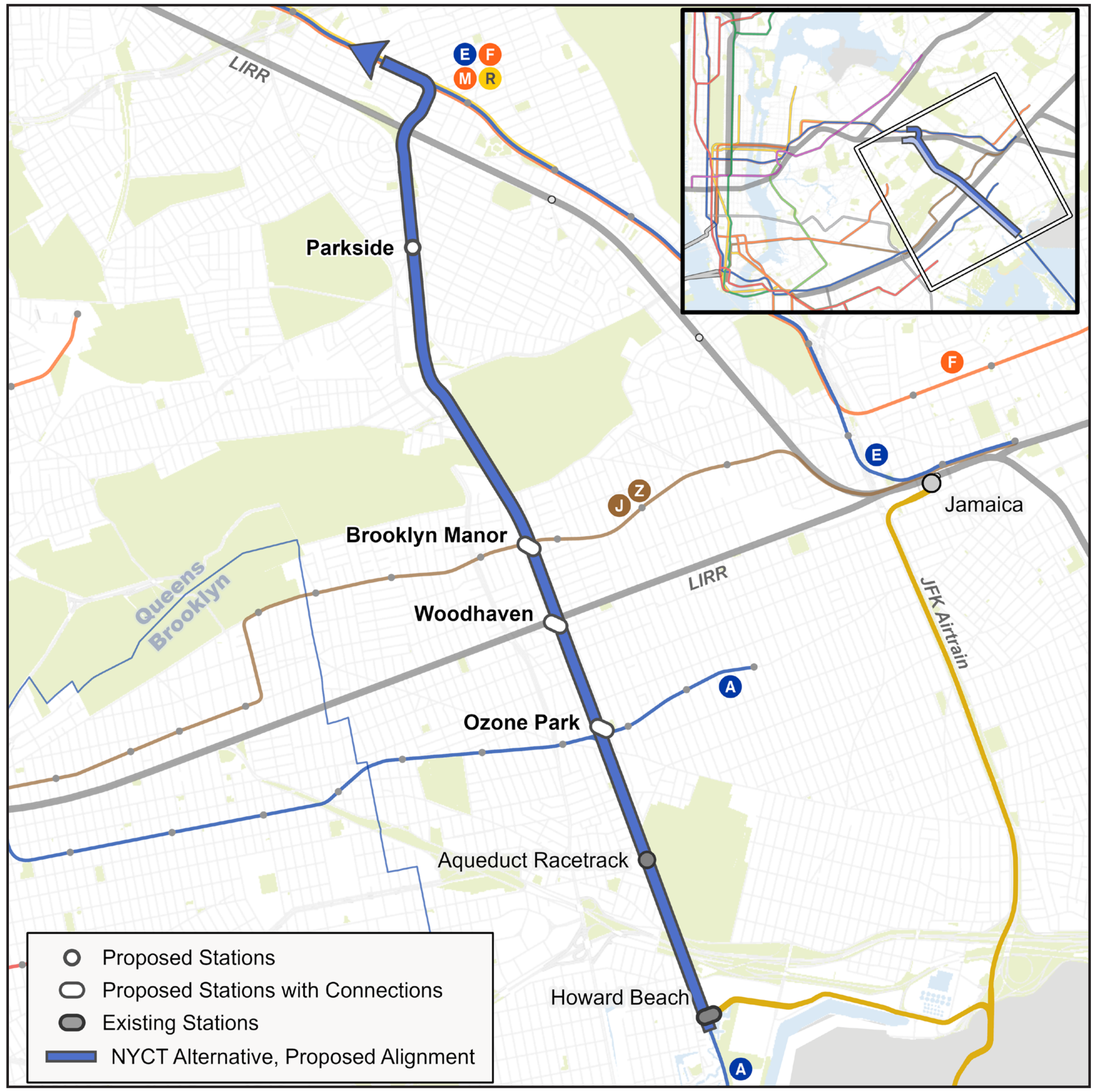
Converting this MTA-owned right-of-way into a busway scores exceptionally well in cost effectiveness since it saves money operationally. It also does well in equity, with most of its riders being from equity areas. However, it does not score well in resiliency and sustainability, nor does it improve systemwide capacity or regional accessibility significantly enough, relative to other projects. Network leverage gets an average score since MTA owns a portion of the proposed busway under the elevated subway line.

Rockaway Beach Branch Reactivation

New York City Transit

Description: Reactivation of 6-mile alignment along former Long Island Rail Road right-of-way serving Central Queens with up to four new stations and connections at Aqueduct and Howard Beach. Alternatives included Long Island Rail Road and New York City Transit subway as the modes.

Project objectives: Provide service to underserved communities; Increase transit options, reduce auto dependence, and improve network connections for intra- and inter-borough travelers; add opportunities for development and growth near stations.



Above, Rockaway Beach Branch Reactivation (NYCT)

Evaluation results

Construction Cost (2027): $5.9 billion

Fleet Cost (2027): $101 million

Annual O&M Cost (2027): $95 million

Daily Ridership (2045): 39,200

New Daily Riders (2045): 2,000

Riders from Equity Areas (2045): 32,940

Travel Time Saved Per Trip (minutes): 4.0

Special Considerations:
New York City-owned right-of-way: plans for a linear park along portions of the corridor, creating a challenge for any future transit alternatives. NYCT option would require tunneling underneath existing buildings north of LIRR right-of-way.

<20
20-39
40-59
60-79
>=80

Scorecard

Criteria	Metrics	Result	Score (0-100)
Cost, Ridership & Time Savings	Cost/Time saved (30 years)	$6.72/min	56
Equity	Percent of riders from Equity Areas	84%	80
Sustainability	Change in daily vehicle miles traveled	-24,297	48
Resiliency	Rail connections within ½ mile (NYC) or 5 miles (suburbs)	6	33
Capacity	Change in passenger hours of crowding systemwide *(AM peak period)*	-842 hours	10
Geographic Distribution	Change in regional accessibility	0 hours	0
Network Leverage	Weighted sum of MTA, Public and Private ROW	66%	54

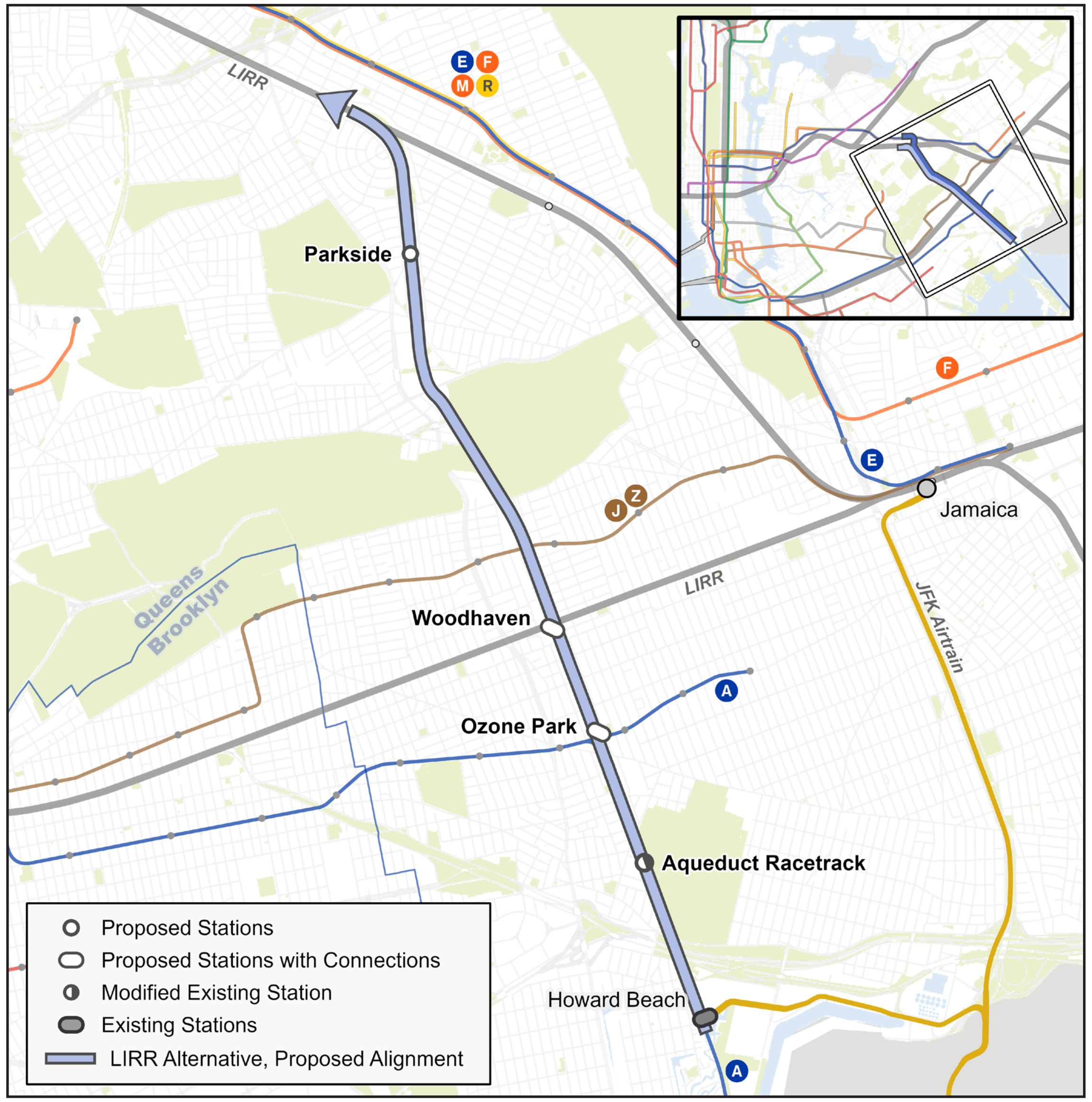
Findings

This project does not score well in most metrics.

Reactivating the Rockaway Beach Branch with NYCT service has a high cost and serves a relatively modest number of riders. This project would reduce auto usage and provide additional rail connections, but compared to other projects, the benefits are average for sustainability and resiliency. There is minimal crowding reduction since some Queens Blvd Line subway service would be moved to serve this new line, and there is no improvement in geographic distribution, resulting in low scores for both. Additionally, a portion of the right-of-way is currently proposed to be a pedestrian and bicycle greenway corridor by New York City, which would compete with a transit alignment along this corridor.

Rockaway Beach Branch Reactivation

Alternative Considered: Long Island Rail Road



Above, Rockaway Beach Branch Reactivation (LIRR)

Evaluation results

Construction Cost (2027): $4.1 billion

Fleet Cost (2027): $169 million

Annual O&M Cost (2027): $22 million

Daily Ridership (2045): 14,500

New Daily Riders (2045): 300

Riders from Equity Areas (2045): 9,430

Travel Time Saved Per Trip (minutes): 0.2

Special Considerations:
New York City-owned right-of-way: plans for a linear park along portions of the corridor, creating a challenge for any future transit alternatives. LIRR option would require reducing service on the main LIRR branch to accommodate services on this new branch.

