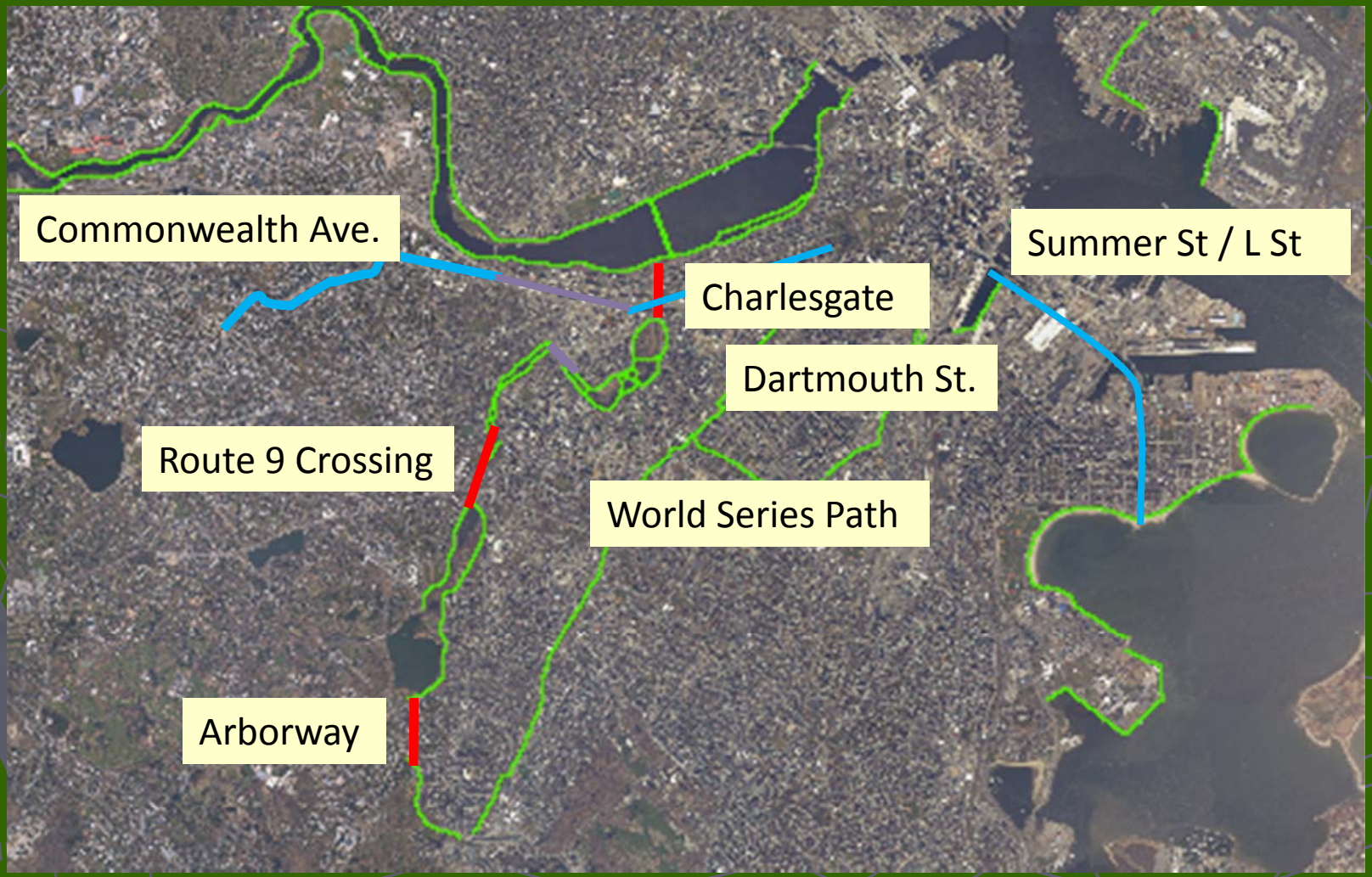
Tonight's 8 Greenway Designs



2008

Charlesgate Connection

Northeastern University's Civil Engineering Transportation Design Capstone

Bicycling Around the Back Bay

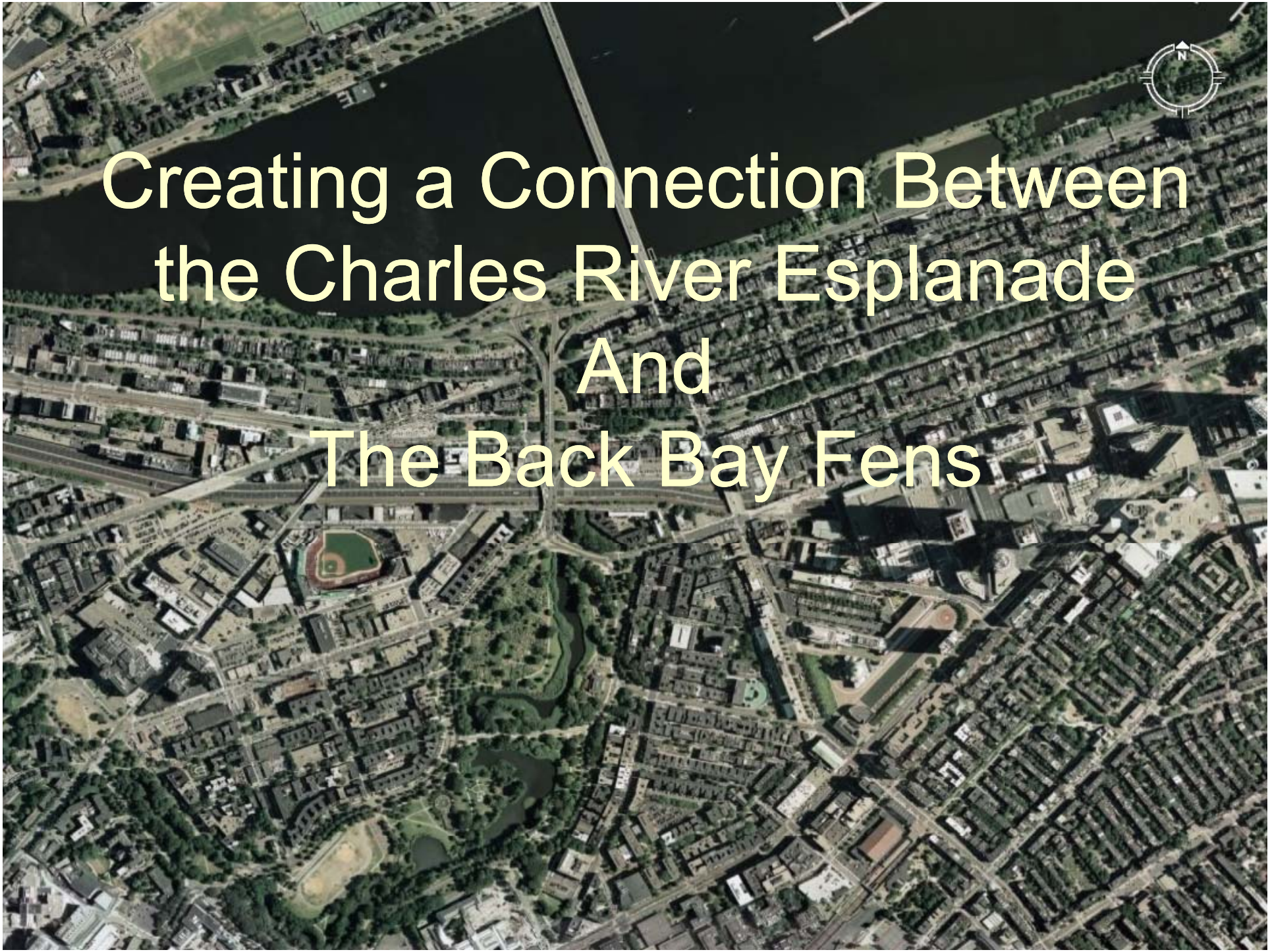
"The BaBBs"

