I-91 Viaduct Study

Springfield, Massachusetts

Working Group Meeting #11

One Financial Plaza
1350 Main Street
3rd Floor, Community Room A
Springfield, Massachusetts

July 31, 2018

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Welcome & Introductions

- Michael Clark – Project Manager (MassDOT)
- Ethan Britland – Project Manager (MassDOT)
- Mark Arigoni, L.A. – Principal-in-Charge (MMI)
- Van Kacoyannakis, P.E. – Traffic (MMI)
- John Hoey - QA/QC (MMI)
- Sarah Paritsky – Public Involvement (Regina Villa)

Agenda

- Welcome and Introductions
- Study Progress & Alternatives Review
- Refresher of the WGM#10
  - Evaluation Criteria Workbook/Comments
- Draft Final Recommendations
- Next Steps

I-91 Viaduct Study Goals, Objectives, and Evaluation Criteria

- **Mobility and Connectivity** – maintain and improve the efficient function of I-91, I-291, associated ramps, and key intersections in the study area, encouraging mode shift through improved bike/ped functionality
- **Safety** – improve bike/ped and vehicular safety throughout the study area, as well as public safety adjacent to the viaduct
- **Environmental Effects** – improve air quality, reduce noise impacts, and decrease environmental impacts such as wetlands incursion and pavement footprint
- **Land Use and Economic Development** – enhance access to existing development parcels and establish new development parcels, while creating more attractive, economically viable riverfront connections
- **Community Effects** – provide fair and equitable treatment for Environmental Justice populations and improve the visual perception of the viaduct
- **Cost** – estimate construction and long-term maintenance costs

Project Review: Alternatives Development

- Ten alternatives initially developed
- Ten Working Group Meetings (WGMs)
- Two Public Meetings
- Three alternatives advanced for analysis
    - Sunken Highway following Current Alignment
    - Sunken Highway following Modified Alignment
    - Reconstructed Elevated Highway

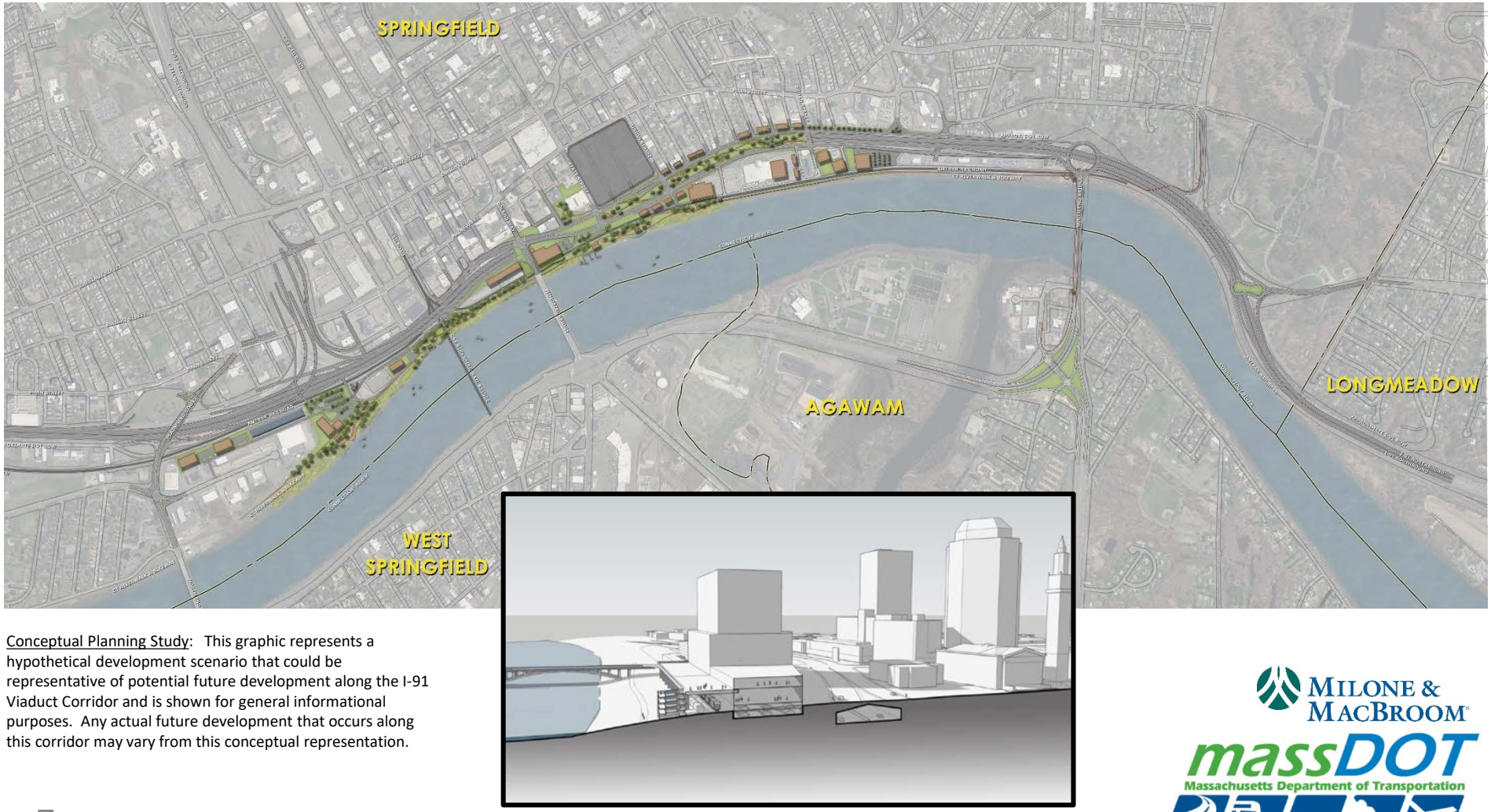
- Detailed Evaluation Criteria Analysis: Alternatives developed to achieve most favorable outcomes for community, environmental impacts, engineering complexity, ease of implementation, and costs