<20
20-39
40-59
60-79
>=80

Scorecard

Criteria	Metrics	Result	Score (0-100)
Cost, Ridership & Time Savings	Cost/Time saved (30 years)	$262.26/ min	0
Equity	Percent of riders from Equity Areas	65%	56
Sustainability	Change in daily vehicle miles traveled	+19,891	0
Resiliency	Rail connections within ½ mile (NYC) or 5 miles (suburbs)	4	22
Capacity	Change in passenger hours of crowding systemwide *(AM peak period)*	+4,040 hours	0
Geographic Distribution	Change in regional accessibility	+5,280 hours	0
Network Leverage	Weighted sum of MTA, Public and Private ROW	51%	34

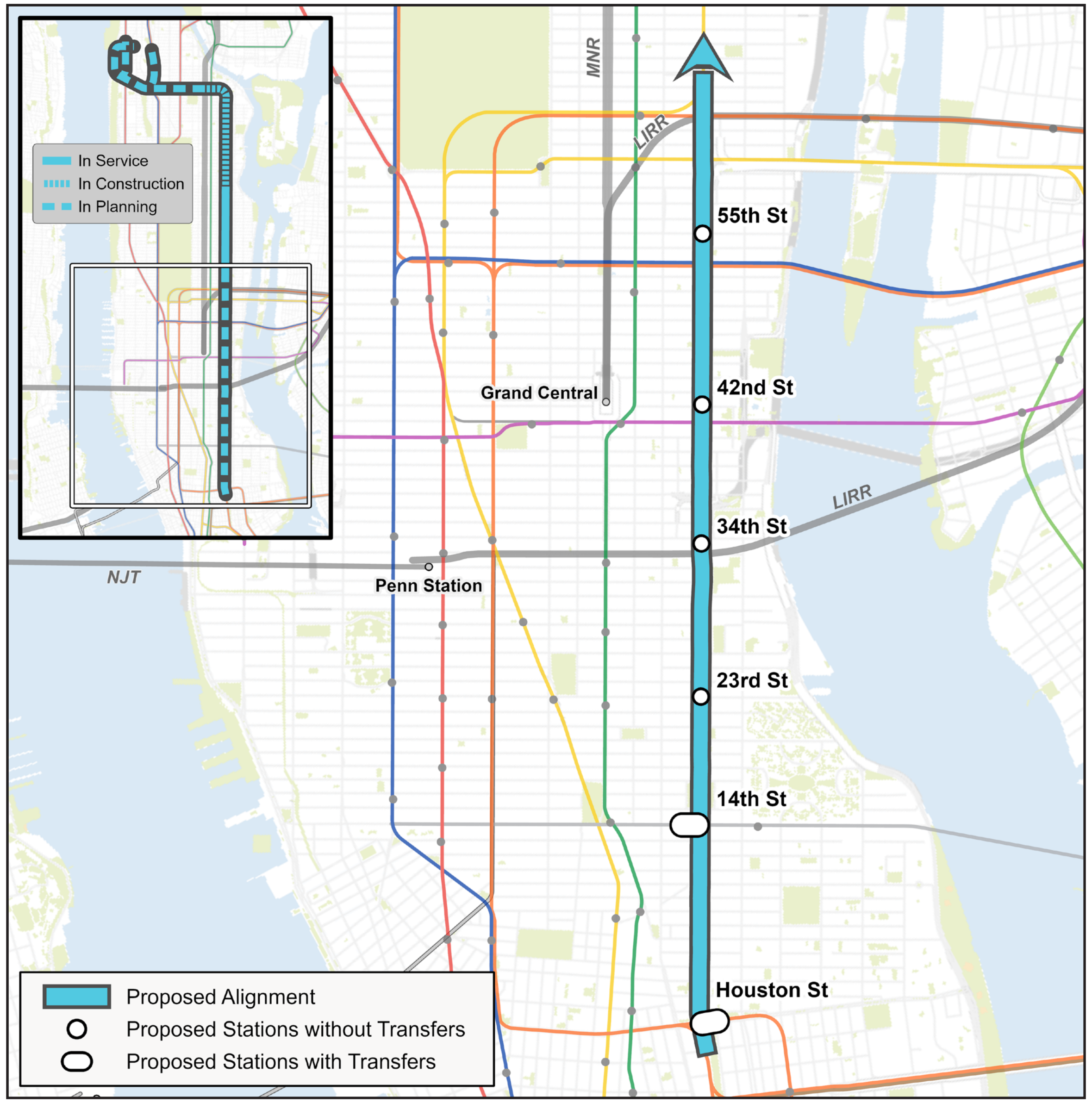
Findings

The LIRR alternative has a slightly lower cost but would serve dramatically fewer riders and would increase travel time to riders on the main LIRR branch, making it even less cost-effective than the NYCT alternative.

Second Avenue Subway South to Houston

Description: Extending the Second Avenue Subway south by three miles, from 72nd Street to Houston Street, including the construction of six new subway stations at 55th, 42nd, 34th, 23rd,14th St, and Houston Streets.

Project objectives: Provide service to underserved communities; enhance transit options and improve network connectivity by providing transfer opportunities; increase subway service frequency between 72nd St and 125th St with the addition of new T line service; reduce travel times for customers east of 2nd Avenue; reduce demand on the Lexington Avenue Line; and support opportunities for development and growth near stations.



Above, Second Ave Subway South to Houston

Evaluation results

Construction Cost (2027): $13.5 billion

Fleet Cost (2027): $611 million

Annual O&M Cost (2027): $106 million

Daily Ridership (2045): 230,400

New Daily Riders (2045): 2,900

Riders from Equity Areas (2045): 137,500

Travel Time Saved Per Trip (minutes): 2.0

<20
20-39
40-59
60-79
>=80

Scorecard

Criteria	Metrics	Result	Score (0-100)
Cost, Ridership & Time Savings	Cost/Time saved (30 years)	$4.47/ min	73
Equity	Percent of riders from Equity Areas	60%	48
Sustainability	Change in daily vehicle miles traveled	-3,747	26
Resiliency	Rail connections within ½ mile (NYC) or 5 miles (suburbs)	16	89
Capacity	Change in passenger hours of crowding systemwide *(AM peak period)*	-2,595 hours	32
Geographic Distribution	Change in regional accessibility	-296 hours	0
Network Leverage	Weighted sum of MTA, Public and Private ROW	50%	33

Findings

The high cost of this project is partially offset by the high ridership and moderate travel time savings.

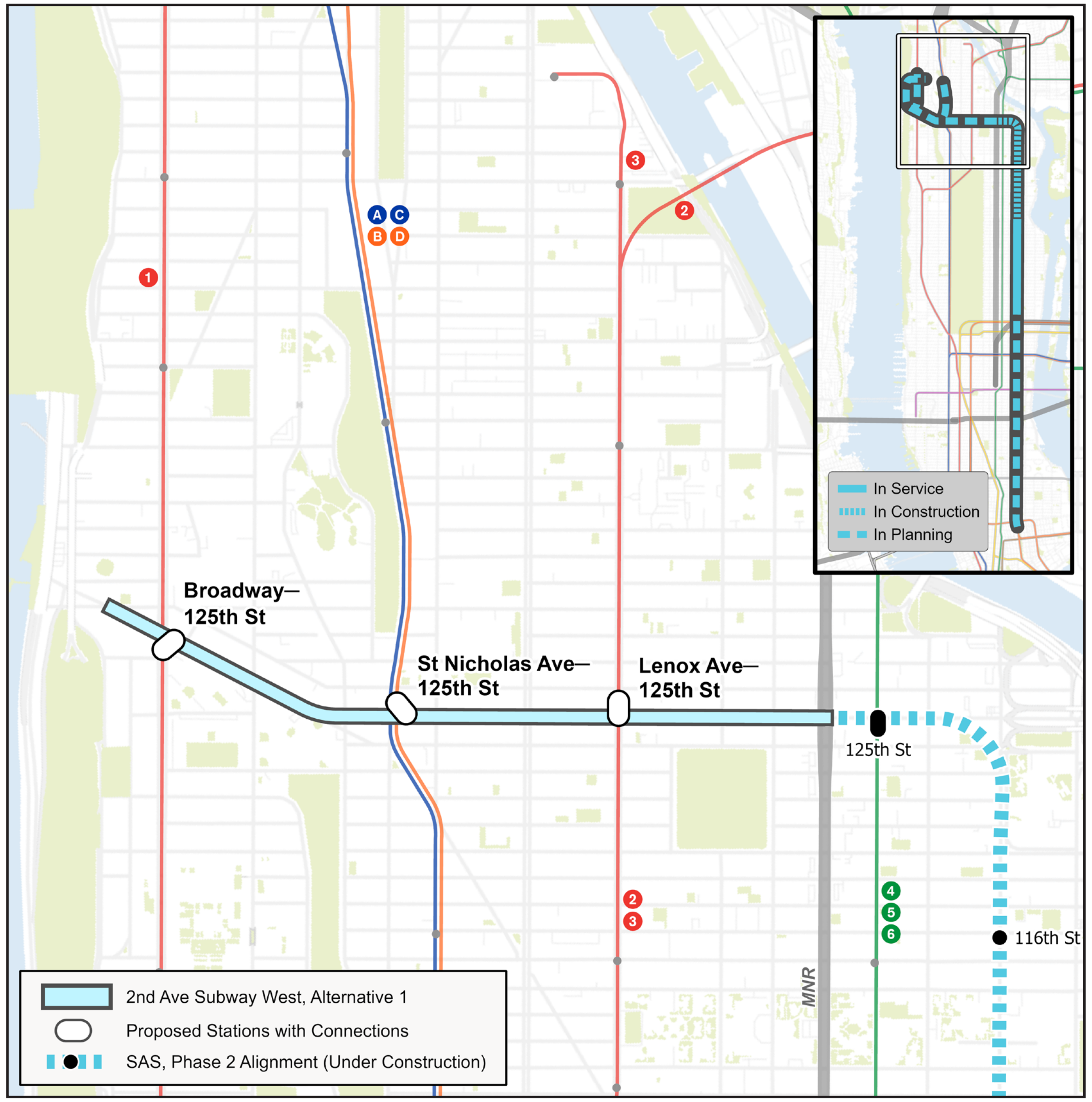
Extending the Second Avenue Subway south to Houston St scores above average in cost effectiveness because of very high ridership and moderate time savings, which offset the project's the high cost. A little more than half of the total riders are from equity areas, resulting in an average score in equity. It reduces auto use only slightly and does not score as well in sustainability compared to other projects. However, it provides new rail connections to many subway lines, and gets a very high resiliency score. While it does reduce crowding, it scores below average in capacity compared to other projects. It does not really improve regional accessibility and scores poorly in geographic distribution. It scores below average in network leverage because it would require tunneling under New York City-owned streets.

Second Avenue Subway West Extension

125th Street/Broadway

Description: Extension of the Second Avenue Subway west along 125th Street, terminating at Broadway-125th St, with three new subway stations.

Project objectives: Improve mobility and connections between West and East sides of Manhattan; provide customers with accessibility to East Side job centers via Second Avenue Subway; add opportunities for development and growth near stations; reduce congestion on bus routes along 125th Street.



Above, Second Ave Subway West to 125th St/Broadway

Evaluation results

Construction Cost (2027): $7.5 billion

Fleet Cost (2027): $611 million

Annual O&M Cost (2027): $65 million

Daily Ridership (2045): 239,700

New Daily Riders (2045): 7,500

Riders from Equity Areas (2045): 224,050

Travel Time Saved Per Trip (minutes): 3.6

Special Considerations:
Prerequisite to this project is the completion of Second Avenue Subway Phase 2.

<20
20-39
40-59
60-79
>=80

Scorecard

Criteria	Metrics	Result	Score (0-100)
Cost, Ridership & Time Savings	Cost/Time saved (30 years)	$1.43/ min	97
Equity	Percent of riders from Equity Areas	93%	93
Sustainability	Change in daily vehicle miles traveled	-26,017	50
Resiliency	Rail connections within ½ mile (NYC) or 5 miles (suburbs)	11	61
Capacity	Change in passenger hours of crowding systemwide *(AM peak period)*	-6,952 hours	87
Geographic Distribution	Change in regional accessibility	-4,106 hours	15
Network Leverage	Weighted sum of MTA, Public and Private ROW	50%	33

