BQE Central Project

Multimodal Project Discretionary Grant Opportunity

Fiscal Years 2023 & 2024

Project Description

Built from 1937 to 1964 under Robert Moses, the Brooklyn-Queens Expressway (BQE)/Interstate 278 in Brooklyn spans 12.1 miles and serves as a vital New York City (NYC) artery and regional transport link. The BQE, which includes segments that are owned and maintained by both the New York State Department of Transportation (NYSDOT) and the New York City Department of Transportation (NYC DOT, also referred to as "the Agency" or "the City"), runs through multifaceted and bustling community landscapes, facilitating the flow of people, commerce, and opportunities. The size and activity of the BQE are also monumental and formative to the people living in neighborhoods that the highway runs through. In a city of 8.8 million residents, the BQE stretches across the most diverse and distinctive pockets of NYC and as such, the design, functionality, and uses of the BQE must amplify and reflect all the communities it serves to usher harmonized growth in quality of life through its longevity and accessibility to all in the City and beyond.

Through the Bipartisan Infrastructure Law (BIL), the Biden Administration has the opportunity to deliver a legacy-defining project with NYC, making crucial capital improvements to this vital section of Interstate-278. Such a project would provide significant safety, environmental, and economic benefits, in addition to reducing lifecycle maintenance costs of this critical regional structure. It is for these reasons the City is seeking $800 million in Multimodal Project Discretionary Grant Program (MPDG) funding. This represents approximately 14% of the estimated total project cost of $5.5 billion.

BQE Central Location

NYC owns the "BQE Central" section of Interstate 278– a 1.5-mile stretch of the BQE between the Atlantic Avenue interchange (approximately Congress Street) and the Sands Street interchange (approximately Nassau Street). This section of the BQE was built close to 80 years ago, and its structural integrity has become an urgent concern for engineers and the public alike. This grant application is focused on the BQE Central Project (also referred to as "the Project").

This corridor of the BQE includes 21 structures that are catalogued with distinct Bridge Identification Numbers (BINs) in the National Bridge Inventory database. The most predominant of the 21 bridge structures is the "Triple Cantilever"– three (3) cantilevered or overhanging reinforced concrete structures in a vertically stacked configuration. This unique 0.4 mile-long structure is located roughly between Joralemon Street and Cranberry Street, and carries the Queens Bound and Staten Island Bound traffic lanes as well as the historic Brooklyn Heights Promenade. The remaining 18 structures include various bridge-types that are either in vertically stacked or in horizontally parallel configurations.

The BQE Central Project passes through densely developed urban areas, including some of the oldest neighborhoods in Brooklyn. It is located west and north of the Brooklyn central business district (Downtown Brooklyn) and travels through the Cobble Hill, Brooklyn Heights, Fulton Ferry, DUMBO, and Vinegar Hill neighborhoods. The BQE is mostly elevated above grade through the Project limits. There are residential, commercial, and park uses adjacent to the BQE Central Project, on both sides, and the highway passes beneath both the Brooklyn and Manhattan Bridges, two of NYC's iconic East River Bridges. The Project is located within the New York—Newark, NY—NJ—CT Urbanized Area. The Project Area overlaps a census tract designated as

Historically Disadvantaged Communities (HDC) and Areas of Persistent Poverty (APP). Within the corridor, the BQE transects several tracts with this designation, and a total population of 192,700 live in Disadvantaged Census Tracts adjacent to the corridor.

Although it is currently safe to the traveling public, reconstructing BQE Central is essential to ensure that this section of the highway will continue to be usable, with modern safety standards, for the next century. Based on ongoing structural assessments and comparisons of existing roadway geometry with current highway design standards, as well as community feedback and concerns, NYC DOT has determined that it must move forward with a project to address the identified deficiencies of BQE Central. These improvements will address existing structural integrity and design challenges while meeting several mutual goals of the Biden Administration:

1. **Safety:** Safety is a key component of the Project, which will yield clear benefits by reducing the impact of crashes and lowering near crashes on the BQE Central structure. The Project will eliminate the non-standard geometry of the Triple Cantilever and thus the inherent risk of crashes resulting from legacy roadway design defects.
2. **State of Good Repair:** The redesign improvements proposed through this Project have the primary purpose of ensuring that this important connector in a major transportation corridor that carries more than 130,000 vehicles per day is in a state of good repair. The proposed Project aims to correct structural concerns associated with aging infrastructure and bring BQE Central into compliance with current geometric design standards and relevant Federal and State codes.
3. **Freight Network Mobility and Economic Impacts:** Enhancing freight network mobility for existing and future supply chain needs is another important reason of this project. The redesign will result in direct benefits to regional movement of freight by maintaining and enhancing large truck access to commercial and industrial areas in NYC as well as Nassau and Suffolk counties, New Jersey, and ports and railyards that connect beyond the region. If left unimproved, State of Good Repair issues will force the City to introduce significant weight restrictions in the near term and consider permanent closure in the medium-term, displacing 13,000 daily trucks onto local streets.
4. **Equity, Environment, Climate Change and Resiliency:** Redesign of the BQE Central will address environmental sustainability and incorporate climate change considerations. Imposing weight restrictions on the BQE would create severe impacts to the surrounding community. This Project has and will continue to employ extensive community outreach and engagement strategies to identify ways to remove or reduce existing barriers in the built environment and to proactively create new connections to transportation options for historically underserved communities. The Project is anticipated to result in approximately 40 to 43 percent of benefits associated with the reduction to co-pollutant emissions—approximately $1.1 to $1.1 million dollars per year—towards benefiting disadvantaged communities.

BQE Central Intersection with Broader Infrastructure Investments

NYC DOT has outlined a large investment for maintaining a state of good repair for its bridge infrastructure. The Agency's program includes investments at strategic points over any given bridge's life cycle to maximize the total useful life of the asset. This includes a mix of preventive

maintenance, bridge repair, component rehabilitation, bridge rehabilitation and bridge reconstruction strategies. To ensure work is completed to applicable City, State and Federal standards, NYC DOT administers a Quality Assurance program consisting of in-house and consultant expertise to ensure the quality of the work performed will meet or exceed its designed life. Over the next 10 years, the Agency has identified the need for over 150 distinct capital bridge-related projects projected to cost $17B of investment. The aforementioned 21 distinct bridge structures within BQE Central consist of less than 14% of the total number of assets identified for capital improvements in NYC DOT's entire bridges portfolio, yet the cost is projected to be almost 30% of the total need over the next 10 years. This creates a burden on the needs of other critical bridge infrastructure, and the need for additional funding sources.

BQE Central Existing Defects and Challenges

The BQE Central has significant infrastructure deterioration that cannot be corrected through routine maintenance. The proposed Project aims to address the deterioration associated with infrastructure built close to 80 years ago, and geometric and structural designs that predate modern federal safety standards, as well as correct for inequitable access that was created through its construction.

The Project will restore the integrity of the structural elements as well as comply with current geometric standards, relevant Federal and State codes, and facilitate increased mobility for disadvantaged communities. Deterioration is associated with multiple factors, including the prolonged exposure to de-icing salts, an antiquated drainage system and poorly designed joints. Because the main reinforcing steel for a cantilevered structure is located at the top of the deck, it is more exposed to the deicing salts as they permeate through the deck. When the drainage system does not operate properly, the ponding not only creates a hazard for motorists, but also allows water to seep further into the deck. At the time of construction, concrete materials were not controlled for alkali-silica reactants, leading to a process that causes the concrete to lose its structural integrity due to a chemical reaction between its internal components.

Current Assessment

NYC DOT has performed a detailed assessment of all 21 bridges in the BQE Central section. The assessment is based on in-depth inspections and evaluation of strength and functional losses of existing material using non-destructive investigative methods and techniques. The unique design of the Triple Cantilever section, which is composed of multiple structures, is the most illustrative example of this phased approach to the highway's construction. While an elegant solution at the time, construction on the main load carrying members must occur perpendicular to traffic as opposed to lane by lane, creating the need to carefully plan any major reconstruction effort to minimize disturbance to the interstate while maintaining critical regional connections. Reconstruction work is further complicated by existing major infrastructure embedded into and immediately adjacent to the structure, including an interceptor sewer, Metropolitan Transit Authority (MTA) fan plants and substations, and nearby structures whose foundations are built into and around the current substructure elements.

