

An aerial photograph of a suburban landscape. A multi-lane highway with a concrete overpass runs diagonally across the middle of the image. To the left of the highway is a residential neighborhood with many houses and trees. In the center, there is a large church with a prominent steeple. Below the highway, there are railroad tracks running parallel to it. The foreground shows some industrial or commercial buildings, including two large white storage tanks. The background is filled with more houses and greenery.

# **Casey Overpass Planning and Concept Design Study**

Prepared for  
**Massachusetts Department of Transportation**  
by  
**HNTB**

**March 12, 2012**





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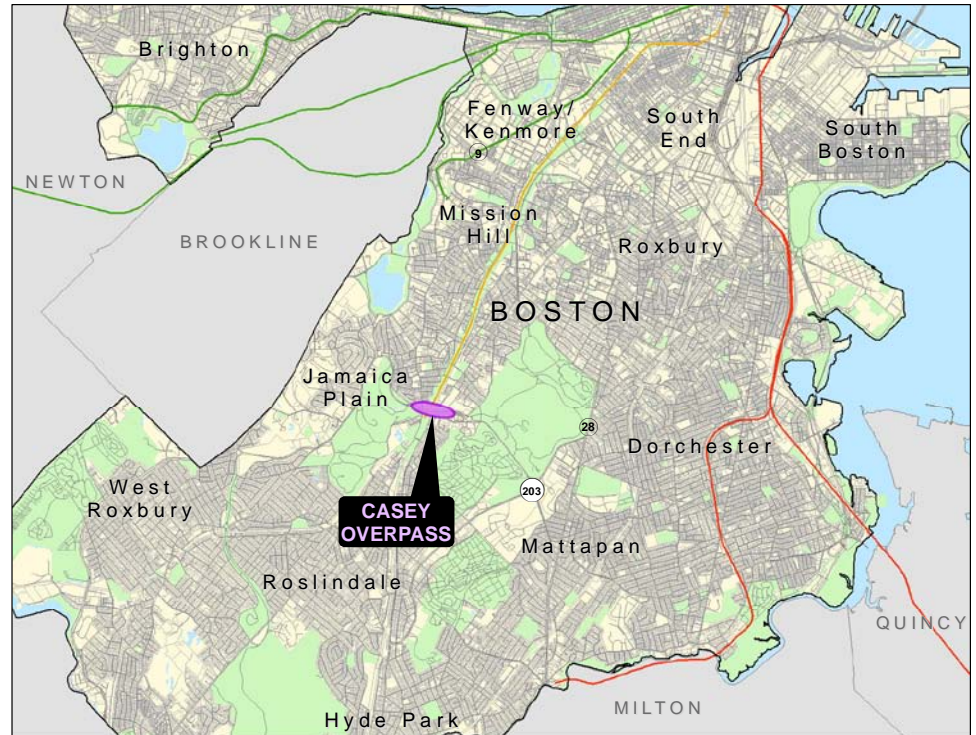
## I. INTRODUCTION

The purpose of the Casey Overpass Planning and Concept Design Study was to work with the community to explore a series of designs and recommend an alternative to replace the Monsignor William J. Casey Overpass (Casey Overpass), the elevated section of Route 203 adjacent to the MBTA's Forest Hills Station in Jamaica Plain.

The Casey Overpass was originally designed to carry three lanes of traffic in each direction and is currently functioning with one lane in each direction carrying approximately 24,000 vehicles a day. The 1,650 foot-long viaduct is structurally deficient due to numerous superstructure and substructure problems resulting from deterioration and design flaws.



Aerial view looking south



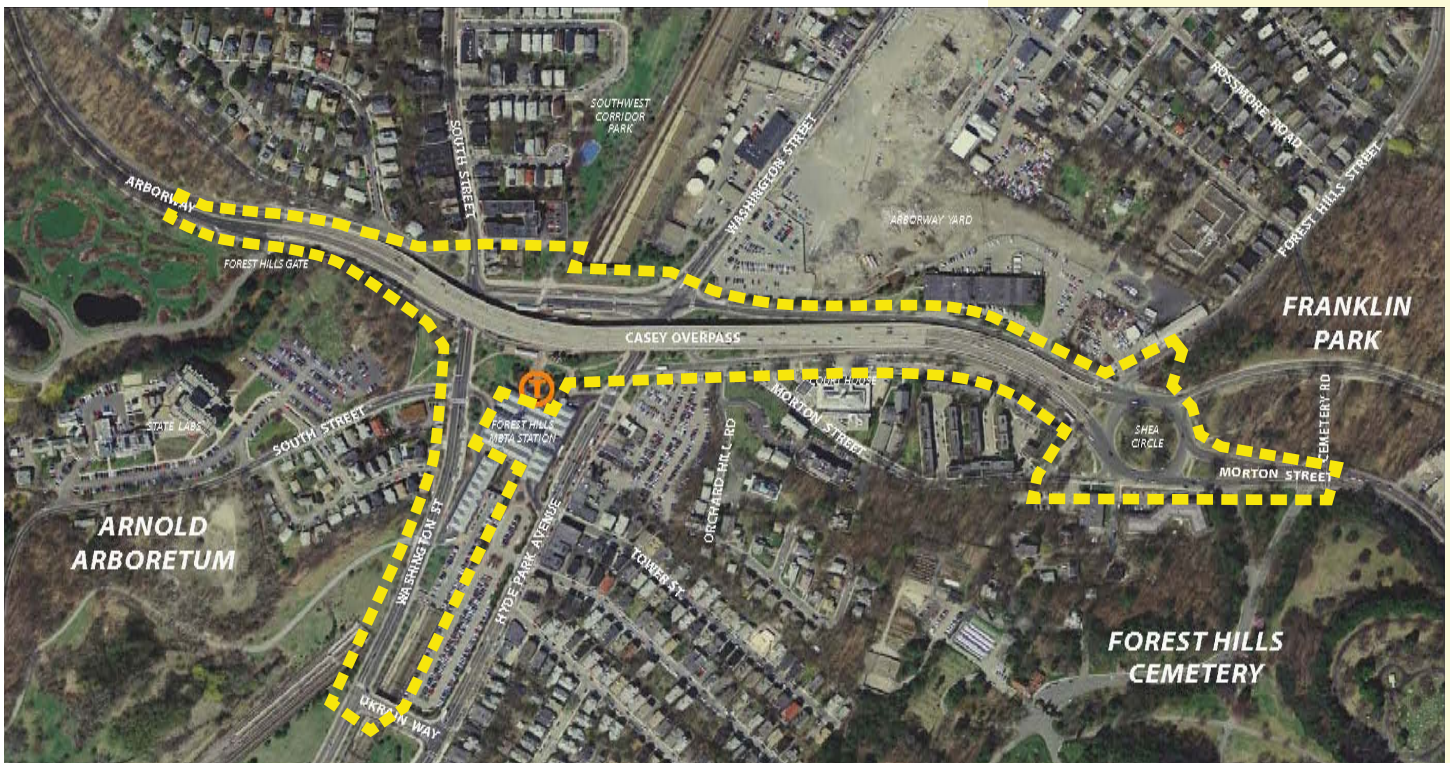
The goal of the planning and concept design process was to identify safe and accessible multi-modal connections, restore the historic Olmsted Emerald Necklace connections (eliminated by the viaduct), and develop a series of landscape and transportation options for the area. The scope of the study included the following:

- Examined existing and future (year 2035) traffic (including: transit, vehicular, pedestrian, and bicycle) and traffic simulations;
- Developed alternatives to replace the Overpass and visual perspectives of existing conditions and future bridge and at-grade conditions;
- Developed order of magnitude cost estimates for the at-grade and bridge alternatives;
- Worked closely with MassDOT (highway and transit), DCR, the City of Boston, and the community to validate findings and recommendations.

The study included a thorough examination of past studies, designs and plans for the area and was built upon the following findings:



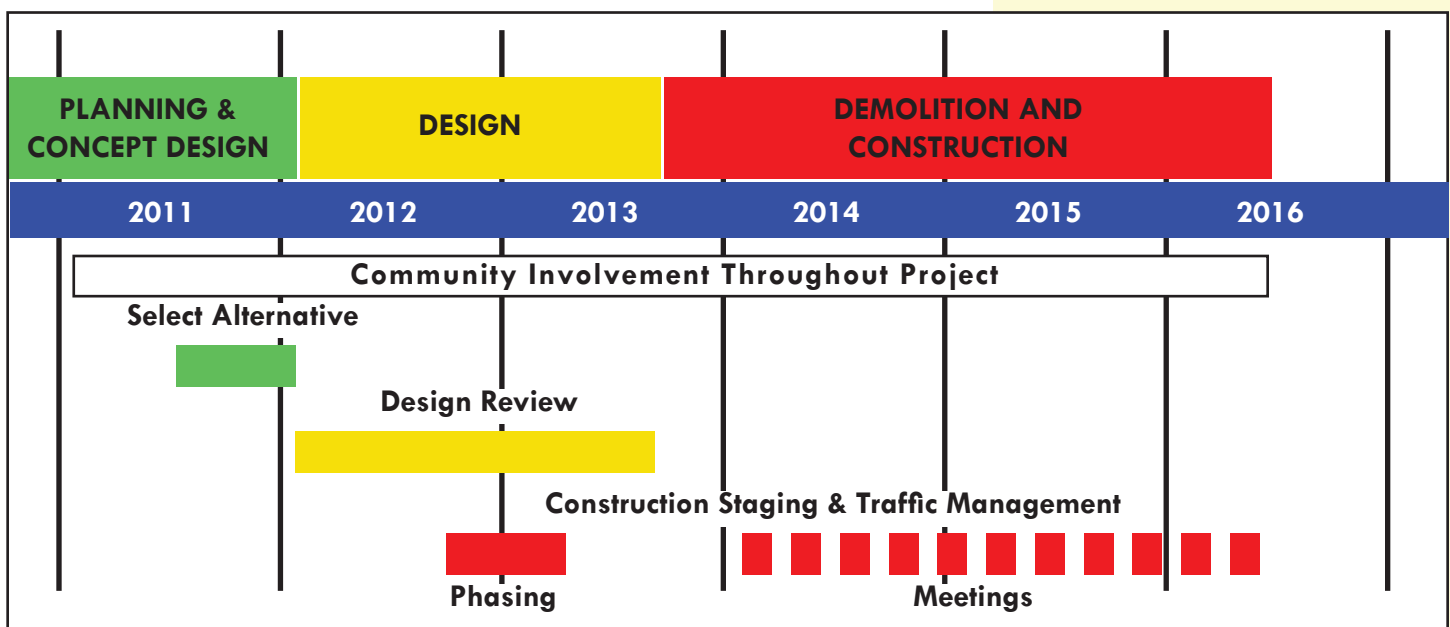
*Casey Overpass undergoing repairs in 2010.*



**Figure 1: Approximate Study Area**

- Bridge rating in June of 2010 which confirmed the state of deterioration of the viaduct;
- Traffic counts completed in June of 2010, plus additional counts taken in September 2011;
- License plate survey completed in October of 2010;
- Local and Regional Traffic Modeling and Analysis completed in August of 2011;
- Visual Inventory of Assets completed in September of 2011;
- Preliminary confirmation of moving MBTA Orange Line vent stacks and headhouse, commuter rail grates and redesign of upper level bus staging area and the Route 39 bus access options to the station.