Findings

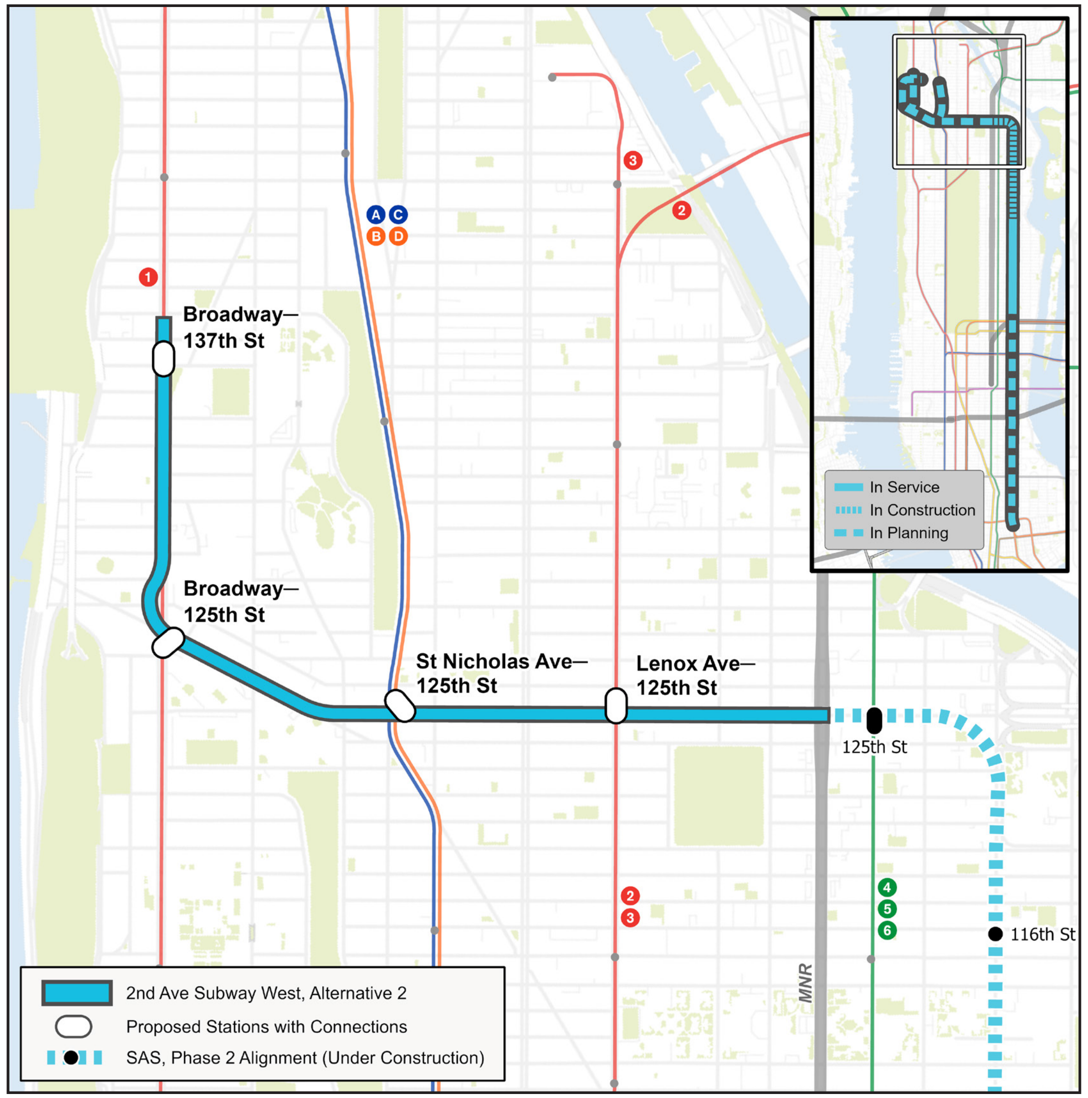
Despite the high cost, this project is cost effective with very high ridership and moderate travel time savings.

Extending the Second Avenue Subway west along 125th Street gets a high score in cost effectiveness because it provides a new east-west connection across Manhattan, saves travel time and serves a great deal of riders, most of which are in equity areas. It reduces car usage by a fair amount and connects with numerous other rail lines, resulting in average sustainability and high resiliency scores. It scores well on capacity since it reduces crowding, mainly on west side subway lines. Though it improves regional accessibility slightly, the score is low relative to other projects. It scores below average in network leverage because it would require tunneling under New York City-owned streets.

Second Avenue Subway West Extension

Alternative Considered: 137th Street/Broadway via Broadway

Description: Extension of the Second Avenue Subway west along 125th Street then turning north along Broadway, terminating at Broadway-137th St, with up to four new subway stations.



Above, Second Ave Subway West to 137th St/Broadway via Broadway

Evaluation results

Construction Cost (2027): $9.1 billion

Fleet Cost (2027): $717 million

Annual O&M Cost (2027): $80 million

Daily Ridership (2045): 256,800

New Daily Riders (2045): 8,800

Riders from Equity Areas (2045): 240,930

Travel Time Saved Per Trip (minutes): 3.8

Special Considerations:
Prerequisite to this project is the completion of Second Avenue Subway Phase 2.

Involves tunneling under existing 1 line requiring stabilization.

<20
20-39
40-59
60-79
>=80

Scorecard

Criteria	Metrics	Result	Score (0-100)
Cost, Ridership & Time Savings	Cost/Time saved (30 years)	$1.52/ min	96
Equity	Percent of riders from Equity Areas	94%	93
Sustainability	Change in daily vehicle miles traveled	-31,518	56
Resiliency	Rail connections within ½ mile (NYC) or 5 miles (suburbs)	11	61
Capacity	Change in passenger hours of crowding systemwide *(AM peak period)*	-10,377 hours	100
Geographic Distribution	Change in regional accessibility	-8,981 hours	34
Network Leverage	Weighted sum of MTA, Public and Private ROW	50%	33

Findings

This alternative is less cost effective than the 125th Steet/Broadway alternative selected for analysis, with a higher cost without a correspondingly higher ridership or time savings benefit. As a result, preliminary analysis indicates that the 125th Street/Broadway alternative is the most promising westward configuration for Second Avenue Subway.

Feasibility of Other Alternatives:

Second Avenue Subway West to 137 Street/Broadway via Riverside

- This alternative was also considered as an alternate underground configuration to reach 137 St and Broadway. Cost modeling showed it would be more expensive and so it was not included in the final analysis at this time.

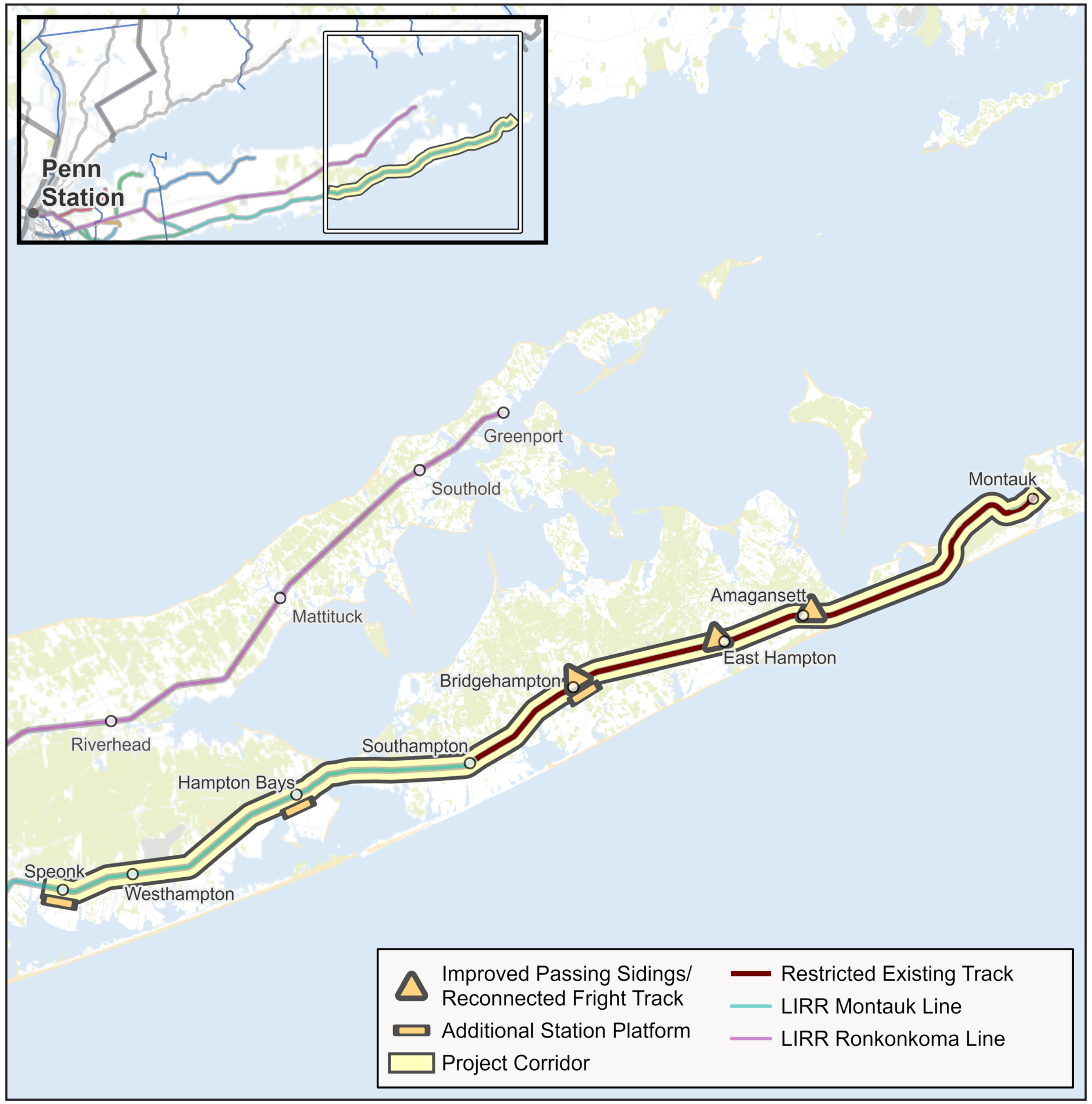
Second Avenue Subway West via St Nicholas Ave

- In further analyzing this alternative, significant operational problems were identified, especially related to capacity on the A B C D lines. As a result, this alternative was not selected for analysis at this time.

Speonk-Montauk Capacity Improvements

Description: Improvements of the Long Island Rail Road Montauk Branch between Speonk and Montauk, including signal upgrades and associated infrastructure work.

Project objectives: Improve operational flexibility and ability to add service westbound during the PM.



Above, Speonk-Montauk Capacity Improvements

Evaluation results

Construction Cost (2027): $260 million

Fleet Cost (2027): $80 million

Annual O&M Cost (2027): $6 million

Daily Ridership (2045): 1,500

New Daily Riders (2045): 100

Riders from Equity Areas (2045): 540

Travel Time Saved Per Trip (minutes): 2.9

Special Considerations:

Full investment package required to take full advantage of benefits, including provision of South Fork Commuter Connection service on summer Fridays in the PM peak.

Studies needed to assess fleet needs and right-of-way requirements.

<20
20-39
40-59
60-79
>=80

Scorecard

Criteria	Metrics	Result	Score (0-100)
Cost, Ridership & Time Savings	Cost/Time saved (30 years)	$13.66 /min	3
Equity	Percent of riders from Equity Areas	35%	16
Sustainability	Change in daily vehicle miles traveled	-2,143	24
Resiliency	Rail connections within ½ mile (NYC) or 5 miles (suburbs)	0	0
Capacity	Change in passenger hours of crowding systemwide *(AM peak period)*	+1,063 hours	0
Geographic Distribution	Change in regional accessibility	-2,049 hours	7
Network Leverage	Weighted sum of MTA, Public and Private ROW	100%	100

