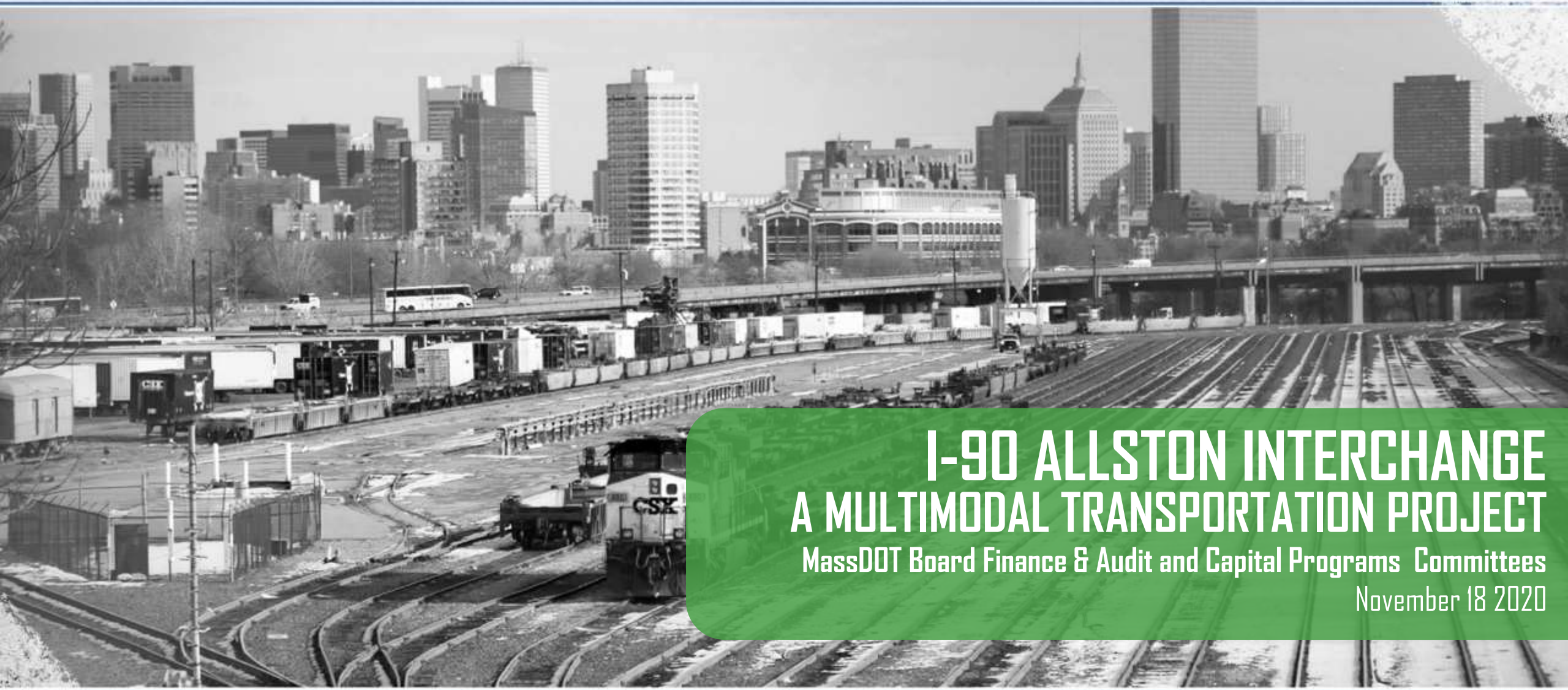

I-90 ALLSTON INTERCHANGE
A MULTIMODAL TRANSPORTATION PROJECT

MassDOT Board Finance & Audit and Capital Programs Committees

November 18 2020

Today's Agenda

- What we heard in the comments
- Identifying a Preferred Alternative
  - Options considered regarding Concurrence Point 3
  - Key considerations and MassDOT Recommendations
- Critical path for the project going forward
  - Return to standard NEPA/MEPA review process
  - Development of a Multimodal Transportation Mitigation Plan
  - Development of a Finance Plan for FY22-26 CIP/STIP
- Other project-related issues requiring resolution

Overview of Comments Received

- A substantial majority of public comments received indicate a preference for the Modified All-At-Grade option
  - About 100 of those called for reducing the number of lanes on the Mass Pike in order to avoid impacts to the Charles River, an option not under consideration
- Very few indicated a preference for either the Modified Highway Viaduct or Soldiers Field Road Hybrid
- Many comments expressed a preference based on assumptions not supported by analysis (eg claim that the Modified All At Grade will allow continuous two track operation of the Worcester Main Line)
- Many comments raised other issues not specific to the identification of a Preferred Alternative for the throat, such as the need for a comprehensive traffic/travel mitigation plan during construction