**Figure 2: Project Schedule**





The study area was generally defined by Cemetery Road to the east, the Forest Hills Gate to the Arnold Arboretum to the west, the intersection of Washington Street and Ukraine Way to the south, and the end of the Southwest Corridor Park to the north (See Figure 1: Approximate Study Area). The traffic analysis extended well beyond this area to include regional traffic.

The Casey Overpass Project is one of MassDOT's Accelerated Bridge Program (ABP) projects. As such, the study is part of a pre-set schedule designed to meet ABP funding requirements. The Schedule of the Project is as follows:

### **Planning and Concept Design Phase**

- January to December, 2011: Planning & Concept Design (Existing Conditions, Selection Criteria and Initial Concepts, 2035 Traffic Analysis, Concept Development and Alternatives Evaluation, and Recommended Alternative)

### **Design Phase**

- July, 2012: Recommended Alternative advanced to 25% Design and file the Environmental Notification Form (ENF)
- February, 2013: Submission of 75% Design
- July, 2013: Submission of Final Design, Plans, Specifications, Estimates

### **Construction Phase**

- October, 2013: Advertising
- October, 2016: Construction Completion

The first assignment of the study was to determine if an at-grade solution was possible given the current Casey Overpass traffic volume estimate of 24,000 Average Daily Traffic (ADT) for vehicle use today and forecasted volumes for the year 2035. This Final Report and attached appendices summarize the major findings and recommendations developed through the nine-month planning process.

## **II. PUBLIC PROCESS**

The public process was organized by MassDOT with support from Legislators and the City of Boston to include a Working Advisory Group (WAG) representing advocacy groups, businesses and neighborhoods (see WAG list of members in Appendix A). The WAG was convened to work closely with MassDOT and the HNTB design team through difficult mobility and livability issues that explored traffic, design and evaluation options and to shape the presentations for each public meeting. The WAG was organized as a true “working group” whereby the members actively contributed to the formation of the designs and evaluation as well as presented at the public meetings. Members were also engaged to actively provide input to the process through five homework assignments and break-out sessions. The first WAG meeting was held in March of 2011 and the final public meeting in March of 2012.

There were a total of six public meetings, preceded by open houses to give members of the public an opportunity to converse one-on-one with members of the HNTB design team and MassDOT. In total, there were 20 formal meetings held over a nine-month period: 14 WAG meetings and six



***WAG Members discussing options in a break-out session***

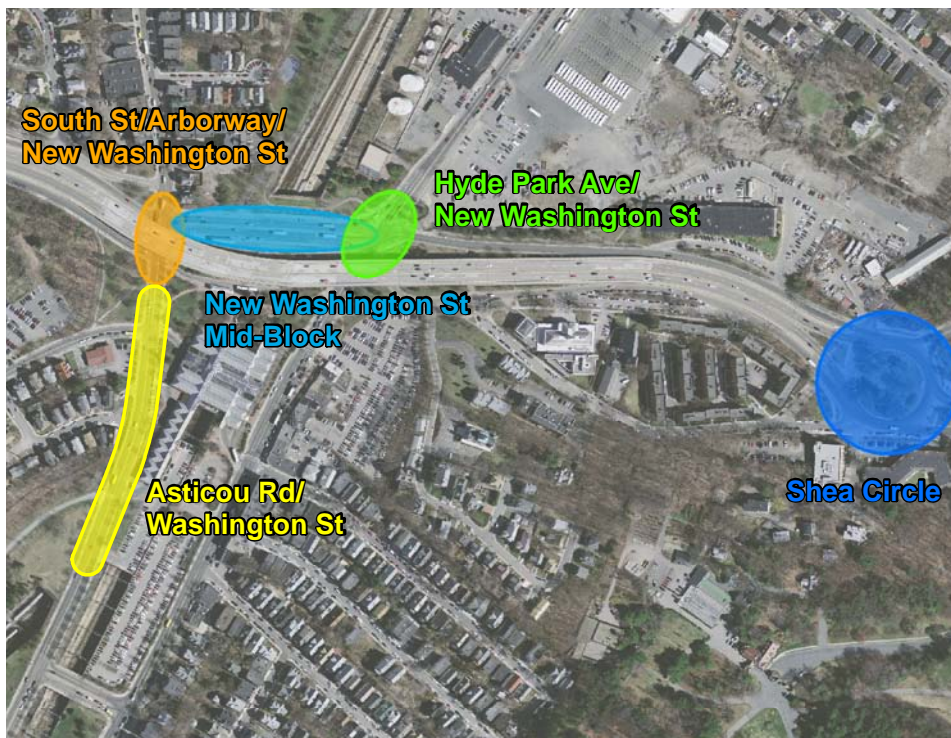


Figure 3: Design Sub Areas

public meetings. The topics, presentations and minutes of the meetings are summarized in Appendix A.

### III. DESIGN PROCESS

The design process began with a thorough evaluation of existing plans, designs and studies completed in the area over the past 10 years (see Appendix B). Many of the design concepts and ideas previously generated were tested as part of this analysis, the most notable included:

- *2008 Structural Condition Investigation and Traffic Study.* The current study reviewed and tested the design concepts from 2008 for New Washington Street and roundabouts located at New Washington Street and at the intersection of New Washington and South streets. The current study determined that the design concepts from 2008 did not meet the fatal flaw analysis.
- *2008 Forest Hills Improvement Initiative Study* that proposed a one-way loop around Forest Hills Station. Although this proposal is not precluded for the future it requires more significant analysis of MBTA future design plans to be viable for the schedule of the Casey Overpass project. **Traffic analysis determined that this proposal was not viable.**
- *2010 Centre and South Street Streetscape and Action Plan, the 2011 City of Boston's Complete Streets, 2004 Arborway Master Plan, and the 2011 MassDOT GreenDOT Policy.*

Through the community process, eight principles were established to guide the design efforts (see Appendix B, D and G). These principles formed the foundation for the fatal flaw criteria (safety, cost, schedule, Emerald Necklace connections, impact on Arborway Yard, current and future transit opera-

#### MOE GUIDING PRINCIPLES


1. Improve safety for all users
2. Improve quality of life for residents
3. Address a structurally deficient bridge
4. Strive to have an inclusive process for the sharing of information
5. Integrate artistic elements in designs
6. Adopt the principles of universal design
7. Protect and respect the design for Arborway Yard
8. Develop alternatives that meet ABP budget and schedule




WAG Members reviewing options


#### Fatal Flaw Test


Concepts for the design sub-areas were selected and tested in the fatal flaw analysis. The team started with over 25 and through the fatal flaw process refined to 14 concepts.