Matt Volovski

Kelly Chronley

Josh Barnett

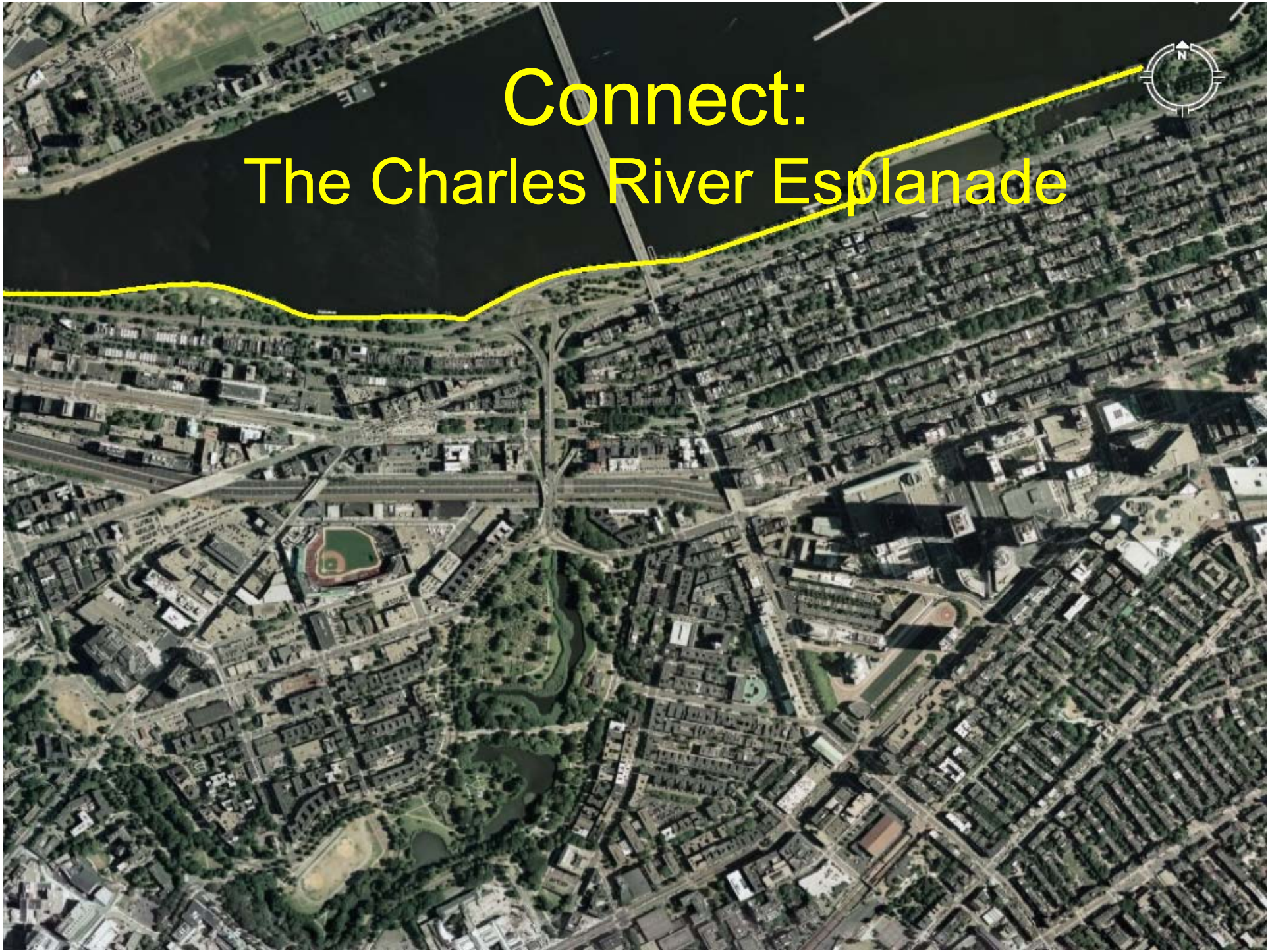
Tony Coward



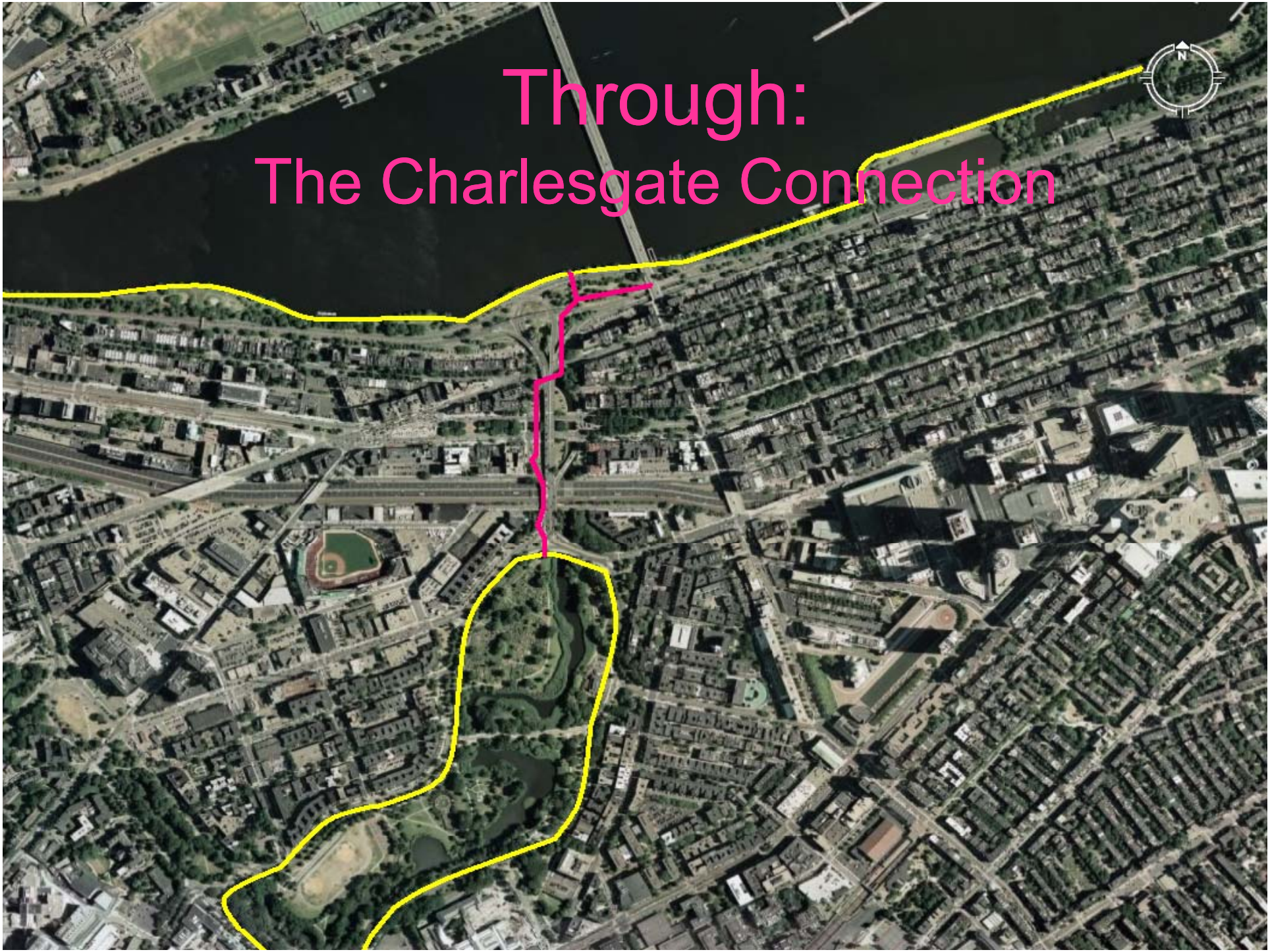
Creating a Connection Between the Charles River Esplanade And The Back Bay Fens

The Charles River Esplanade


The Back Bay Fens


Connect:
The Charles River Esplanade


With:
The Back Bay Fens


Through:
The Charlesgate Connection

Introduction
Utilized by a Wide Array of Users

Commuters

- Harvard University with Harvard Medical
- Boston University with Boston University Medical
- MIT University with Longwood Medical Area and Jamaica Plain
- Massachusetts General Hospital with Longwood Medical Area and Jamaica Plain
- Downtown to Fenway/Jamaica Plain

Recreationalists

- Connects the beautiful Charles River and Fens Parks
- Provides access to Olmsted's Park
- Discovers the Lost Park

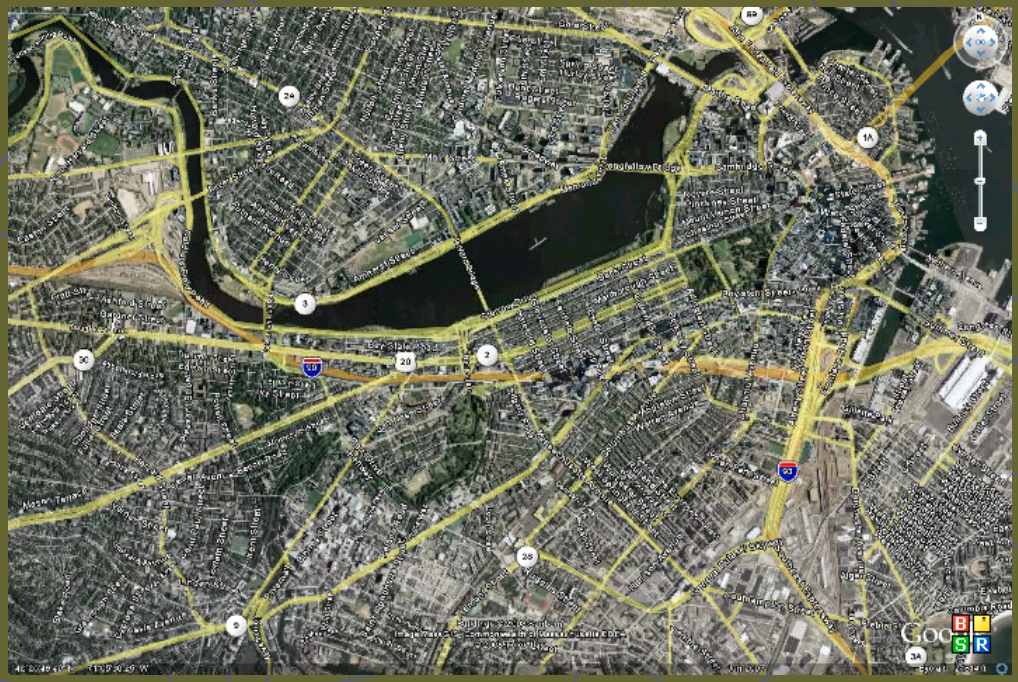
Previous Proposals

- Emerald Necklace Master Plan (1989)
- Muddy River Delta Proposal (1996)
- 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:

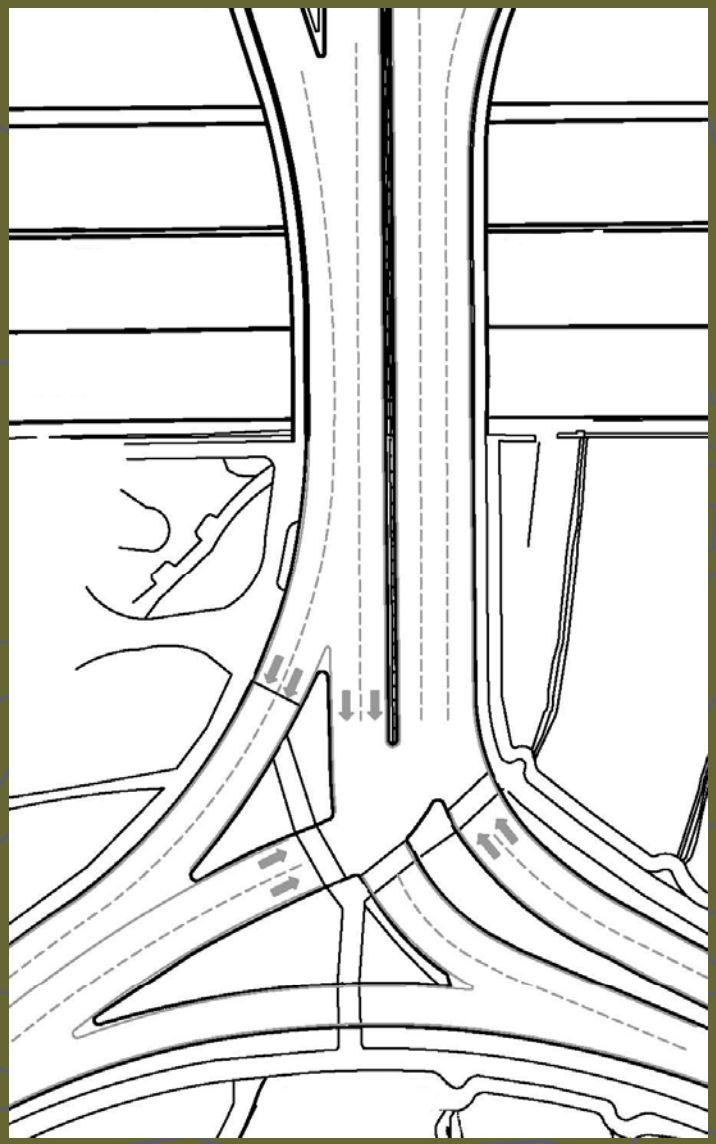
- The Massachusetts Turnpike
- The railroad tracks
- The Bowker Overpass

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

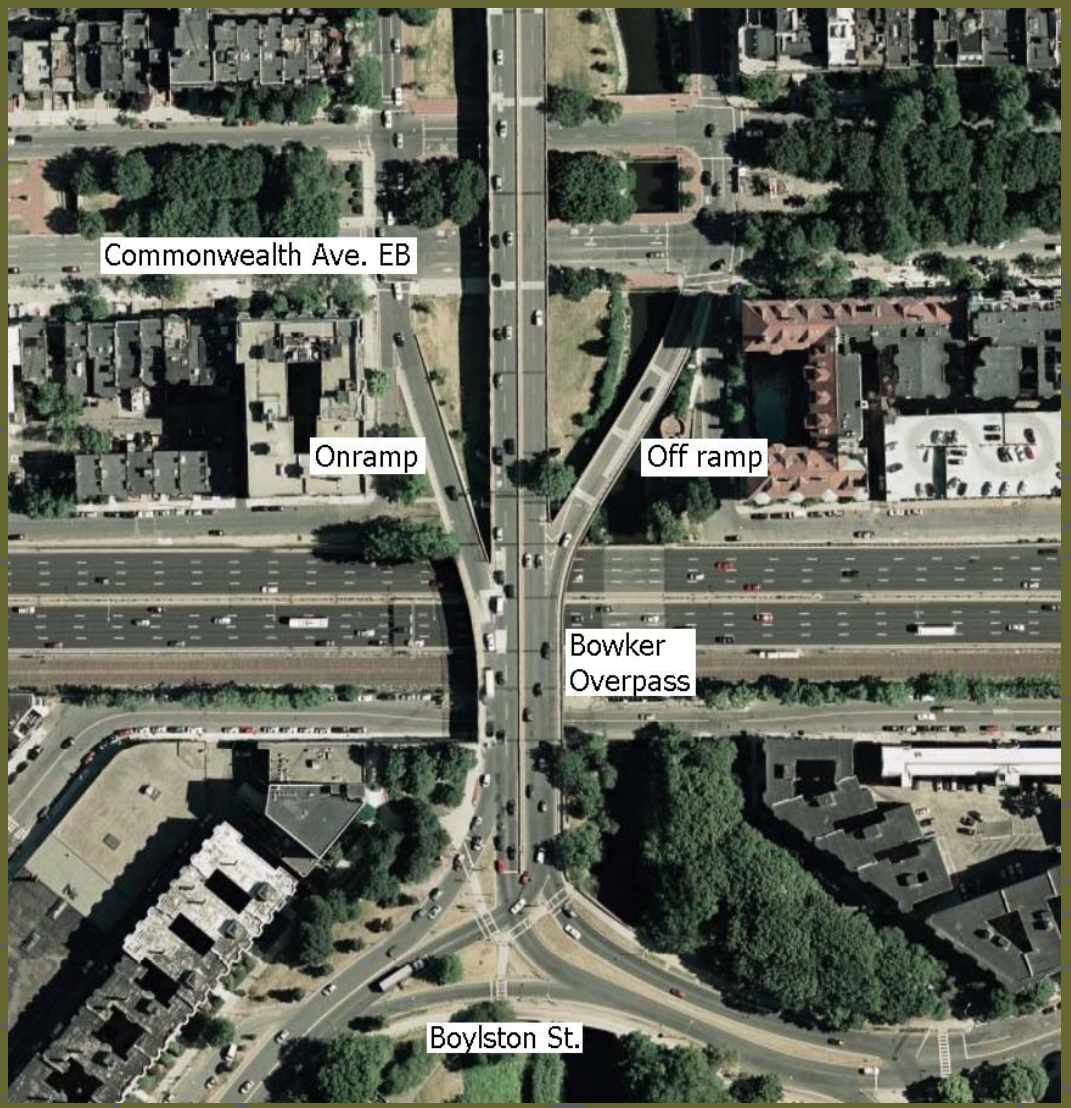
Northbound Lanes

- 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?