Summary of Comments Received

Preferred Alternative	Total
Modified All-At-Grade	397
Modified Highway Viaduct	4
Modified SFR	3
Other: Reduce lanes/no fill	99
MAAG of SFR Hyrbid	2
No Preference Given	26
Count as of 11/03/2020	531

Overview of Comments Received (cont'd)

- Commenters with environmental connections generally preferred no intrusion into the Charles River, to be accomplished by dropping the number of highway lanes.
- Many comments were received from elected and appointed officials, from local boards and committees up to Senator Markey and Congresswoman Pressley.
- In those letters not expressing a preference for the modified all at-grade (but noting the popularity of that option) several major themes were present:
  - The Turnpike should have same number of lanes, and disruptions to existing road and rail access should be minimized
  - The option selected should not be subject to frequent flooding
  - Concern about the impact on MBTA service of shutting down the Grand Junction for a number of years
  - The project should not be funded solely by toll payers, and in fact toll relief should be considered

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Identifying a Preferred Alternative: Options considered regarding Concurrence Point 3

- MassDOT considered three options for moving forward:
  - Identify one of the three variants as the preferred alternative at Concurrence Point 3 this fall, as planned
    - Soldiers Field Road Hybrid
    - Modified Highway Viaduct
    - Modified All-At-Grade
  - Postpone Concurrence Point 3 and the identification of a Preferred Alternative until summer 2021 when a draft Environmental Impact Statement has been released
  - Withdraw the Allston Multimodal Project from the MEPA and NEPA review processes and proceed with a No Build option that repairs the aging and structurally deficient I-90 viaduct through the throat

Soldiers Field Road Hybrid is unlikely to be identified as the Preferred Alternative

- The Soldiers Field Road Hybrid, the result of a year's worth of work with the Independent Review Team and the Allston Task Force, at one point had widespread stakeholder support
- Additional work done on how to construct the SFR hybrid confirmed that while this option will not impact the Charles River once the permanent condition is achieved, it requires major incursions into the river during a lengthy construction period
- The Soldiers Field Road Hybrid both fails to satisfy the desire of many commenters to remove any viaduct between Boston University and the Charles River and requires substantial impacts to the Charles River during construction and so seems unlikely to emerge as the Preferred Alternative compared to the Modified All-At-Grade (which eliminates any viaduct) and the Modified Highway Viaduct (which eliminates any substantial impacts to the Charles River during construction or permanently)

Key consideration: Impacts to the Charles River and permitting risk

	Modified At-Grade	Modified Highway Viaduct
Federal:	+/- 51,100 sq. ft. of total permanent impacts to the Charles River	1000 sq. ft. of total permanent impacts to the Charles River
State:	+/- 41,700 sq. ft. impacts to LUW +/- 1,480 lf impacts to bank +/- 4,720 sq. ft. impacts to BLSF	1000 sq. ft of total permanent impacts to the Charles River

- Consistent with state and federal laws and regulations, MassDOT's intention is to avoid and minimize impacts to the Charles River wherever practical
- The Federal Clean Water Act, The State Wetland Protection Act, and Massachusetts Public Waterfront Act all include provisions for the avoidance and minimization of wetlands and waterways impacts
- Ability to permit, level of complexity and types of permits required for each alternative have not yet been established by environmental agencies and no decision on state permits can be made until after completion of the MEPA process
- The risk in obtaining required state and federal permits is one of the factors that must be considered in the designation of a preferred alternative

Key consideration: Impacts to commuters and roadway users

	Modified At-Grade	Modified Highway Viaduct
Construction Duration	6-7 Years	6-7 Years
Interstate 90	Potential for greater opportunity to maintain 4 lanes on I-90 for certain stages exists. Minimum 3 lanes of I-90 maintained in each direction throughout construction, except for short durations to lower I-90 profile in the vicinity of the Comm. Ave. overpass.	Limited opportunity to maintain 4 lanes on I-90 for certain stages exists. Minimum 3 lanes of I-90 maintained in each direction throughout construction.
Soldiers Field Road	2 lanes of SFR in each direction maintained throughout construction, except for short durations to switch over to trestle and then to new SFR Viaduct and to also lower SFR profile to accommodate new GJ Bridge	2 lanes maintained in each direction throughout construction
Worcester Mainline	May either be shielded, shifted and a reduction to a single-track operation for certain periods of time	May either be shielded, shifted and a reduction to a single-track operation for certain periods of time
Grand Junction Rail	Must be closed early on during construction and remain closed throughout much of construction, necessitating construction of a South Side Maintenance Facility. A 100+ mile detour would be required to transfer equipment to the BET in Somerville for heavy maintenance.	Remains open throughout most of the construction period. Does not necessitate construction of a South Side Maintenance Facility. Supports continuity of operations and a reliable fleet of well-maintained equipment using existing facilities.