Findings

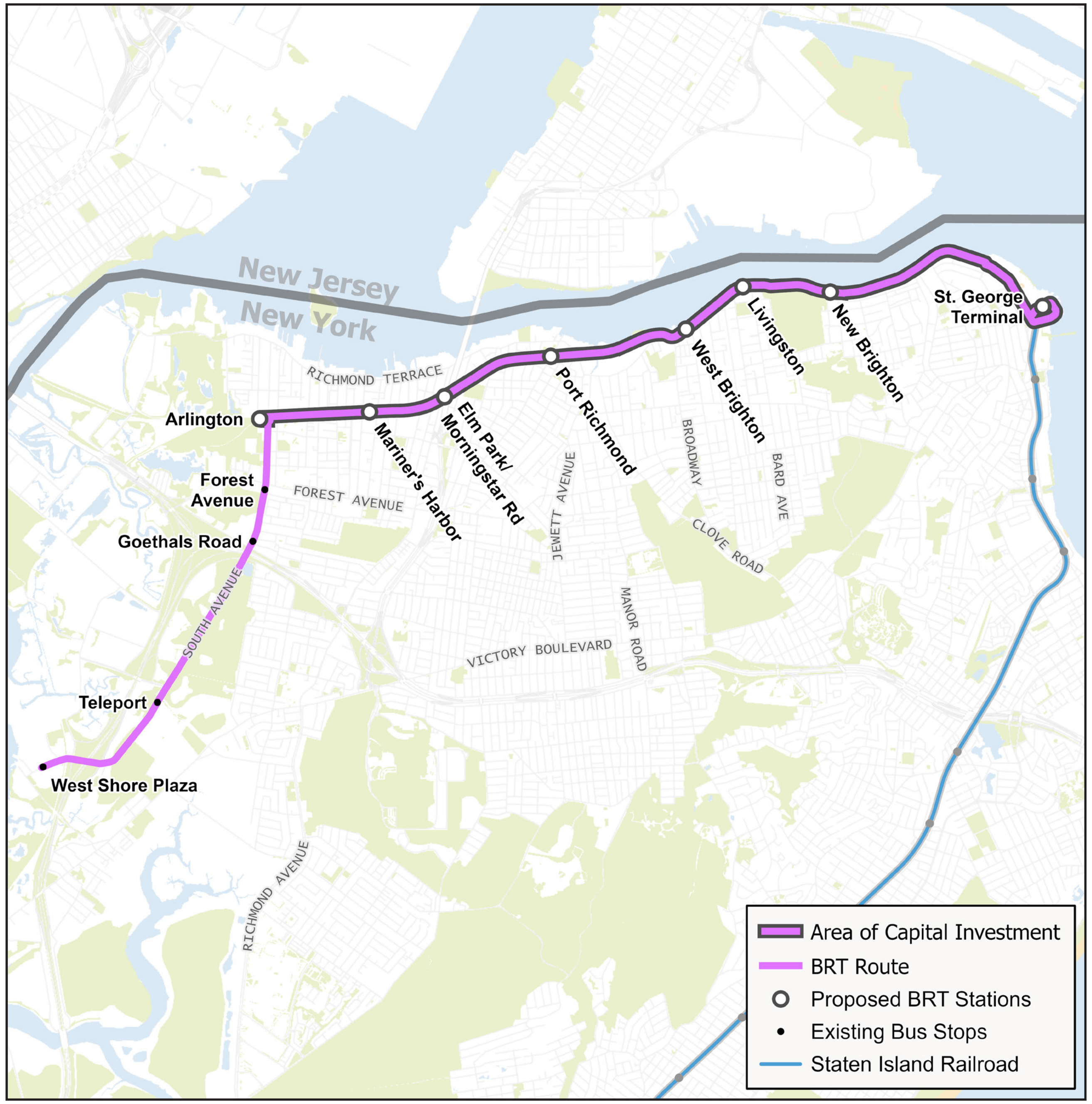
This project would not attract many riders and, despite its relatively low cost, it is not cost effective. It would not significantly address highway congestion concerns to/from the South Fork.

Improvements to the LIRR's Montauk Branch are not cost effective with very low ridership and moderate time savings. It would not serve many riders from equity areas. While it reduces vehicle usage slightly, it is below average compared to other projects and does not score well in sustainability. It does not provide any new rail connections and scores poorly in resiliency. It gets a low score for capacity as well, since it actually increases crowding and adds more riders to existing LIRR trains. It improves regional accessibility slightly but scores low in geographic distribution relative to other projects. Since it is entirely on MTA's right-of-way, it scores well in network leverage.

Staten Island North Shore Bus Rapid Transit

Description: Implementation of a new 8-mile Bus Rapid Transit (BRT) service along 4.8 miles of the former North Shore Railroad right-of-way and 3.2 miles on City streets; operating on an exclusive bus lane along Richmond Terrace (0.5 mi) and in mixed traffic along South Avenue (2.7 mi).

Project objectives: Improve connections between neighborhoods and existing North and West Shore activity centers, industries, employment centers, and the Staten Island Railway; enhance transit reliability.



Above, Staten Island North Shore Bus Rapid Transit

Evaluation results

Construction Cost (2027): $1.3 billion

Fleet Cost (2027): $34 million

Annual O&M Cost (2027): $24 million

Daily Ridership (2045): 32,000

New Daily Riders (2045): 1,300

Riders from Equity Areas (2045): 22,820

Travel Time Saved Per Trip (minutes): 5.6

Special Considerations:
Competing transportation demands along portions of former North Shore railroad right-of-way and along Richmond Terrace, including potential impact to significant number of on-street parking spaces and NYPD parking.

Parkland alienation and historic preservation concerns at Snug Harbor.

Preserving active maritime business uses at Atlantic Salt and Caddell Dry Dock with a land exchange.

<20
20-39
40-59
60-79
>=80

Scorecard

Criteria	Metrics	Result	Score (0-100)
Cost, Ridership & Time Savings	Cost/Time saved (30 years)	$1.43/ min	97
Equity	Percent of riders from Equity Areas	71%	64
Sustainability	Change in daily vehicle miles traveled	-7,904	30
Resiliency	Rail connections within ½ mile (NYC) or 5 miles (suburbs)	1	6
Capacity	Change in passenger hours of crowding systemwide *(AM peak period)*	+42 hours	0
Geographic Distribution	Change in regional accessibility	-11,013 hours	42
Network Leverage	Weighted sum of MTA, Public and Private ROW	50%	33

Findings

This project improves reliability and efficiency, resulting in the travel time savings for a significant number of riders and a high cost effectiveness score.

A new BRT route along Staten Island's North Shore receives a high cost effectiveness score due to reduced travel times for a significant number of riders. It scores above average in equity since many of those riders are from equity areas. Although it reduces vehicle usage, it is below average compared to other projects and receives a fair score in sustainability. It scores poorly in resiliency since it only provides one new rail connection. It scores poorly in capacity as well since it increases crowding by adding riders to subway lines in lower Manhattan. It improves regional accessibility and receives an average score in geographic distribution relative to other projects. For network leverage, it scores below average since its alignment is along New York City-owned right-of-way.

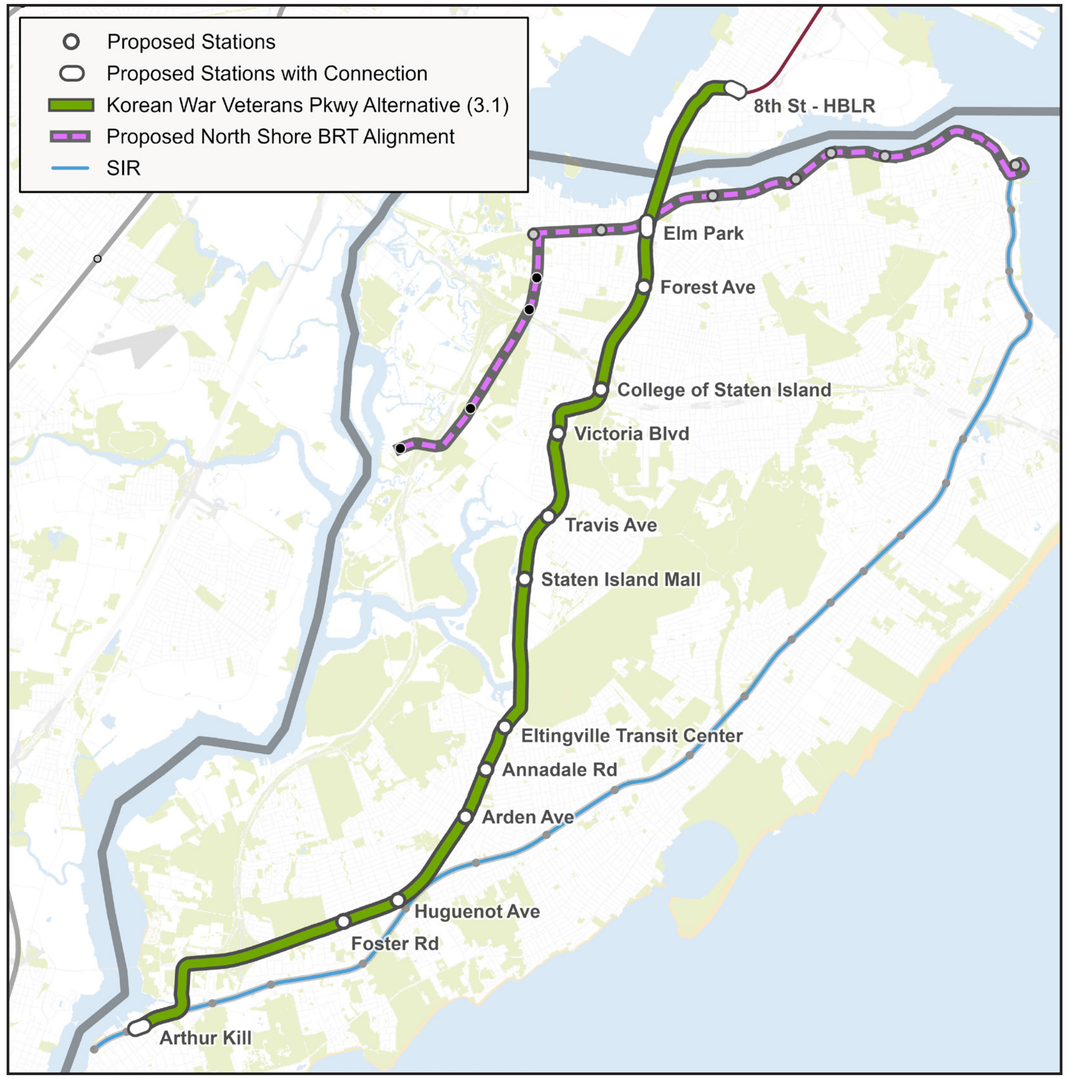
Staten Island West Shore Bus Rapid Transit

Korean War Veterans Pkwy

Description: Improvements to transit connectivity and access within, to, and from the West Shore of Staten Island.

The best performing alternative considered is Bus Rapid Transit along Korean War Veterans Pkwy and Richmond Avenue from Tottenville to Bayonne

Project Objectives: Provide more reliable transit service on Staten Island's West Shore. Improve connections between neighborhoods, activity, and employment centers, and add opportunities for development and growth near stations.



Above, Staten Island West Shore BRT via Koren War Veterans Pkwy

Evaluation results

Construction Cost (2027): $1.9 billion

Fleet Cost (2027): $11 million

Annual O&M Cost (2027): $29 million

Daily Ridership (2045): 16,900

New Daily Riders (2045): 3,500

Riders from Equity Areas (2045): 6,320

Travel Time Saved Per Trip (minutes): 9.9

Special Considerations:
The North Shore BRT project is part of the baseline for the West Shore Transit Improvements. Therefore, the West Shore Transit improvements could not occur until after North Shore BRT is operational.

<20
20-39
40-59
60-79
>=80

Scorecard

Criteria	Metrics	Result	Score (0-100)
Cost, Ridership & Time Savings	Cost/Time saved (30 years)	$1.95/ min	93
Equity	Percent of riders from Equity Areas	37%	19
Sustainability	Change in daily vehicle miles traveled	-25,279	49
Resiliency	Rail connections within ½ mile (NYC) or 5 miles (suburbs)	3	17
Capacity	Change in passenger hours of crowding systemwide *(AM peak period)*	-46 hours	0
Geographic Distribution	Change in regional accessibility	-25,566 hours	100
Network Leverage	Weighted sum of MTA, Public and Private ROW	50%	33