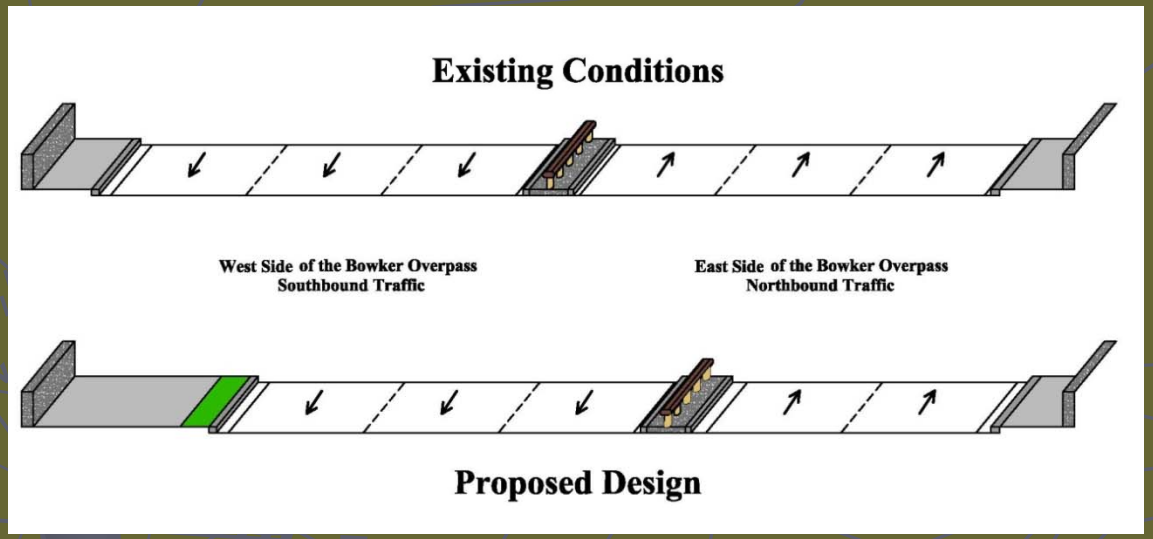
Northbound Off-ramp Feasibility

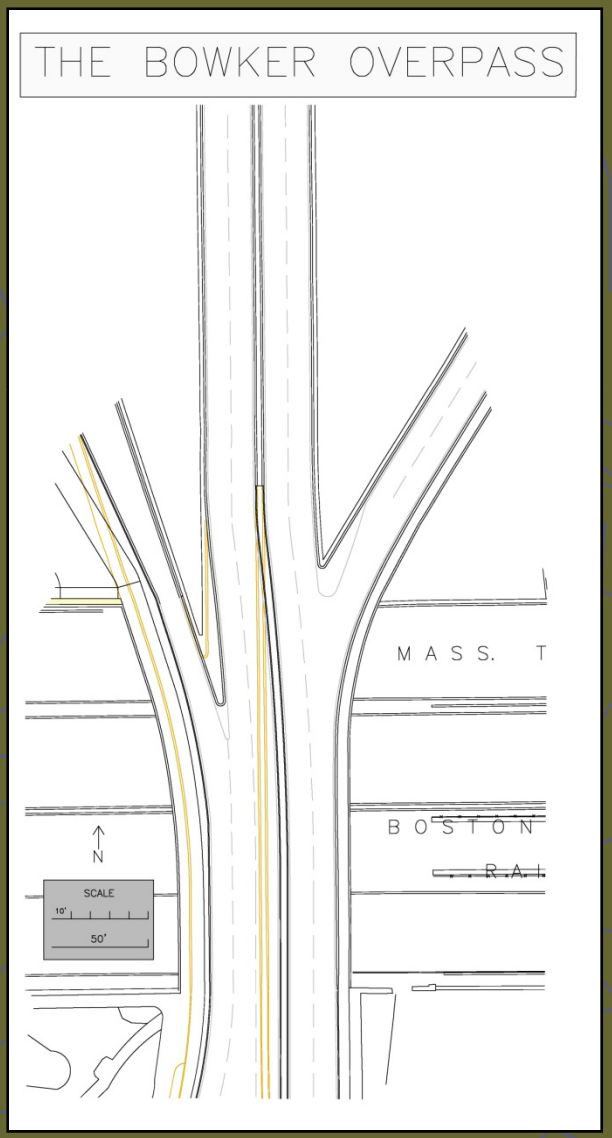
- Single narrow sidewalk
- Not ADA compliant
  - Would be very difficult to gain compliance
- 2 lanes
  - Both are necessary for queue storage
- Ramp structure can not support cantilever

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

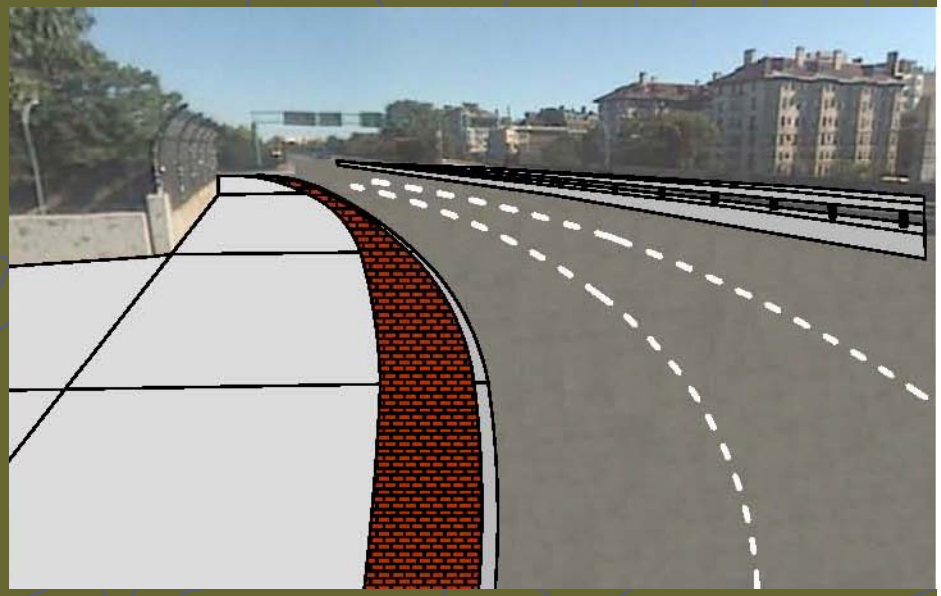
Moving The Median





Moving The Median

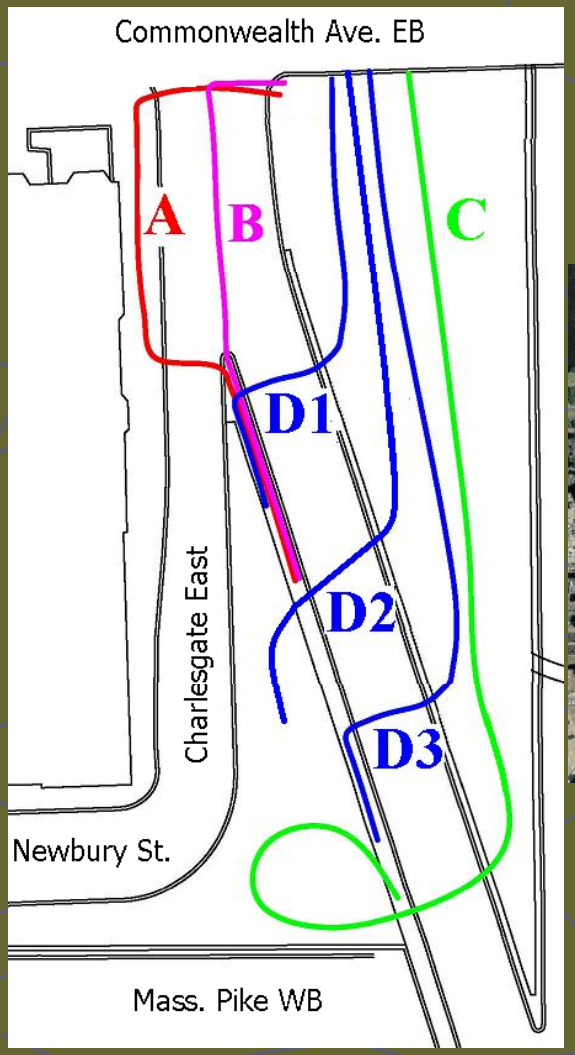
Existing Conditions
This is an image taken from the Bowker/Boylston Intersection looking at the southbound lanes of the Bowker Overpass.



Proposed Conditions
This is a rendering of what the southbound lanes of the Bowker Overpass will look like.

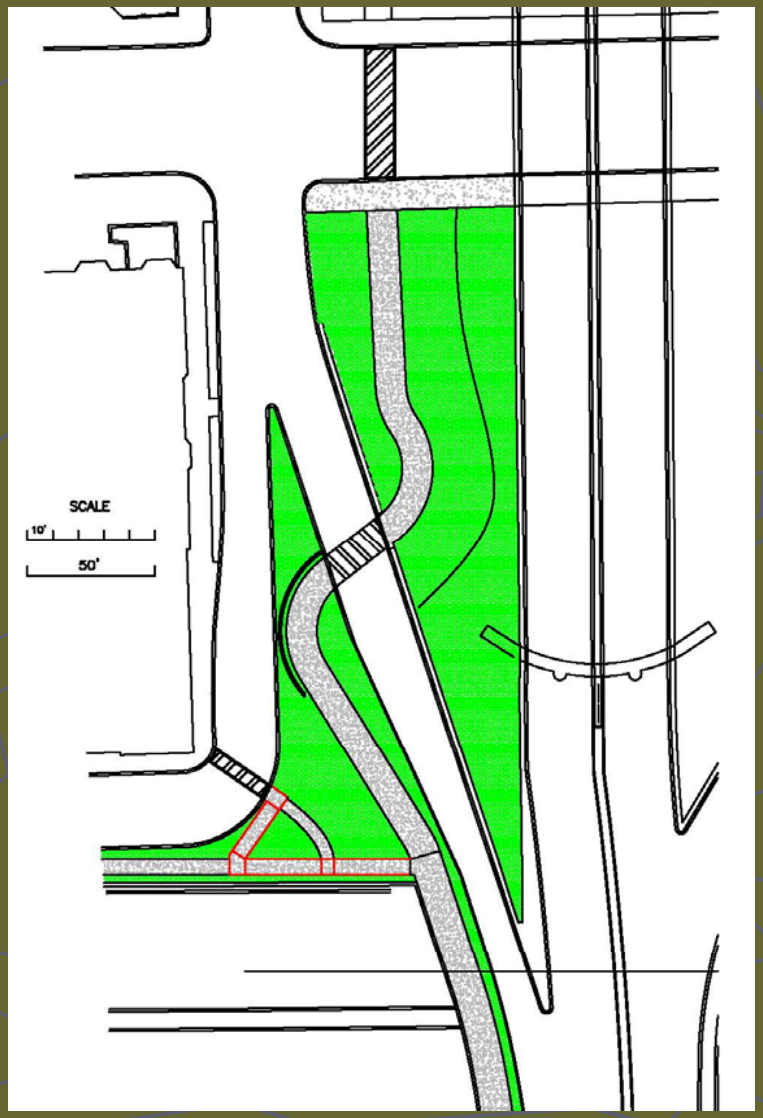
Southbound Onramp Alternatives Considered