Refresher of Three Alternatives

1. Sunken, Tunnel, or Combination(s) following current I-91 Alignment
2. Sunken, Tunnel, or Combination(s) following modified I-91 Alignment (section of combined rail and highway corridor)
3. Reconstructed Elevated Structure (Modern Viaduct)

Alternative No.1

Sunken following current I-91 Alignment



Conceptual Planning Study: This graphic represents a hypothetical development scenario that could be representative of potential future development along the I-91 Viaduct Corridor and is shown for general informational purposes. Any actual future development that occurs along this corridor may vary from this conceptual representation.

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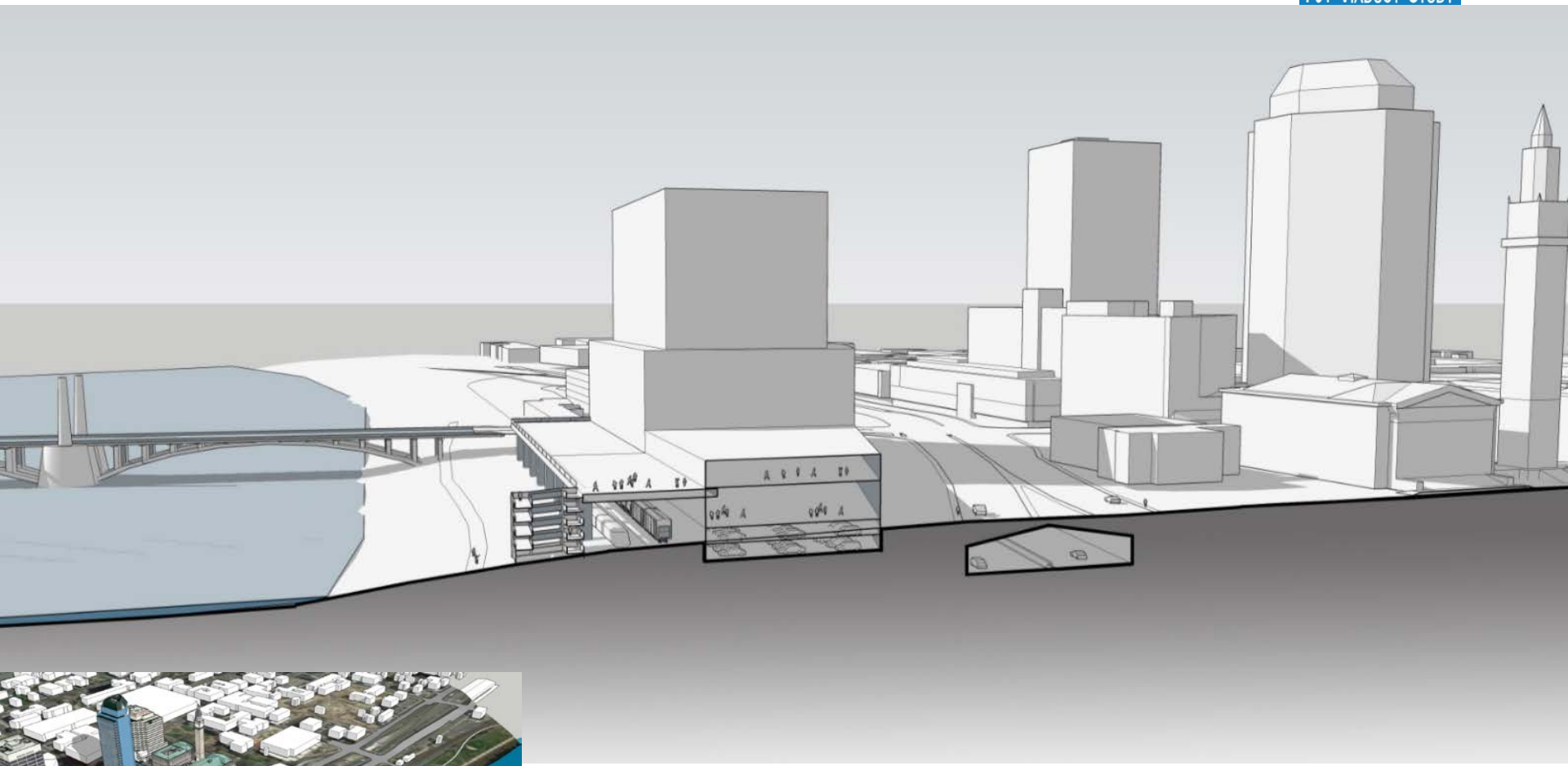
I-91 VIADUCT STUDY