 Improve safety for all modes and users


 ABP timeline and budget

 Restore Emerald Necklace Connections

 Avoid impact to Arborway Yard

 Provide for acceptable local and regional operations

 Allow for urban design opportunities

 Avoid adverse impacts on future transit operations and inter-modal connections

Design concepts must have passed the fatal flaw test.

Figure 4:  
Fatal Flaw Analysis Criteria



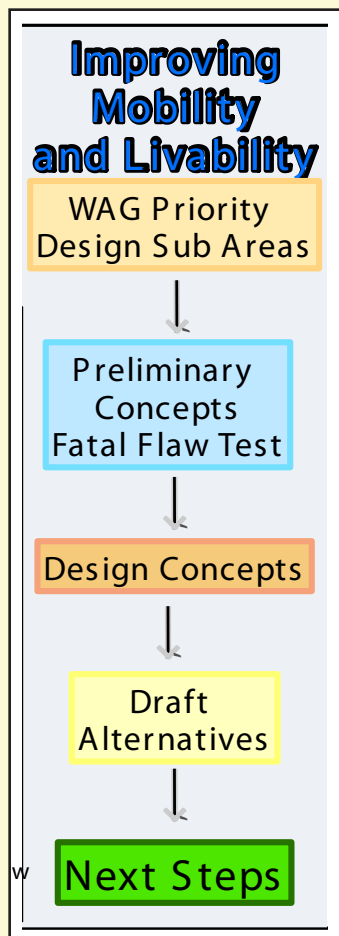


Figure 5: The Design Process

**Livability Goals were given equal weight with Mobility Goals to create integrated designs that improve the quality of life for all users.**

tions, acceptable level of traffic service, and urban design opportunities). In addition to the principles, Measures of Evaluation (MOEs) were developed by the WAG that guided the design and provided an objective basis for comparing alternatives to each other and to the existing conditions. These are discussed more fully in Section V and include a balance between livability and mobility goals, objectives and measures. The livability MOEs insured that traffic issues would not dominate and that quality-of-life issues were given equal weight.

The study area was broken down into five smaller sub areas for detailed examination of traffic and urban design opportunities focused on intersections and crossings that pose the greatest challenges today (See Figure 3: Design Sub Areas). Over 25 concepts were developed to meet the goals of safely moving vehicles, transit, bikes and pedestrians in and around this area, including those in previous studies, and tested against the principles. Of the 25 concepts for the different sub areas only 14 passed the fatal flaw test. These sub area concepts were assembled in various combinations to form corridor-wide concepts and are shown in Appendix B.

**The analysis of existing traffic conditions identified that the north/south movements at the surface exceeded the east/west through traffic volumes. As the evaluation of existing conditions, preliminary design concepts, and evaluation criteria evolved it became apparent that the current surface street network would need to be replaced regardless of whether an at-grade or bridge solution was selected. All designs henceforth included a thorough evaluation of the surface network with the assumption of utilizing current right-of-way for the area along New Washington Street and completely removing existing intersections, lanes and crossings and starting anew with the goal of meeting livability and mobility objectives for all modes.**

The at-grade concepts examined the relocation of MBTA vent stacks, head house and commuter rail grates to allow for maximum flexibility as well as address both north/south and east/west access and circulation needs. The bridge concepts were focused on the east/west corridor and did not include the relocation of any MBTA infrastructure.

Based on the review of past studies and current traffic conditions for all modes, the study focused on solving for the surface street network, examining modal connections, access, and crossings to address the current congestion problems and confusing network today. During the third series of WAG meetings, three areas became the focus for evaluating the fourteen concepts: 1.) The corridor defined by the intersections of New Washington Street with South Street, and with Hyde Park Avenue; 2.) Forest Hills Station upper bus way area on Washington Street (western side) between Ukraine Way and New Washington Street; and 3.) Shea Circle. The HNTB design team recognized the ability of all designs for Shea Circle to work with both bridge and at-grade alternatives and therefore the design of Shea Circle was deferred to the 25% design phase of the project.

Basic requirements guiding all designs were advanced by the WAG and MBTA.

- Include on-street bike lanes in all surface street designs and off-street

bicycle paths along the entire corridor.

- Retain full access for MBTA station by all modes.
- Maintain final design elements in the Arborway Yard study, including all access points and multi-use pathways.
- Transit priority for all designs to hold harmless headways and travel times for bus operations (signal priority at the intersections, queue jumping and dedicated lanes, if possible, to improve operations).
- Remain consistent with the City of Boston's base of a level of service (LOS) D as a minimum standard for intersection design and travel times.
- Incorporate the Boston Redevelopment Authority's (BRA) future build out estimates for 2035 as a base for the 2035 traffic forecasts.
- Honor Olmsted's Emerald Necklace vision for this area to the best extent possible.

To address the community's concerns with the surface street network, the concepts that were selected and then advanced were as follows.

