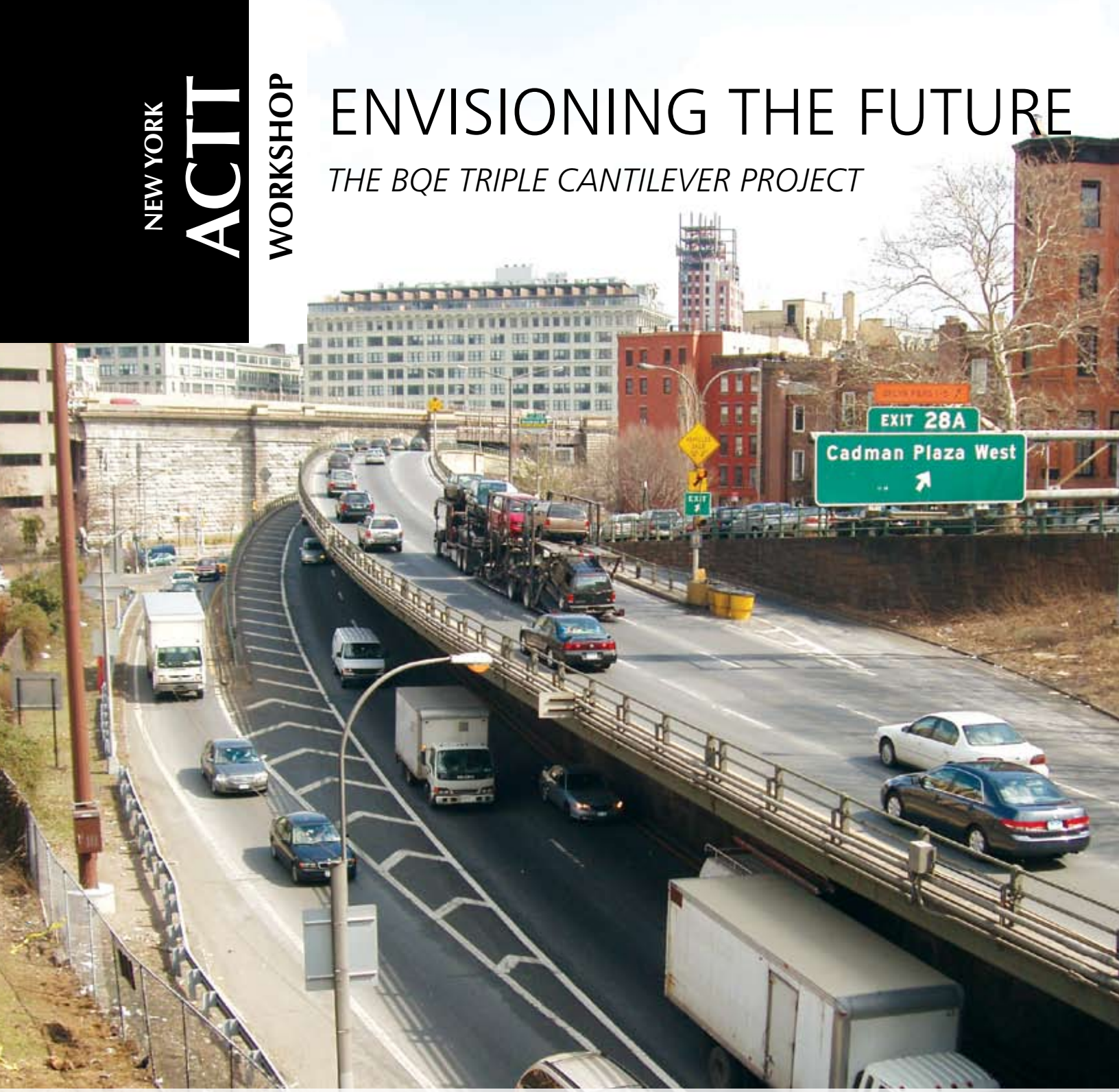
NEW YORK ACTT WORKSHOP

ENVISIONING THE FUTURE

THE BQE TRIPLE CANTILEVER PROJECT



U.S. Department of Transportation
Federal Highway Administration

NEW YORK CITY DOT

New York State Department Of Transportation

ACTT

ACCELERATED CONSTRUCTION TECHNOLOGY TRANSFER

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- ACTT provides a fresh outlook by bringing national experts to your planning table.
- ACTT introduces innovations that have been tested elsewhere.
- ACTT saves time: according to FHWA's *ACTT II* report, published in March 2005, "most agencies have found ways to slice construction time by 30 percent or more."
- ACTT saves money: ACTT suggestions enabled New Jersey to reduce its budget for the Route 46 bridge project from $10 million to $7.2 million.
- ACTT works for you and your customer!