- **(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

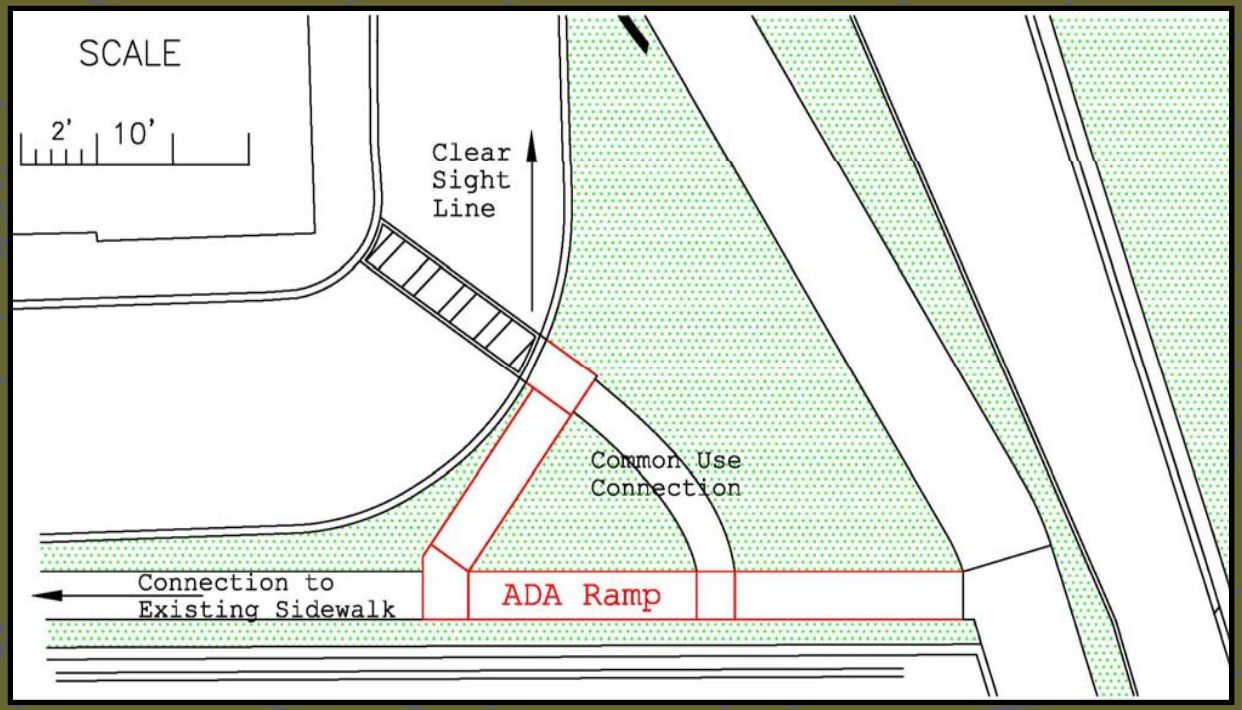
- The Onramp Crossing Features:
  - Signaled crossing
  - 125’ from intersection providing room for 10 cars in a queue
  - Separate ADA ramp to Charlesgate West and Newbury St.



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



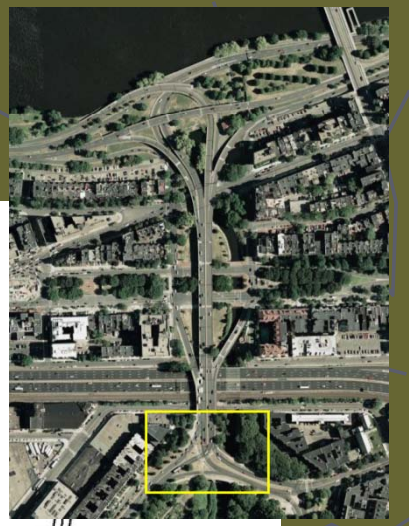
ADA Features:

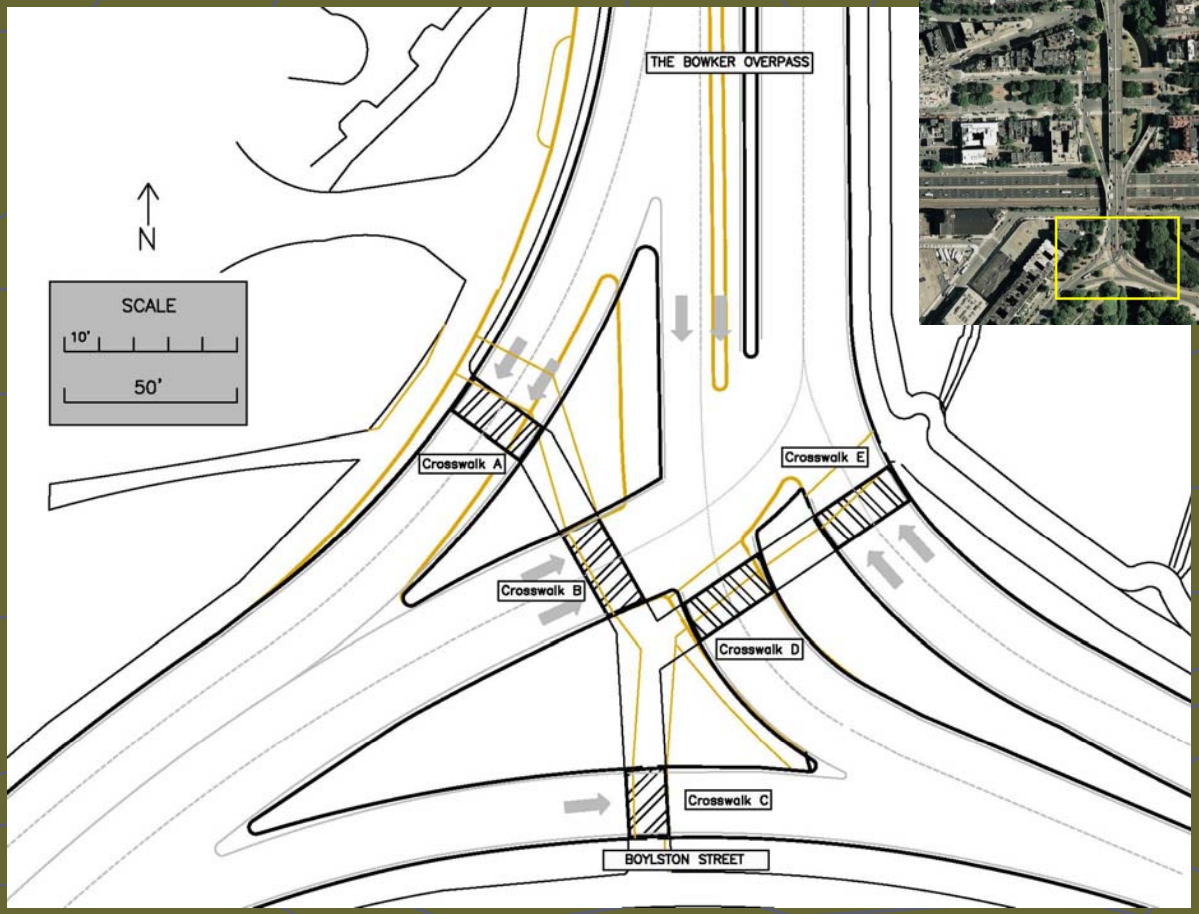
- 1/12 slope
- Landings every 30 linear feet

Bowker Overpass / Boylston Street Intersection Timings

Objective:

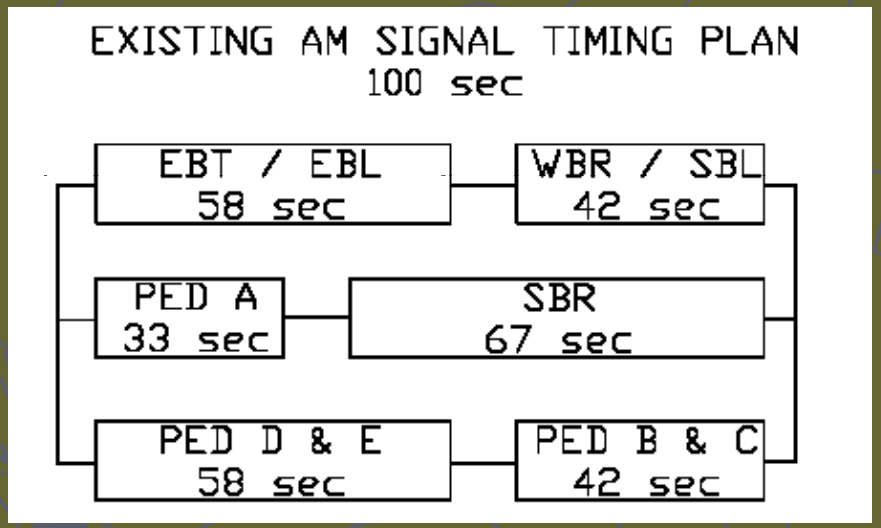
- Improving pedestrian service through intersection
- While maintaining or improving vehicular service

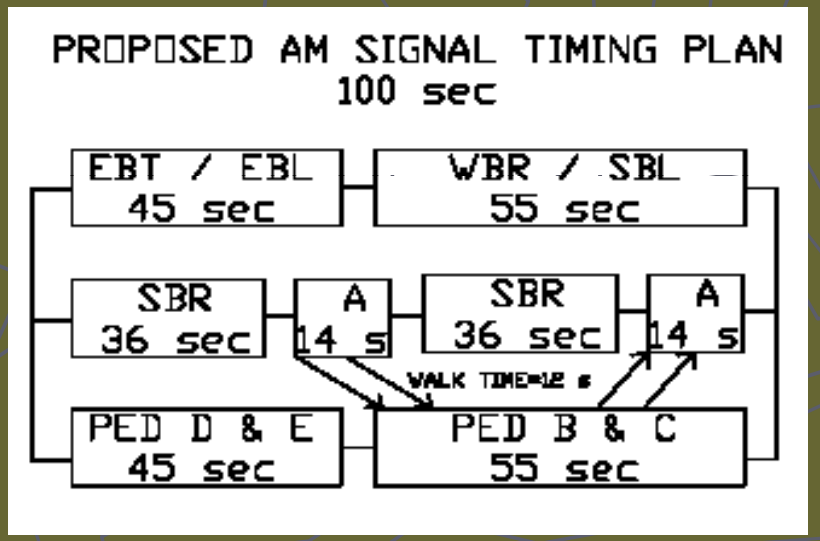




Signal Timing Plan Modifications:

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

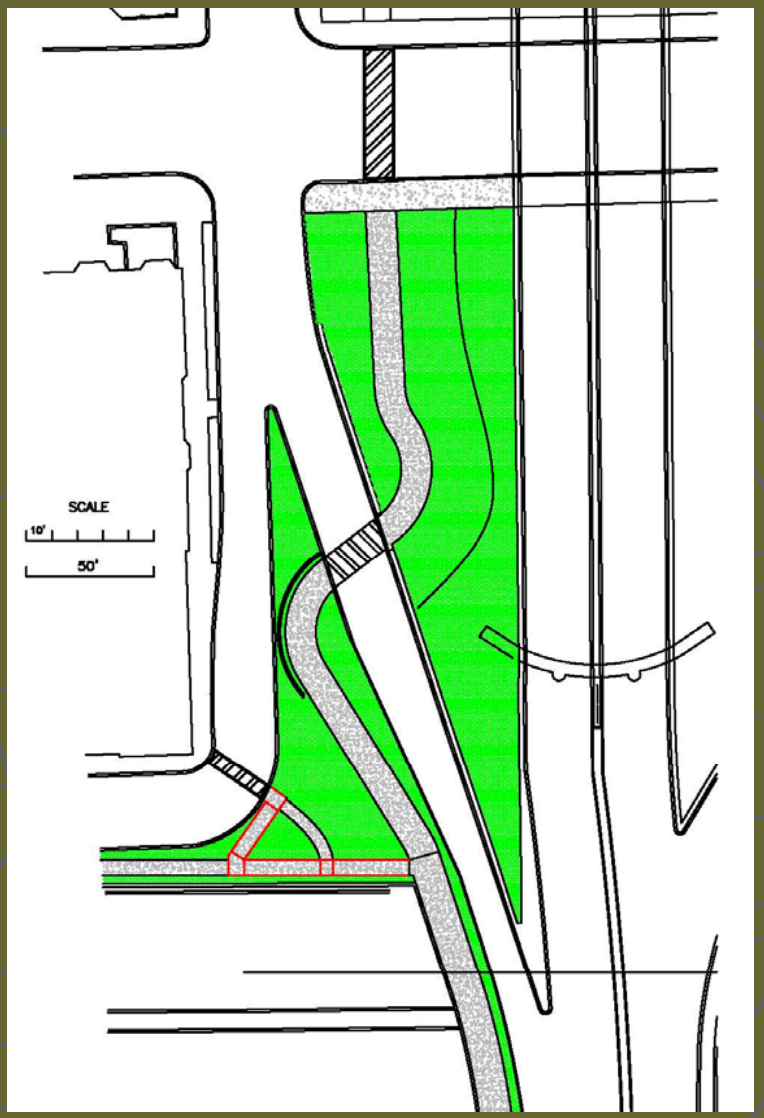
EXISTING AM SIGNAL TIMING PLAN
100 sec

EBT / EBR	SBT / SBL
62 sec	PED A
	38 sec

PROPOSED AM SIGNAL TIMING PLAN
100 sec

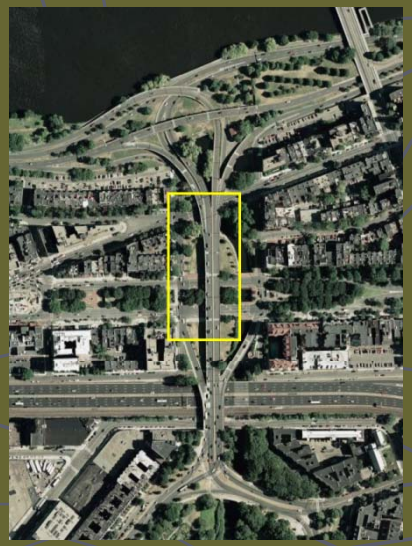
EBT / EBR	SBT / SBL
62 sec	PED A & B
	38 sec

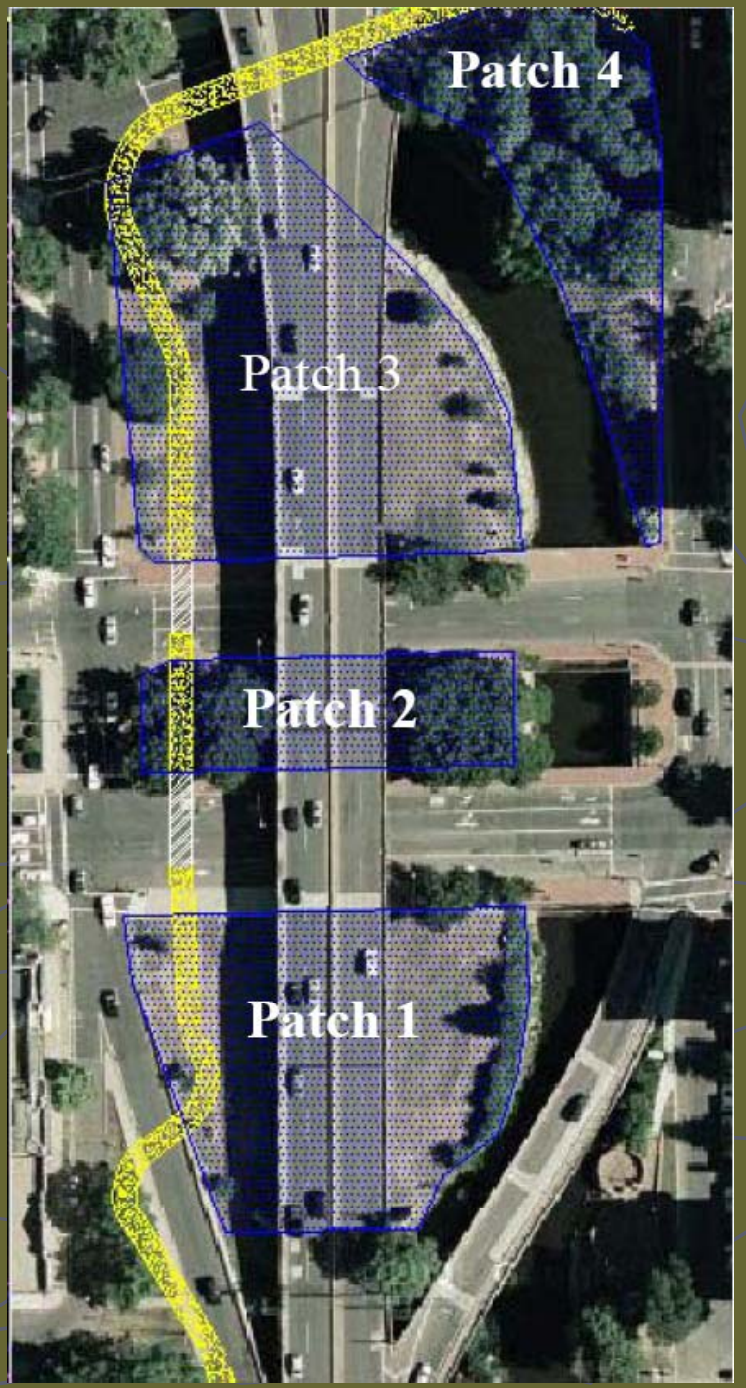
RAMP	PED	ON-RAMP
10 s	25 s	65 s



Olmsted's Park

- Four Patches Connected
  - Concurrent Pedestrian Phases across Charlesgate East and West.

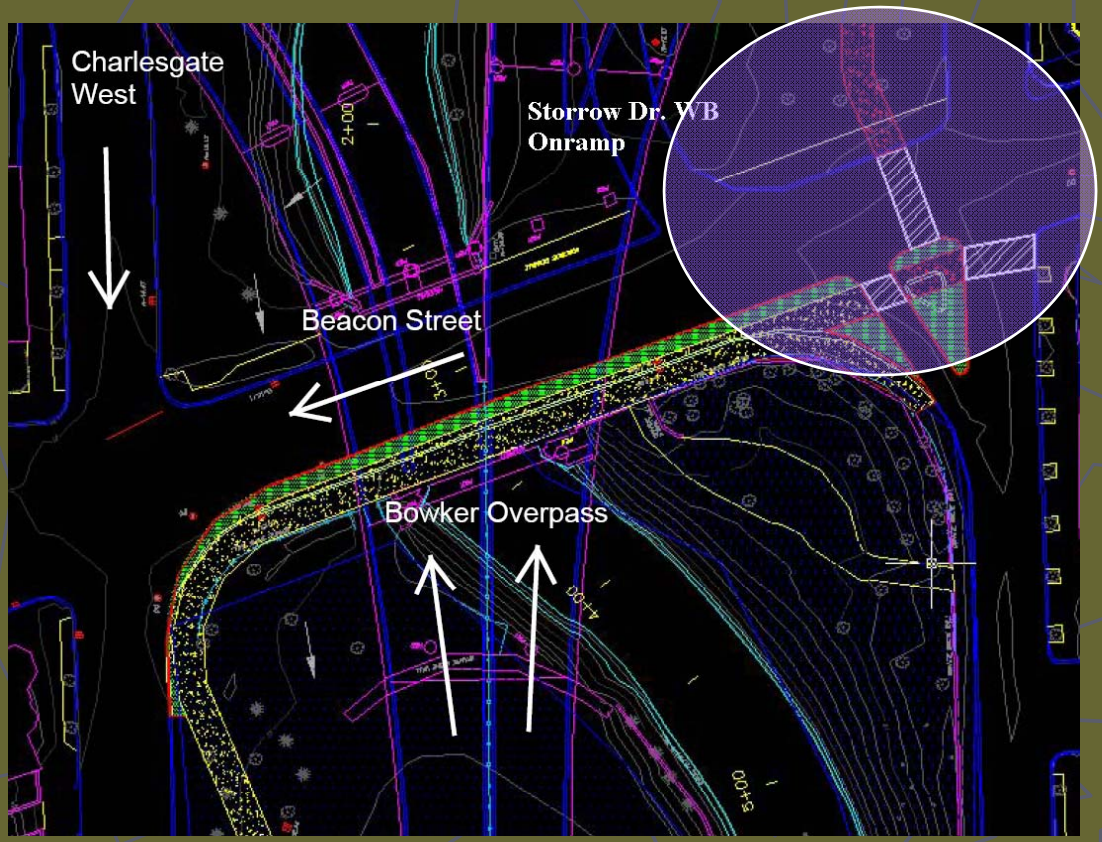




Olmsted's Park – Beacon Street

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

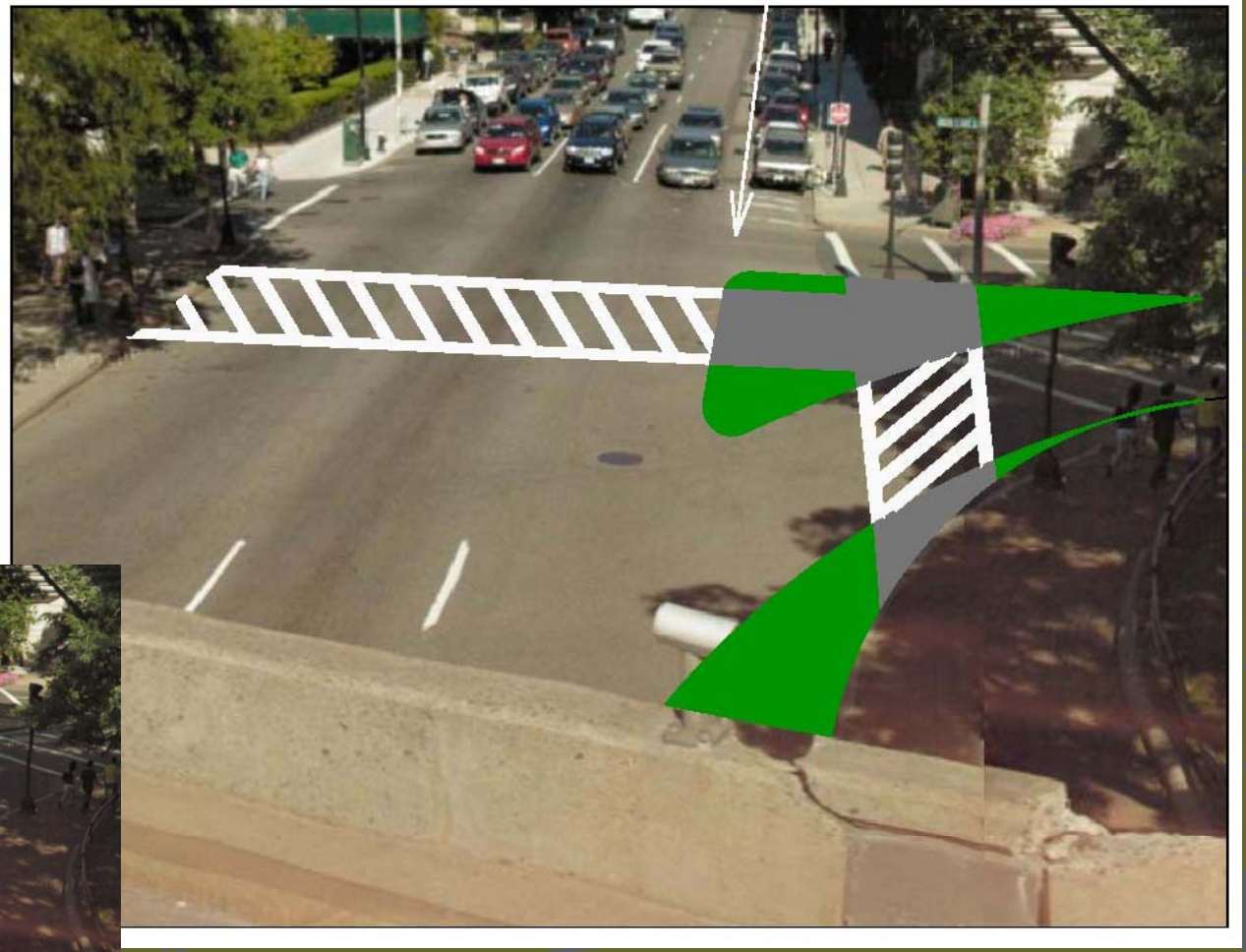
- Currently oversized lanes
- Reduce lane width to standard 12'
- Expand south curb line
  - Creates a constant sightline down Beacon
  - Allows island to be enlarged