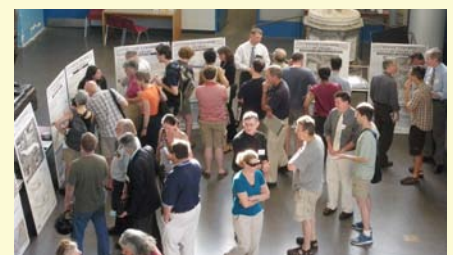
- **New Washington Street:** "Bow Tie", Continuous Flow and Traditional Intersection. The WAG selected the "Bow Tie" with further design suggestions to improve the travel time and pedestrian and bike crossings and circulation.
- **Shea Circle:** Traditional Rotary, Shea Square, and "Egg-a-bout" of which all the concepts reduced the multiple entry roadways to improve circulation and access. The preference was for Shea Square, however because the Emerald Necklace – including the rotary at Shea Circle – is listed on the National Register of Historic Places, any modifications will have to be justified with the Massachusetts Historic Commission. Advancement of the Shea Circle concepts and review with the Massachusetts Historical Commission will be part of the 25% design effort.
- **MBTA Upper Deck:** Three-bay and two-bay concepts for relocated bus operations. The relocation allowed for the widening of Washington Street in order to address the community's request for better allocation of space for taxis and passenger car drop-off areas, school bus drop-off, and bike and pedestrian connections to the MBTA Forest Hills Station, Blackwell Footpath entrance at the Arboretum, and destinations to the south.
- **Morton Street Area:** One-way loop with a service roadway parallel to the corridor and a concept with direct connections to the corridor with a limited frontage road serving only the courthouse and abutting residential buildings. Preference was given to a blend of the options resulting in a layout with a parallel frontage road, single entrance and exit connections to the Arborway, and reduced on-street parking adjacent to the residential buildings to maximize open space.
- **Bridge Replacement:** Single, Split and Inverse Split bridges. After many discussions on the goal and purpose of the bridge and based on thoroughly vetted (with the community, city and DCR) designs to address commuter and recreational at-grade accommodations for bike



WAG members report back to the whole group



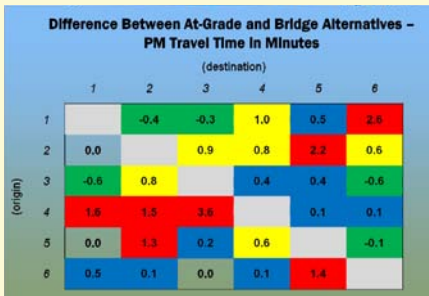
WAG members summarize discussion points in break-out session



Open house prior to 9/13 public meeting

***The mobility analysis performed for this project considered pedestrian, bicycle, transit, and vehicular modes of travel.***

***The livability analysis considered improved visibility, sustainability, and the creation of a sense of place to celebrate the area's architectural, transportation and open space history.***



**Traffic analysis included a travel-time comparison between alternatives on critical links in the study area**

and pedestrian access, crossings and circulation, connecting to north/south and east/west, it was deemed that the single bridge design met the goals and purpose without including a pedestrian walkway.

The concepts that were then presented at the fourth series of WAG and public meetings and attached in Appendix B, included:

- Single, Split and Inverse Split Bridge with a new surface street network below;
- Wide Median At-Grade;
- Narrow Median At-Grade;
- MBTA Upper Bus Way with two and three-bus bay options to address conflicts along Washington Street/Asticou Road area and provide better capacity for the bus operations; and
- Shea Square and the Egg-a-bout to be carried through understanding that each design is interchangeable with any alternative.

To further narrow down the alternatives, subsequent meetings were held with the following stakeholders to resolve the following issues:

- DCR to validate design concepts, ownership, parking memorandum and design guidelines;
- City of Boston to review traffic analysis and design concepts for intersections and signalization; and
- MBTA to assess the viability of the relocation of the Orange Line vent stacks south of the station, the relocation of a head house north of the station, and use of the upper level bus bays for the staging and circulation of the Route 39 Bus.

Through the fourth series of WAG meetings, the study addressed expanded bicycle and pedestrian circulation at-grade, optimal circulation for Morton Street, gateway opportunities for the Southwest Corridor Park, landscaping consistent with the vision of Olmsted, and solutions for MBTA infrastructure and operations. As a result, it was determined to advance two alternatives to the fifth series of community meetings.

- A medium median at-grade alternative that included a 2-bus bay design, retained the current location of the Route 39 bus in front of the station, and included improvements to the Washington Street/South Street roadway (north/south); and
- A single bridge alternative that included surface roadway reconfigurations in the east/west corridor.

#### IV. TRAFFIC ANALYSIS

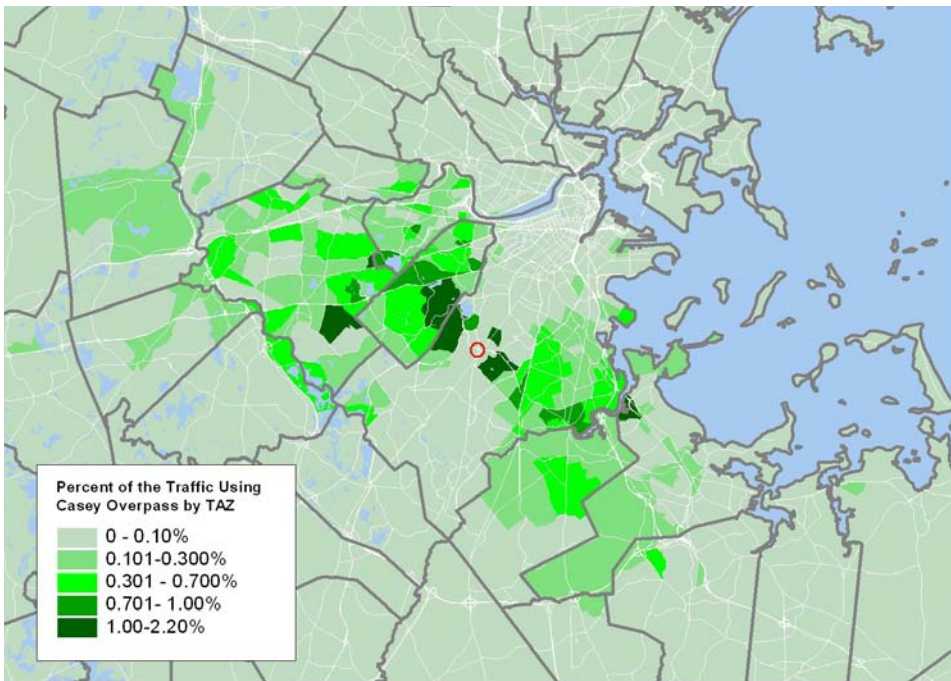
The traffic analysis included a study of eighteen intersections (twelve signalized and six unsignalized) in the vicinity of the Casey Overpass. This effort built on the information presented in the prior studies of this area, including conceptual design alternatives for at-grade roadway solutions. The analysis performed for this project considered pedestrian, bicycle, transit and vehicular modes of travel. Analysis methodologies specific to each of these modes were applied to provide a thorough assessment of the concepts and alterna-