Alternative #1

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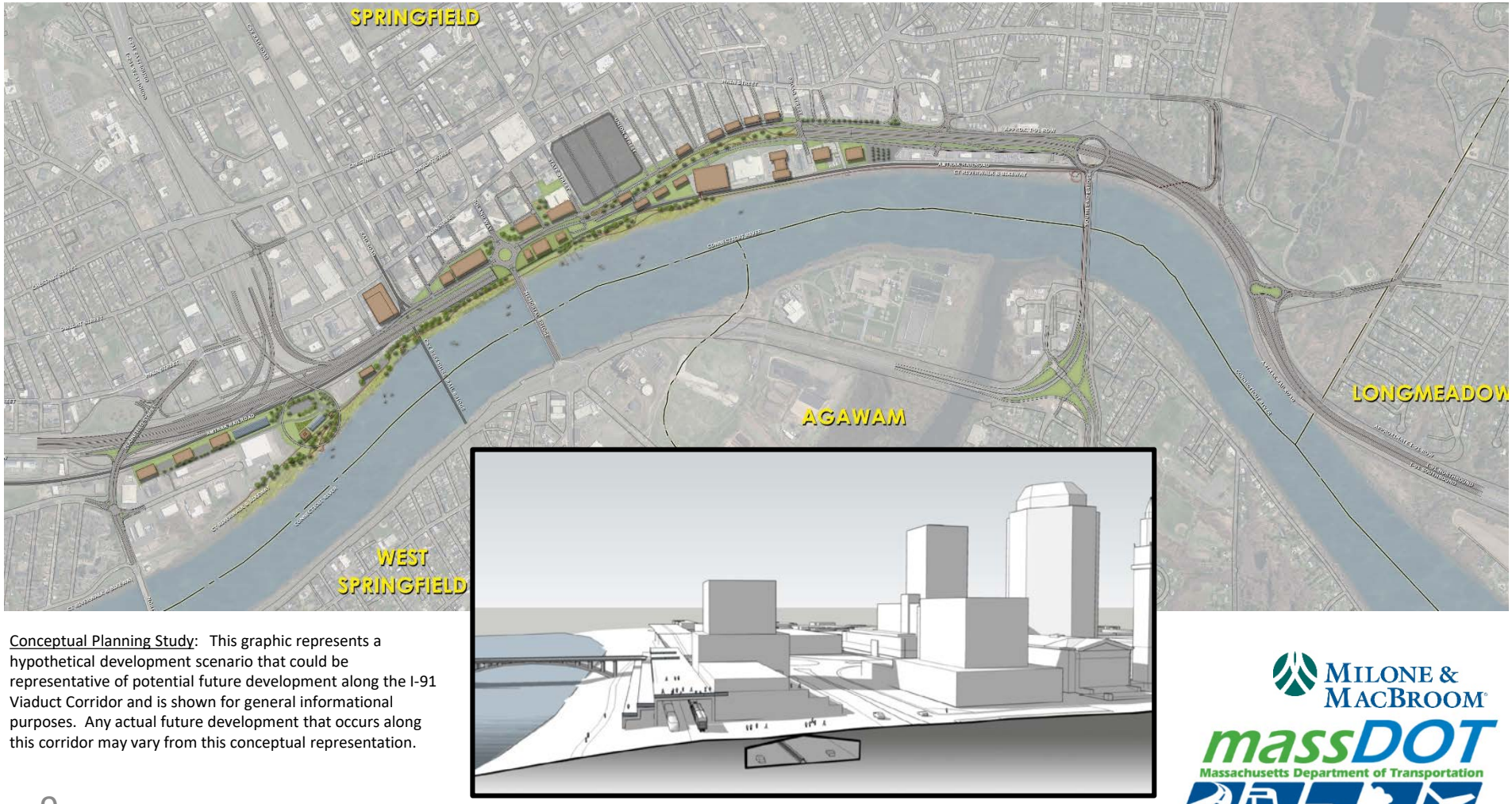
Alternative No. 2

Sunken following modified I-91 Alignment



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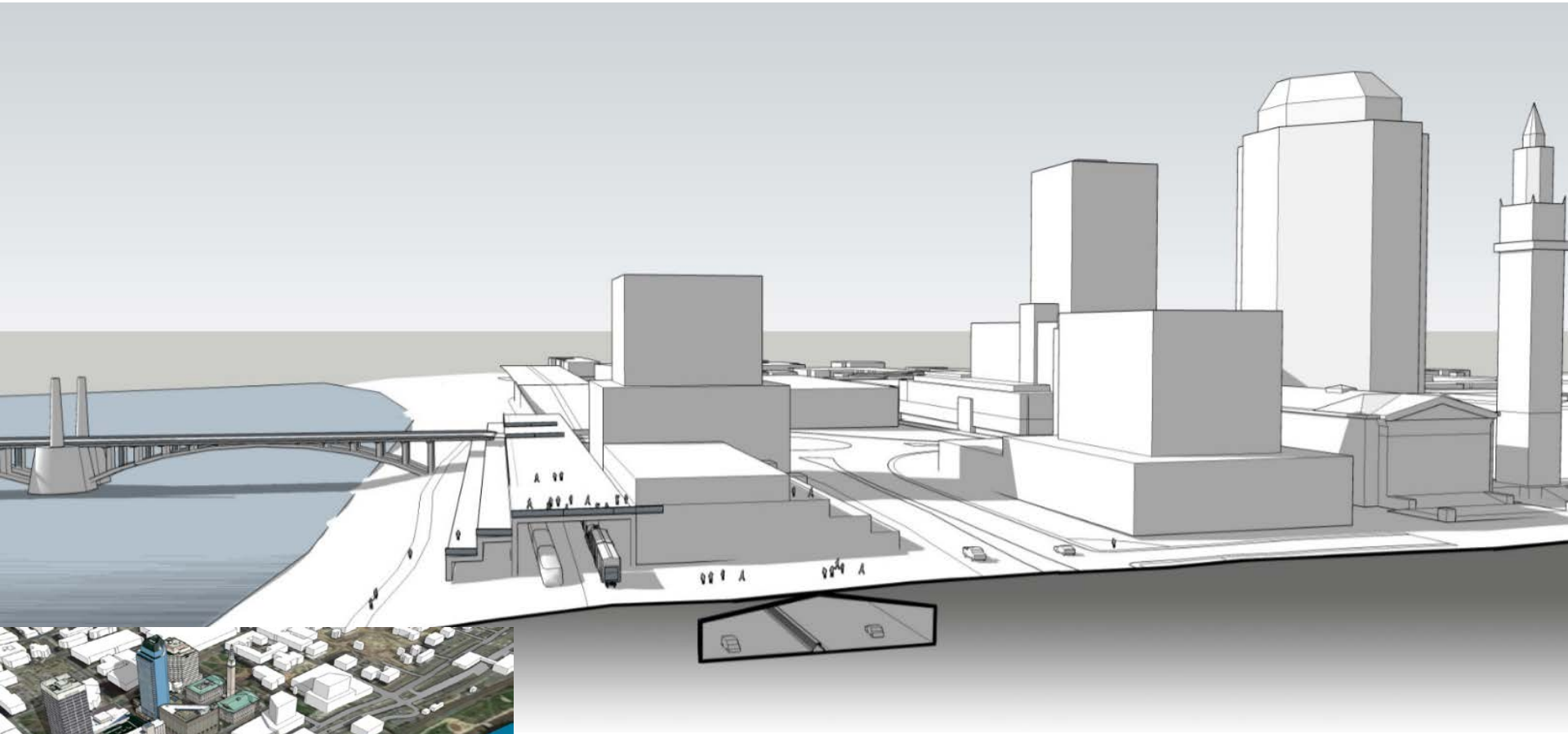

