Tonight’s 8 Greenway Designs
Charlesgate Connection

Northeastern University’s Civil Engineering Transportation Design Capstone

Bicycling Around the Back Bay
“The BaBBs”

Matt Volovski
Kelly Chronley
Josh Barnett
Tony Coward
Creating a Connection Between the Charles River Esplanade and The Back Bay Fens
The Charles River Esplanade
The Back Bay Fens
Connect:
The Charles River Esplanade
Through: The Charlesgate Connection
Introduction
Utilized by a Wide Array of Users

<table>
<thead>
<tr>
<th>Commuters</th>
<th>Recreationalists</th>
</tr>
</thead>
<tbody>
<tr>
<td>Harvard University with Harvard Medical</td>
<td>Connects the beautiful Charles River and Fens Parks</td>
</tr>
<tr>
<td>Boston University with Boston University Medical</td>
<td>Provides access to Olmsted’s Park</td>
</tr>
<tr>
<td>MIT University with Longwood Medical Area and Jamaica Plain</td>
<td>Discovers the Lost Park</td>
</tr>
<tr>
<td>Massachusetts General Hospital with Longwood Medical Area and Jamaica Plain</td>
<td>Downtown to Fenway/Jamaica Plain</td>
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</tbody>
</table>
Previous Proposals

- Emerald Necklace Master Plan (1989)
- Charlesgate Interchange Park Charrette (1998)
- The Emerald Necklace Greenway Plan (2001)
- The MDC Charlesgate Connection Plan (2002)
- The Boston Bicycle Summit (2007)
Our Design
General Overview

General Specifications

- Accommodates:
  - Pedestrian
  - Cyclists
  - Handicapped

- 12 foot width

- Buffered from traffic
Bowker Overpass

The Objective:
To get between the Bowker/Boylston intersection and Commonwealth Ave.
- Currently the sidewalks on the Bowker Overpass are inadequate, only 6’ wide and un-buffered from traffic.

The Obstacles:
- The Massachusetts Turnpike
- The railroad tracks
- The Bowker Overpass

The Need:
- Additional width on the overpass
- The structure can not support a cantilevered pedestrian bridge
- A free-standing pedestrian bridge over the Mass. Pike and railway would be Long (>200’) and costly
Northbound Lanes

- Currently there are 3 southbound lanes and 3 northbound lanes
- 3 southbound lanes are critical to the functionality of the intersection
- 3 northbound lanes only serve the function of 2 lanes:
  - Only 2 lanes of traffic ever enter the northbound lanes
  - Creates additional movements and conflicts for drivers
- Elimination of 1 NB lane would increase driving safety while providing space for a pathway.
Off-ramp vs. On-ramp

Which Side of the Overpass is Best Suited for the Path?
Northbound Off-ramp Feasibility

- Single narrow sidewalk
- Not ADA compliant
  - Would be very difficult to gain compliance
- 2 lanes
  - Both are necessary for queue storage
- Ramp structure cannot support cantilever
Southbound Onramp
Feasibility

- Single narrow sidewalk
- Not ADA compliant
  - Currently there is a ramp that can be upgraded for compliancy
- 2 lanes
  - Both are not necessary
  - Two lanes merge down to one before entering the overpass
- Ramp structure can be altered
Moving The Median

Existing Conditions

West Side of the Bowker Overpass
Southbound Traffic

East Side of the Bowker Overpass
Northbound Traffic

Proposed Design
Moving The Median

**Existing Conditions**
This is an image taken from the Bowker/Boylston Intersection looking at the southbound lanes of the Bowker Overpass.

**Proposed Conditions**
This is a rendering of what the southbound lanes of the Bowker Overpass will look like.
Southbound Onramp Alternatives Considered

- **(A)** Requires crossing Charlesgate West traffic twice
- **(B)** Not enough width
- **(C)** Not enough clearance
- **(D1, 2, 3)** The final three alternatives were paths that crossed over the on-ramp at different locations.
The Selected Design

► The Onramp Crossing

Features:
- Signaled crossing
- 125’ from intersection providing room for 10 cars in a queue
- Separate ADA ramp to Charlesgate West and Newbury St.
New Path Down from the Bowker Onramp to Commonwealth Ave. EB
ADA Compliance

- Connects Overpass to the corner of Charlesgate West and Newbury Street.
- Ideal Crossing Location Because:
  - Clear sightline down Charlesgate West
  - Short crossing distance (25’)
  - Motorists will be slowing to round the corner

ADA Features:
- 1/12 slope
- Landings every 30 linear feet
Objective:

- Improving pedestrian service through intersection
- While maintaining or improving vehicular service
Signal Timing Plan Modifications: Minimizing Delay for Pedestrians and Vehicles

Pedestrians delay shortens from 69 sec to 38 sec and from 41 sec to 38 sec

Vehicular delay maintained or improved
Signal Timing Coordination

EXISTING AM SIGNAL TIMING PLAN
100 sec

EBT / EBR
62 sec

SBT / SBL
PED A
38 sec

PROPOSED AM SIGNAL TIMING PLAN
100 sec

EBT / EBR
62 sec

SBT / SBL
PED A & B
38 sec

RAMP
10 s

PED
25 s

UN-RAMP
65 s
Olmsted’s Park

Four Patches Connected

- Concurrent Pedestrian Phases across Charlesgate East and West.
Olmsted’s Park – Beacon Street

Multi-use path adjacent to the south side of Beacon.