tives considered.

An existing conditions analysis was conducted to provide an understanding of existing travel demands within the study area and for comparative purposes during the development of alternatives. Existing intersections in the study area operate with excessive delays primarily focused along New Washington Street and South Street. The poorly configured roadways at the intersections of South Street with New Washington Street and the Arborway ramps create additional turning movements and signal spacing that is extremely difficult to effectively coordinate. These problems are exacerbated by the mid-block pedestrian signal on New Washington Street located approximately 100' east of the South Street intersection. All of the design concepts developed included some level of improvement to the surface street network to address the current deficiencies.

The existing traffic volumes were projected to the design year of 2035 with input from the Central Transportation Planning Staff (CTPS) and the BRA. The regional travel demand model maintained by CTPS was used to provide



the base volumes for 2035. Specific local development projects were then identified by the BRA. The traffic volumes projected for these developments were added to the base volumes for 2035 to develop the 2035 volumes that provided the foundation of the analysis for the project alternatives.

The analysis of the alternatives was conducted with increasing detail as the alternatives were further developed. Initial design concepts were either generated from previous studies or from the HNTB design team working with the WAG and were subjected to a fatal flaw screening analysis to determine if each had the ability to accommodate projected travel demands and to meet the project principles. Those concepts that survived the initial screening were presented to the WAG and the public for consideration. That process resulted in the selected alternatives. These alternatives were analyzed in greater detail using traditional traffic analysis software (Synchro) for comparison to each other and to existing conditions.

***A series of three technical memoranda present the detailed traffic analysis results for existing and future conditions.***

***Figure 6: Destination of traffic in the AM peak period using the Casey Overpass by percent of TAZ***

***Both alternatives accommodate projected 2035 volumes.***

***VISSIM animations were provided illustrating pedestrians, bicycles, transit, and vehicular traffic for the two alternatives.***

**Overall capacity for the two alternatives is comparable.**

**Vehicular traffic operation is not a differentiator between the alternatives.**

**Figure 7: Proposed Project Areas**

**A new and improved surface street network is included as part of both alternatives.**

The process ultimately yielded two conceptual alternatives, an at-grade and a single bridge alternative. The previous traffic analysis was updated to reflect the design of these two alternatives. The analysis results were used to develop travel time comparisons for the two alternatives and approximate travel times for existing conditions were provided for comparative purposes. These alternatives were also subjected to additional analysis and animations using VISSIM, which allows for realistic portrayals of actual operations for pedestrians, bicycles, transit, and vehicular traffic. The detailed analysis, traffic model results, and VISSIM animations were presented to the WAG and the public.

The conclusion of the traffic analysis conducted for the Casey Overpass project is that both alternatives accommodate projected 2035 traffic volumes and will provide an acceptable improvement over existing conditions. While there are differences between the alternatives, the overall analysis results and capacity for the two alternatives are comparable and overall traffic operations are not a differentiator between the alternatives.

The traffic analysis effort is documented in depth in a series of technical memoranda and other data (Appendix C) as follows:





- Casey Overpass Project – Existing Traffic Analysis and Future Volumes, September 22, 2011;
- Casey Overpass Project – Alternatives Analysis, October 18, 201.

These technical memoranda:

- Outline the study area intersections, data collection effort, and existing traffic volumes based on this data collection effort. They also identify next steps in the traffic analysis process;
- Present the traffic analysis results for existing conditions and the projected traffic volumes for the year 2035. This memorandum outlines the process of incorporating the traffic projections from the CTPS regional model and the local development projects identified by BRA;
- Identify the two alternatives that were subjected to detailed analysis and presents the results for all modes of travel. This memorandum includes the urban facilities analysis, which assesses operations for pedestrians, bicycles, and transit service. The vehicular traffic analysis results for the two alternatives are also presented and travel times for all of the possible connections within the study area are provided.

## V. MEASURES OF EVALUATION (MOEs)

MOEs were developed over a number of WAG meetings with the intent of initially evaluating a series of four at-grade and bridge alternatives. Over the course of the community planning process, the WAG requested more designs be developed for a bridge replacement. The MOEs were then refined to measure mobility and livability benefits of a series of at-grade and bridge alternatives.

Working with the WAG, the MOEs developed for this study broke new ground in evaluating the benefits of the alternatives in that they incorporated multi-modal (transit vehicles, pedestrian and bicycle) measures as well as livability measures that targeted defined principles and quality of life goals. The measures were defined, redefined, and refined based on extensive input and available data that produced meaningful results for each of the alternatives on their own merit.