Alternative #2

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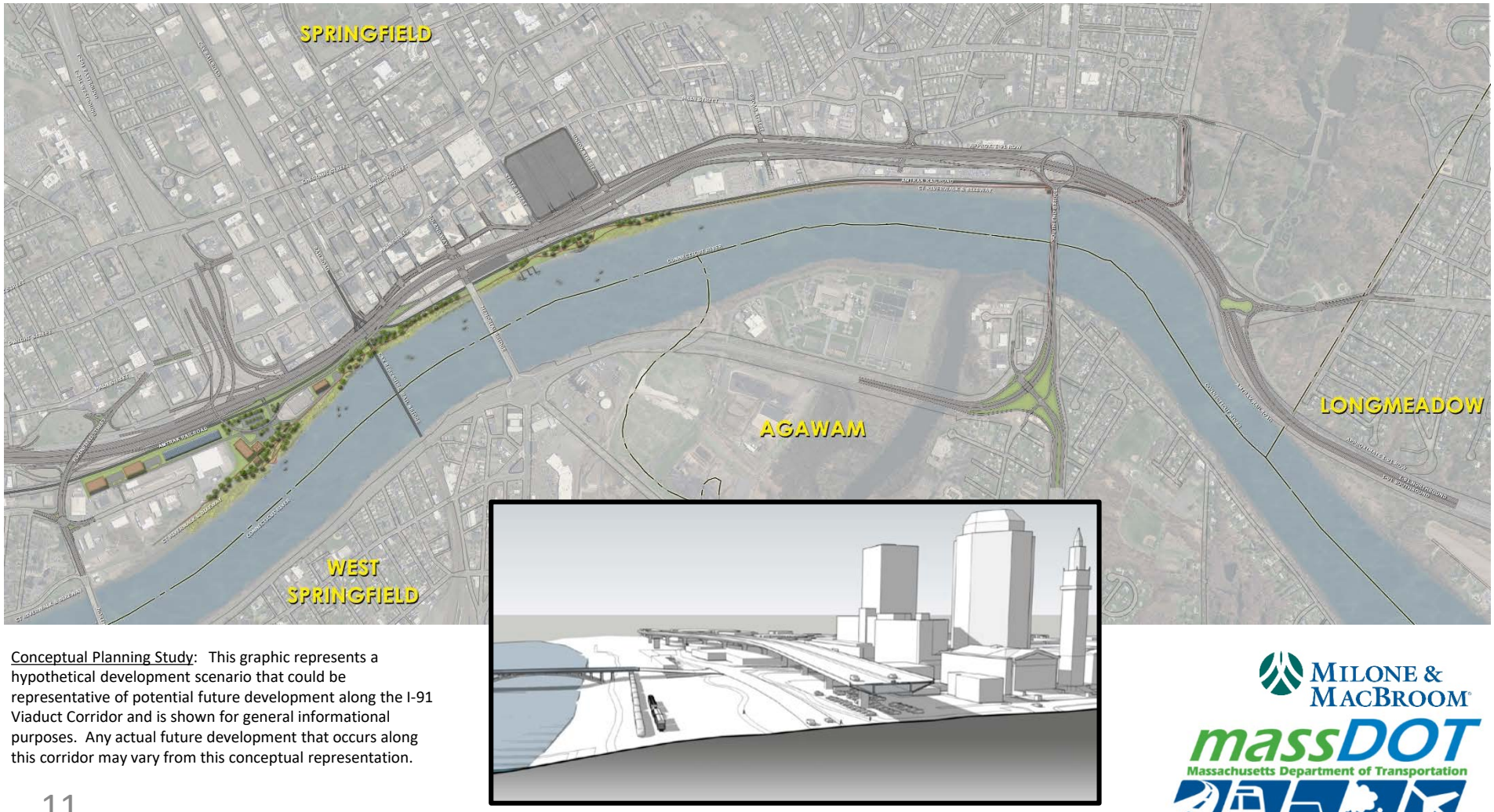
Alternative No. 3

I-91 Viaduct Study

Reconstructed Elevated Structure (Modern Viaduct)