How do I ACTT?

- Select a corridor: ACTT is most helpful when applied during the project development phase.
- Make a workshop proposal to ACTT team members, and submit a copy of your proposal to the FHWA Division Office. Include details on the project corridor, timeline and goals.
- Hold a pre-workshop meeting with the ACTT management team.
- Select a meeting site, and coordinate workshop details with the FHWA Division Office.
- Host the workshop.
- Draft a report for submittal to FHWA.
- Incorporate ACTT into project operations.

WHY ACTT?

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> "New York is the most ethnically diverse, religiously varied, commercially driven, famously congested, and, in the eyes of many, the most attractive urban centre in the country."
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> — ***"New York City."*** *Encyclopædia Britannica. 2006. Encyclopædia Britannica Premium Service. July 2006. <http://www.britannica.com/eb/article-215653>.*

And the Brooklyn-Queens Expressway (BQE) is considered by many to be an integral part of that dynamic centre.

Famous for its rush-hour traffic, the BQE (or I-278) runs from southern Brooklyn to the Grand Central Parkway in Queens. Various sections of the 60-year-old roadway are currently being reconstructed, with an additional 1.5-mile section under examination by the New York State Department of Transportation (NYSDOT) and a panel of National transportation experts at an Accelerated Construction Technology Transfer (ACTT) workshop in March 2006.

The segment under study runs between Atlantic Avenue and Sands Street in Kings County and consists of a roadway elevated on a variety of steel and concrete bridges. It carries a daily traffic volume of 123,000 vehicles and serves as a critical link for the New York City metropolitan area. Project constraints for the BQE "triple cantilever" project include substandard features and potential impacts on business development, residential communities, city parks, historical resources and multi-modal infrastructure.

Knowing this, the project team asked for input from the following skill sets at the BQE "triple cantilever" workshop:

- Construction.
- Environment.
- Geometric Design.
- Public Involvement.
- Structures.
- Traffic/Safety/Intelligent Transportation Systems (ITS)/Work Zone.

Workshop attendees focused on how the ACTT process applied to their area of expertise, while the group as a whole brainstormed two key issues: 1) viable options for rehabilitating or replacing the bridge, and 2) ways to alleviate long-standing congestion. Following extensive discussion and intermingling, each skill set presented a list of priority recommendations that NYSDOT is evaluating.

Because the project is in the early planning phase, NYSDOT has not yet developed any cost estimates or construction timeframes. The DOT plans to begin the Environmental Impact Statement (EIS) process in 2007, with a Record of Decision (ROD) expected in approximately five years.

1.1. Opening Session

NYSDOT held its ACTT workshop March 21-23, 2006, at the Crowne Plaza LaGuardia in Queens, NY.

Jerry Blanding, innovative contracting engineer for FHWA's Resource Center in Baltimore, served as the moderator, providing an overview of the ACTT concept. NYSDOT Regional Director Douglas Currey and FHWA New York Division Administrator Robert Arnold provided opening remarks, after which participants introduced themselves. Harold Fink, NYSDOT structural engineer, discussed the project, and the group headed out in two buses for a tour of the project area, stopping at multiple locations to inspect site conditions first-hand.

1.2. Workshop Process

The New York workshop followed the traditional ACTT structure, with attendees gathering briefly to receive instructions on Wednesday morning. Following that, the skill sets broke into individual groups and came back together to present their initial findings prior to lunch. The teams spent Wednesday afternoon intermingling and developing their final recommendations, which skill set representatives presented to the group on Thursday morning.

1.3. Skill Set Goals

The NYSDOT team provided the following general goals for workshop attendees:

- Develop options to rehabilitate or replace the bridges and at-grade sections while maintaining traffic lanes.
- Discuss potential treatment methods to be done overnight and on weekends.
- Minimize design and construction time.
- Address substandard vertical and horizontal clearances.
- Add shoulders where feasible.
- Implement context sensitive solutions (CSS), and improve connections to adjacent park facilities.

In addition, the project management team provided participants in each skill set with an established group of goals that was unique to their subject area:

Construction

- Minimize environmental impacts.
- Minimize traffic impacts.
- Minimize lane closures.
- Consider various demolition and construction methods/procedures.
- Recommend methods and materials that will allow for faster construction.
- Recommend methods to reduce turn-around time and personnel requirements.