The MOEs were evaluated using three mobility goals and three livability goals. The goals were further defined by nine mobility and seven livability objectives. Measures were then developed based on available and quantifiable data with sixteen mobility and fifteen livability measures (see Appendix D).

### MOE GOALS

1. Improve roadway geometry to enhance circulation for all modes and users.
2. Improve access, modal and intermodal local and regional corridor connections to promote transportation choices.
3. Remove barriers for neighborhood connections and integrate transit into economic centers and residential areas.
4. Integrate sustainability into design concepts.

MOEs - The Distribution

MOE	Livability	Mobility
Goals	3	3
Objectives	7	9
Measures	15	16

MOEs - The Results

MOEs	Existing Cond.	Bridge	At-Grade
Mobility	-10	+3	+7
Livability	-10	0	+13
Total	-20	+3	+20



5. Create a destination and sense of place and celebrate the area's architectural, transportation and open space history.
6. Improve the visibility, connectivity and access to gateway open spaces.

The results of the MOEs provide an accurate description of the failures of the existing conditions to meet basic mobility and livability goals as it received a review of minus 21 out of a total of 31 measures. This reflects the disconnected, confusing and convoluted street network that exists today. Understanding these problems, both the at-grade and bridge alternatives developed a new streetscape to replace the disorganized network and address community concerns for safer and more accessible crossings and connections for all modes.

The bridge alternative's primary function was to provide an elevated bypass from the local community and did well on those measures. However, even with a new surface street designed to correct the current convoluted conditions, this alternative fell quite short of meeting the community's goals for an integrated network with the restoration of the Emerald Necklace and received a total of only three points. The at-grade alternative addressed both the local goals for livability and mobility and was designed to meet the regional and local forecasted travel demand. As a result, this alternative received nineteen points (see detailed account of measures in Appendix D).

## **VI. AT-GRADE AND SINGLE BRIDGE ALTERNATIVES**

### **At-Grade Conceptual Alternative**

The specific project area for each of the alternatives is different based on the order of magnitude costs to replace the Overpass (see Figure 7). During the fifth Series of WAG meetings, based on community review and input, the at-grade and bridge alternatives were refined as follows (see Appendix E). The options for the Shea Circle area – signalized intersections and signalized roundabout - are interchangeable between the two alternatives.



**Community members review the alternatives prior to a public meeting at Boston English High School**

- Route 39 bus remains in current location – north end of MBTA Forest Hills Station, but is located curbside on New Washington Street.
- Location of MBTA upper bus way moved southward to facilitate bus operations and reduce impact of bus operations on abutting Asticou neighborhood.
- MBTA Upper bus way includes two bays and an expanded layover area.
- MBTA Upper bus way includes new location of Orange Line emergency vent stack adjacent to south side of building.
- Off-street bicycle paths were included along Washington Street between New Washington Street and Ukraine Way.
- Additional space provided (but not assigned) for taxi and drop-off areas as well as school bus operations on Washington Street, between New Washington Street and Ukraine Way.
- Between New Washington Street and South Street, an additional southbound travel lane replaces drop-off lane to minimize congestion.

- Reduced on-street parking on the frontage road adjacent to courthouse to maximize open space near Shea Circle.
- Access from Morton Street/frontage road was modified to maximize open space by Shea Circle.
- The U-turn on the eastern side was moved closer to Hyde Park Avenue to reduce travel times for surface street circulation.

### Bridge Conceptual Alternative

- Route 39 bus remains in current location – north end of MBTA Forest Hills Station, but is located curbside on New Washington Street.
- Space provided (but not assigned) for taxi and drop-off areas as well as school bus operations along north side of New Washington Street.
- Access from Morton Street/frontage road was modified to maximize open space by Shea Circle.
- Reduced on-street parking on the frontage road adjacent to the courthouse to maximize open space near Shea Circle.

**Figure 8:**  
**Conceptual At-Grade Alternative**





## VII. ORDER OF MAGNITUDE COST ESTIMATES

The order of magnitude cost estimates were based on the conceptual design for the at-grade and bridge alternatives (see Appendix F).

The bridge alternative project area only includes the corridor of the existing overpass due to the cost of constructing a new bridge. The at-grade alternative extends south from New Washington Street along Washington Street between South Street/New Washington Street intersections connecting to Ukraine Way and includes the MBTA upper bus way area (See Figure 7 – Proposed Project Area).

The basic assumptions guiding the analysis of the bridge alternative included:

- Project area includes only the east-west Route 203, a shorter, narrower and lower, single lane bridge with shoulder in each direction, plus a redesigned surface street below with modest landscaping.
- Although interchangeable, cost estimates for Shea Circle assume the Egg-a-bout concept.
- Estimates include demolition of structure, surface street site preparation (excavation, demolition), design improvements (drainage, roadway, catch basins, utilities) and modest landscaping.
- Future repairs and O&M costs for the bridge estimated at \$42.3 million and at-grade roadways for the east –west corridor along New Washington Street at \$6.5 million.
- Estimates DO NOT INCLUDE signage, aesthetic treatments for the bridge structure, lighting, or pavement markings (all elements to be designed in the next phase).

**Figure 9:**  
**Conceptual Bridge Alternative**





<b>Bridge Alternative - Sub Areas</b>	<b>Estimate</b>
New Washington Street corridor	\$ 30.2 million
Single span bridge	\$ 36.4 million
Shea Egg-a-bout	\$ 6.1 million
Initial construction costs	\$ 72.7 million
Estimated O&M (Life-Cycle) costs	\$ 48.8 million

The basic assumptions guiding the analysis of the at-grade alternative included:

- Project area includes the east-west surface street corridor and the north/south connection adjacent to the MBTA upper bus way.
- Although interchangeable – cost estimates for Shea Square.
- MBTA emergency vent stack assumed to be relocated to the southern end of Forest Hills Station.
- Estimates include surface street site preparation (excavation, demolition), design improvements (drainage, roadway, catch basins, and utilities) and modest landscaping.
- The O&M estimated costs for the at-grade roadways including the east–west corridor along New Washington Street at \$5.4 million.
- The estimates for the canopy at the upper deck of Forest Hills Station are preliminary. Future analysis that will examine relocating the existing canopy and other alternatives are not estimated herein.
- Estimates DO NOT INCLUDE signage, aesthetic treatments, landscaping, lighting, pavement markings, (all elements to be designed in next phase). Architectural treatments for the head house, vent stacks and canopy are also not estimated.