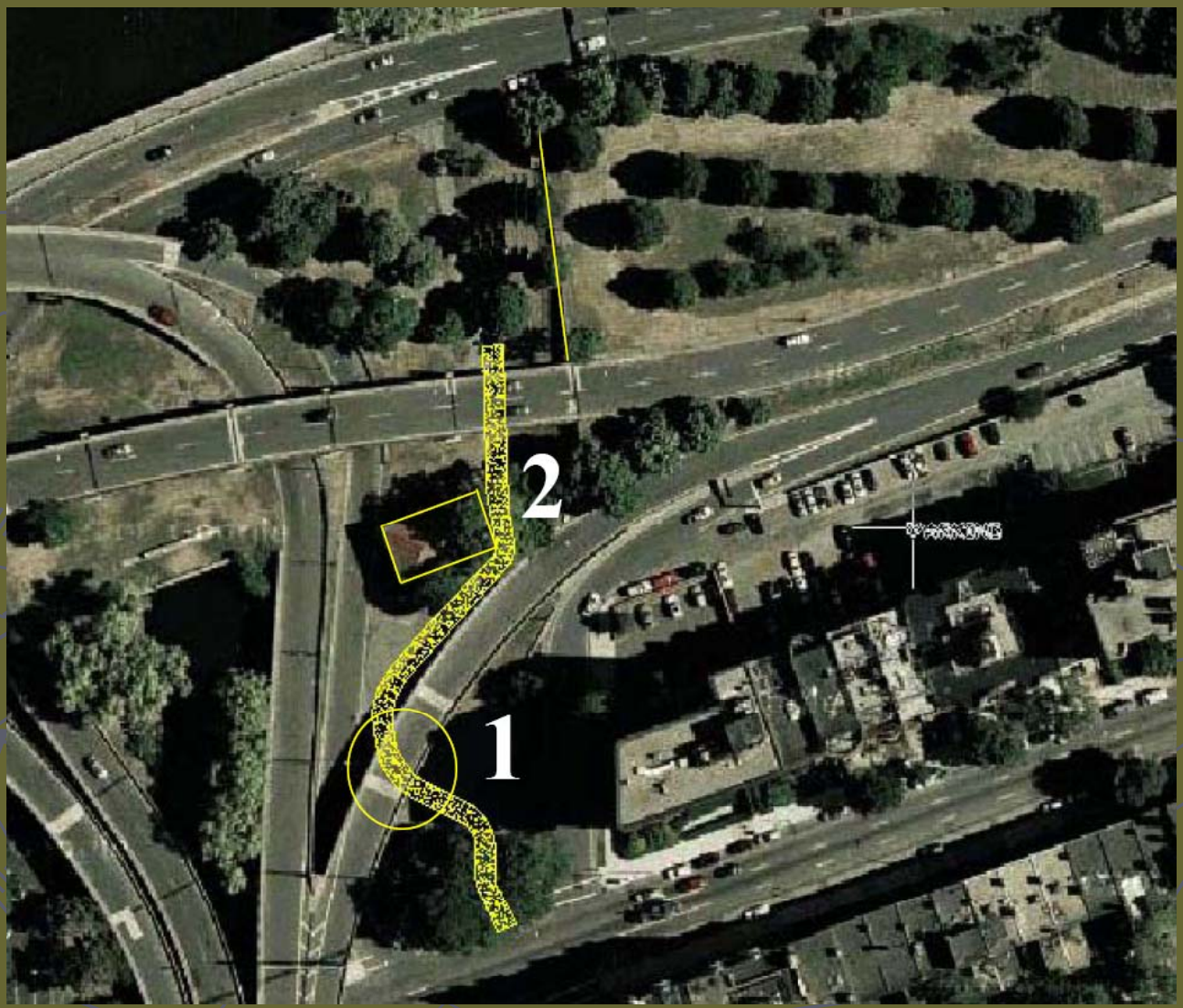
Olmsted's Park – Beacon Street

Expand South Curb line

- Creates a constant sightline down Beacon
- Allows island to be enlarged



Two Obstructions



Two Obstructions (Overpass Clearance)

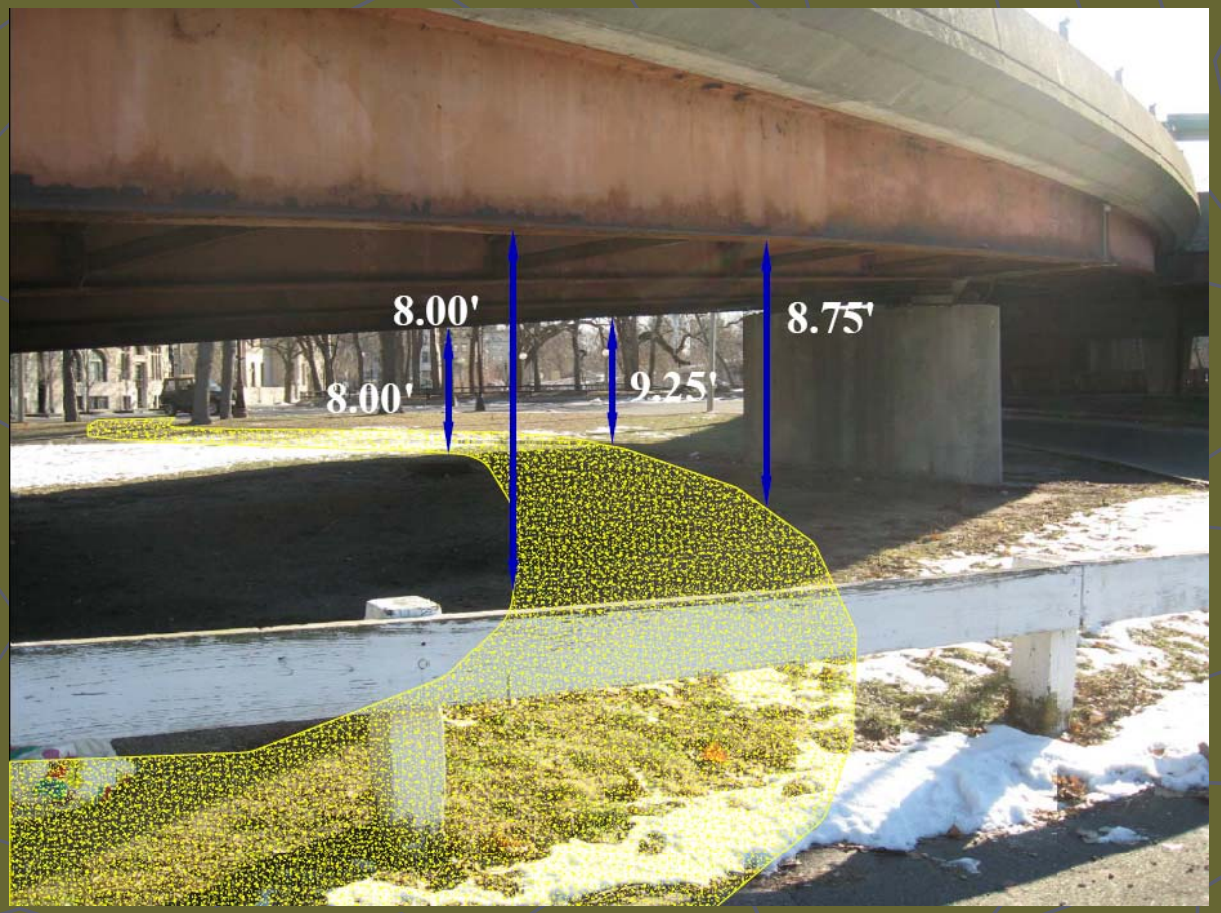
- Go to Right of Pier:
  - Left side of pier does not have required width
  - Left side of pier in not buffered from traffic

Two Obstructions (Overpass Clearance)

- Alternative
- Right Side of Pier
  - Current overhead clearance for right side of pier

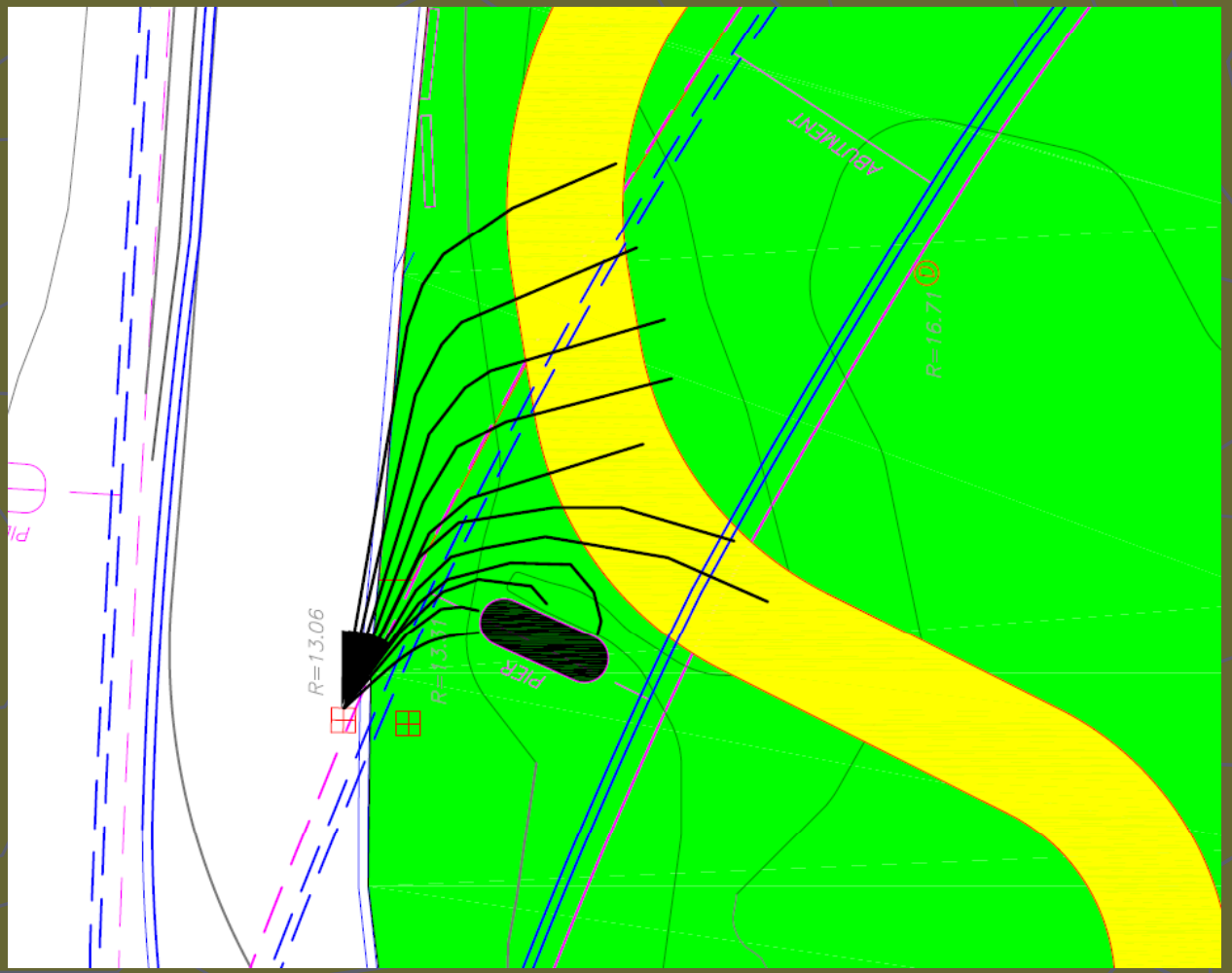
Two Obstructions (Overpass Clearance)