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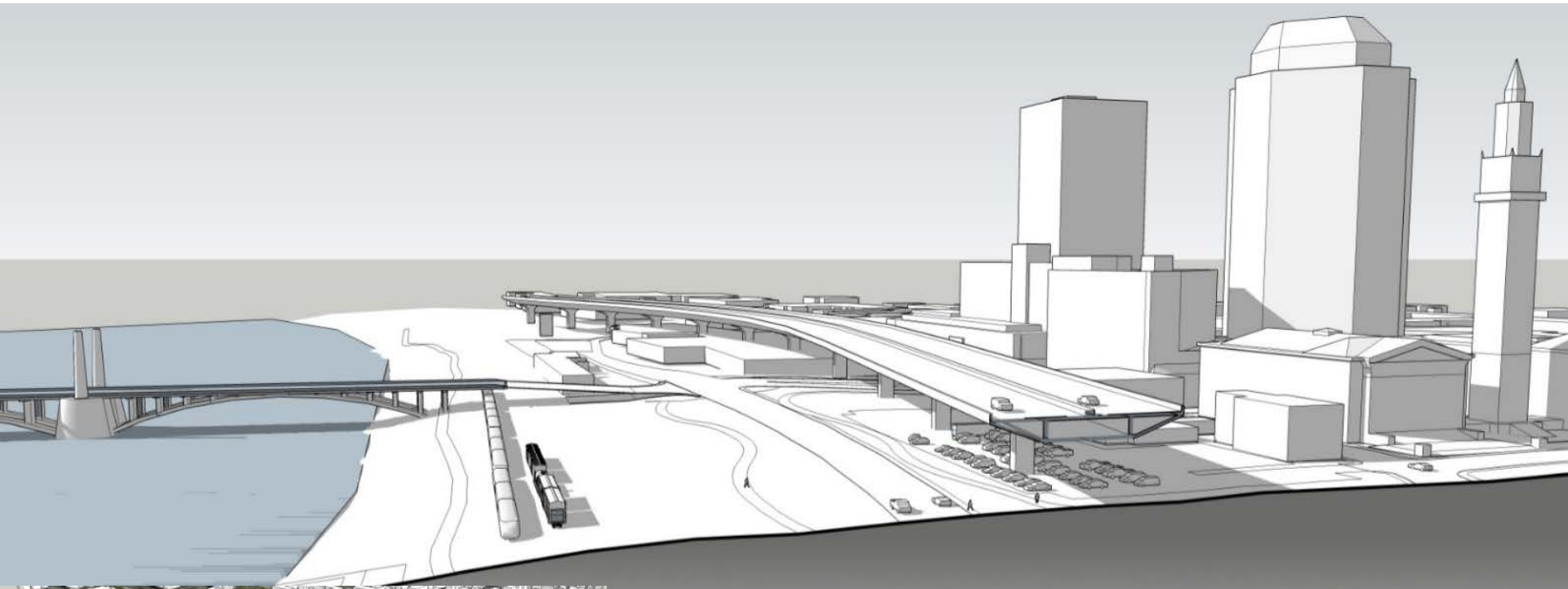
I-91 VIADUCT STUDY



Alternative #3

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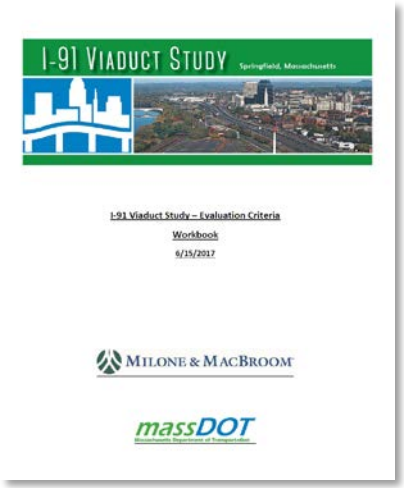
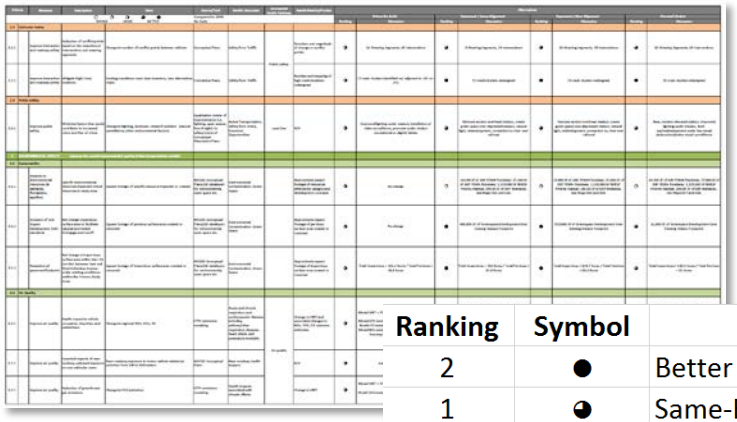
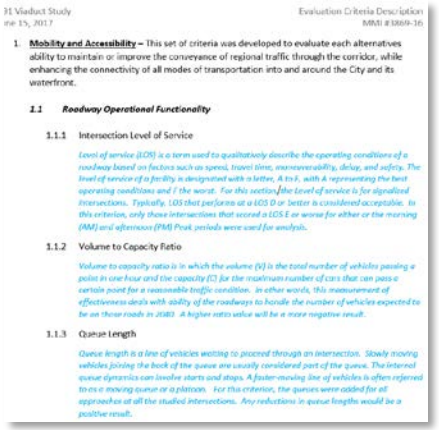
WGM#10 - Evaluation Criteria / Comments

- A workbook was developed to function as a stand alone document providing information to support ratings shown in the Evaluation Criteria.
- Comments were generated by the working group following WGM #10.
- Responses to comments were provided and posted to the study website (handout provided)





Ranking	Symbol	
2	●	Better
1	◕	Same-Better
0	◑	Same
-1	◔	Same-Worse
-2	○	Worse



1. **Mobility and Accessibility –** This set of criteria was developed to evaluate each alternatives ability to maintain or improve the conveyance of regional traffic through the corridor, while enhancing the connectivity of all modes of transportation into and around the City and its waterfront.