<b>At-Grade Alternative - Sub Areas</b>	<b>Estimate</b>
New Washington Street corridor	\$ 31.1 million
Washington Street/Asticou Road, busway and canopy	\$ 2.3 million
MBTA vent stack (southern location) head house and commuter rail grates (including canopy for relocated upper bus way)	\$ 13.2 million
Shea Square	\$ 6.0 million
Initial construction costs	\$ 52.6 million
Estimated O&M (Life-Cycle) costs	\$ 5.4 million

## VIII. RECOMMENDED ALTERNATIVE

The at-grade and bridge alternatives selected at the conclusion of the fourth series of community meetings were tested based on the following criteria.

- Conceptual designs demonstrated that the at-grade alternative met the project principles, restored the historic Olmsted connection, and improved access, connections and crossing for all modes both local and

regional better than existing conditions.

- Application of MOEs that defined the base for existing conditions along with the two alternatives. In this evaluation, the existing conditions failed to meet the goals and objectives, the bridge alternative only met the regional bypass for vehicles objectives and the at-grade met 19 out of 21 measures (See Appendix D).
- The order of magnitude costs for the project. Based on the conceptual alternatives the estimated costs are:
  - o Bridge: \$73 million
  - o At-Grade: \$53 million

The estimates include demolition of structure, surface street site preparation (excavation, demolition), design improvements (drainage, roadway, catch basins, utilities) and modest landscaping. They do not include: design fees, signage, aesthetic treatments for the bridge structure, lighting, architectural treatments, and pavement markings (see Appendix F).

- Community input, including the WAG, comments at public meetings, and letters and e-mails to MassDOT, favored the at-grade alternative over the bridge alternative.

Based on the analysis and the process, MassDOT announced the selection of the at-grade alternative on March 8, 2012. The at-grade conceptual design met all the criteria for safety, modal access and circulation, Olmsted con-

### ***Selected At-Grade Alternative***



nections, mobility and livability goals and measures advanced by the WAG.

## **IX. NEXT STEPS**

The design team will work with MassDOT, MBTA and DCR to resolve the design and sequencing of the elements for the at-grade design to advance the project to 25% design. The critical elements will include finalizing locations and designs for:

- The MBTA vent stacks, commuter rail grates, head house and canopy;
- Signalization and roadway configurations for New Washington Street, Shea Square and Washington Street/South street corridors for all modes;

- Preliminary staging and sequencing for demolition of Casey Overpass; and,
- Preliminary landscaping designs for pedestrian, bicycle, median treatments in the project study area.

The design team will work with the WAG to address important operational elements such as school buses, Route 39 Bus circulation, needs for drop-off and pick-up locations and taxi areas adjacent to the Forest Hills Station.

The schedule for the 25% design phase will commence in spring of 2012 with the following milestones.

- Convene a series of technical advisory meetings with the WAG on mobility, livability and construction management topics necessary to advance the conceptual design to 25% throughout the spring and summer of 2012.
- Present the updated at-grade design and the process to complete the 25% design at a public meeting in spring of 2012.
- Work with city and state agencies on ownership, design standards and operational elements.
- Submit an Environmental Notification Form (ENF) for the at-grade design to MassDOT in May of 2012.
- Submit a 25% design of an at-grade network to MassDOT and the City of Boston for their review by September of 2012.
- Hold a public hearing in November of 2012 on the 25% design revised submission.

Specific tasks included in 25% design:

- Work with the MBTA to design options for:
  - o The location and architectural design of the relocated MBTA head house north of station;
  - o Complete the code analysis for the relocation of the head house with the MBTA;
  - o Location and configuration of the Bus 39 operations during and post construction;
  - o Relocation of the Upper Deck southward with two bus bays, canopy redesign, egress and landscaping;
  - o Commuter rail vent system with cover;
  - o Relocation of the MBTA Orange Line vent stacks, including an NFPA 130 study; and
  - o Perform additional survey of the upper level bus way, and station tunnel for the proposed head house.
- Advance the design of Shea Square and review with the Massachusetts Historic Commission and the City of Boston.
- Develop the final roadway network that addresses bike lanes, parking, taxi, drop-off areas, curb cuts, lighting, signals and pedestrian and bike crossings.



**The redesign of Shea Circle is an important element of the 25% Design Phase**



- Develop a landscaping plan for the corridor that includes bicycle paths and pedestrian walkways.
- Develop a signage plan that includes regulatory, historic and wayfinding signs.
- Explore non-peak hour design options (signals and lane uses).
- Develop design treatments for the area in front of the MBTA Forest Hills Station and at the end of the Southwest Corridor Park.
- Explore further operational treatments for Forest Hills Road and Asticou Road.
- Prepare cost estimates for the 25% design submission.

The 25% Design Phase is the first of three design phases that will transform the planning concept developed to date into a set of drawings and specifications that will be used for construction. The 25% Design Phase will incorporate three-dimensional engineering into the concepts by developing typical cross sections, super-elevations, drainage plans and topography. As details of the design become more refined, cost estimates will be developed in parallel to keep the project on budget. Preliminary plans for construction phasing will also be prepared so that the construction period is as short as possible and to keep traffic moving smoothly during construction. Through all of the design phases and construction, the community will continue to be involved in review as the design evolves.