Findings

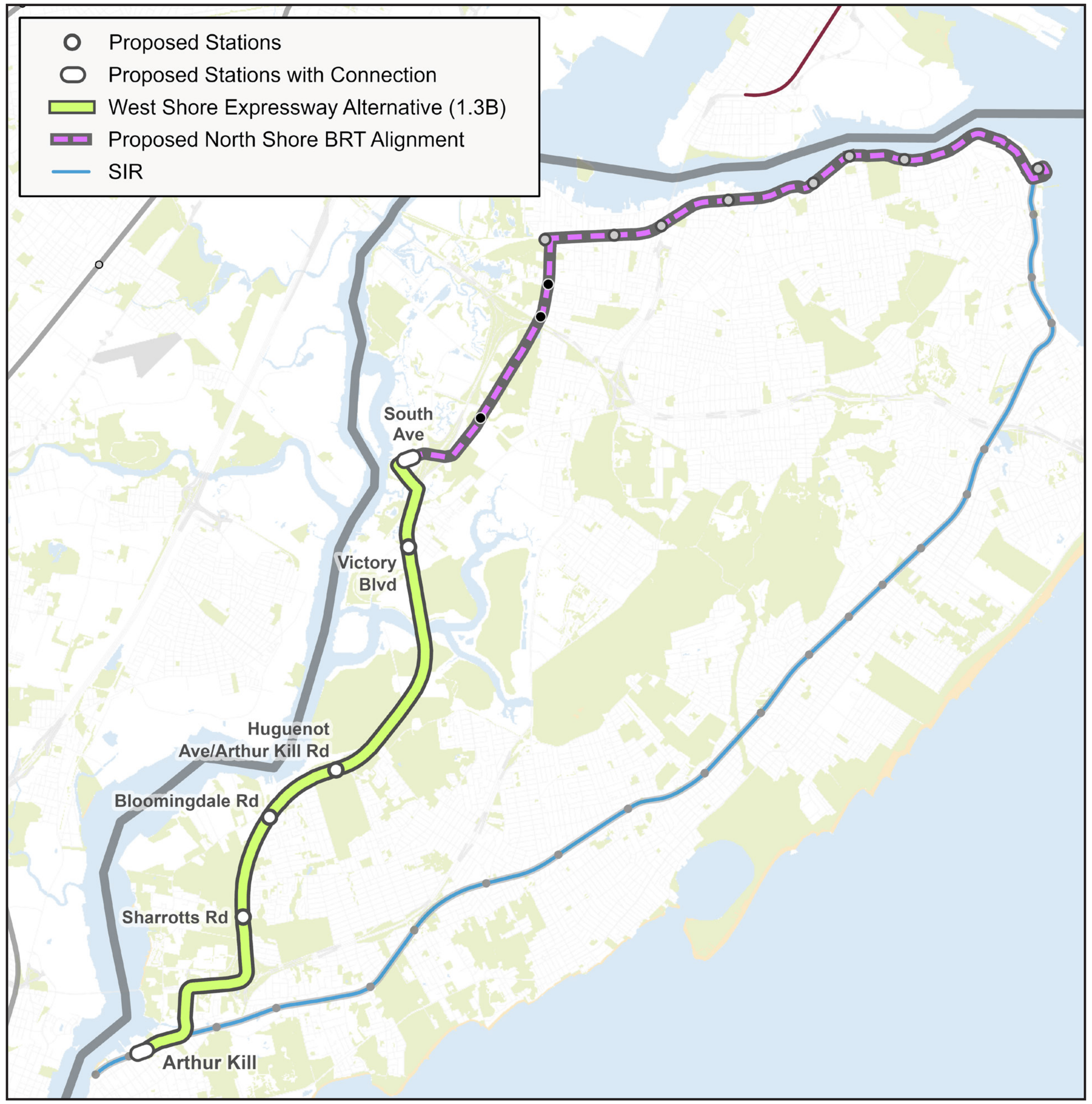
This project would provide better connections and reliability, resulting in significant travel time savings, but for a relatively small number of riders.

A new BRT route along Staten Island's Korean War Veterans parkway receives a high cost effectiveness score since it provides a significant reduction in travel time for project riders. It improves regional accessibility and receives a high score geographic distribution. It receives a low score in equity since about a third of riders are from equity areas. The reduction in vehicle usage is moderate and it receives an average score in sustainability. Resiliency is below average compared to other projects, but it would provide connections to three rail lines, one of which is NJ Transit LRT at Bayonne. It scores poorly in capacity since it does not meaningfully reduce crowding. For network leverage, it scores below average since its alignment is along City-owned right-of-way.

Staten Island West Shore Bus Rapid Transit

Alternative Considered: West Shore Expressway

Description: Bus Rapid Tranist along West Shore Expwy from Tottenville to North Shore.



Above, Staten Island West Shore BRT via West Shore Expressway

Evaluation results

Construction Cost (2027): $2.1 billion

Fleet Cost (2027): $16 million

Annual O&M Cost (2027): $24 million

Daily Ridership (2045): 8,200

New Daily Riders (2045): 2,200

Riders from Equity Areas (2045): 2,440

Travel Time Saved Per Trip (minutes): 12.8

Special Considerations:
The North Shore BRT project is part of the baseline for the West Shore Transit Improvements. Therefore, the West Shore Transit improvements could not occur until after North Shore BRT is operational.

<20
20-39
40-59
60-79
>=80

Scorecard

Criteria	Metrics	Result	Score (0-100)
Cost, Ridership & Time Savings	Cost/Time saved (30 years)	$3.34/ min	82
Equity	Percent of riders from Equity Areas	30%	9
Sustainability	Change in daily vehicle miles traveled	-16,545	39
Resiliency	Rail connections within ½ mile (NYC) or 5 miles (suburbs)	1	6
Capacity	Change in passenger hours of crowding systemwide *(AM peak period)*	-47 hours	0
Geographic Distribution	Change in regional accessibility	-10,613 hours	41
Network Leverage	Weighted sum of MTA, Public and Private ROW	50%	33

Findings

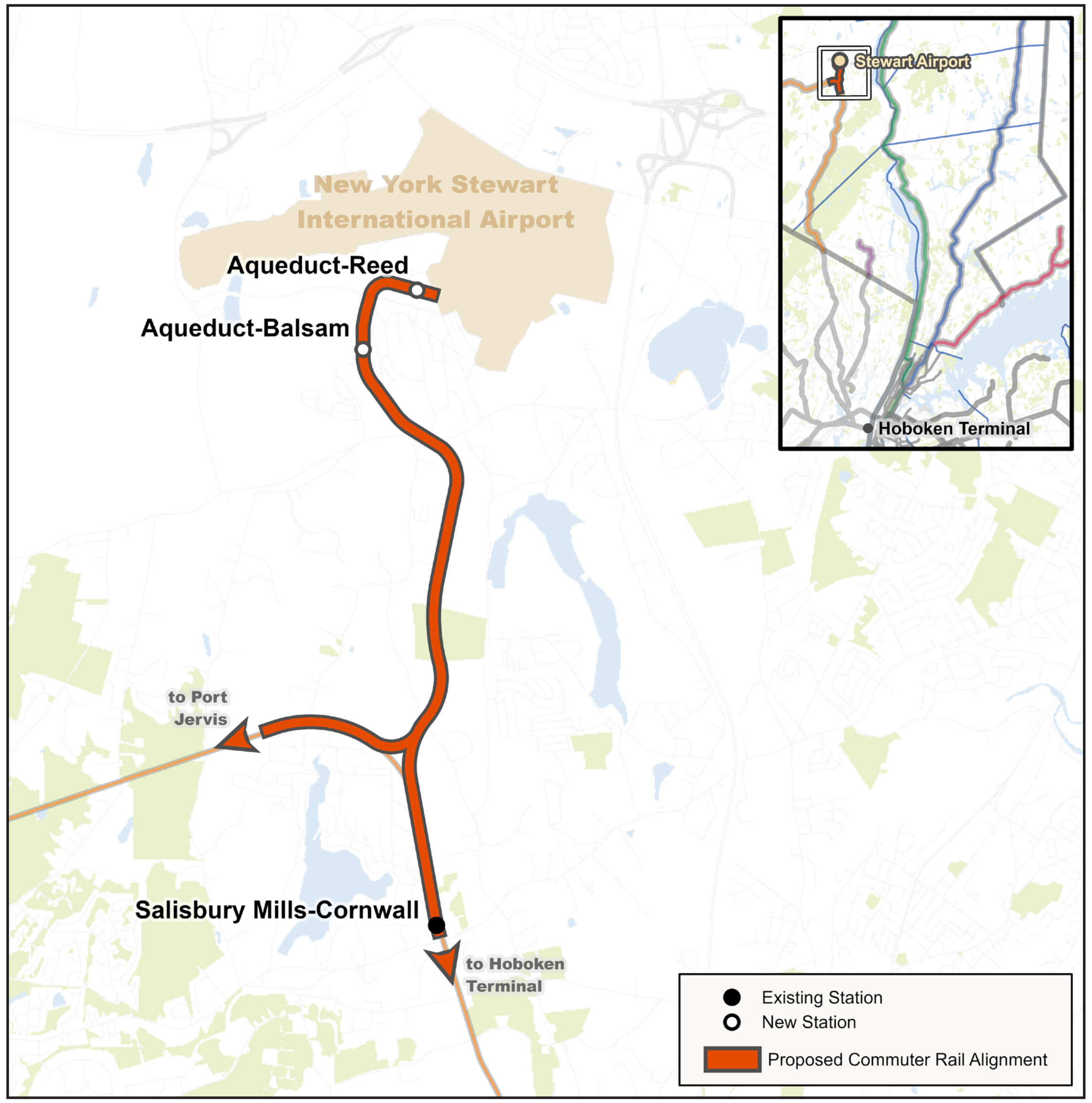
Routing the West Shore BRT via the West Shore Expressway is less cost effective than via the Korean War Veterans Parkway, as its ridership is lower while its cost is higher.

Stewart Airport Commuter Rail

Description: Implementation of new or improved transit service to Stewart International Airport (SWF). Several alternatives were analyzed, as listed below, although the Evaluation results on this page correspond to the Commuter Rail option.

- Bus from Beacon Station on the Metro-North Hudson Line
- Direct bus service from NYC
- Commuter rail extension from Salisbury Mill on the Port Jervis Line*
- Bus Rapid Transit from Salisbury Mills

Project objectives: Improve mobility and transit access between Orange County, Stewart International Airport and surrounding regions, Lower Hudson Valley, and New York City and reduce traffic and vehicle emissions to/from the airport.



Above, Stewart Commuter Rail Alternative

Evaluation results

Construction Cost (2027): $1.4 billion

Fleet Cost (2027): $461 million

Annual O&M Cost (2027): $43 million

Daily Ridership (2045): 4,300

New Daily Riders (2045): 1,900

Riders from Equity Areas (2045): 3,260

Travel Time Saved Per Trip (minutes): 7.9

Special Considerations:

Commuter rail extension from Salisbury Mills Station on the Port Jervis Line (PJL) to SWF would be the only alternative that MTA Metro-North would operate.

Direct Manhattan Service via Secaucus Loop, Gateway Program, Penn Station Expansion, other NJ improvements, and PJL improvements are a prerequisite.

Requires coordination with the PANYNJ, NYS DOT, and the Town of New Windsor.

<20
20-39
40-59
60-79
>=80

Scorecard

Criteria	Metrics	Result	Score (0-100)
Cost, Ridership & Time Savings	Cost/Time saved (30 years)	$10.65/ min	**26**
Equity	Percent of riders from Equity Areas	75%	**68**
Sustainability	Change in daily vehicle miles traveled	-117,470	**100**
Resiliency	Rail connections within ½ mile (NYC) or 5 miles (suburbs)	1	**6**
Capacity	Change in passenger hours of crowding systemwide *(AM peak period)*	+3 hours	**0**
Geographic Distribution	Change in regional accessibility	+20,390 hours	**0**
Network Leverage	Weighted sum of MTA, Public and Private ROW	30%	**7**

Findings

This project would attract relatively few riders at a high cost, and is dependent on additional long-term, high cost regional investments.

Construction of a commuter rail extension from the Port Jervis Line to Stewart Airport does not score well in most metrics. Cost effectiveness gets a low score mainly due to low ridership and the high cost. It does score above average in equity since many of its riders are from equity areas. Also, it reduces vehicle usage significantly, largely because it provides an alternative to driving to Stewart Airport therefore getting a high score in sustainability. It would only provide one new rail connection, resulting in a low resiliency score. It does not improve capacity or geographic distribution, both of which receive low scores. Network leverage gets a low score since MTA does not own the right-of-way along the proposed alignment.

Sunnyside Station (LIRR)

Description: Construction of a new Long Island Rail Road station in Sunnyside/Long Island City area.

Project objectives: Improve connectivity for Sunnyside and Long Island City neighborhoods to the existing network.

Above, Sunnyside Station (LIRR)

Evaluation results

Construction Cost (2027): $490 million

Fleet Cost (2027): N/A

Annual O&M Cost (2027): $2 million

Daily Ridership (2045): 7,900

New Daily Riders (2045): 900

Riders from Equity Areas (2045): 5,120

Travel Time Saved Per Trip (minutes): 1.6

Special Considerations:

Unique and complex station location at Harold Interlocking.

Coordination required with Amtrak, which owns the right-of-way.

Adds travel time for existing LIRR customers.