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

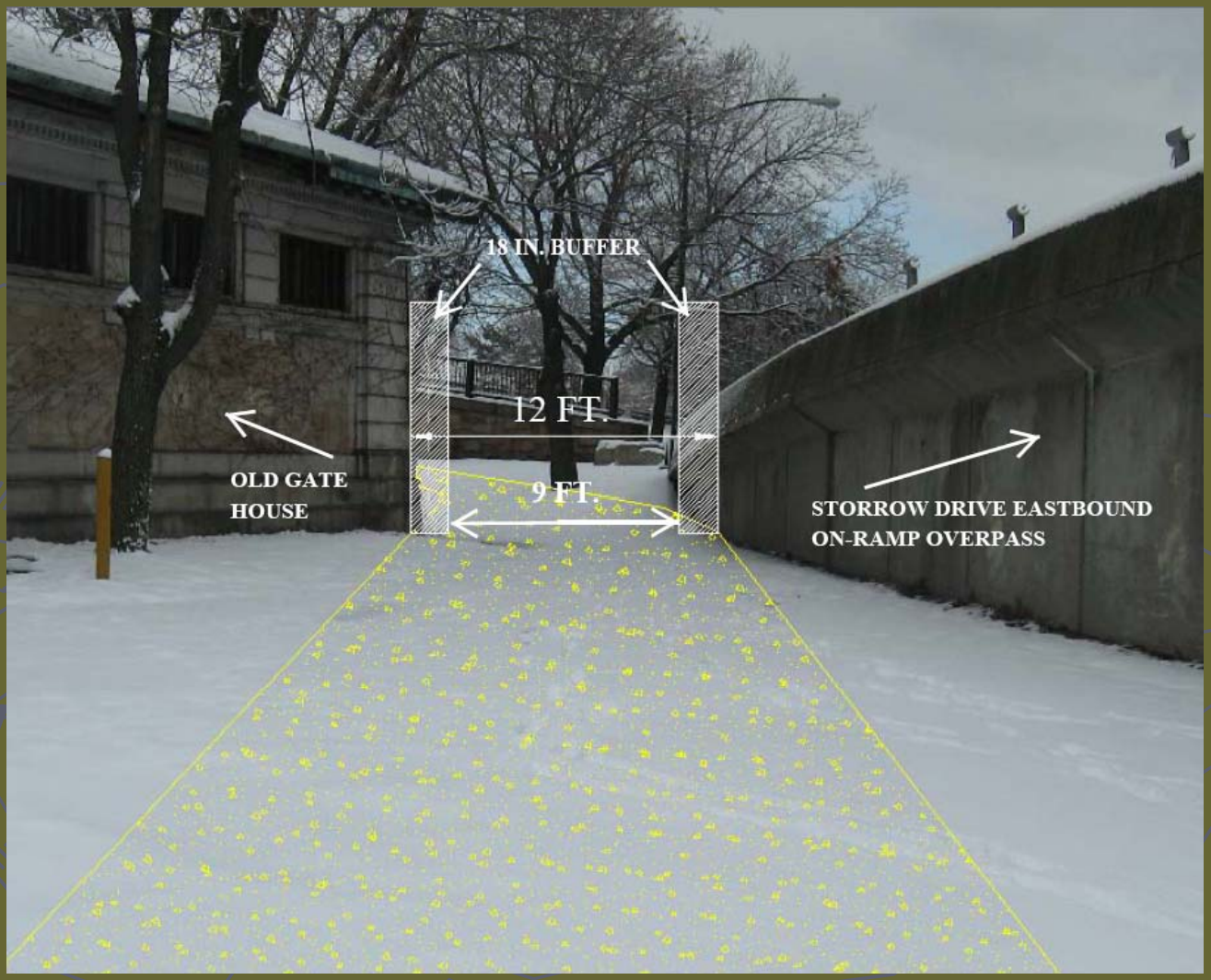


Two Obstructions (Overpass Clearance)

- Excavation Under Overpass
  - Drainage solution



Two Obstructions (Gate House)



“The Lost Park”

View along the Charles River downstream

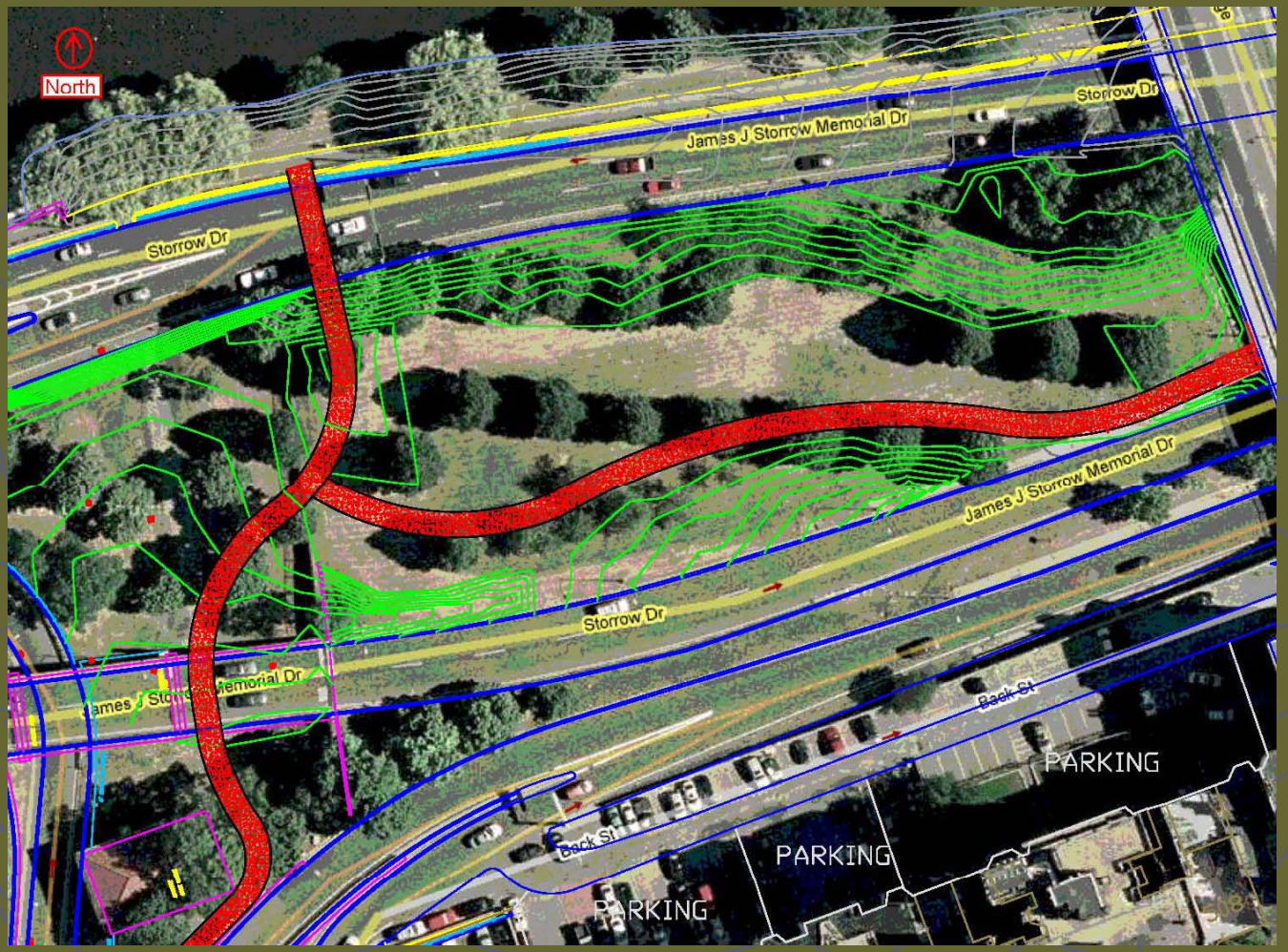
View from the upper level of the park

-Reclaiming 2.5 acres of parkland near the Charles River

-Creating a destination rather than just a connection

Establishing Destination

Proposed Path Layout

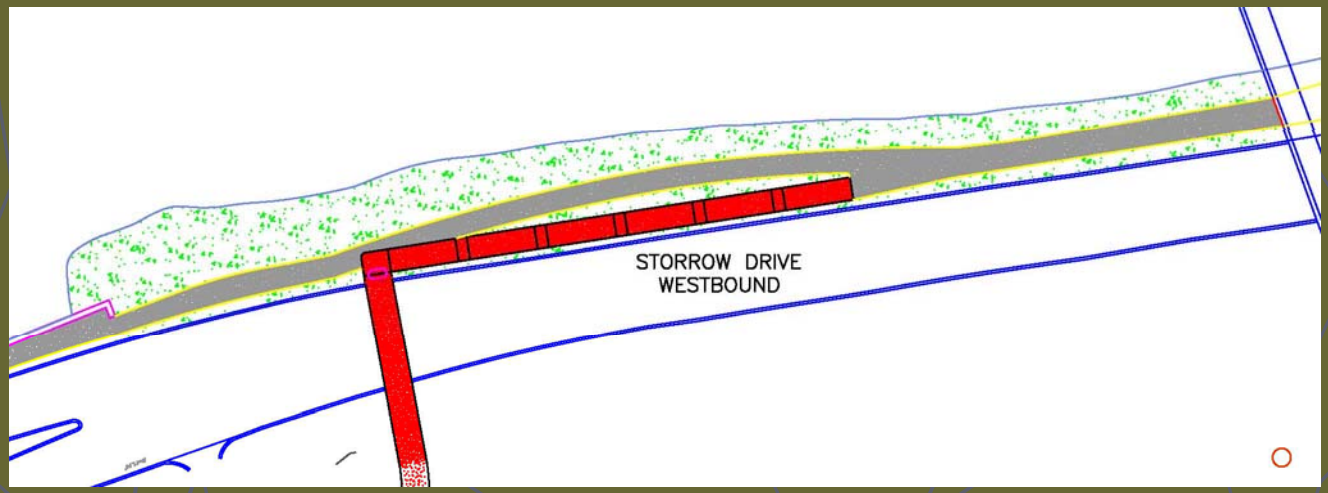


Storrow Drive Westbound Crossings (4 Bridge/Ramp Alternatives)