NYC DOT completed a preliminary Topographic Survey as well as preliminary geotechnical and hazardous material investigations. NYC DOT is also performing traffic analysis and environmental assessments ahead of the environmental review process. The Project is currently in

the pre-scoping and alternative development phase. The environmental review is expected to evaluate multiple options, including partial and full replacement of the BQE Central structures. NYC DOT is actively studying lane configuration alternatives that will be evaluated through the environmental review process. Regardless of the lane configuration, in addition to standard 12-foot lanes in each direction, NYC DOT is proposing shoulders on the inside and outside for safety and appropriate provisions for merging for traffic from the ramps. Proposed configurations will conform to standard specifications outlined by the Federal Highway Administration (FHWA).

BQE Central Project History

Over the past several years, NYC DOT has completed technical investigations to assess the structural conditions of BQE Central. NYC DOT conducted technical investigations, vibration monitoring, and materials analysis on BQE Central's concrete cantilever structures. Preliminary seismic assessment was done in 2003; soil evaluation found no soil liquefaction potential. In-depth inspections were done in 2016, followed by vibration monitoring and materials analysis. A Weigh-In-Motion system collected real-time truck data, complementing a Load Rating Analysis for projected structure life. The agency implemented a Structural Health Monitoring program for cantilever structures. Recent Inspection Reports highlighted issues with cantilever deck condition. Interim repairs are ongoing, but some structures are past design life and nearing the end of useful life. To address some of the operational and structural deficiencies identified in the studies described above, in 2021, NYC DOT restriped the roadway from three moving lanes in each direction to two moving lanes in each direction from the vicinity of Atlantic Avenue interchange to the Brooklyn Bridge interchange. The lane reduction allowed for lane widths and shoulders more closely aligned with modern standards, leading to safety improvements, and reduced traffic volumes on BQE Central, lessening strain on structural elements of the Triple Cantilever section.

BQE Central Proposed Solutions

In February 2023, NYC DOT presented publicly three refined concepts – The Terraces, The Lookout, and The Stoop– with possible partial or full replacement options of the retaining walls of the Triple Cantilever. It was noted to the public that many of the urban design features of each concept could be applied to either a full or partial replacement. Extensive modeling and calculations were undertaken to ensure feasibility of the concepts presented. NYC DOT's engineering team used existing structural models and created preliminary models for the concepts using Bridge Information Modeling systems, as well as structural analysis models. Preliminary efforts were made to ensure proposed concepts were designed to code standards and would likely pass design code reviews. Finally, a preliminary fatal flaw analysis was performed, which included: assessing potential conflicts with surrounding infrastructure, right of way, and utilities; a basic review of roadway widths, geometry and safety considerations; and a conceptual review of bridge types and structural configurations. Additional information about these concepts and about additional geographies in the Project area, including the Atlantic Avenue interchange and Columbia Heights and adjacent parks; Old Fulton Street and Anchorage Plaza; DUMBO and Manhattan Bridge Parks can be found in the appendix titled BQE Central Project Supplement starting on page 4.

Concept 1: Partial Replacement (The Terraces)	***Concept 2: Full Replacement (The Lookout*)**	***Concept 3: Full Replacement (The Stoop)***
Structure: The Terraces concept was presented as a partial replacement, the goal is to maximize rehabilitating and reusing the existing substructure. These elements would be repurposed to create a more conventional frame structure by pairing it with columns, connected via a floorbeam/stringer system to support a new structural deck. Urban Design: This design concept brings two standard accessible ramps together from the Brooklyn Heights Promenade to Furman Street, where Brooklyn Bridge Park has an arrival plaza at Clark Street, and creates landscaped steps cascading directly into the park. This approach reduces the visual presence of the highway as seen from both the Promenade and the Park.	Structure: The Lookout concept was presented as full replacement of the structure, including the substructure elements which concurrently support the cantilever decks and retain fill to support Brooklyn Heights. Where this approach is not feasible along the cantilever corridor, partial replacement options could be considered. A full replacement of all bridge elements yields the longest design life of the options. Urban Design: The concept builds upon existing berm structures located in the Park to create direct landscaped areas that connect to the Promenade at up to three key pedestrian entry points. These multifunctional planted and programmed landscapes would work to limit the visual presence of the highway as seen from both the Promenade and the Park.	Structure: The Stoop, which can only be completed with a full replacement of the structure (described under "The Lookout"), brings the roadways down to a single level at a central point in Brooklyn Bridge Park. Urban Design: The concept expands the Brooklyn Heights Promenade, allowing for an open space in a 150-foot area. This concept was inspired by a community-driven plan, adapted to existing constraints of the corridor. Where the roadway comes down to one level, the Brooklyn Heights Promenade extends and slopes down into a broad stoop overlooking the skyline and Brooklyn Bridge Park. Similar to the Terraces and the Lookout, pedestrian access would connect to the major pedestrian routes in Brooklyn Heights. Because the Stoop merges down to a single level, it could potentially have a greater direct impact on Brooklyn Bridge Park. Because of the braiding and unbraiding of the roadway needed to form the single level section, more of the highway structure is exposed., These elements could be mitigated throughout the design process.

BQE Central Project

Multimodal Project Discretionary Grant Opportunity

Fiscal Years 2023 & 2024

Outcome Criteria Narrative

Table of Contents

I. Project Outcome Criteria #1: Safety

Current Conditions and Safety Trends

Traffic has increased 10 percent over the past 22 years within the Triple Cantilever section of BQE Central. The crash rates within this segment of the BQE exceed the statewide average for similar roadways, with 136 crashes occurring in 2022 on BQE Central between 1.5-mile segment of Congress Street and Nassau Street. A comprehensive analysis of crash data was conducted for this complex BQE segment, revealing significantly higher crash rates than the NYSDOT average for similar classified roadways. Many of these crashes can be attributed to substandard road designs in this stretch. The table below indicates the crash severity on the BQE during 2022. The crashes were concentrated around the entrances and exits of the highway. Addressing these infrastructure challenges and non-standard features is crucial for improving the safety, efficiency, and long-term sustainability of the BQE Central section. By undertaking a permanent project rather than incremental emergency maintenance, a comprehensive solution can be implemented. Crash rate maps, in addition to maps of Vision Zero Priority Locations can be reviewed in the project supplement, Figure 9 to 11. Vision Zero Priority Locations are comprised of corridors and intersections making up the majority of pedestrian killed or severely injured (KSI) crashes in each borough designated by NYC DOT.

Year	K - Fatal	A - Serious Injury	B - Injury	C - Possible Injury	O - No Injury	U - Unknown
2022	0	1	28	20	37	50

Table 1 2022 Crashes by Severity

Year	Rear End	Head On	Side Swipe	Right Turn (With Other Car)	Left Turn (With Other Car)	Other	Total Crashes
2022	**63**	**3**	**54**	**2**	**1**	**13**	136
	46%	2%	40%	1%	1%	10%	

Table 2 2022 Crashes by Collision Type

Description of the Safety Problem

Non-standard roadway geometry

The BQE has many non-standard features that contribute to crashes, delays, and congestion within the BQE Central limits, including substandard lane widths, lack of shoulders, substandard speed change lanes, substandard horizontal curvatures and stopping site distances, and low vertical clearance. The non-standard features of this roadway prevent the BQE Central segment from supporting the design speed expected of a roadway of this classification.

Shoulder widths differ throughout the BQE Central section and do not conform to modern safety standards. Shoulders exist only in limited sections of BQE Central and, where present, are narrower than the standard widths, with the majority of the right and left shoulders being one foot wide (compared to a standard of 10 feet for right shoulders and 4 feet for left shoulders). Lack of shoulders and sub-standard shoulders and lane widths reduce safety and contribute to the high level of congestion caused by crashes, breakdowns, and other incidents. The safety effects of the substandard shoulders and narrow lane widths are evidenced by the high percentage (40%) of sideswipe collisions in the project area. Additionally, nearly 40% of the contributing factors to crashes along the mainline of BQE Central involved passing maneuvers, which further support the need for improved lane widths and shoulders. This lack of shoulders also provides limited bypass for emergency, construction, or repair vehicles and personnel in the event of a crash, breakdown, or other disruptive roadway event. In the event of a breakdown, crash, or incident that requires the closure of one or more travel lanes, the existing shoulders cannot provide sufficient bypass, which results in congestion, delays, and the diversion of some vehicles onto local streets, increasing safety risk for non-motorized roadway users. All the on-ramps and off-ramps in the BQE Central have substandard existing geometric and roadside safety features. There is currently a lack of and deficient acceleration and deceleration lanes, and the on- and off-ramps are located at points of heavy pedestrian and/or bicycle traffic, creating conflict points between vehicles and pedestrians and bicyclists. Acceleration and deceleration lanes assist in minimizing conflicts by providing sufficient spacing for vehicles to change their speed while entering or exiting a highway.