1.1 Roadway Operational Functionality

1.1.1 Intersection Level of Service

Level of service (LOS) is a term used to qualitatively describe the operating conditions of a roadway based on factors such as speed, travel time, maneuverability, delay, and safety. The level of service of a facility is designated with a letter, A to F, with A representing the best operating conditions and F the worst. For this section, the Level of service is for signalized intersections. Typically, LOS that performs at a LOS D or better is considered acceptable. In this criterion, only those intersections that scored a LOS E or worse for either or the morning (AM) and afternoon (PM) Peak periods were used for analysis.

1.1.2 Volume to Capacity Ratio

Volume to capacity ratio is in which the volume (V) is the total number of vehicles passing a point in one hour and the capacity (C) for the maximum number of cars that can pass a certain point for a reasonable traffic condition. In other words, this measurement of effectiveness deals with ability of the roadways to handle the number of vehicles expected to be on those roads in 2040. A higher ratio value will be a more negative result.

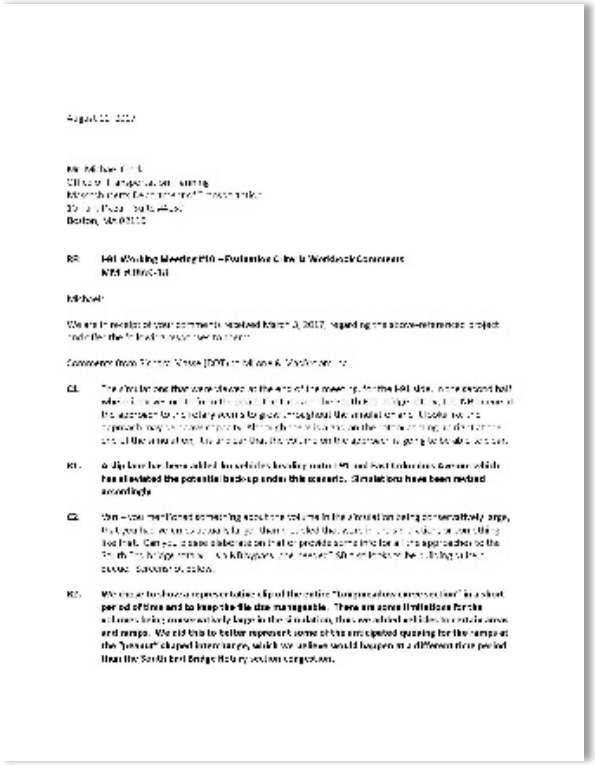
1.1.3 Queue Length

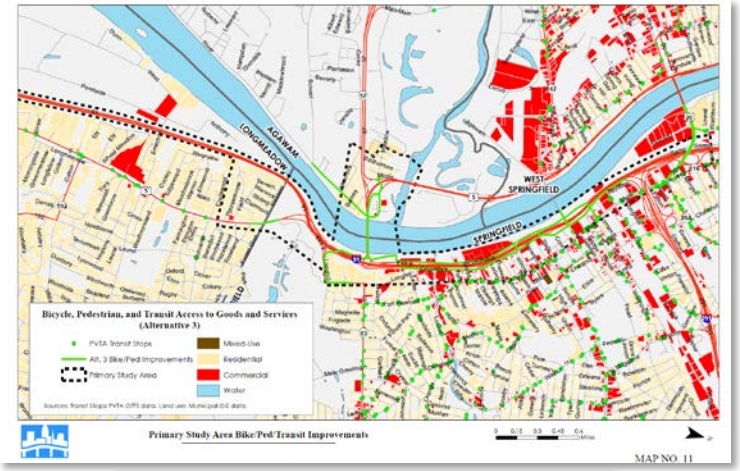
Queue length is a line of vehicles waiting to proceed through an intersection. Slowly moving vehicles joining the back of the queue are usually considered part of the queue. The interest queue dynamics can involve starts and stops. A faster-moving line of vehicles is often referred to as a moving queue or a platoon. For this criterion, the queues were added for all approaches at all the studied intersections. Any reductions in queue lengths would be a positive result.

WGM#10 - Evaluation Criteria / Comments

- The Evaluation Criteria was further developed and refined based on comments provided following the WG meeting in June (2017)

- Mapping & Ratings (Harvey Ball/Numeric) were reviewed and revised as necessary.