Environment

- Ensure that the project complies with air quality standards and regulations.
- Maintain or improve water quality during and after construction.
- Investigate CSS.

Geometric Design

- Minimize traffic congestion at the interchanges.

Public Involvement

- Use media relations to keep the traveling public informed.

Structures

- Reduce construction time.
- Recommend wall and bridge types that will reduce both the number of construction phases and the overall construction timeframe.
- Utilize precast and prefabricated sections to reduce the construction timeframe.
- Reduce the cost of structures.
- Minimize the length of traffic closures.
- Recommend environmentally-friendly construction methods.

Traffic/Safety/ITS/Work Zone

- Use incident management (IM) systems and other ITS innovations.
- Reduce or eliminate work zone congestion.
- Consider the effects of lane closures.

2.1. Project Overview

In 1940, urban planner Robert Moses recommended construction of the BQE in order to fill a gap in New York City's arterial system and aid in National defense, and work on the BQE was begun. Now almost 60 years old, this major artery is in need of reconstruction, with work being done in phases to accommodate burgeoning traffic.

The most notable bridge along the project corridor, the triple cantilever, is a reinforced concrete, multi-level structure built in 1948. It carries six lanes of the BQE on two cantilevers, with the three eastbound lanes located above the three westbound lanes. The third cantilever features the Brooklyn Heights Promenade, a pedestrian walkway with views of the East River and the Manhattan skyline. Furman Street runs parallel to the Interstate, at grade. Local street intersections and connections to the Brooklyn Bridge north of the triple cantilever add to the complexity of the structure.

NYSDOT has defined the scope of the BQE "triple cantilever" project as follows: 1) either rehabilitate or replace the triple cantilever itself, and 2) either rehabilitate or replace the 21 other structures within the project area. NYSDOT's primary goal is to address the safety and congestion problems caused by heavy traffic conditions throughout the corridor. The number of structures involved makes this a complex project, and traffic control will be a major challenge.

Table 1. Bridge Details

Description	Type	Deck Area	Number of Spans
Westbound BQE over Furman Street – Atlantic Avenue end	Reinforced Concrete Cantilever	10,988.00	7
Eastbound BQE over Furman Street – Atlantic Avenue end	Reinforced Concrete Cantilever	8,375.00	5
Westbound BQE over Joralemon	Reinforced Concrete Cantilever	2,100.00	1
Eastbound BQE over Joralemon	Reinforced Concrete Cantilever	5,900.00	2
Westbound BQE over Furman Street	Reinforced Concrete Cantilever	78,022.00	45
Eastbound BQE over Furman Street	Reinforced Concrete Cantilever	120,734.00	69
Promenade Deck	Reinforced Concrete Cantilever	46,184.00	34
Columbia Heights over the BQE	Steel Stringer and floor	16,500.00	1
Westbound BQE over York Street	Concrete Cantilever Steel Crossbeams	9,380.00	6
Eastbound BQE over York Street	Reinforced Concrete Cantilever	17,956.00	11
Westbound BQE over Fulton Street	Steel Stringer	4,500.00	2
Eastbound BQE over Fulton Street	Riveted Girder Concrete Cantilever	4,500.00	2
Westbound BQE over Washington Street	Steel Stringer	2,525.90	1
Eastbound BQE over Washington Street	Steel Stringer	2,525.90	1
BQE over Prospect Street	Concrete Rigid Frame	1,138.70	1
Westbound BQE over Adams Street	Concrete Rigid Frame	2,550.00	1
Eastbound BQE over Adams Street	Concrete Rigid Frame	2,618.00	1
BQE over Pearl Street	Concrete Rigid Frame	4,484.00	1
BQE over Jay Street	Concrete Rigid Frame	5,092.00	1
BQE over Prospect Street	Steel Rigid Frame	8,690.00	1
BQE over Sands Street	Steel Rigid Frame	10,950.00	1

Note: A large percentage of the deck area noted above is carried on cantilever or other non-redundant structures, which complicates maintenance and protection of traffic (MPT) and staged construction procedures.

2.2. Project History and Development

NYSDOT plans to begin the EIS process in 2007, with a ROD expected in approximately five years.

As the project stands, several key decisions remain:

- NYSDOT must evaluate the effect of construction on through and local traffic patterns.
- The State needs to design around the “choke points.”
- NYSDOT must implement operational improvements.
- The State needs to determine whether the corridor can be closed using either short-term closures or 24/7 construction operation.
- The DOT must evaluate the feasibility of using Furman Street as a detour and make a determination on temporary closure of the Brooklyn Bridge, the Manhattan Bridge and local street systems.
- NYSDOT needs to address substandard features and determine whether the alignment can be modified to improve these aspects.
- The State must determine whether shoulders can be added along a majority of the project corridor (if not everywhere).
- The DOT needs to evaluate whether opportunities to widen the triple cantilever promenade are feasible.
- NYSDOT must make a decision on CSS (at Parklands) and work to achieve public consensus.