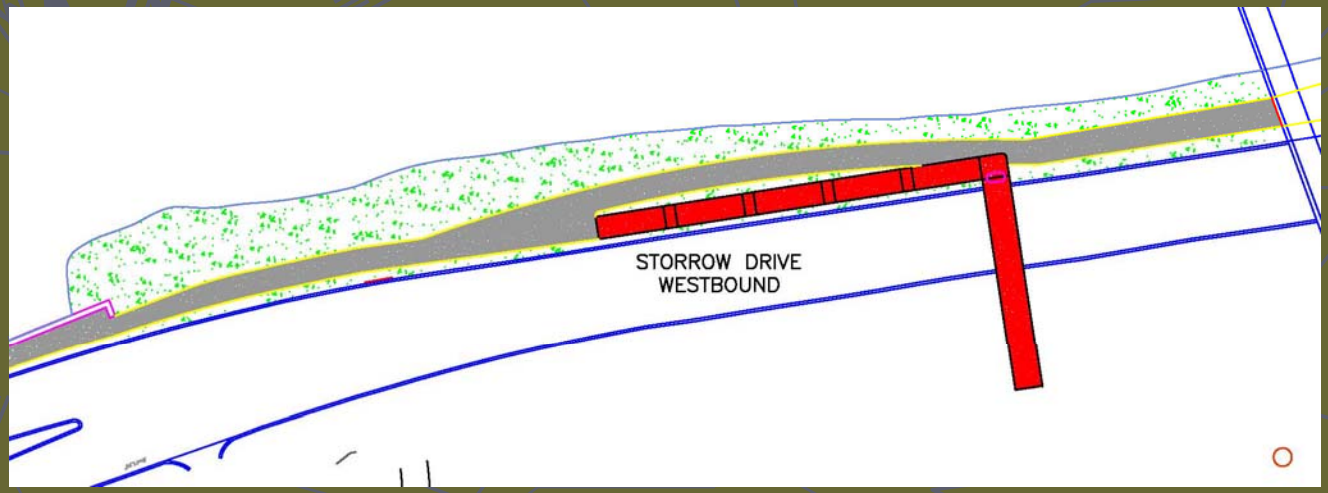
All bridges were designed meeting the following requirement:

- 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

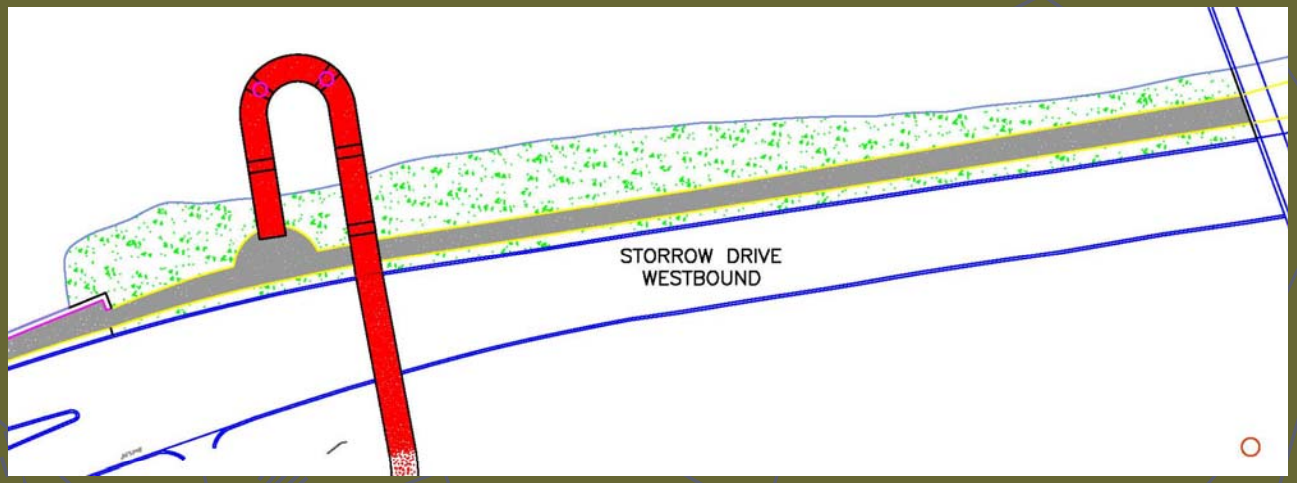


Alternative A:
Bridge crossing to the west and the resulting 193’ ramp down towards the east

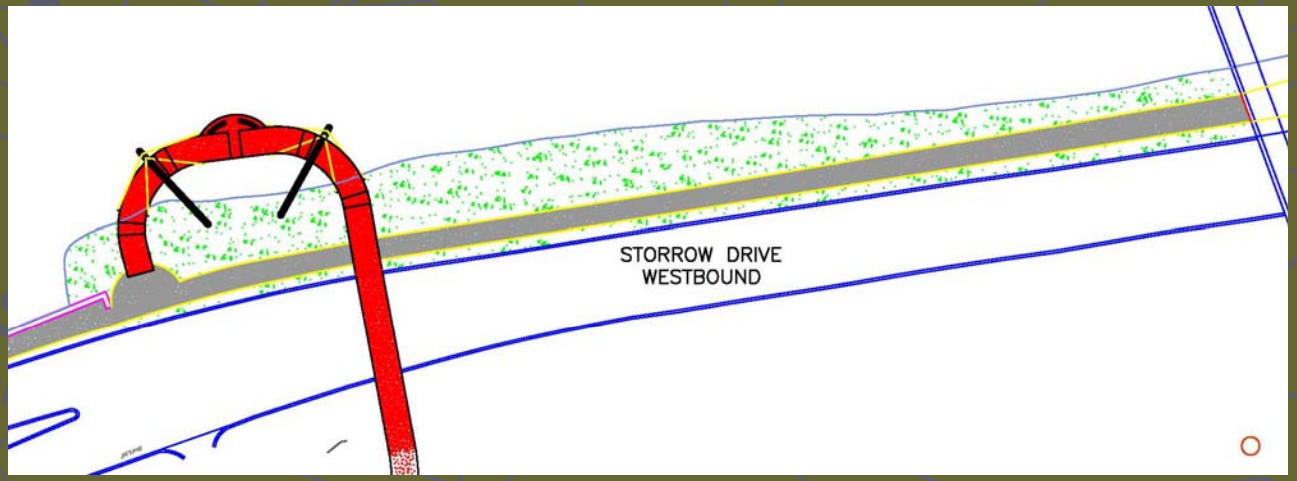


Alternative B
Bridge crossing to the east and the resulting 150’ ramp down towards the west

Alternatives C & D

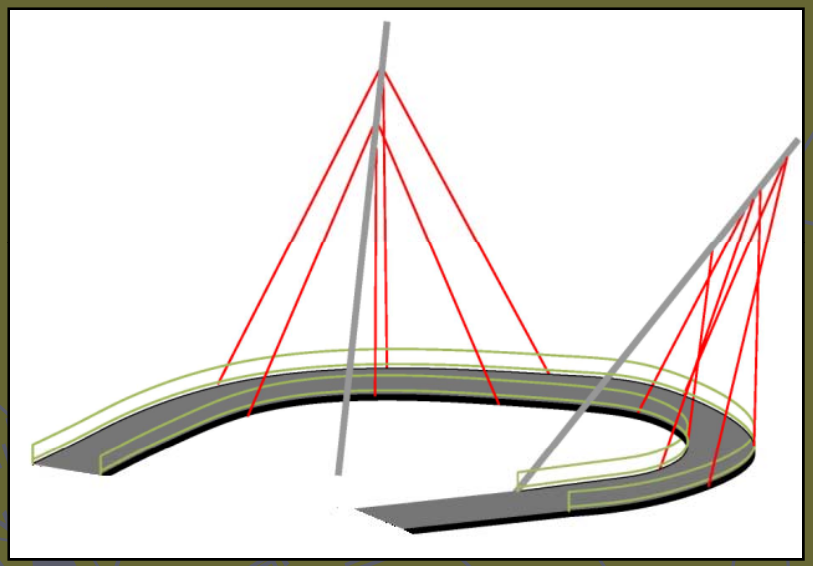


Alternative C
The design calls for a piers to be placed in the Charles River. The major benefit is the relatively low visual impact.



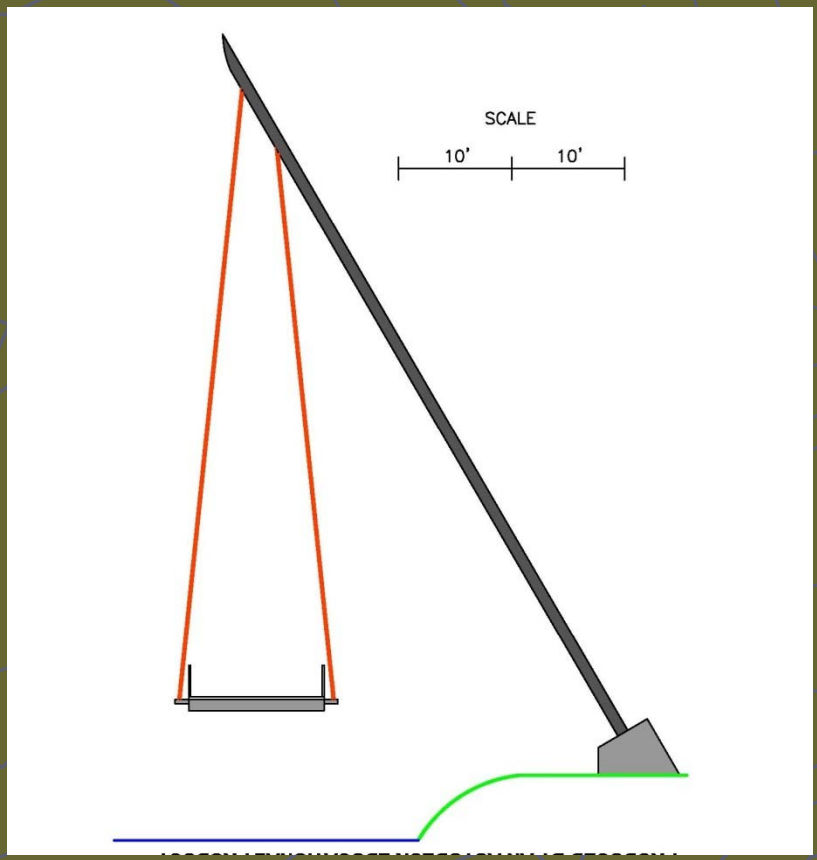
Alternative D
The grand design. It calls for a cable-stayed ramp extending over the river.

Alternative D (cont.)



3-D Rendering

Typical Elevation



Alternatives Comparison Table

Alternative	Horizontal Impact	Distance over River	Extra Travel Distance (Compaired to best Alternative)	
			Upstream	Downstream
A	193'	0'	464'	407'
B	150'	0'	342'	0'
C	52'	62'	65'	240'
D	114'	32'	0'	291'

Cost Estimate
(Excluding Footbridge)

Item	Amount	Unit	Unit Cost ($)	Boston Metro Area Multiplier	Inflation Multiplier	Total Cost ($)
Asphalt Paving	3,360	Square Yard	15	1.18		59,472.00
Crosswalk	11	Crosswalk (ladder stripping)	300		1.25	4,125.00
Curb Construction	924	Linear Foot	6.75	1.18		7,359.66
Curb Removal	816	Linear Foot	4.85	1.18		4,669.97
Excavation	116	Cubic Yards	1.5	1.18		205.32
Fill	1150	Cubic Yards	3.3	1.18		4,478.10
Handicap Ramp	19	Ramp	800		1.25	19,000.00
Island Modification	2.61	400 Square Feet	20,000		1.25	65,250.00
Lane Marking/Modification	0.53	Mile	3000		1.25	1,987.50
Reconstructing Median	3.86	100 Feet	20,000		1.25	96,500.00
Sidewalk Deconstruction	300	Linear Foot	3.5	1.18		1,239.00
Signal Addition (Ped)	6	Signal	30,000		1.25	225,000.00
Signal Addition (Traffic)	1	Signal	60,000		1.25	75,000.00
Signal Timing Modification	3	Signal System/Intersection	200			600.00
Total						**564,886.55**

Questions?

The Boston Globe

Acknowledgements:

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.