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Comparison of Alternatives

I-91 Viaduct Study

Note that Build Alternative cost estimates include component improvements

	Sunken Highway Following Current Alignment	Sunken Highway Following Modified Alignment	Reconstructed Elevated Highway
Mobility and Connectivity	Some reduction in number of merge, diverge, and weave locations Improvement in vehicular travel time along I-91 and study area	Highest reduction in number of merge, diverge, and weave locations Minimal change in vehicular travel time along I-91 and decline in study area	Some reduction in number of merge, diverge, and weave locations Improvement in vehicular travel time along I-91 and smaller improvement in study area
Safety	Reduction of on-ramps/off-ramps improves bike/ped conditions Redesign of 15 crash clusters	Reduction of on-ramps/off-ramps improves bike/ped conditions Redesign of 15 crash clusters	Reduction of on-ramps/off-ramps improves bike/ped conditions Redesign of 15 crash clusters
Environmental Effects	Slight increase in VMT and decrease of air quality 27,000 square feet of wetlands impacts Reduced noise impacts	Slight increase in VMT and decrease of air quality 27,000 square feet of wetlands impacts Reduced noise impacts	Virtually no change in VMT or air quality 27,000 square feet of wetlands impacts Similar noise impacts
Land Use and Economic Development	468,800 square feet of space over highway created Potential for $2.2 million in annual tax revenue at full build-out	553,800 square feet of space over highway created Potential for $3.5 million in annual tax revenue at full build-out	13,800 square feet of space over highway created Potential for $300,000 in annual tax revenue at full build-out
Community Effects	Potential for greenspace and better connection to Riverfront 10-15 year construction duration	Potential for greenspace and better connection to Riverfront 10-15 year construction duration	Potential for activation of space underneath viaduct 8-12 year construction duration
Cost (in 2040 dollars)	$3.78 billion	$3.74 billion	$3.14 billion

All alternatives compared against Rehab Option

Rehabilitation of viaduct under current alignment at existing elevation

Cost - $695 million

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Cost Estimates

Alternative	Rehab	Alt. 1	Alt. 2	Alt. 3	Associated Projects
Order of Magnitude Construction Cost (in 2040 dollars)	$695 M	$3.78 B	$3.74 B	$3.14 B	$826 M

Alt. 1 – Sunken in Current Alignment Alt. 2 – Sunken in New Alignment Alt. 3 – Reconstructed Elevated

All Alternative costs include I-91 SB/I-291 NB and I-291 SB/I-91 NB ramp systems, which may require replacement prior to expected lifespan of viaduct

- Component breakdowns for Build Alternatives:
  - I-91 through downtown core (Alts. 1/2) - $2.475-2.5 billion
  - I-91 through downtown core (Alt. 3) - $1.875 billion
  - I-91/I-291 interchange (all) - $407-424 million
  - I-91 northern touchdown (all) - $33 million
  - E/W Columbus Avenue frontage road improvements - $155-160 million
- Components which can be constructed regardless of Alternative:
  - Longmeadow Curve - $213 million
  - South End Bridge - $206 million
  - US-5/MA-57 interchange in Agawam - $157 million
  - I-291 SB to I-91 SB entrance - $152 million
  - Plainfield Street improvements (north of I-291) - $76 million
  - CT Riverwalk/Bikeway improvements - $20 million
  - Under viaduct improvements – (approx.) $2 million

Draft Final Recommendations

- **Viaduct Rehabilitation** emerged as the most sensible option for a long-term repair project

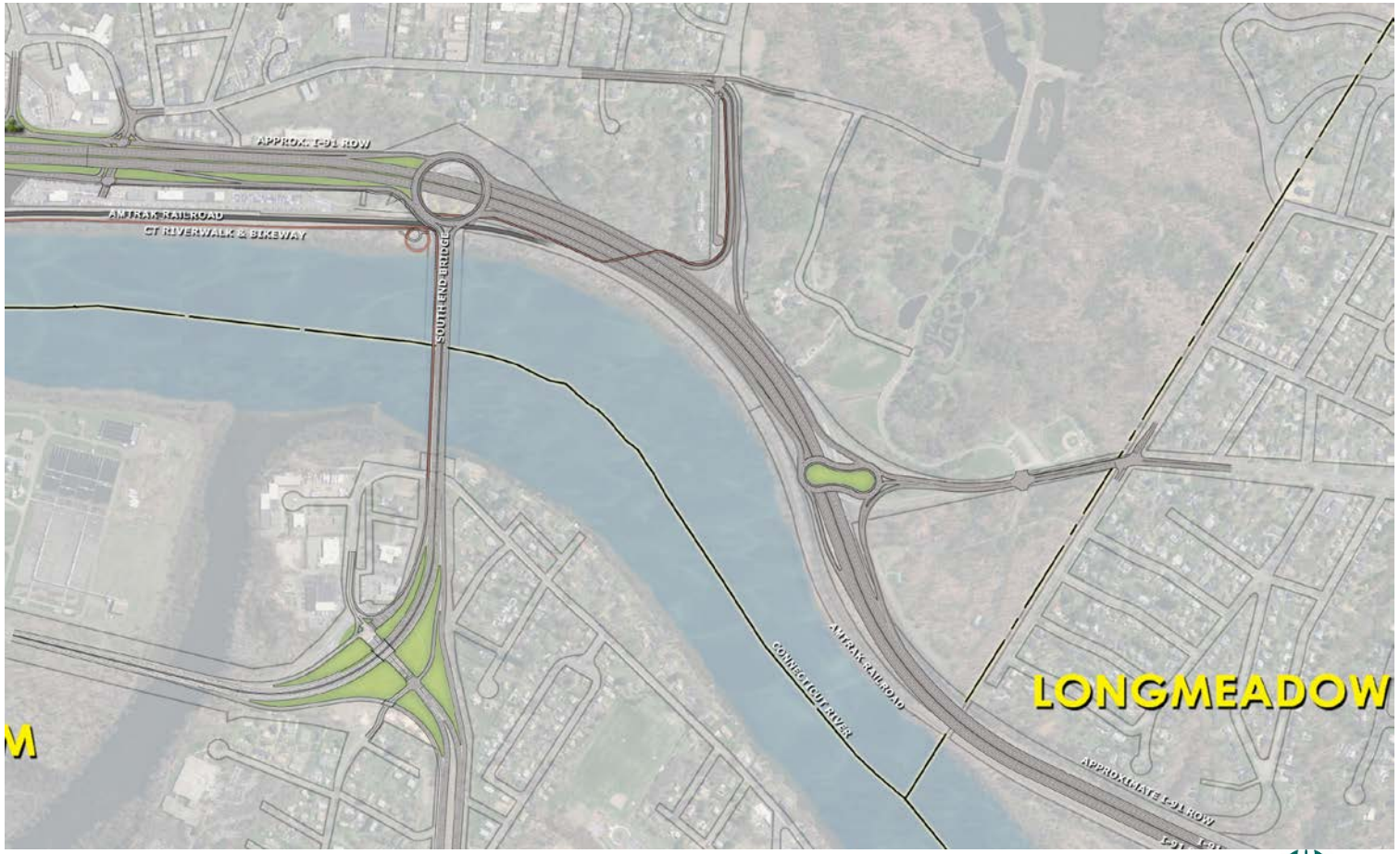
- Several options for **short and mid-term improvements**
  - Longmeadow Curve improvements
  - I-291 SB to I-91 SB ramp relocation
  - Route 20 improvements in Springfield
  - Short-term alternatives in and around viaduct