2.3. Project Challenges

Traffic

This segment of I-278 carries a daily traffic volume of 123,000 vehicles and serves as a critical link for the metropolitan area. Connections to the Brooklyn Bridge, the Manhattan Bridge and the local street system fall within the project limits. Because this section of the highway carries both commuter and through traffic, the through traffic lanes must be maintained throughout the life of the project. NYSDOT must determine the most efficient means for this to be accomplished. In addition, the traffic impacts due to partial or complete closure must be addressed: NYSDOT must decide whether a short-term major construction project with total closure would be better than a long-term project with recurring nighttime closures.

Time

One of NYSDOT’s goals is to minimize the amount of time that roadway traffic patterns will be affected. The project team has discussed the possibility of prefabricating structure components off-site, when possible, and bringing them in via barge on the East River.

3.1. Construction

The construction crew offered the following recommendations:

Construction Sequencing and MPT

- Consider weekend closures of the ramps at the interchanges.
- Keep lanes open at peak times.
- Notify the public of closures.
- Consider temporary directional closures.
- Employ longer-term lane closures to shorten the construction timeframe.
- Utilize temporary bridges to maintain traffic.
- Examine detours; advertise well; utilize ITS.
- Develop and utilize an IM system.

Innovative Materials, Equipment and Procedures

Incorporate innovate materials, equipment and procedures, such as:

- Rapid setting (quick-cure) concrete.
- Precast deck and pavement panels.
- Prefabricated bridge elements.
- Innovative equipment and materials specifications.
- Micro piles.
- Geofoam (for embankments).
- Roll-in structures.
- Composite fiber wrap.

Advanced Coordination

- Coordinate with park construction; work with other agencies early.
- Utilize the park as the staging area. Obtain the necessary easements now.
- Let an advance utilities relocation contract.
- Establish a utility corridor.
- Place temporary noise walls in lieu of berms to free up areas for future staging.

Constructability

- Involve the construction industry in the design process. Pay for their services/expertise.
- Consider contractor equipment placement and lay-down during design.
- Use barges for delivering materials and for staging.
- Use Pier 7 for storage/staging.
- Have the DOT design the plan for MPT.

Contract Administration

- Use incentives/disincentives.
- Require critical path scheduling.
- Schedule wisely regarding seasons and concrete placement.
- Utilize design-build (D-B).
- Incorporate a field change order (FCO) provision in the contract.
- Promote partnering.

Subway Vent Building Conflicts

- Investigate relocating or modifying the subway vent building – or go around it.

Subway Line Issues

- Consider the location of the subway tunnels when selecting foundations.
- Identify and address engineering restrictions early in the design process.

Brooklyn Bridge Options

- Consider installing a temporary structure through the Brooklyn Bridge abutment.
- Construct a temporary structure around the Brooklyn Bridge abutment.
- Rehabilitate the existing BQE structure under the bridge without changing the design.
  - ❖ Consider replacing the beams of the Brooklyn Bridge with shallower ones to solve the vertical clearance issue.

Environmental Concerns

- Require noise and vibration control.
- Specify that the contractor use low-noise equipment.
- Provide for real-time monitoring of the surrounding structures.
- Monitor air quality.
- Utilize low sulfur diesel fuels.

3.2. Traffic/Safety/ITS/Work Zone

The traffic/safety/ITS/work zone group focused on project needs and constraints in order to facilitate traffic flow and promote public safety.

The team noted the following traffic needs/issues and then proceeded with their recommendations:

- Maintaining the desired number of full-width traffic lanes in each direction.
- Putting traffic on Furman Street.
- Rerouting traffic or changing local street patterns.

- Using movable traffic barriers.
- Studying acceptable traffic delays using Quick Zone.
- Establishing an incident detection system.
- Utilizing portable smart zones featuring cameras, signs and detectors on alternate routes.
- Providing better traffic signal coordination on local roads for detoured/rerouted traffic.
- Having an adequate law enforcement presence for speed control.

Safety

- Consider closure(s) of the East River Bridges (ERB)/local street ramps.
- Consider using Furman Street as a detour route.