<20
20-39
40-59
60-79
>=80

Scorecard

Criteria	Metrics	Result	Score (0-100)
Cost, Ridership & Time Savings	Cost/Time saved (30 years)	No Time Saved*	0
Equity	Percent of riders from Equity Areas	65%	55
Sustainability	Change in daily vehicle miles traveled	-15,006	38
Resiliency	Rail connections within ½ mile (NYC) or 5 miles (suburbs)	6	33
Capacity	Change in passenger hours of crowding systemwide *(AM peak period)*	+1,216 hours	0
Geographic Distribution	Change in regional accessibility	-246,220 hours	100
Network Leverage	Weighted sum of MTA, Public and Private ROW	38%	17

** No overall time savings due to increased travel for existing users.*

Findings

This project saves travel time for new riders but creates additional travel time for existing LIRR customers, resulting in no net time savings. Despite the relatively low cost, there are marginal benefits in an area already well served by transit.

A new LIRR station in Sunnyside/Long Island City is not cost effective even though it saves time for new riders, because it creates additional travel time for existing LIRR customers, resulting in no net time savings. It receives an average score for equity since more than half of the riders are from equity areas. It provides new connections to rail lines and scores average in resiliency, but the reduction in vehicle usage is lower than other projects and it receives a fair score in sustainability. The network leverage score is below average because MTA does not own the land required for this station.

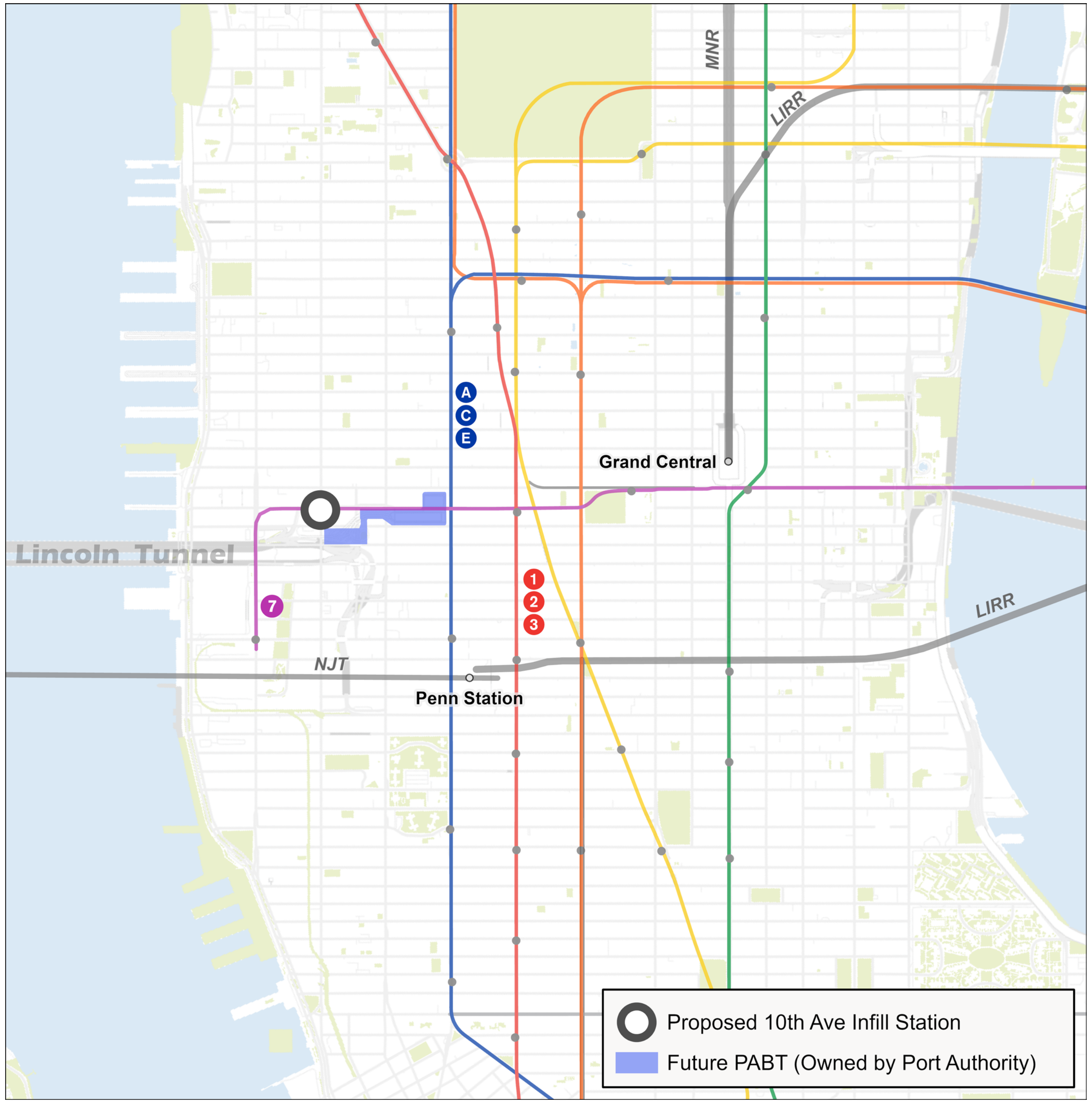
Feasibility of Other Alternatives:

In addition to creating a stop for LIRR service, creating a stop for Metro-North Penn Access Service at the proposed Sunnyside station was explored. Metro-North and Amtrak trains from the Hell Gate Line (connecting from points north) will follow the newly constructed Westbound Bypass through the busy Harold Interlocking to avoid interference with LIRR inbound services. Since the Westbound Bypass is climbing a grade from a tunnel at the location of the proposed Sunnyside Station, it is not physically possible to stop trains using the bypass at the Sunnyside platforms (which are already locationally constrained due to track geometry).

Tenth Av Station on the 7 Line

Description: Construction of a new subway station at 41 Street and 10 Avenue on the 7.

Project objectives: Shorten commute times to developing areas of Hudson Yards.



Above, 10th Ave Station on the Flushing 7 Line

Evaluation results

Construction Cost (2027): $1.9 billion

Fleet Cost (2027): $41 million

Annual O&M Cost (2027): $10 million

Daily Ridership (2045): 55,000

New Daily Riders (2045): 600

Riders from Equity Areas (2045): 26,860

Travel Time Saved Per Trip (minutes): 0.9

Special Considerations:
Easement needed in CUNY building to lead to a 40th St station house; additional ventilation building has not been obtained.

Coordination with PANYNJ needed to ensure new bus terminal does not encoroach on station envelope, minimizes elemnts that would prevent the station from being built via cut and cover, and to understand potential connections between new bus terminal and station.

<20
20-39
40-59
60-79
>=80

Scorecard

Criteria	Metrics	Result	Score (0-100)
Cost, Ridership & Time Savings	Cost/Time saved (30 years)	$81.29/ min	0
Equity	Percent of riders from Equity Areas	49%	34
Sustainability	Change in daily vehicle miles traveled	-198	22
Resiliency	Rail connections within ½ mile (NYC) or 5 miles (suburbs)	3	17
Capacity	Change in passenger hours of crowding systemwide *(AM peak period)*	-1,086 hours	13
Geographic Distribution	Change in regional accessibility	-1,023 hours	3
Network Leverage	Weighted sum of MTA, Public and Private ROW	100%	100

Findings

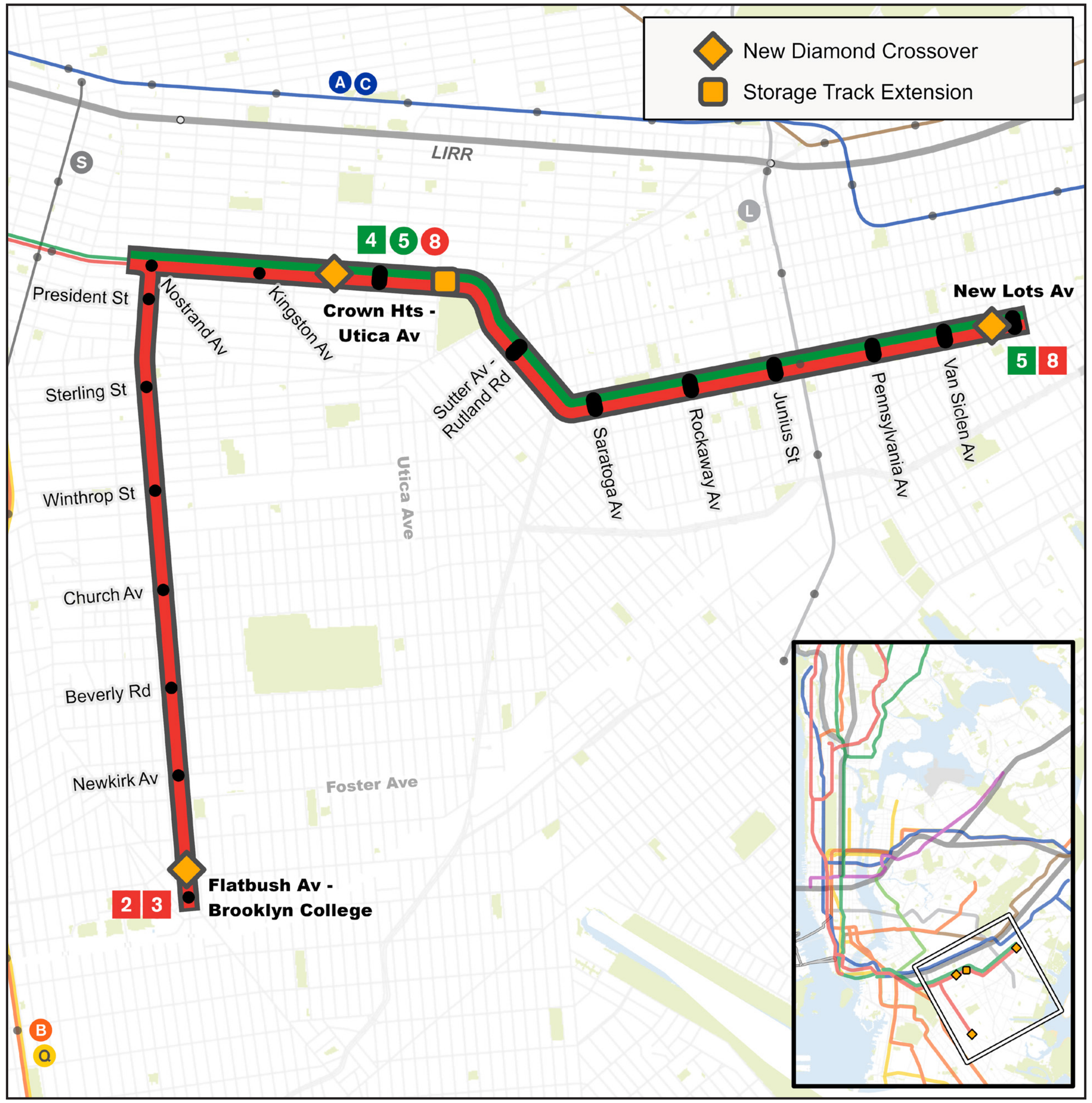
This project has a high cost in relation to the benefits that it provides. While it would shorten travel times slighlty for a small number of new riders, it would add travel time for existing riders to or from 34th St.

An infill station on the 7 line would shorten commute times for some customers traveling to and from emerging areas of Hell's Kitchen and Hudson Yards, but the project would have a significant construction cost and would not substantially decrease crowding or expand accessibility regionally, since it serves an area already served by other transit lines. The project would reduce the travel times for those using the station by 1 minute, but it would increase the travel times of those traveling through the station by 1 minute as well, resulting in small overall time savings in relation to the cost of the project. The project does not perform well in serving riders from equity areas in relation to other projects. It scores well in network leverage since it's within the MTA's right-of-way.

Utica Nostrand Junction Capacity Improvements

Description: Construction of subway improvements, including three new crossovers at the Brooklyn IRT (numbered lines) terminals and extended storage tracks south of Crown Heights-Utica Av to alleviate the Nostrand Junction chokepoint and improve service.

Project objectives: Boost service reliability and capacity by mitigating congestion issues at Nostrand Junction. Addresses major bottlenecks, enhance operations, and reliability. Increase service capacity for existing customers of the 2 3 4 5 lines not just in Brooklyn, but also in Manhattan and the Bronx.