- Municipal (local cities and towns) and regional parties (PVPC) should work with MassDOT to initiate the project development process
  - For locally-owned infrastructure, municipalities and PVPC pursue with support from MassDOT
  - For MassDOT infrastructure, MassDOT District 2 pursue with local support

Short and Medium-Term Alternatives

- Related projects **outside of the Viaduct** which serve study goals and objectives
- Can be implemented as stand-alone projects or in logical groups
- Dependent upon current project needs and available or programmed funding opportunities

Longmeadow Curve Improvements



Longmeadow Curve Improvements

- Construction of collector-distributor roads along I-91 mainline and roundabouts at South End Bridge and U.S. Route 5
  - Ability to access I-91 southbound from US-5 in Longmeadow
- Elimination of weaving hazards along I-91 mainline
- Elimination of US-5/MA-57 rotary in Agawam for operational and safety improvements
- Creation of pedestrian access from Forest Park to Connecticut Riverwalk and Bikeway in Springfield across South End Bridge to Agawam

Estimated 2040 costs:

Longmeadow Curve - $213 million
South End Bridge - $206 million
US-5/MA-57 interchange in Agawam - $157 million
Bicycle/pedestrian bridge - $20 million

I-291 Southbound to I-91 Southbound On-Ramp Relocation

- Shifts on-ramp from left-hand entrance onto I-91 to right-hand entrance
- Eliminates weaving movements from on-ramp to Exit 7 towards Memorial Bridge
- Restriping with deck replacement project to discourage weaving movements
- Estimated 2040 cost - $152 million

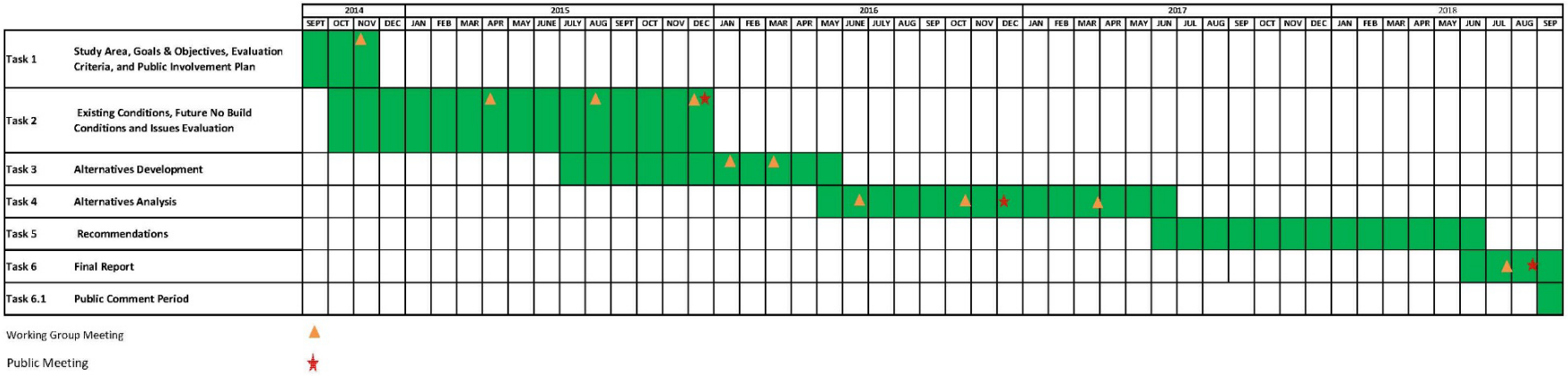
Route 20 Improvements in Springfield

- New bridges over I-91 and railroad tracks
- Third lane of westbound vehicular travel
- Bicycle and pedestrian improvements
- Intersection reconstruction at Main Street and Avocado Street
- Initiate the project development process

Short Term Improvements

- Safety and aesthetic improvements underneath viaduct
- Improvements or relocation of pedestrian bridge behind former Luxe Burger/BHOF
- Improvements to walkway underneath railroad to riverfront north of State Street
- Improve at-grade pedestrian crossing to riverfront south of State Street (active crossing)
- Add sidewalk to west side of US-5 in Springfield - link Forest Park with Longmeadow
- All cost estimates for improvements at less than $2 million in 2018 dollars

Project Schedule



Next Steps

- Final Public Informational Meeting
- Draft Report Published for Public Comment
- Final Report issued after 30 day public comment period

Questions & Comments

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Ethan Britland, Project Manager
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Study Website Link:
www.mass.gov/i-91-viaduct-study

Thank you

for your continued participation and commitment to the project.