ITS

- Provide real-time traffic information.
- Expand the existing network.
- Use Highway Advisory Radio (HAR) to broadcast current information.
- Use the 511 National traveler information system.
- Use variable message signs (VMS) to display travel time and/or dynamic messages.

IM

- Conduct bi-weekly incident management meetings.
- Provide around-the-clock tow truck service in the work zone.
- Maintain detailed records containing pre-accident data, a history of the work area and the latest on construction monitoring.
- Use highway cameras.
- Monitor work zone safety.
- Promote alternate routes.

3.3. Public Involvement

The team stated that an effective public relations campaign is necessary to keep motorists informed of construction activities. They based their recommendations on the “identify, involve and inform” pyramid:

- Define the target audience, including:
  - The traveling public.
  - Local businesses.
  - Residents within the project area.
  - Civic and community leaders.
  - Elected officials.

- ❖ The media.
- ❖ Internal audiences.

- Utilize outreach tactics such as:
  - ❖ Project brand/logo.
  - ❖ An 800 number.
  - ❖ Web site with two-way information sharing.
  - ❖ Door-to-door contacts.
  - ❖ Displays in the neighborhood and along the BQE.
  - ❖ Project newsletter.
  - ❖ “Dear neighbor” letters.
  - ❖ E-mails.
- Provide information on both the NYSDOT and the New York City Department of Transportation (NYCDOT) web sites.
- Keep the lines of communication open. Establish a point-of-contact person.
- Consider proposals for a public awareness program.
- Use television and radio traffic reports.
- Encourage flexible work schedules and working from home for commuters.
- Take advantage of public transportation; increase bus routes.
- Work with interested parties.
- Celebrate project milestones.
- Keep the public informed!

The team also noted the following barriers to implementation:

- Public acceptance of the inconveniences caused by the project.
- Traffic congestion and disruption to commuters.
- Availability of alternate routes.
- Local residents’ concerns.
- Truck traffic.
- Politics.
- Cost/funding availability.
- Coordination among all interested parties.

3.4. Geometrics

The geometrics design team provided a summary of their ideas before detailing each recommendation:

- Consider a stacked section within the existing ROW.
- Construct a trench section on a new alignment.
- Utilize an alternative or split alignment under the Brooklyn Bridge.
- Drop each bound one level.
- Consider rehabilitation improvements.
- Make operational improvements.

Stacked Section within Existing ROW

- Stack the opposing travel lanes vertically; do not offset them.
- Utilize a stacked configuration from Atlantic Avenue through the Brooklyn Bridge.
- Construct a 48-foot-wide section (three lanes plus shoulders).
- Utilize either a cantilever or frame configuration.

Pros:

- Allows for construction within the existing ROW.
- Improves horizontal sight distance.
- Improves vertical clearance.
- Adds shoulders.
- Eliminates most substandard features.
- Maintains two-plus-three lane configuration during construction.
- Has a relatively low cost.

Cons:

- Requires a construction easement over Furman Street.
- Necessitates a temporary eastbound detour.
- Forces construction over traffic.
- Requires reconstruction of the promenade.

Trench Section

- Move both travel lanes/directions downward so they are parallel to or under Furman Street.
- Construct a side-by-side typical section.
- Start south of Atlantic Avenue and connect to the existing BQE "trench."
- Go under Atlantic Avenue and Furman Street.
- Tie into the existing alignment at Old Fulton Street.

Pros:

- Minimizes MPT.
- Reduces construction time and complexity.
- Produces a new section built to modern standards.
- Keeps existing cantilever available for local traffic or alternative development.
- Improves aesthetics.
- Has no impact on the promenade.

Cons:

- Has potential noise and air impacts.
- Requires ventilation for full lids.
- Temporarily disrupts proposed park/phasing.
- Has potential hazardous materials (HAZMAT), archaeological and utility crossing issues.

New Brooklyn Bridge Portal

- Shift alignment one portal to the north.
- Utilize a stacked configuration or split alignment.
- Construct a new tangent alignment west of the Brooklyn Bridge.
- Utilize an S-curve back into the existing alignment east of the Brooklyn Bridge.

Pros:

- Minimizes MPT.
- Reduces construction time and complexity.
- Increases vertical clearance.
- Adds shoulders.

Cons:

- Faces historic impact issues.
- Impacts the anchorage ventilation system.
- Have to decide if/how to maintain existing ramp connections during construction.

Dropping Each Bound One Level

- Construct the southbound at grade.
- Move the northbound into the old southbound space.
- Shift Furman Street and integrate into park development.
- Construct a frame or cantilever section for the elevated northbound lanes.