The BQE traffic study area contains 195 local intersections, of which 38 intersections have been identified as high crash locations and are designated as Vision Zero Priority locations by NYC DOT, including the entire length of Atlantic Avenue corridor and many intersections. See BQE Central Project Supplement Figure 13 for Vision Zero Priority Locations in BQE Traffic Study. The intersection of Atlantic Avenue interchange has long been an area of concern for the public. In 2021, a fatal crash took place during nighttime hours at an intersection directly adjacent to the Queens-bound BQE entry and exit ramps, caused by a high-speed driver who ran a red light. These types of incidents, both along the BQE mainline and the adjacent local intersections, have detrimental effects, causing harm to individuals, financial losses, significant congestion, and delays along a substantial stretch of the BQE and throughout the surrounding roadway network.

The BQE Central section features several locations below standard vertical clearances, as low as 13 feet 2-inch clearances. These non-standard clearances force large trucks to divert onto busy local streets, creating higher levels of traffic stress and air pollution levels at the street level, or causing unforeseen bridge strikes, a dangerous safety hazard to drivers and fellow motorists.

The BQE Central is characterized by non-standard horizontal curves and locations with limited stopping sight distances. Stopping sight distance is the distance needed for drivers to see an object on the roadway ahead and bring their vehicles to safe stop before colliding with the object. Non-standard horizontal curvatures and limited stopping sight distances compounded by acceleration and deceleration lanes in areas where multiple lanes merge are roadway factors that contribute to crashes.

Bicycle and Pedestrian Connections

The area surrounding the BQE Central experiences heavy pedestrian and bicycle flow, which must navigate around the barrier that the highway creates while interacting with vehicular traffic at multiple conflict points. The user experience of this localized environment ranks poorly due to these external stressors, and thus creates the need to enhance safety, reduce conflicts between pedestrians and cyclists and vehicles, and increase the number and quality of active mobility connections across the highway corridor. The BQE Central entrance and exit ramps at Atlantic Avenue and Columbia Street, Old Fulton Street, and Sands Street are each located at points of heavy pedestrian and/or bicycle traffic, creating conflict points between vehicles and pedestrians/cyclists. The existing interchanges at these locations are complex with multiple vehicle-pedestrian conflict points and poor facilities to support the safe passage of large numbers of pedestrians and bicyclists through these areas. Furthermore, traffic diversions from BQE Central to local streets due to the non-standard features described above result in increased traffic on local streets, increasing the potential for conflicts between vehicles and other road users in neighborhoods along the BQE Central corridor.

Safety Impact

The proposed project improvements will follow the National Highway Safety Improvement Program and National Roadway Safety Strategy guidelines to provide a safer roadway. Countermeasures from these programs will be investigated and adopted as appropriate. As a result of the proposed project improvements, the crash rate on the BQE is anticipated to decrease because of the infrastructure upgrades mentioned previously, including wider travel lanes, provision of shoulders, lengthened ramp acceleration and deceleration lanes, greater vertical clearances, updated medians, improved horizontal curvatures, greater stopping sight distances, improved drainage, better lighting, new signage, striping, and pavement and advanced Intelligent Transportation Systems (ITS). Specific provisions such as the replacement of the Triple Cantilever's original bridge railings and crash attenuation systems with a NYSDOT approved barrier system meeting Testing Level TL-5 should reduce the injury severity rate on this section of roadway.

For the local streets, the proven Vision Zero design guidelines will be used to develop roadway, intersection, sidewalk, and multimodal facility designs. There would be pedestrian and bicycle safety benefits associated with the project improvements, including reduced pedestrian crossing distances, normalization of intersection turning radii, reduction of vehicle/pedestrian and bicyclist conflict points, pedestrian-oriented streets, new and improved facilities at intersections and streets. In addition, one of the project objectives is to reduce the number of conflicts between pedestrians and bicyclists with vehicles by relocating, combining and/or removing freeway ramps that intersect with local streets.

II. Project Outcome Criteria #2: State of Good Repair

The Project will not only address current structural issues and worsening vulnerabilities of the BQE Central structure but will rebuild the infrastructure to incorporate the most current safety, roadway, resiliency, and equity engineering practices. If these issues remain unattended, they pose a significant risk to the efficiency of the transportation network, the movement of goods and people, and the overall economic growth in NYC.

Description of Current Conditions

The current condition of the BQE Central section reveals significant infrastructure deterioration that should be addressed through a capital improvement project. The proposed Project will address the challenges associated with the aging infrastructure, including tackling outdated safety features. This includes restoring the integrity of structural elements as well as complying with the current geometric and safety standards and other relevant Federal and State codes, where practicable. Detailed images of current conditions can be found in BQE Project Supplement on page 19.

The structures within BQE Central, have undergone limited structural rehabilitation, resulting in noticeable deterioration in the concrete superstructures and substructures. Visible signs of superstructure deterioration include scaling, efflorescence, transverse cracking, map cracking, and spalling with exposed and corroded rebar underneath. The absence of a waterproofing membrane on the cantilever allows water and de-icing salts to penetrate the concrete, hastening the deterioration process.

Water leakage through failed expansion joints (spaced at every 50 feet) has also contributed to structural deterioration. Concrete cores taken during past inspections revealed significant chloride penetration on all deck joints and retaining walls at traffic level, leading to increased steel rebar corrosion. Additionally, the concrete lacks air-entrainment, making it susceptible to freeze-thaw damage. NYC DOT has performed several emergency joint repairs. These repairs have demonstrated that there is no waterproof membrane. Some of the original granite and brick facade on the substructure walls has either fallen, been pinned in place or removed to prevent hazards to traffic and pedestrians. These short-term solutions expose the structural elements to further deterioration. While temporary bearing supports have been installed at two multi-girder bridges to address flagged conditions, and steel mesh has been added at all joints on the cantilever structures, and critical locations of the underdeck to protect vehicles and pedestrians from falling debris, these bandage solutions are unsustainable: the steel mesh has been replaced multiple times by maintenance crews, requiring larger sections to be installed each time to find appropriate anchorage locations on the underside of the cantilevered sections in the vicinity of the joints.

Thorough inspections included areas that were previously inaccessible and had not been inspected since the structure was built. The results were analyzed to project the remaining service life of the structures.

NYC DOT continues to perform maintenance and localized repairs to correct identified structural and serviceability problems to extend the remaining service life of the bridges. The localized repairs generated from issues noted in the bi-annual inspection as well as emergent issues that are noted during quarterly inspections have not been enough to stop the structural deficiencies continuing to progress, despite these aggressive maintenance and repair efforts. The inspection data and material science corrosion modeling indicate that the level of rebar section loss will continue and result in the need for frequent emergency repairs causing major service disruptions. The unique nature of the cantilever structures makes repairs complicated and requires extensive lane closures.

Projected Vulnerabilities if Unaddressed

Deteriorating conditions necessitate increased spot repairs and milling and paving for the BQE. Around 20% of the deck requires local repairs every three years, while the entire deck would need milling and paving every three years. This maintenance, including traffic management, costs an estimated $7.3 million annually in 2023 dollars, significantly higher than regular NYC bridge maintenance costs. Without this project, the deteriorating conditions would force BQE weight restrictions beyond 2028 (assume 2032) and full closure by 2036, redirecting traffic to diversion routes with higher maintenance needs. The traffic flow increase from BQE to local streets would demand substantial traffic management efforts involving staff, vehicles, barriers, and signs, impacting neighborhoods. The experience from other major diversions indicates deploying staff for shifts, resulting in costs. The significant growth in traffic at downtown Brooklyn bottlenecks would require around $50 million annually for additional traffic enforcement staff.

BQE Central Impact on Asset Condition and Maintaining Ongoing State of Good Repair

The proposed project will reshape BQE Central as it currently stands to address the following needs: structural deterioration, non-standard roadway geometry, regional and local vehicular connectivity, create and increase access to park space, and enhance bicycle and pedestrian connections across the corridor. The intent of the proposed project is to address deteriorated and sub-standard conditions of various structures within the BQE Central Project limits. The site contains significant constraints which require certain bridge elements to be retained and rehabilitated. This would make full replacement in certain sections within the project limits unfeasible.

NYC DOT and NYSDOT will continue to inspect the new assets that are constructed as part of this project in accordance with the federally mandated inspection program. NYC DOT will continue to perform preventive maintenance and repair activities on these assets along with other bridges in its inventory using a combination of its in-house and contracted crews to ensure the state of good repair of the newly constructed assets. These actions are primarily funded through City's Annual expense operating budget.

Reducing Lifecycle Costs

The proposed project will eliminate the need for most of this maintenance once the new structure is completed. In the first thirty years of the new structure's life, spot repairs will not be required and milling and paving will revert to a typical 10- to 15-year cycle, at a cost of $5.6 million each time.