Above, Utica Nostrand Junction Capacity Improvements

Evaluation results

Construction Cost (2027): $410 million

Fleet Cost (2027): $230 million

Annual O&M Cost (2027): $24 million

Daily Ridership (2045): 319,900

New Daily Riders (2045): 8,700

Riders from Equity Areas (2045): 295,080

Travel Time Saved Per Trip (minutes): 1.7

Special Considerations:
Subway improvements are required to add capacity and remove Nostrand Junction bottlenecks; this is a separate project and is assumed as a baseline condition for for Utica Avenue transit improvements.

Branch to Flatbush Av-Brooklyn College loses direct service requires cross-platform transfer to Lexington Av line weekdays

Service Plan:

2 3 lines to/from Flatbush Av-Brooklyn College

4 5 lines to/from Crown Heights-Utica Av and New Lots Av

A new 8 line to/from New Lots Av with local stops at Nostrand Av and Kingston Av

<20
20-39
40-59
60-79
>=80

Scorecard

Criteria	Metrics	Result	Score (0-100)
Cost, Ridership & Time Savings	Cost/Time saved (30 years)	$0.28/ min	100
Equity	Percent of riders from Equity Areas	92%	91
Sustainability	Change in daily vehicle miles traveled	-55,752	82
Resiliency	Rail connections within ½ mile (NYC) or 5 miles (suburbs)	2	11
Capacity	Change in passenger hours of crowding systemwide *(AM peak period)*	-13,078 hours	100
Geographic Distribution	Change in regional accessibility	-43,841 hours	100
Network Leverage	Weighted sum of MTA, Public and Private ROW	100%	100

Findings

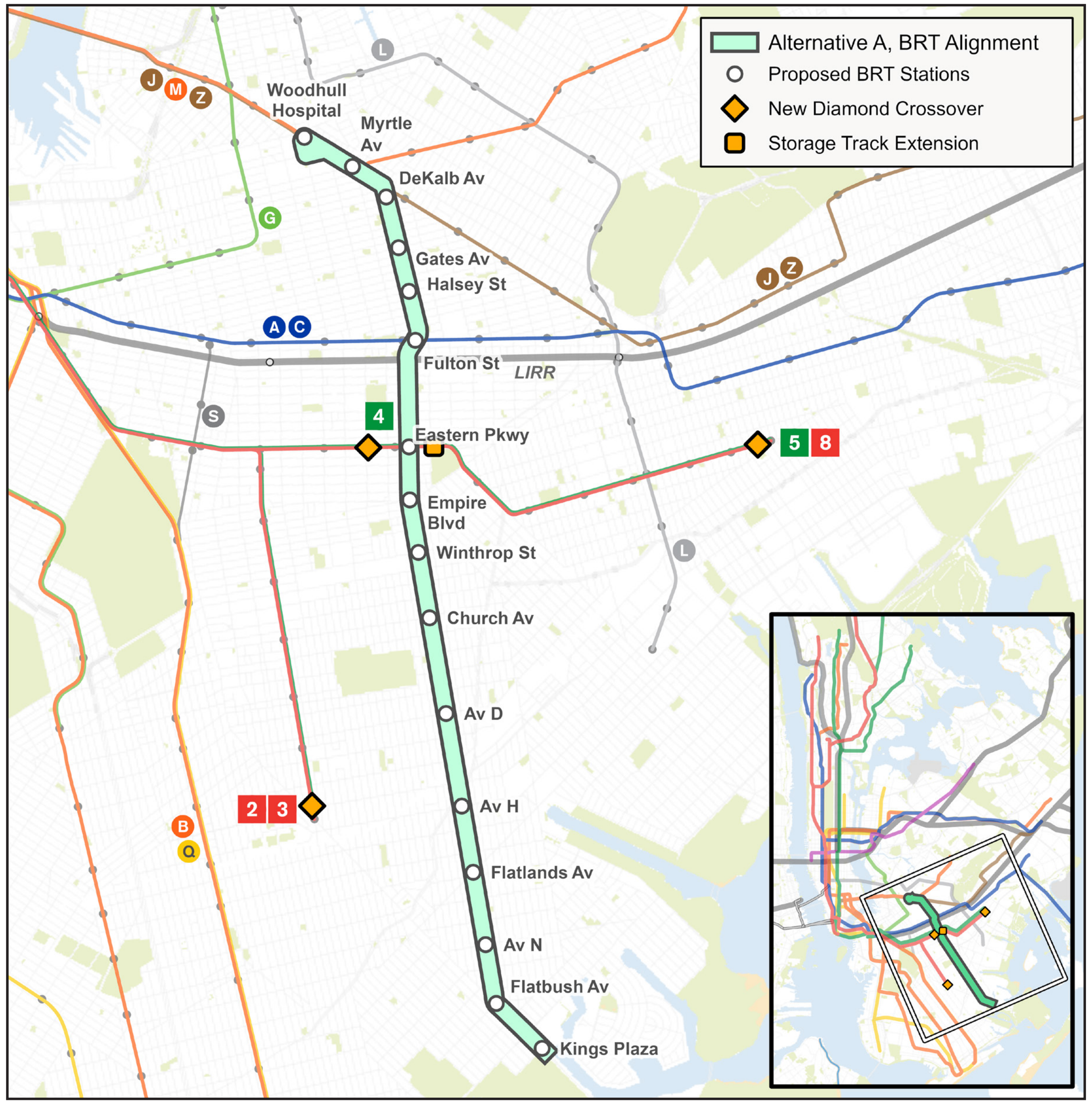
This project alleviates a major chokepoint at Nostrand Junction, resulting in significant benefits for customers along the entirety of some of the busiest subway lines, and increases service on 2 3. It reduces travel times for thousands of riders, many of them from equity areas.

The Utica Nostrand Junction Capacity Improvements scores very well in most metrics, with a low cost for total time saved, high ridership, high number of riders from equity areas. The subway improvements scores very well in reducing passenger hours of crowding, improves regional accessibility and scores highly in equity. The project reduces crowding on the 3 4 5 lines.

Utica Alt A: BRT (Kings Plaza to Woodhull Hospital)

Description: Implementation of enhanced transit services along the Utica Avenue Corridor in southeast Brooklyn by considering several options, with subway improvements as part of the baseline. Alternative A consists of a Bus Rapid Transit (BRT) route between Kings Plaza and Woodhull Hospital. with center running BRT lanes and stations.

Project objectives: Improve travel options for intra- and inter-borough travelers in underserved communities to activity centers; provides opportunities for development and growth near stations; address major bottlenecks and enhances service for existing customers of the ②③④⑤ lines as well as the B46 local and B46-SBS bus customers, one of the city's busiest bus corridors.



Above, Utica Alt A: BRT (Kings Plaza to Woodhull Hospital)

Evaluation results

Construction Cost (2027): $300 million

Fleet Cost (2027): N/A

Annual O&M Cost (2027): $6 million

Daily Ridership (2045): 71,900

New Daily Riders (2045): 3,900

Riders from Equity Areas (2045): 67,810

Travel Time Saved Per Trip (minutes): 3.9

Service Plan:

②③ lines to/from Flatbush Av-Brooklyn College

④ line to/from New Lots Av and Crown Heights-Utica Av

⑤ to New Lots Av and Crown Heights-Utica Av

⑧ to New Lots Av

BRT (Alt A): BRT replaces B46 local/SBS between Woodhull Hospital and Kings Plaza

<20
20-39
40-59
60-79
>=80

Scorecard

Criteria	Metrics	Result	Score (0-100)
Cost, Ridership & Time Savings	Cost/Time saved (30 years)	$0.36/ min	100
Equity	Percent of riders from Equity Areas	94%	94
Sustainability	Change in daily vehicle miles traveled	-16,692	40
Resiliency	Rail connections within ½ mile (NYC) or 5 miles (suburbs)	6	33
Capacity	Change in passenger hours of crowding systemwide *(AM peak period)*	+3,674 hours	0
Geographic Distribution	Change in regional accessibility	-6,484 hours	24
Network Leverage	Weighted sum of MTA, Public and Private ROW	59%	45

Findings

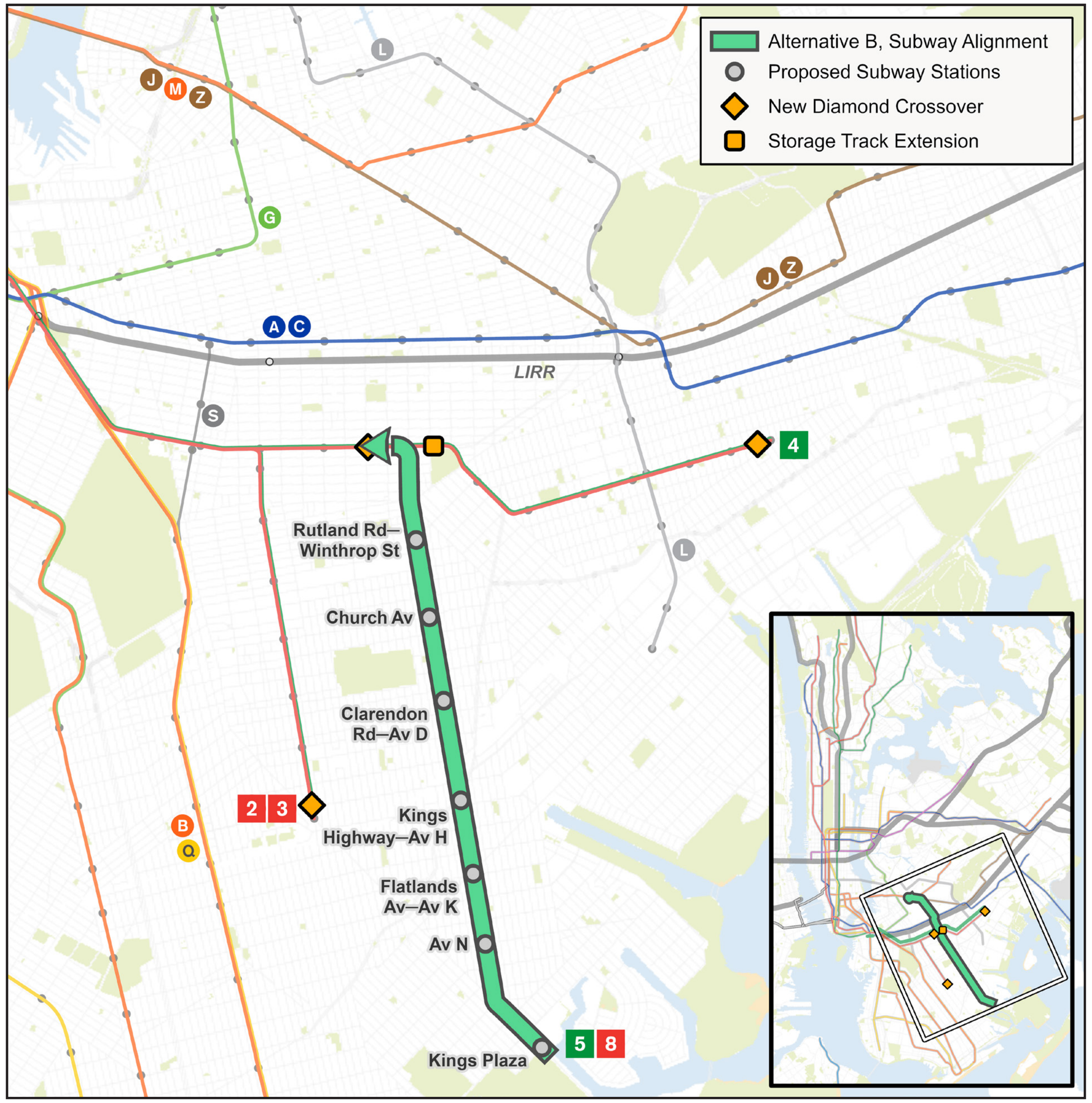
Utica Alt A BRT does very well in cost effectiveness and equity.