Pros:

- Reduces structure cost.
- Increases vertical clearance.
- Adds shoulders.
- Frees the upper cantilever for other uses.

Cons:

- Impacts the park.
- Has a more complex MPT.
- May not meet vertical alignment criteria.
- Maintains the one-way operation on Furman Street.

Rehabilitation Improvements

- Reconstruct the Brooklyn Bridge span to increase vertical clearance over the BQE.
- Add pocket shoulders.
- Add a safety shape rail.
- Install a vertical clearance warning system.

Operational Improvements

- Add a deceleration lane to the northbound off-ramp of the Brooklyn Bridge.
- Add an acceleration lane to the southbound on-ramp at Old Fulton Street.
- Add a third lane/acceleration lane (southbound) for the Sand Street on-ramp.
- Improve ramps' core geometry.

3.5. Environmental

The environmental group began by discussing key project needs, after which they focused on addressing environmental and permitting concerns in a streamlined manner, all with the purpose of accelerating the project:

- Form a multi-disciplinary project design team.
- Establish a project development process that integrates engineering, environmental analysis, agency coordination and public involvement into a collaborative decision-making process.
- Conduct a comprehensive internal and external scoping process to:
  - Refine project purpose and need.
  - Delineate and map the environmental context.
  - Obtain agency and public input.
  - Establish transportation and environmental performance measures that will support environmental streamlining and stewardship.
- Develop/analyze alternatives that meet the project purpose and need while meeting:
  - State and Federal transportation and environmental performance measures.
  - The needs of the regulatory agencies and the public.
- Develop mitigation measures for unavoidable environmental impacts.
- Document the project development process through/with the following:
  - Comprehensive project files.
  - National Environmental Policy Act (NEPA) documents.
  - Categorical exclusion (CE) or environmental assessment (EA).
- Strive to satisfy as many regulatory permit requirements as possible as part of the project development process.
- Address the following environmental issues:
  - Surface water quality and storm water management.
  - Traffic and construction noise.
  - Air toxins and equipment emissions.

- ❖ Blackstone River Heritage corridor preservation.
- ❖ Historic sites and districts.
- ❖ Contaminated soils and groundwater.
- ❖ Environmental justice (EJ).
- ❖ Visual quality and aesthetics.
- ❖ Riverine vegetation and habitat connectivity.
- ❖ Construction waste management.
- ❖ Detours through residential and business communities.
- ❖ Night-time construction lighting and noise pollution.

- Use a project design team approach that includes the following:
  - ❖ Project team leader.
  - ❖ Engineering group.
  - ❖ Environmental group.
  - ❖ Public involvement group.

All proposed work must not only address the environmental regulatory requirements but must also ensure that all parties involved (public agencies, contractors and citizenry) work together to complete as much of the permitting as possible in the early phases of the project. All work needs to address regulatory requirements. Limiting the environmental impacts, i.e., avoiding work in the river or placing new construction outside the 100-year flood plain, will help accelerate the project by avoiding possible permitting delays and unanticipated environmental issues.

Note: Since the workshop, NYSDOT has learned that the BQE "triple cantilever" and the Brooklyn Heights Historic District at the top are part of a National Landmark, which subjects the project to Section 110 review. In addition, the portion of the Interstate located on the BQE "triple cantilever" was part of the June 16, 2006, *Federal Register* "Preliminary List of Nationally and Exceptionally Significant Features of the Federal Interstate Highway System." NYSDOT anticipates that this portion of the Interstate will be included on the final list as well.

3.6. Structures

The structures team discussed the "realities" of rapid construction, saying that NYSDOT could obtain only two of three key benefits – rapid construction, high quality and low cost – and they recommended speed and quality. They suggested eliminating temporary bridges to help offset the additional cost of rapid construction. Their recommendations are as follows:

General Recommendations

- Utilize self propelled modular transporters (SPMTs) for rapid bridge change-outs.

- Consider horizontal skidding.
- Utilize precast abutments and piers as well as prefabrication of the superstructure.
- Consider complete bridge prefabrication, Epping prefabrication and/or superstructure prefabrication with continuity.
- Construct mechanically stabilized earth (MSE), precast gravity or precast cantilever retaining walls.
- Utilize materials that provide long-term durability, such as:
  - High-performance concrete (HPC).
  - High-performance steel (HPS).
  - Epoxy-coated/stainless steel reinforcements.
  - Weathering steel.
- Evaluate all rehabilitation options.
- Take into consideration the age of the structure.
- Consider present seismic requirements.
- Address funding limitations.
- Evaluate environmental issues such as historic structures, views and noise levels.