III. Project Outcome Criteria #3: Economic Impacts, Freight Movement, and Job Creation

In recent decades, NYC has experienced record growth in population and jobs, resulting in rapid economic development and unprecedented growth and strain in the freight sector. While the COVID-19 pandemic impacted the economy, housing costs, the number of residents, jobs, and visitors continue a decades-long trend of steady growth. The BQE Central reconstruction project will ensure timely and efficient movement of goods and people, thereby supporting continued

economic growth, alleviating the stressors associated with the 21st century transportation of goods and services, and creating sustainable job opportunities for community members.

The City's complex freight network—with trucks delivering 90 percent of our goods—has played a critical role in supporting the City's ability to handle this growth. The growth of e-commerce, which was accelerated by the COVID-19 pandemic, has dramatically increased freight volumes to businesses and residences. More than 80 percent of New Yorkers receive at least one package at home each week, and nearly 1 in 5 New Yorkers receive packages on four or more days per week, leading to an increase in delivery vehicles on city streets and the highway network. Between January 2020 and December 2021, NYC DOT estimated that freight traffic across the Hudson River between New Jersey and New York increased by over 50 percent, and it expects the amount of freight to continue increasing. Earlier estimates projected regional freight movement growth of 68 percent between 2012 and 2045.

Freight and Multimodal Transportation Options

Through the BQE, NYC DOT supports freight movement in NYC and beyond – and by extension, the region's economic vitality. As the only major trucking through-route east of the Hudson River within NYC, it provides an alternative to the congested, heavily utilized Interstate 95 corridor and is a direct truck freight route connecting nearly eight million residents of Brooklyn, Queens, and Long Island with destinations to the south, including the Mid-Atlantic and southern States, and serving as a vital connector to the region's three international airports.

The BQE's critical infrastructure facilitates the movement of goods within NYC, to and from Nassau and Suffolk counties, and to and from New Jersey including the Ports of Newark and Elizabeth, and links to highway and rail infrastructure that serves the rest of the region and nation. The BQE also provides crucial freight access to Staten Island and the East River bridges and tunnels serving the Manhattan Central Business District. In addition to its role in the freight network, the BQE carries upwards of 75 million passengers per year in automobiles and buses.

The e-commerce boom also resulted in proliferation of major goods distribution facilities across NYC's industrial areas, and most recently in Brooklyn, which further demonstrate the need for essential freight routes like the BQE to connect to, from, and through Brooklyn. Data from 2017 and 2018 shows that the section of the BQE in Brooklyn between Sands Street and the Kosciuszko Bridge carries about 11,600 trucks per day, which represents about nine percent of the total daily traffic. The section south of Atlantic Avenue to the Verrazzano Bridge carries about 10,400 trucks per day, representing about 7 percent of the total daily traffic.

An analysis of anonymized truck and commercial vehicles GPS data shows that between 2019 and 2022 there was a significant increase in trips into key waterfront industrial business zones (IBZs) in Brooklyn and residential neighborhoods in Lower Manhattan and south Brooklyn. For maps showing this comparison, please see BQE Central Project Supplement Figure 13 and 14. To accommodate this unprecedented growth, NYC DOT is undertaking initiatives with partners including other government agencies and the private sector to transform the way freight moves throughout the city. This includes developing Delivering New York: A Smart Truck Management Plan for New York City, which lays out NYC's freight vision. NYC DOT has also identified opportunities and strategies to build upon the New York City Economic Development

Corporation's FreightNYC plan with another report, Delivering Green: A vision for a sustainable freight network serving New York City, and coordinate with New York State's Freight Transportation Plan. The City is committed to bold action to make our freight system more sustainable and efficient by encouraging greener and more efficient truck deliveries, increasing the share of goods moved by water, rail, and cargo bicycles, and supporting innovation and new technologies to foster a culture of compliance with rules and regulations.

Improve multimodal transportation systems for affordable transportation options

Modernizing BQE will greatly benefit the economy of NYC and the surrounding region. Upgrading the BQE Central and rectifying the highway's geometric anomalies will facilitate traffic flow, reduce congestion, and decrease travel times for commuters and freight. This increased efficiency will lead to cost savings for businesses, resulting in strengthened productivity and competitiveness for local businesses and the region. Enhancing the cycling and pedestrian connections across the corridor and creating a more unified, streamlined, and positive roadway experience will encourage the use of modes of active mobility, thereby improving the community's access to more affordable transportation options and alternatives to automotive transportation.

Increase intermodal and/or multimodal freight mobility

As Brooklyn's only Interstate highway, the BQE prevents regional truck and other traffic from relying on local Brooklyn streets. As such, BQE Central serves an annual average daily traffic of more than 130,000 vehicles, including 13,000 daily trucks.[2] The Project aims to maintain safe and efficient regional and local connectivity for the traveling public and to provide for the movement of goods and services along this important regional and local roadway by reconstructing the deteriorating infrastructure and bringing it up to modern safety standards.

***Improve regional and* local economic performance**

Enhancing the BQE will improve regional and local economic performance by increasing land use productivity at intermodal and/or multimodal freight facilities, such as ports and distribution centers. The costs of not carrying out this project would be immense. Traffic simulations performed for the benefit-cost analysis project that traffic delays in the City because of the full closure of the BQE would grow by nearly 600,000 hours per weekday with full closure of the BQE, at an economic cost of over $5 billion annually. The degradation in quality of life caused by such massive congestion would ripple throughout the economy: the City's competitiveness as a global capital would suffer and it would reduce its ability to retain and attract talent from around the country and across the world. The region's freight sector would be particularly hard-hit if BQE Central closed. Using the REMI PI+ model from Regional Economic Models, Inc., New York City Economic Development Corporation estimated the impact of the higher truck transportation costs following a full closure in 2036. The model projects that the City would see a permanent loss of nearly 5,000 jobs solely due to predicted increases in shipping costs. There

[2] https://bqevision.com/about/background

would be additional losses associated with decreased competitiveness of the freight industry and reduced access to regional and global consumers and suppliers.

Job Creation

The Project aims to advance President Biden's commitment to growing economic opportunity through workforce development and expanding access to jobs in the infrastructure sector. The City's workforce development strategies will be deployed to train, place, and retain workers in well-paying jobs and will be considered in the City's procurement efforts of the design-build contract. Based on the project's estimated $5.5 billion cost and utilizing the IMPLAN input-output model, the Project is estimated to generate over 11,400 person-years of construction employment, which is equivalent to 1,900 full-time construction jobs. In addition to these high-quality direct construction jobs, the Project's capital investment will support over 7,300 person-years of employment at businesses providing goods and services to the Project (indirect jobs) and will support approximately 7,900 person-years of employment at businesses servicing workers' consumer demands (induced jobs).

The Project will lead to indirect job creation in various sectors such as retail, services, and manufacturing who rely on this important transportation infrastructure. A discussion of the methodology to derive these projections can be found in Appendix 3.

Workforce Training and Development

The City's Project Labor Agreement (PLA) commits to creating greater access to apprenticeships for residents in disadvantaged communities and underrepresented populations, including women, people of color, and people with convictions. Additionally, the City is currently establishing a Community Hiring Office that will oversee operational and programmatic goals including analysis on current-state job development and pre-apprenticeship opportunities, coordination with Unionized Trades, and mapping a vision for low-income New Yorkers to access jobs that lead them to the middle-class.

IV. Project Outcome Criteria #4: Climate Change, Resiliency, and the Environment

GHG Emissions Impact

Imposing weight restrictions and permanent full closure would create congestion, air quality, and safety issues for the communities immediately adjacent to the BQE. When large, heavy trucks are rerouted on local streets, the community suffers. Shifting trucks to local streets would cause severe traffic throughout Brooklyn Heights, Downtown Brooklyn, and other neighborhoods adjacent to the BQE, as passenger vehicles, taxis, for-hire vehicles, trucks, buses, bikes, and pedestrians all compete for space. This would result in a regional increase of Greenhouse Gas (GHG) emissions.

By averting the diversions and congestion that would follow closure of the structure, the Project would prevent the emissions of 1.8 tons of PM2.5 per year for the 2032 analysis year and 3.5 tons per year for the 2036 analysis year. By avoiding an increase in emissions from partial and full closures of the BQE, the Project would benefit the entire region, as regional air quality conditions are anticipated to improve from the decrease in emissions. However, the projected benefits associated with the reduced co-pollutant emissions are anticipated to most directly

benefit areas immediately adjacent to local roadways that would experience increased vehicle volumes in the no-build scenario—many of in which have been identified as Disadvantaged Communities. The Project's benefits to Disadvantaged Communities are discussed in a section below.