- Currently oversized lanes
- Reduce lane width to standard 12’
- Expand south curb line
  - Creates a constant sightline down Beacon
  - Allows island to be enlarged
Olmsted’s Park – Beacon Street

Expand South

Curb line
- Creates a constant sightline down Beacon
- Allows island to be enlarged
Two Obstructions
Two Obstructions (Overpass Clearance)

► Go to Right of Pier:
  - Left side of pier does not have required width
  - Left side of pier in not buffered from traffic
Two Obstructions (Overpass Clearance)

- Alternative
- Right Side of Pier
  - Current overhead clearance for right side of pier
Two Obstructions (Overpass Clearance)

- Alternative B:
  - Right Side of Pier
    - Overhead Clearance for Right Side of Pier After Re-grading

[Image of a bridge with measurements showing clearance heights of 8.00' and 9.25']
Two Obstructions
(Overpass Clearance)

- Excavation
  - Under Overpass
    - Drainage solution
Two Obstructions (Gate House)
“The Lost Park”

- Reclaiming 2.5 acres of parkland near the Charles River
- Creating a destination rather than just a connection

View along the Charles River downstream

View from the upper level of the park
Establishing Destination

- Charles River Esplanade
- Mass Ave. Bridge
- Beacon St./Back Bay Fens
Proposed Path Layout
Storrow Drive Westbound Crossings (4 Bridge/Ramp Alternatives)

All bridges were designed meeting the following requirement:

- A clearance of 12' from Storrow Drive to the bottom of the bridge deck
- A 1' thick bridge deck
- A single span crossing Storrow Drive supported on both sides with piers
- An overall width of 12'
- The ramp is compliant with ADA requirements 1/12 slope
- Landings provided every 2.5' of elevation change
Alternatives A & B

**Alternative A:**
Bridge crossing to the west and the resulting 193’ ramp down towards the east.

**Alternative B:**
Bridge crossing to the east and the resulting 150’ ramp down towards the west.
Alternatives C & D

**Alternative C**
The design calls for a piers to be placed in the Charles River. The major benefit is the relatively low visual impact.

**Alternative D**
The grand design. It calls for a cable-stayed ramp extending over the river.
Alternative D (cont.)

3-D Rendering

Typical Elevation
## Alternatives Comparison Table

<table>
<thead>
<tr>
<th>Alternative</th>
<th>Horizontal Impact</th>
<th>Distance over River</th>
<th>Extra Travel Distance (Compared to best Alternative)</th>
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<tr>
<td></td>
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<td>Upstream</td>
</tr>
<tr>
<td>A</td>
<td>193'</td>
<td>0'</td>
<td>464'</td>
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<tr>
<td>B</td>
<td>150'</td>
<td>0'</td>
<td>342'</td>
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<tr>
<td>C</td>
<td>52'</td>
<td>62'</td>
<td>65'</td>
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<tr>
<td>D</td>
<td>114'</td>
<td>32'</td>
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## Cost Estimate
(Excluding Footbridge)

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<tr>
<th>Item</th>
<th>Amount</th>
<th>Unit</th>
<th>Unit Cost ($)</th>
<th>Boston Metro Area Multiplier</th>
<th>Inflation Multiplier</th>
<th>Total Cost ($)</th>
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<tbody>
<tr>
<td>Asphalt Paving</td>
<td>3,360</td>
<td>Square Yard</td>
<td>15</td>
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<td>205.32</td>
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<td><strong>Total</strong></td>
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<td><strong>564,886.55</strong></td>
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Questions?

This report could not have been possible without the support of our Professor Peter Furth and the coordination of our design team. We would like to first thank VHB and the Boston Water and Sewer Commission for providing the CAD files for the existing conditions of the Charlesgate connection. We also would like to recognize Herb Nolan of the Solomon Fund for showing interest to advance this project further once we graduate. A few others we would like to thank: Nicole Freedman, Boston's Bicycle Planner, Noah Bierman, Boston Globe, John Kennedy, VHB, John Ciccarelli, Bicycle Solutions, and Northeastern University for providing the survey equipment, as well as the software to finish this project.