Traffic

- Utilize night-time lane closures.
- Allow full closure on some weekends (one direction at a time).
- Close Columbia Heights for nine months, and provide temporary pedestrian access.
- Close Furman Street at night.
- Maintain pedestrian traffic on the upper deck.
- Close the eastbound Brooklyn Bridge ramp for several weekends, and close Old Fulton Street to provide construction access.

Staging and Access Areas

- Provide barge access at Atlantic Street.
- Consider using the park areas for staging/access.
- Obtain a construction easement through the Brooklyn Bridge Park.
- Consider permanent easements.

Temporary Structures

- Address cost concerns.
- Utilize the area near 360 Furman Street and vent buildings.
- Use park properties.

Structure Issues

- Rehabilitate some structures.
- Evaluate viable options for the triple cantilever.
- Consider columns on Furman.

- Locate the utilities under the footings.
- Use prefabrication, either by the piece or for the total structure.
- Tunnel under Brooklyn Heights.
    - Cost is a concern: the estimate is $3-4 billion.

Triple Cantilever

- Convert the structure to a steel frame.
- Locate columns across Furman Street behind the sidewalk.
- Build without closures.
- Discuss potential loss of cantilever “look.”

Columbia Heights

- Close the roadway for nine months.
- Move the west abutment back, and keep the east abutment.
- Replace the superstructure.
- Relocate or reduce the size of the vent building.
- Address issues with the old park.

Cranberry Street Vent Building

- Try to reduce the footprint, or relocate the building.
- Allow for minor widening of the BQE.
- Take advantage of the additional options for temporary structures.

Old Fulton Street

- Build a one-lane temporary bridge to the east.
- Transition back under the Brooklyn Bridge.
- Address the poor geometry for high speeds; it is okay for rush-hour, low-speed traffic.
- Consider closing the right lane during low-volume/high-speed periods.

4.1. Next Steps

The impartial examination of the project by National transportation experts helped refine the scope of the BQE project: the solutions presented during the workshop reinforced some of the original design concepts and provided new direction for other aspects of the project.

NYSDOT is evaluating the recommendations from all the skill sets and will determine which ideas or suggestions will be incorporated into the BQE “triple cantilever” project. Key ideas under consideration include the following:

- Utilizing temporary bridges.
- Double decking the BQE at Old Fulton Street.
- Using Furman Street as a detour.
- Studying potential re-alignment at the Brooklyn Bridge.
- Using pre-fabricated bridge units.
- Forming a community advisory group early in the process.

GLOSSARY OF FREQUENTLY USED TRANSPORTATION ACRONYMS

ACRONYM	FULL NAME
AASHTO	American Association of State Highway and Transportation Officials
ACC	Acid Copper Chromate
ACTT	Accelerated Construction Technology Transfer
AGC	Associated General Contractors of America
AMPM	Active Management Payment Method
ASCE	American Society of Civil Engineers
ASR	Alkali-Silica Reaction
BIMRS	Bridge Incident Management and Response System
BQE	Brooklyn-Queens Expressway
CAD	Computer-Aided Design
CCA	Chromated Copper Arsenate
CE	Categorical Exclusion
CM at Risk	Construction Manager at Risk
CPM	Critical Path Method
CRCP	Continuously Reinforced Concrete Pavement
CSS	Context Sensitive Solutions
CTAP	Community Technical Assistance Program
D-B	Design-Build
D-B-B	Design-Bid-Build
DEIS	Draft Environmental Impact Statement
DMS	Dynamic Message Sign
DOT	Department of Transportation
EA	Environmental Assessment
EIS	Environmental Impact Statement
EPS	Expanded Polystyrene
ERB	East River Bridges
EJ	Environmental Justice
FAA	Federal Aviation Administration
FCC	Federal Communications Commission
FCO	Field Change Order
FEIS	Final Environmental Impact Statement
FHWA	Federal Highway Administration
GARVEE	Grant Anticipation Revenue Vehicle
GPS	Global Positioning System
GRS	Geosynthetic Reinforced Soil
HAR	Highway Advisory Radio
HAZMAT	Hazardous Materials
HMA	Hot Mix Asphalt
HOV/HOT	High Occupancy Vehicle/High Occupancy Toll