Resiliency and Disaster Preparedness

The Project design aligns with NYC's resiliency guidelines and takes into account future conditions for sea level rise and precipitation. The New York City Panel on Climate Change (NPCC) projects sea levels to rise by up to 30 inches by the 2050s and up to 75 inches by the century's end. Extreme weather events are expected to increase in intensity and/or frequency, posing a threat to the City's infrastructure..

The Project's design ensures that roadway elevations will remain unchanged from the existing BQE Central structure, already exceeding future flood hazard projections for 1-percent annual chance coastal storm surges. The design includes new structure decks and stormwater drainage facilities. The concrete decks would be designed to provide waterproofing to the structure. Changes to stormwater regulations will impact the Project's design to ensure climate impacts are considered in drainage planning. The existing structure's surface water drainage system is currently failing and will be replaced with a new system that ensures all stormwater is fully captured and routed to the existing stormwater facilities.

Regional Planning

The regional Transportation Improvement Program (TIP) and Statewide Transportation Improvement Program (STIP) Shared Vision for Regional Mobility emphasize minimizing environmental impact and reducing GHG emissions. This Project aligns with objectives to manage roadway capacity efficiently, curb congestion and vehicular emissions, and promote environmentally responsible transportation projects. It addresses unequal emission impacts on communities. The Project also aligns with the 2018-2045 Regional Transportation Plan (Plan 2045) goals, focusing on improving quality of life and enhancing transportation system safety. The Project's location corresponds to Plan 2045's Coordinated Development Emphasis Areas in the BQE corridor, coordinating land development and transportation investments for environmental sustainability, local economic growth, and quality of life improvements. Desired outcomes include better mobility, access, commuting, recreation, and safer walking and bicycling via corridor and park space enhancements.

Project Benefits Accruing in Disadvantaged Communities

Through an analysis of Disadvantaged Communities across NYC using data from the Climate and Economic Justice Screening Tool (CEJST), NYC DOT was able to estimate how the Project would address the burdens suffered by Disadvantaged Communities, in the project area and throughout the corridor. Several disadvantaged tracts in the project area and throughout the BQE corridor in Brooklyn have acute levels of poverty and historic concentrations of disinvestment due to historic planning policy and their adjacency to critical BQE feeders and entrance/exit ramps.

In order to reach the major industrial zones in the BQE Central area, trucks often must pass through Disadvantaged Communities. For instance, truck traffic from BQE Central travels over the Gowanus Expressway where 93% of the census tracts are disadvantaged – ranking in the 91st percentile for carcinogenic air toxins risk. Impacts of urban highways like the BQE are especially acute in minority and low-income communities because the highway network was purposely built adjacent to these communities. Neighborhoods bifurcated by highway infrastructure tend to face disinvestment, and have restricted access to jobs, education, healthcare, recreation, and other key destinations.

The BQE Central Project will benefit Disadvantaged Communities adjacent to the project area and along the BQE corridor in a few key ways:

- **Avoiding Additional GHG Emissions:** By maintaining BQE Central as a functioning corridor for freight and motorist travel, the Project will prevent additional GHG emissions from severely diminishing air quality in surrounding neighborhoods.
- **Enhancing Street Safety**: Reconfiguring connections between the highway, arterial roadways, and local streets will prioritize taking traffic off local streets and minimizing potential conflicts between drivers and other road users.
- **Increasing Connectivity**: Creating new bicycle and pedestrian connections creates opportunities. These new paths will serve as routes to employment, education, recreation, and commerce.
- **Creating and Increasing Access to Park Space**: Parks and green spaces are proven to have positive health impacts on communities. Parks offer the opportunity to engage in physical activity, experience nature, and participate in community activities.

As an example, one of the census tracts adjacent to BQE Central is comprised of 44% Black and 38% Latino populations.[3] It is home to Farragut Houses, a NYC Housing Authority (NYCHA) public housing development, home to over three thousand New Yorkers. It is in the 98th percentile for people in households whose income is less than or equal to twice the federal poverty level, the 90th percentile for asthma, and the 99th percentile for diesel particulate matter exposure. Currently, Farragut Houses is isolated by surrounding highway infrastructure. Every day, residents navigate complicated and often treacherous streets on their way to work, to school, to the grocery store, or to the doctor. Reimagining the highway configuration offers the opportunity to remove excess traffic from local streets and better connect residents to resources by removing or moving highway infrastructure that broadly reduces accessibility, particularly to local parks near the Atlantic Avenue interchange, along the Triple Cantilever section, and near the Brooklyn and Manhattan Bridges.

[3] USDOT Equitable Transportation Community Explorer, https://experience.arcgis.com/experience/0920984aa80a4362b8778d779b090723/page/ETC-Explorer---National-Results/

An estimate of the reductions to co-pollutants that would directly benefit disadvantaged communities was prepared for the Project through reviewing the roadway segments within Brooklyn used in the emissions analysis and where emission reductions would occur. The location where emissions reductions associated with vehicle diversions and reduced travel speeds within Brooklyn were projected to occurred compared against the boundaries of identified Disadvantaged Communities. The 2032 and 2036 ratios between the total emissions reductions and those that would fully or partially occur within a Disadvantaged Community was then calculated for each pollutant (NO_x, SO_2, and $PM_{2.5}$). **Table 5** shows the percentage of emission reductions that would occur within Disadvantaged Communities—ranging from 40 to 49 percent.

Table 5 shows the Project's total emission reductions benefits for the 2032 and 2036 analysis years, as well as the portion of these emissions that are estimated to occur within Brooklyn's identified Disadvantaged Communities. Approximately 44 percent of benefits associated with the reduction to co-pollutant emissions within Brooklyn—approximately $1.1 to 2.1 million dollars per year—would be generated by emission reduction that are projected to occur within Disadvantaged Communities. Therefore, a significant portion of the Project's emissions reduction benefits are anticipated to be directed to Disadvantaged Communities.

Additionally, many Disadvantaged Communities in NYC are located within a coastal floodplain, including the coastal communities of the Bronx, portions of Northwest Queens, Northwest Brooklyn, South Brooklyn, and North Staten Island. Therefore, a significant portion of the benefits associated with reduced GHG emissions would result in indirect benefits to these communities with lessened impacts from global climate change.

Analysis Year	Pollutant	Total Emissions Reductions (Tons/Year)	Percent of Benefit Realized Within Disadvantaged Communities	Disadvantaged Communities Emissions Reductions (Tons/Year)	Co-Pollutant Monetized Benefit (2021 dollars) (1)	
					Total	Disadvantaged Communities
2032	NO_x	(39.1)	41%	(15.9)	$813,131	$330,806
	SO_x	(0.248)	47%	(0.116)	$14,030	$6,571
	$PM_{2.5}$	(1.790)	45%	(0.805)	$1,789,978	$804,469
	Total	**N/A**	**N/A**	**N/A**	**$2,617,139**	**$1,142,026**
2036	NO_x	(66.5)	49%	(32.5)	$1,385,095	$675,944
	SO_x	(0.457)	40%	(0.185)	$25,825	$10,451
	$PM_{2.5}$	(3.457)	42%	(1.463)	$3,456,427	$1,462,851
	Total	**N/A**	**N/A**	**N/A**	**$4,867,347**	**$2,149,245**

Notes:
(1) Monetized benefits estimated based on the damage costs specified in Appendix A, Table A-6 of USDOT BCA Guidance for 2032 and 2036.

Table 5 Operational Analysis Period Emission Reductions within Disadvantaged Communities (tons per year)

Lifecycle Project Delivery – Lower Embodied Project Materials

NYC DOT will follow Executive Order 23 and explore the potential of using NYSDOTapproved recycled material like Recycled Portland Cement Concrete Aggregate (RCA), Fly Ash, etc. if the use is cost-effective and consistent with NYSDOT technical specifications for selective use in the Project. NYC DOT is also committed to evaluating construction methods that would result in lower carbon footprint than traditional methods of moving construction materials using adjacent waterways instead of trucks. NYC DOT will also prioritize local sourcing or production of construction materials, and seek vendors with a proven history of environmentally friendly operations (clean trucks, efficient routes, low-carbon materials, etc.).