A BRT route between Kings Plaza-Woodhull Hospital receives a high cost effectiveness score due to its relatively low cost, high ridership and moderate time savings. It also scores highly in equity with most of its riders from equity areas. Since the BRT would extend north of Utica Avenue, it would provides rail connections to the ⒶⒸⒿⓂ, as well as the ④⑤ at Utica Avenue, resulting in an average resiliency score. The reduction in vehicle usage is moderate in relation to other projects and it receives average scores in sustainability. This BRT option scores poorly in capacity since it would result in a net increase in crowding due to transfers to the subway, increasing it on others that are at or near capacity already. Regional accessibility is improved but is relatively low compared to other projects and scores below average. Since most of the BRT alignment is on New York City-owned streets and not on MTA property, it gets an average network leverage score.

Utica Alt B: Subway to Kings Plaza

Description: Implementation of enhanced transit services along the Utica Avenue Corridor in southeast Brooklyn by considering several options, with subway improvements as part of the baseline. Alternative B consists of a subway extension to Kings Plaza.

Project objectives: Improve travel options for intra- and inter-borough travelers in underserved communities to activity centers; provides opportunities for development and growth near stations; address major bottlenecks and enhances service for existing customers of the 2 3 4 5 lines as well as the B46 local and B46-SBS bus customers, one of the city's busiest bus corridors.



Above, Utica Ave Alt B: Subway to Kings Plaza

Evaluation results

Construction Cost (2027): $15.8 billion

Fleet Cost (2027): $410 million

Annual O&M Cost (2027): $124 million

Daily Ridership (2045): 55,600

New Daily Riders (2045): 2,900

Riders from Equity Areas (2045): 48,060

Travel Time Saved Per Trip (minutes): 9.0

Service Plan:

2 3 lines to/from Flatbush Av-Brooklyn College

4 line to/from New Lots Av

5 line to/from Kings Plaza

8 line to/from Kings Plaza with local stops at Nostrand Av and Kingston Av

<20
20-39
40-59
60-79
>=80

Scorecard

Criteria	Metrics	Result	Score (0-100)
Cost, Ridership & Time Savings	Cost/Time saved (30 years)	$4.82/ min	71
Equity	Percent of riders from Equity Areas	86%	83
Sustainability	Change in daily vehicle miles traveled	-30,917	55
Resiliency	Rail connections within ½ mile (NYC) or 5 miles (suburbs)	2	11
Capacity	Change in passenger hours of crowding systemwide *(AM peak period)*	-3,364 hours	42
Geographic Distribution	Change in regional accessibility	-13,184 hours	51
Network Leverage	Weighted sum of MTA, Public and Private ROW	59%	45

Findings

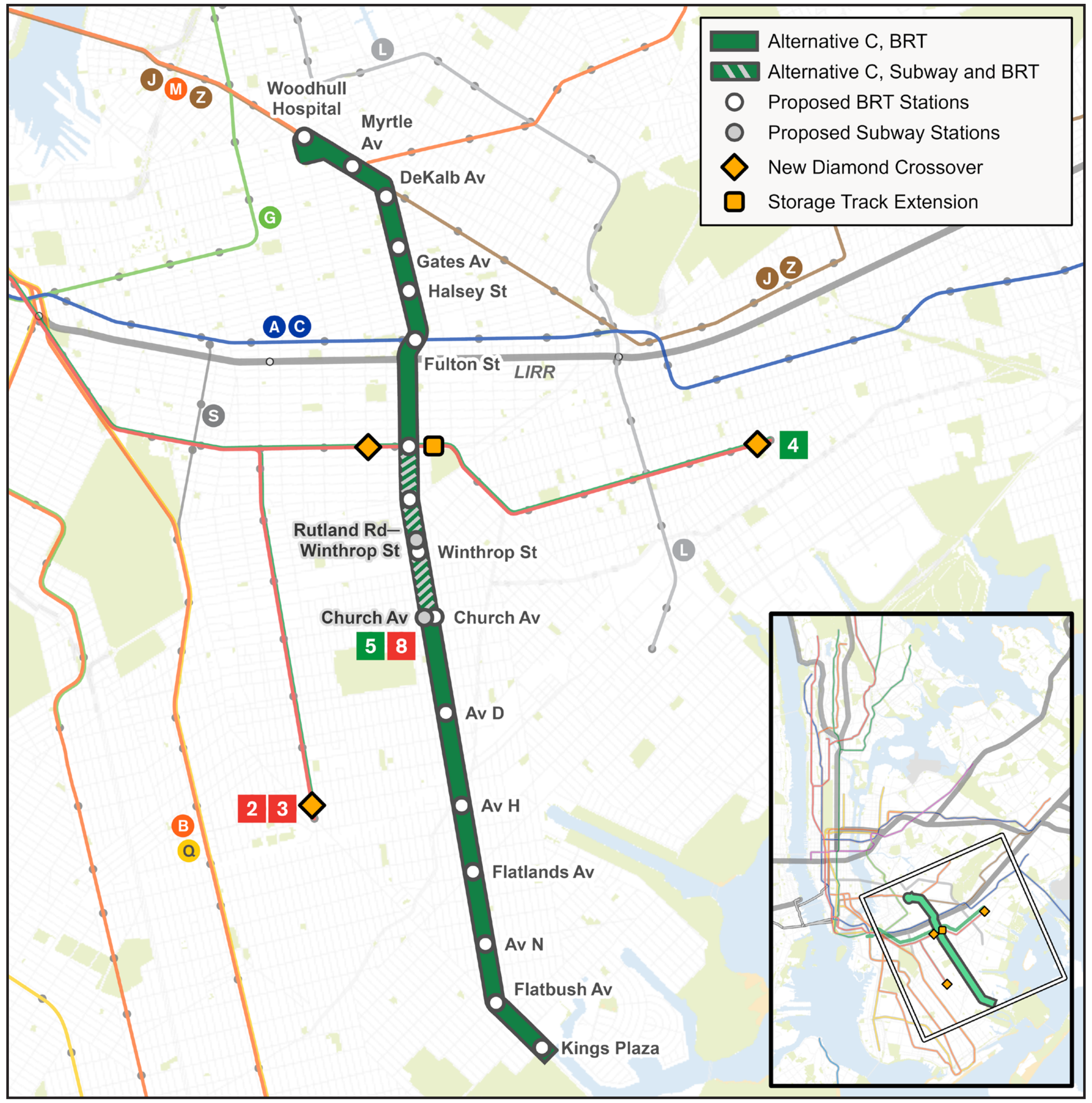
Utica Alt B is in the middle when it comes to cost effectiveness, mainly because of travel time savings and high ridership. However, cost is extremely high, especially in comparison to the Utica Alt A BRT, which also delivers significant benefits for a fraction of the cost.

A full subway extension to Kings Plaza along Utica Avenue (Alt B) receives an above average cost effectiveness score mainly due to the travel time savings it provides project riders, though it is very expensive. It scores well in equity with the majority of its riders from equity areas. With only two new rail connections, it receives a low score in resiliency, because, unlike the BRT, the subway extension would not provide new connections to the A C J M north Utica Avenue. It would reduce vehicle usage enough that it receives an average score in sustainability. This subway extension has the potential to reduce crowding systemwide and gets a average score for capacity. Similarly, it would improve regional accessibility somewhat, and gets an average score for geographic distribution. Since most of the subway alignment is on New York City-owned streets and not on MTA property, it gets an average network leverage score.

Utica Alt C: Subway to Church Avenue and BRT

Description: Implementation of enhanced transit services along the Utica Avenue Corridor in southeast Brooklyn by considering several options, with subway improvements as part of the baseline. Alternative C consists of a subway extension to Church Avenue and a Bus Rapid Tranist route between Kings Plaza and Woodhull Hospital.

Project objectives: Improve travel options for intra- and inter-borough travelers in underserved communities to activity centers; provides opportunities for development and growth near stations; address major bottlenecks and enhances service for existing customers of the 2 3 4 5 lines as well as the B46 local and B46-SBS bus customers, one of the city's busiest bus corridors.



Above, Utica Ave Alt C: Subway to Church Ave and BRT

Evaluation results

Construction Cost (2027): $6.9 billion

Fleet Cost (2027): $190 million

Annual O&M Cost (2027): $47 million

Daily Ridership (2045): 81,200

New Daily Riders (2045): 7,300

Riders from Equity Areas (2045): 75,680

Travel Time Saved Per Trip (minutes): 7.3

Service Plan:

2 3 lines to/from Flatbush Av-Brooklyn College

4 line to/from New Lots Av

5 line to/from Church Av

8 line to/from Church Av with local stops at Nostrand Av and Kingston Av

<20
20-39
40-59
60-79
>=80

Scorecard

Criteria	Metrics	Result	Score (0-100)
Cost, Ridership & Time Savings	Cost/Time saved (30 years)	$1.73/ min	95
Equity	Percent of riders from Equity Areas	93%	92
Sustainability	Change in daily vehicle miles traveled	-39,094	64
Resiliency	Rail connections within ½ mile (NYC) or 5 miles (suburbs)	6	33
Capacity	Change in passenger hours of crowding systemwide *(AM peak period)*	-4,121 hours	51
Geographic Distribution	Change in regional accessibility	-12,715 hours	49
Network Leverage	Weighted sum of MTA, Public and Private ROW	59%	45

Findings

Utica Alt C is in the middle when it comes to cost effectiveness, mainly because of travel time savings and high ridership. However, the cost is extremely high, especially in comparison to the Utica Alt A BRT, which also delivers significant benefits for a fraction of the cost.

A partial subway extension to Church Avenue along Utica Avenue (Alt C) receives an above average cost effectiveness score mainly due to the travel time savings for a significant number of riders in a dense portion of Brooklyn, though it is still quite expensive. It scores well in equity with the majority of its riders from equity areas. It provides six new rail connections and receives an average score in resiliency, and an above average score in sustainability due to a significant reduction in vehicle usage. This partial subway extension gets average scores in capacity and geographic distribution since it does result in some crowding reductions and improves regional accessibility. Since most of the alignment is on New York City-owned streets and not on MTA property, it gets an average network leverage score.

W to Red Hook

Description: Extension of the W line from Whitehall Street in Manhattan through the Montague Street Tunnel to Red Hook, Brooklyn with three additional new stations at Columbia St, Atlantic Basin, and Red Hook.

Project objectives: Increase service and transit options for communities in Red Hook; reduce travel times between Red Hook and Lower Manhattan; and provide opportunities for development and growth near stations.

Above, W to Red Hook

Evaluation results

Construction Cost (2027): $11.2 billion

Fleet Cost (2027): $295 million

Annual O&M Cost (2027): $68 million

Daily Ridership (2045): 7,600

New Daily Riders (2045): 100

Riders from Equity Areas (2045): 1,740

Travel Time Saved Per Trip (minutes): 2.4

Special Considerations:
Significant project risks include:

- Breaking through Montague Tube's cast-iron lining.
- Constructing a grade separated turnout under Furman Street.
- Avoiding potential conflicts with BQE triple cantilever reconstruction and the Red Hook Interceptor Sewer.

<20
20-39
40-59
60-79
>=80

Scorecard

Criteria	Metrics	Result	Score (0-100)
Cost, Ridership & Time Savings	Cost/Time saved (30 years)	$90.46 /min	0
Equity	Percent of riders from Equity Areas	23%	0
Sustainability	Change in daily vehicle miles traveled	-1,154	23
Resiliency	Rail connections within ½ mile (NYC) or 5 miles (suburbs)	0	0
Capacity	Change in passenger hours of crowding systemwide *(AM peak period)*	-8,012 hours	100
Geographic Distribution	Change in regional accessibility	-1,297 hours	4
Network Leverage	Weighted average of MTA, Public and Private ROW	65%	53

Findings

The project performs poorly due to its high cost in relation to its benefits. Despite reducing crowding, the project would attract relatively few riders, while providing no significant improvements in time savings, geographic distribution, or percentage of equity riders.

Extending the W line to Red Hook gets a low score in cost effectiveness due to its high cost and low ridership. It does not score well in equity with less than a quarter of its riders from equity areas. It reduces vehicle usage slightly, but in comparison to other projects, it gets a below average score in sustainability. Only one new rail connection is provided resulting in a low score in resiliency. This project scores very well in capacity since it reduces crowding on existing subway lines by providing an alternative to the 4 5 2 3 R N lines serving Brooklyn, and improves crowding on the 6 by providing additional service on the parallel W. Geographic distribution receives a low score, relative to other projects, since the regional accessibility improvement is small. The network leverage score is average because only about a third of the alignment is on MTA owned right-of-way.