ACRONYM	FULL NAME
HPC	High-Performance Concrete
HPS	High-Performance Steel
IM	Incident Management
IT/ITS	Intelligent Transportation/ Intelligent Transportation Systems
LIMS	Laboratory Information Management System
LOS	Level of Service
MIS	Major Investment Study
MOT	Maintenance of Traffic
MPO	Metropolitan Planning Organization
MPT	Maintenance and Protection of Traffic
MSE	Mechanically Stabilized Earth
NEPA	National Environmental Policy Act
NHI	National Highway Institute
NYCDOT	New York City Department of Transportation
NYSDOT	New York State Department of Transportation
PCC	Portland Cement Concrete
PMT	Project Management Team
PR	Public Relations
PSAs	Public Service Announcements
QA/QC	Quality Assurance/Quality Control
RAP	Reclaimed Asphalt Pavements
RFI	Request for Information
RFP	Request for Proposal
RFQ	Request for Qualifications
ROD	Record of Decision
ROW	Right-of-Way
RPMs	Raised Pavement Markers/Markings
RSCH	Repeated Shear at Constant Height
RWIS	Roadway Weather Information System
SAFETEA-LU	Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users
SCC	Self-Consolidated Concrete
SEP	Special Experimental Project
SIP	State Implementation Plan
SIP Forms	Stay-in-place Forms
SMA	Stone Matrix Asphalt
SPDI	Single Point Diamond Interchange
SPMTs	Self-propelled Modular Transporters
SUE	Subsurface Utility Engineering

ACRONYM	FULL NAME
TIF	Tax Incremental Financing
TIG	Technology Implementation Group
TMDL	Total Maximum Daily Loading
TRB	Transportation Research Board
TSA	Transportation Security Administration
TSP	Thrift Savings Plan
VMS	Variable Message Sign
VPD	Vehicles Per Day

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Innovative Financing. The team's primary goals are to align potential financing options with project goals; match anticipated cash flow with project management; and provide options for managing competing priorities for existing resources.

ROW/Utilities/Railroad Coordination. The ROW group's primary role is to ensure that ROW, utilities and railroad work comply with state laws and procedures. They must also consider the numbers and types of businesses and residences impacted by a project and evaluate the ready availability of additional right-of-way.

Geotechnical/Materials/Accelerated Testing. The geotechnical team explores subsurface conditions to determine their impact on the project; pursues options for expediting materials acceptance and contractor payment; and evaluates the use of innovative materials in accordance with project performance goals and objectives.

Traffic Engineering/Safety/ITS. The traffic engineering team strives to enhance safety; improve traffic management; and explore technologies, including ITS systems, that will communicate real-time construction information to the public.

Structures (Bridges, Retaining Walls, Culverts, Miscellaneous). The structures skill set focuses on accelerating the construction of structures. Their task is to identify the most accommodating types of structures and materials that will meet design requirements and minimize adverse project impacts.

Innovative Contracting. The innovative contracting group explores state-of-the art contracting practices and strives to match them with the specific needs of the project.

Roadway/Geometric Design. The roadway team evaluates proposed geometrics and identifies the most accommodating product with the minimum number of adverse impacts.

Long Life Pavements/Maintenance. The maintenance skill set identifies pavement performance goals and objectives and explores future maintenance issues for the project corridor, including winter service, traffic operations and preventative maintenance.

Construction (Techniques, Automation and Constructability). The construction crew explores techniques that will encourage the contractor to deliver a quality product within a specific timeframe while maintaining traffic.

Environment. The environment team ensures that the scope of work and construction activities reflect local environmental concerns. Their goal is to provide the most accommodating and cost effective product while minimizing natural and socio-economic impacts.

Public Relations. The public relations skill set discusses ways to partner with local entities and effectively inform both local communities and the traveling public about the project before, during and after construction. Their role is to put a positive spin on the project.

Background of ACTT

ACTT is a process that brings together public- and private-sector experts from across the country in a setting that encourages flexibility and innovation. The goal is to recommend technologies that will accelerate construction time while reducing user delay and community disruption. This necessitates a thorough examination of all facets of a highway corridor with the objective of improving safety and cost effectiveness while minimizing adverse impacts to the traveling public.

The ACTT concept was originated by the Transportation Research Board (TRB) in conjunction with FHWA and the Technology Implementation Group (TIG) of the American Association of State Highway and Transportation Officials (AASHTO). Following the completion of two pilot workshops, one in Indiana and one in Pennsylvania, the originating task force, A5T60, passed the concept off to FHWA and TIG to continue the effort. They have done so by coordinating a series of ACTT workshops around the country, with several more pending in 2006.

More information on the ACTT program is available online at http://www.fhwa.dot.gov/construction/accelerated/index.cfm.

FHWA-IF-06-035 NEW YORK