V. Project Outcome Criteria #5: Equity, Multimodal Options, and Quality of Life Addressing the Unequal Burdens of Transportation Impacts

As described above, the BQE Central Project will play a key role in addressing regional and local challenges of urban goods movement. Any action related to the BQE has the potential to directly affect Disadvantaged Communities. Although NYC DOT is aggressively seeking to decrease the number of trucks on its streets, trucks will continue to be the primary mode for the movement of freight for the foreseeable future. This dependence on trucks, which emit fine particulate matter and GHGs, results in increased toxins linked to premature death and chronic illnesses. These impacts are felt throughout NYC but are particularly pronounced in low-income communities of color adjacent to the City's highway network, including the BQE. Highways were intentionally built adjacent to low-income communities of color, and as a result, these communities have historically been overburdened and continue to face a disproportionate share of the unwanted byproducts of trucking activity. It is therefore essential to ensure the efficient movement of goods and services by minimizing freight bottlenecks on the BQE, which disproportionately harm Disadvantaged Communities.

Completion of this project will avoid emissions, noise, and safety impacts that would result from full closure of BQE Central. On a typical weekday, approximately 50 percent of vehicles traveling Queens-bound on the BQE Triple Cantilever originate from a disadvantaged community within Brooklyn, while 40 percent of those total Queens-bound trips have a destination to a disadvantaged community. Similarly, 40 percent of the Staten Island-bound BQE Triple Cantilever vehicles start their trip from a disadvantaged community in Brooklyn and over 50 percent of the vehicles on the structure end their trip in a disadvantaged community within the borough. Arterial streets in the neighborhoods surrounding BQE Central would experience the greatest increases in traffic and associated environmental burdens and additional traffic increases on local streets across much of Brooklyn would affect additional Disadvantaged Communities located throughout the borough. Improving BQE Central will allow the City to investigate long-term strategies to improve conditions and reduce transportation disadvantage in Disadvantaged Communities, whereas a full closure would substantially add to burdens that these communities already endure.

Community Engagement

Recognizing the critical role BQE Central plays in NYC's neighborhoods and economy, NYC DOT has worked to engage a wide range of stakeholders including City, State, and Federal elected officials, Community Boards, neighborhood associations, NYCHA tenant associations, business improvement districts (BIDs), the freight industry, transportation, accessibility, and environmental justice advocates, cultural organizations and institutions, stakeholders for whom English is not their primary language, and the general public. The Agency has made unprecedented efforts to employ both traditional and inventive engagement strategies. In September 2022, NYC DOT initiated a multi-pronged outreach process to reach as many stakeholders as possible. This process was anchored by three rounds of public workshops offered both in-person and virtually, with translation services in several languages. Feedback was compiled and posted on the Project website and used to further develop and refine design concepts presented.

A Community Visioning Council (CVC) was formed to advise NYC DOT on engagement content and strategies, guide workshops, meet on a regular basis throughout the visioning process to discuss emerging concerns, plan for future engagement, and share feedback. Members act as ambassadors from their communities to NYC DOT to advise on the engagement process and support communication between NYC DOT and broader constituencies. The CVC works in partnership with the City to ensure an effective, responsive, and equitable visioning process for participants.

The Agency also established the Community Partner program, which includes 17 funded community-based organizations to support outreach in communities traditionally disenfranchised by traditional engagement opportunities. The Community Partners host their own workshops in their preferred languages, mediums, and venues of their constituencies, and are responsible for compiling and sharing feedback with NYC DOT. NYC DOT also conducted a survey to capture information about habits and preferences of stakeholders with regards to BQE Central. The survey received nearly 1,900 responses, and another survey will be conducted in Fall 2023.

Local Hiring and Inclusive Economic Development

The City of New York's Office of Talent and Workforce Development works in conjunction with NYC DOT to ensure community hiring through the City's HireNYC Program. This program encourages the hiring of residents from neighborhoods with high poverty levels. NYC DOT will seek to maximize participation in local hiring programs. Another such program – the NYC Pathways to Industrial and Construction Careers (PINCC)- offers strong promise for this project and will be utilized to the maximum extent feasible. PINCC focuses on building regional workforce systems through the aligning of a workforce development plan across several agencies, training and employer partners in NYC in order to encourage hiring policies and workplace cultures that promote the entry and retention of underrepresented populations. The PINCC Program will assist Cash Assistance and Supplemental Nutrition Assistance Program (SNAP) Recipients through the Human Resources Administration (HRA) for access into transportation, mechanical, back-office and construction careers. Over the next three years the PINCC Program will train over 2,700 individuals and place over 1,800 individuals in good paying jobs, paying prevailing wage, or higher, with benefits. The PINCC Program uplifts the

objectives of FHWA through comprehensive coordination of resources, job training, and employer engagement, specifically customized to eliminate barriers for low-income populations to gain access opportunities for financial self-sufficiency. If selected, NYC DOT will work with PINCC to source eligible and qualified candidates to support this Project.

Hiring and Retention of Underrepresented Populations

NYC DOT has demonstrated commitment to expanding access to good paying infrastructure jobs, including programming for hiring halls to expand and retain employment of underrepresented communities in the infrastructure sector. NYC DOT will build on best practices opening pathways to the infrastructure sector for underrepresented communities by collaborating closely with the firms delivering this Project. Additionally, the City established a Community Hiring Office to oversee programmatic goals including analysis on current-state job development, pre-apprenticeship opportunities, coordination with Unionized Trades, and mapping a vision for low-income New Yorkers to access jobs that lead them to the middle-class.

NYC DOT has sought to leverage its buying power to improve diversity in procurement. NYC DOT has a strong record of commitment to expanding access for Minority and Women-owned Business Enterprises (MWBEs), including NYC DOT industry days for MWBE firms and successful compliance with federal DBE requirements on federally assisted contracts. The Project will build on NYC DOT's commitment to creating an equitable environment in which federal Disadvantaged Business Enterprises (DBEs) can compete fairly for contracts and subcontracts relating to federally-assisted procurements. The federal commitment to providing contracting opportunities to utilize DBE services will be delivered by this Project (NYC DOT will apply a DBE commitment that amounts to a specified percentage of the contract costs). In addition, this Project will support NYC DOT's procurement diversity goals and participation in citywide strategies to expand opportunity for MWBE utilization. To reach the agency's goal of 30% MWBE utilization and provide greater access to contracting opportunities for MWBEs to develop and grow, NYC DOT has created an agency-wide initiative to create MWBE-only pre-qualified list, de-bundle contracts, utilize MWBE Discretionary spending and work with Chief Business Diversity Officer in developing a citywide mentoring program for FY 24.

VI. Projected Outcome Criteria #6: Innovation Areas: Technology, Project Delivery, and Financing

Technology

Screen Lines

NYC DOT has been collecting annual key screen lines since 1948 and has continuously sought to improve and expand both the data collected and the use of this data to plan for mobility improvements citywide. NYC DOT's partnership with the NYC Police Department (NYPD) and NYSDOT on the Joint Traffic Management Center (JTMC) uses cameras and speed detection equipment to monitor traffic conditions in real-time and speaks to the opportunities that this Project will bring to improve safety on the BQE. The BQE Project will build upon these and other efforts to enable NYC DOT's Traffic Operations, Information Technology & Telecommunications (ITT), and Transportation Planning & Management (TPM) divisions to demonstrate the potential real-time data collection system to support improved safety, operations

management and monitoring, evaluation, and planning efforts. Additionally, as described above, NYC DOT will explore the use of low carbon materials to the extent feasible for a structure of this complexity and nature.

Weigh-in-Motion

Overweight trucks add to strain on infrastructure, particularly for aging assets like the BQE Triple Cantilever, hastening structural deterioration. The Federal Highway Act of 1956 (near the time of construction) set the legal load limits for trucks at 73,280 pounds. The legal limit for the structure has been updated to 80,000 pounds. In 2019, NYC DOT began to collect data to better assess the volume of overweight trucks on the Triple Cantilever, using Weigh-in-Motion (WIM) technology. WIM systems capture axle weights and gross vehicle weights of vehicles while they are in motion. Through analysis of data collected, NYC DOT determined that about 10% of all trucks using the Triple Cantilever are in excess of legal limits, equating to roughly 100 to 200 trucks a day. This additional wear and tear places further fatigue loading on the structure beyond the designed thresholds on already compromised reinforcing steel. In 2023, NYC DOT began a first-in-the-nation automated enforcement program using a WIM system to issue violations to overweight trucks traveling over the Triple Cantilever. Automated enforcement offers a more effective alternative to traditional enforcement by eliminating the need to pull over and weigh trucks to identify violators and issue fines.

*Project Delivery a*nd *Financing*

NYC DOT was authorized to use the Design-Build method of contracting for the Project in April 2018. The Design-Build method will benefit the City through time and cost savings. NYC DOT estimates Design-Build for this Project could save over a hundred million dollars and over a year on project delivery. NYC has successfully utilized Design-Build authorization on a number of projects, including the $175 million St. George Ramps project. One of the largest flex-funded American Recovery and Reinvestment Act projects in the nation, the St. George Ramps were completed well ahead of the contract completion date and all Federal funds were drawn down ahead of schedule. The City anticipates the BQE Central Project will be another example of a successful Design-Build project, helping NYC DOT to complete this complex Project with less disruption to the community and at a lower cost.

BQE Central Project

Multimodal Project Discretionary Grant Opportunity

Fiscal Years 2023 & 2024

Project Readiness

NYC DOT, in consultation with the New York State Department of Transportation (NYSDOT) and the Federal Highway Administration (FHWA), is assembling documents to start the environmental review process. An Environmental Impact Statement (EIS) is expected, with a Notice of Intent (NOI) anticipated to begin the National Environmental Policy Act (NEPA) in Spring 2024. NYC DOT is in the Pre-NOI phase, preparing FHWA documents, and conducting traffic analyses (studying two- or three-lane alternatives), and early field work for the EIS. NYC DOT is conducting community engagement to understand community needs. The EIS will determine BQE Central Project components. NYC DOT will continue to study concepts in collaboration with NYSDOT and FHWA in order to prepare to formally enter the environmental review process for BQE Central.

NEPA Description

NYC DOT is currently preparing plans, analysis, studies, and reports to support entry into the NEPA process and has been developing strategies and engineering concepts to address the BQE Central for several years. NYC DOT is targeting the issuance of an NOI in Spring 2024.

NYC DOT is working closely with FHWA and NYSDOT to lay out shared policy goals applicable to the BQE corridor, prepare a Pre-NOI Report, and develop an overall project schedule. The Pre-NOI Report will contain all the key information and analysis that FHWA requires to demonstrate that NYC DOT is ready to enter NEPA, so it can issue the NOI and begin the two-year regulatory time clock to complete NEPA. Specifically, the Pre-NOI Report contains the following studies:

- Statement of Need, Purpose, and Objectives;
- Agency Coordination Plan;
- Public Involvement Plan;
- Environmental Justice and Limited English Proficiency Outreach Plan;
- Identification of Cooperating Agencies;
- Permitting Timetable;
- Preliminary Range of Alternatives, describing NYC DOT's process for identifying and screening preliminary project alternatives;
- Extent of Analysis for Resources, which documents existing social, economic, and environmental conditions in the project's study area and the proposed methodologies for analyzing each resource category in the EIS; and
- Identification of Potentially Significant Impacts and Potential Mitigation Strategies, which documents NYC DOT's preliminary understanding of impacts the project is likely to result in, and ideas for partially or fully mitigating project impacts.

In addition to the Pre-NOI Report, NYC DOT is undertaking a detailed traffic study that will be complete before the NOI is issued. The traffic study covers a large section of Brooklyn, specifically 195 local street intersections in Downtown Brooklyn and Southwestern Brooklyn in

addition to the mainline and ramp segments of the BQE in these areas. With this work in place before the NOI, NYC DOT can begin noise, air quality, and other long-lead time studies immediately after issuance of the NOI, which will place the Project in an advantageous position to reach a Record of Decision (ROD) within the two-year statutory limit. NYC DOT is also undertaking existing conditions surveys of noise, natural resources, open space, and visual resources in advance of the NOI. This ongoing work will further enhance the Project's readiness to enter NEPA and expeditiously complete the technical analysis and develop the EIS for agency and public review. NYC DOT is also working with FHWA and NYSDOT to ensure the Project's readiness for a timely Section 106 process—often a critical-path element of the overall project delivery process.

NYC DOT expects the following schedule based on the issuance of an NOI in Spring 2024.

Milestone	Targeted Completion Date
Publish Notice of Intent	Q1 2024
Draft Scoping Report / Scoping Information Packet	Q1 2024
Scoping Meeting	Q2 2024
Final Scoping Report	Q3 2024
Notice of Availability of the Draft EIS	Q3 2025
Public Hearing on the Draft EIS	Q3 2025
End of Draft EIS Comment Period	Q4 2025
Publish Joint Final EIS & ROD	Q1 2026

Information on reviews, approvals, and permits by other agencies.

The FHWA is the Federal Lead Agency for NEPA, and NYC DOT is the project sponsor. As the direct recipient of Federal-aid highway funds from FHWA, NYSDOT is responsible for overseeing implementation of federal aid transportation programs and projects and is also a Joint-Lead Agency for State Environmental Quality Review Act and City Environmental Quality Review. As defined by CFR § 601.4 and 601.5, these agencies are responsible for managing and advancing the coordination process, ensuring that the environmental review process is conducted properly, and preparing and delivering the EIS for BQE Central. The FHWA, NYSDOT, and NYC DOT are committed to the efficient management of the Project and providing opportunities for coordination with interested Federal, State and local agencies.

NYC DOT is applying for Federal funds and other federal approvals for implementation of the Project, and therefore, the Project is subject to NEPA. Accordingly, public and agency coordination efforts will follow 23 USC § 139 ("Efficient Environmental Reviews for Project Decision-making and One Federal Decision"). This directs the lead agencies to identify Cooperating and Participating Agencies in its NEPA actions and to maintain open lines of communication with these agencies as the Project progresses.

FHWA, NYC DOT, and NYSDOT are responsible for ensuring that the environmental review process is conducted properly and in accordance with all applicable environmental regulations. The lead agencies are also responsible for circulating and making publicly available the NOI, scoping documents, notices of public meetings or hearings, the *Draft Environmental Impact Statement* (DEIS), the *Final Environmental Impact Statement* (FEIS), and ROD (all of which are discussed below) to Cooperating and Participating Agencies.

In accordance with Council on Environmental Quality guidance, Cooperating Agencies will provide input on:

- Purpose and need;
- Range of alternatives;
- Methodologies;
- Identification of issues that could substantially delay or prevent granting of permit/approval; and
- Mitigation.
- Cooperating Agencies also share the responsibilities of Participating Agencies. The role of Participating Agencies is to:
- Provide comments, responses, studies, or methodologies on those areas within the special expertise or jurisdiction of the agency; and
- Use the process to address any environmental issues of concern to the agency.

NYC DOT will also obtain relevant land use and other regulatory approvals required by New York State and New York City, including New York State parkland alienation legislation, which must be enacted by the New York State Legislature, and NYC's Uniform Land Use Review Procedure (ULURP), which must be authorized by the NYC Planning Commission and the NYC Council. As NYC DOT refines Project details, the Agency will closely monitor any other City and State approvals that may be required in order to proceed with the Project. These approvals will be sought in parallel with the environmental review process and secured in advance of the issuance of a ROD.

Project Risks and Risk Management

The EIS will include an evaluation of potential environmental effects resulting from the implementation of the Project. The analyses and evaluations conducted for the EIS will identify the potential for effects; whether the anticipated effects would be adverse; and mitigation/avoidance measures for adverse effects. The EIS will also include evaluations under Section 4(f) of the U.S. Department of Transportation (USDOT) Act of 1966, Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations," and other relevant federal, state, and local rules and regulations. Consultation under Section 106 of the National Historic Preservation Act of 1966 will be undertaken concurrently with the environmental review processes.

NYC DOT is advancing studies to the extent feasible and practicable to assess complex technical analyses needed for the environmental review. NYC DOT is also conducting existing conditions data collection and preliminary analysis, taking advantage of the growing season for natural resources and the primary visitation season for open space resources in the Project Area. NYC DOT is also developing methodologies and study areas for critical resource topics that will involve multiple agencies in coordination, including historic and archaeological resources, parkland, and environmental justice. NYC DOT will also engage with key agency stakeholders to coordinate with them in advance of seeking their review of the EIS.

Right of Way Acquisition Plans

After the Notice of Intent is issued, anticipated in Spring 2024, the scoping period for the EIS will begin, and the need for property acquisitions will be identified. This will be carried into the Draft EIS. Both ULURP and the parkland alienation process will begin prior to completion of the Final EIS. As NYC's formal land use approval process, ULURP involves extensive coordination with the NYC Department of City Planning (NYCDCP), the local community, the Brooklyn Borough President, the NYC Planning Commission, and the NYC Council. Each has an opportunity to weigh in on the approvals being sought, and their potential effects on existing and future conditions in the neighborhood. The parkland alienation process involves coordination with the New York State legislature to change park boundaries, and account for reduced access during the Project construction period. Both of these processes will formalize the limits of the transportation right-of-way and adjacent park boundaries.

TIP Action

The New York Metropolitan Planning Organization (NYMTC) is in the process of adding the EIS phase of this project to the Transportation Improvement Program (TIP) and State Transportation Improvement Program (STIP). The notice of comment period for the TIP amendment began on August 16, 2023 and ends on August 25, 2023 after which it will be included in the TIP/STIP. NYMTC has found the Project to be consistent with the Metropolitan Planning Process (MPO). The Project is currently on NYMTC's federally approved long range vision plan and the TIP)/STIP. NYC DOT, which is a voting member of NYMTC, will ensure this Project is programmed with the additional federal funds in the TIP/STIP well before grant award. NYMTC has also provided a letter of consistency affirming that these funds will be added to the TIP/STIP and is consistent with current regional transportation plans. The letter can be found in the "Letters of Support" file and on the grants webpage linked here.

Technical Capacity

NYC DOT oversees the largest and most accomplished bridge program in the United States, with 794 bridges, an inventory that includes 25 movable bridges and the iconic East River Bridges, including the world-famous Brooklyn Bridge. NYC DOT's Division of Bridges, with an annual operating budget of more than $100 million and a ten-year capital budget of over $17 billion, employs over 700 professionals, and has recently been honored by awards from the American Society of Civil Engineers, the American Council of Engineering Companies of New York, and the National Steel Bridge Alliance. NYC DOT is focused on delivering this Project to ensure the

flow of mobility and infrastructure improvements throughout the project area, and that the construction timeline is minimized. The team will deliver this Project using design-build procurement, which is detailed in the Outcome Criteria. NYC DOT has extensive experience negotiating consultant contracts and task orders while maintaining costs within a specified budget as well as supervising that work. The Agency will follow internal policies and procedures in developing partnerships with other institutions.

Financial Completeness

The MPDG funds will be significantly leveraged with a local match of $4.4 billion in NYC capital funds. A total of $200 million is the required 20 percent local match amount. The non-federal share is identified in NYC's budget in the Capital Commitment Plan in the following Budget Lines: HB0278, HB1012, and HB0215. This budget is part of the Mayor's approved 10 Year Capital Commitment Plan and is available to the public.

NYC DOT, as an agency of the City of New York, has financial controls and systems in place to identify funds for the entire project cost. The Agency has identified the source of local match. Local match funds will be made available through the proceeds of general obligation bonds and through tax-levy revenues. The City will raise the funds for the entire Project's cost, including the Federal and State shares, up front. Reimbursement for the Federal and State shares will be sought on an ongoing basis as the Project progresses and payments are made to contractors. NYC DOT has extensive experience with administering Federal grants and complying with Federal requirements. The City of New York, including NYC DOT, successfully undergoes Federal and State Single Audit each year, as required by 2CFR 200.

NYC DOT has extensive experience administering USDOT grants and complying with federal requirements and negotiating Architecture and Engineering consultant contracts and task orders while maintaining costs within budget a specified budget. Under the Brooks Act requirement, consultant costs will be negotiated via a request for qualifications, from which the most qualified consultant firm will be identified. Following this step, a cost negotiation will occur to determine if the most-qualified firm can provide the services at a reasonable price. The final agreed-upon price represents a maximum price that cannot be exceeded without additional contract negotiations. Given NYC DOT's extensive experience working with consultants, it is believed that the Project estimates provided are fair and reasonable. Additionally, NYC DOT has multi-year capital budgets in the billions of dollars, that can be made available to absorb any cost overruns, should they occur.

BQE Central Project

Multimodal Project Discretionary Grant Opportunity

Fiscal Years 2023 & 2024

Project Budget, Sources and Uses of Funding: Project Budget

For this application, a preliminary cost estimate was developed for a full replacement option and includes the cost of construction staging for Queens-bound traffic at the Brooklyn Bridge. The budget also includes improvements at the Atlantic Avenue Interchange and the Manhattan Bridge/BQE connection to better address truck traffic while maximizing safety and pedestrian connections. The estimate was based on materials takeoffs from the conceptual structural designs and roadway geometric layout. Historical unit prices from the NYC area were utilized to establish costs. Parametric estimating practices were relied upon to establish a baseline for certain features that will require additional community engagement, including park spaces for which specific programming and amenities are yet to be determined. The estimated construction cost for this alternative is $5.5 billion.

Cost Estimate Description

Based on the detailed assessment of all 21 structures within the BQE Central section and preliminary studies of the site conditions, NYC DOT has developed preliminary alternatives for full and partial replacements, while maintaining two lanes of traffic in each direction for majority of construction activities. Overnight or weekend closures for specific construction activities is anticipated. The ongoing traffic studies will determine the final lane configuration, such as the two and three standard width through lanes in each direction. All preliminary estimates are developed utilizing methodology NYC has established for major projects. Base costs for Structures, Roadway, Parkland, and Utilities were developed based on the conceptual designs, and contingencies to encompass the unknowns were utilized in developing estimates.

Description of Previously Incurred Costs

In the last five years, NYC DOT has performed preventive maintenance work, localized bridge repair work and pavement resurfacing work utilizing in-house forces on the order of $4M. NYC DOT recently let a $26M interim repair contract to address structural and serviceability issues in two spans to extend the remaining service life. Additionally, NYC DOT installed the Weigh-In-Motion (WIM) system on the Queens-bound traffic lanes for a cost of $2.7M (more information about WIM Program available in the projected Outcome Criteria #6)**.** As part of preliminary investigations and studies to define the detailed scope of work for the project and develop various alternatives, which includes preparation documents and community outreach ahead of the environmental review process, the total cost incurred to date is over $35 million. This cost also includes engineering services for extensive structural evaluations, ongoing interim repairs and installation of WIM monitoring systems within the Project limits.

Plan for Covering the Full Cost of the Project

The MPDG funds will be significantly leveraged with a local match of $4.4 billion in NYC capital, 80% of the project cost. Of the overall local match allocated to this project, a total of $220 million is the required 20% match amount for all federal funding. The total required non-federal share match is available in NYC's budget and is documented in the "Funding Commitments" file in the application. For the BQE Central project, the required local match is budgeted in Capital Commitment Plan in the following Budget Lines: HB0278, HB1012, and HB0215. This budget is part of the Mayor's approved 10 year capital plan and is available to the public (see "Funding Commitments" file). The Project costs are supplemented by existing formula funding from National Highway Performance Program (NHPP) and Congestion Mitigation and Air Quality program funding amounting to $300 million. These funds have been allocated to NYC DOT and are available for this project.

NYC has $4.4 billion committed to this Project, and FHWA formula funding will be available upon the review and approval of the Design Approval Document (DAD) design-build procurement, and subsequent obligation of federal funds. If selected for award, a total of $2.7 billion will be allocated out of the total project cost. The City has funding available for the remaining cost of the project not supported with federal funding and will allocate capital funding available. To support funding for this project, NYC also intends to apply for future federal grants, whose program goals and Notices of Funding Opportunity align with the Project objectives.

Plan for Funding Entire Project	
Funding Source	Amount Available (000's)
NYC Capital (Approved to be programmed in the TIP)	$4,400,000
FHWA Formula Funding	$300,000
MPDG	$800,000
Total	**$5,500,000**

Table 1 below shows the sources and uses of project funding for this project, as well as each of the major construction activities delivered through the Design-Build Contract. Included in the project budget is a $2.1 billion that is available should the project costs increase. This estimate is currently high because the Project is in the design phase. Table 2 below shows a summary of non-participating costs of this Project. NYC DOT will not be seeking reimbursement for these costs.

Table 1- Funding Source (Amount in 000's)	Utilities	Structures	Parkland	Roadway	Contingency	Total Funding
MPDG Funds	$32,000	$296,000	$72,000	$88,000	$312,000	$800,000
Other Federal Funds	$12,000	$111,000	$27,000	$33,000	$117,000	$300,000
Non-Federal Funds	$181,000	$1,613,000	$421,000	$494,000	$1,691,000	$4,400,000
Total	$225,000	$2,020,000	*$520,000*	*$615,000*	*$2,120,000*	$5,500,000
Percentage of total cost	4%	37%	9%	11%	39%	

Table 2 Description	Non-Federal Share (NYC Capital Funds)	Federal MPDG Funds	Other Federal Funds	Total
Non-Participating Costs				
Data Collection, Traffic Modelling and In-Depth Inspection	$20	$0	$0	**$20**
Environmental Impact Statement and NEPA	$42	$0	$0	**$42**
Construction Support Services	$300	$0	$0	**$300**
Resident Engineering Inspection	$300	$0	$0	**$300**
Railroad Force Account	$200	$0	$0	**$200**
Subtotal Non-Participating Costs	**$862**	**$0**	**$0**	**$862**
	100.00%	***0.00%***	***0.00%***	**100.00%**