Key consideration: Changes to most recent proposed project schedule

- **Concurrence Point 3 on Preferred Alternative:** Fall 2020
- MEPA Notice of Project Change (NPC) : Winter 2021
- NEPA Draft Environmental Impact Statement (DEIS) : Summer 2021
- MEPA Final Environmental Impact Report (FEIR) : Fall 2021
- NEPA Final Environmental Impact Statement (FEIS)/ Record of Decision (ROD) : Winter 2021/2022
- Design-Build Procurement Begins: Mid-2022
- Design-Build Award: Mid-2023
- Construction Begins: Late 2023/Early 2024

MEPA re-start needs to be reassessed

Traffic Mitigation Plan in These Documents

For Design-Build Procurement Need Funding in Place Here

Key considerations in comparing throat options

	Modified Highway Viaduct	Modified All-At-Grade
Cost of project	$1.3 Billion	$1.3 Billion +$300M MBTA maintenance facility
Duration of construction	6 – 7 years	6 – 7 years
Need to construct in Charles River		
During construction	Limited impacts to the Charles River associated with stormwater outfalls	Construction and permanent impacts in the River are expected to have similar footprint
Permanently	1000 sq. feet of total permanent impacts to the Charles River (outfalls)	Just under one acre of impacts to state- and federally-protected resources
Duration of closure for Grand Junction bridge	Remains open throughout most of the construction period	Must be closed early on during construction and remain closed throughout much of construction, necessitating construction of a South Side Maintenance Facility
Resiliency	Does not introduce below grade elevations	Introduces grade-cut sections on I-90
Status of viaduct	Turnpike is still carried on a new viaduct, further from the River	No viaduct remains in the throat area between Boston University and the Charles River

Evaluation of options for proceeding at this point in time

- Identify the Modified All-At-Grade as the Preferred Alternative at this time: Despite strong public support for removal of the viaduct and this option, MassDOT cannot identify the Modified All-At-Grade as the Preferred Alternative without further evaluation of impacts to the Charles River and related permitting risks and of impacts to MBTA commuter rail operations due to prolonged closure of the Grand Junction bridge including the need for a maintenance facility

- Identify Modified Highway Viaduct as the Preferred Alternative at this time: Advantages of this option include de minimis impacts to the Charles River both during construction and permanently and the ability to avoid commuter rail disruptions caused by prolonged closure of the Grant Junction bridge, but replacing the viaduct is strongly opposed by many stakeholders and so MassDOT does not recommend identifying this as the Preferred Alternative at this time

Recommendation: Postpone identification of a Preferred Alternative

- MassDOT can, if desired, postpone Concurrence Point 3 and the identification of a Preferred Alternative until spring/summer 2021, when a draft Environmental Impact Statement has been prepared
- MassDOT had focused on identifying a Preferred Alternative this month to allow resumption of the state MEPA review process and move ahead with critical state permitting for the project
  - Depending on how MassDOT proceeds in MEPA, postponing this decision could delay the project schedule by approximately one year
  - This would increase project costs by pushing the project construction out by a year or more
- Postponing the decision would give MassDOT more time to
  - Analyze differences between the remaining throat options and present that analysis in the Draft Environmental Impact Statement next summer
  - Advance important work on developing a multimodal mitigation plan for the project and present that work publicly in the DEIS
  - Advance a finance plan to determine how the project would be paid for
- MassDOT is still working to understand the schedule implications of this recommendation and develop a revised NEPA/MEPA strategy and schedule

Additional Recommendation: Continue to pursue one or more No Build options until such time as a Preferred Alternative is identified and fully funded

- MassDOT will continue to carry the No Build option described in the NEPA SSR into the DEIS
- MassDOT has also initiated development of a less expensive No Build that could be built in a shorter time frame and provide 10-15 more years of service life for the viaduct
  - This option could allow planning/design/debate to proceed on the permanent version of the multimodal project to continue for 5-10 more years without concern about viaduct condition
  - This option could be funded out of Metropolitan Highway System reserves without the need to increase tolls or bond against toll revenues
  - A disadvantage to this "substantial repair" option is that it requires two rounds of construction options and, ultimately, paying for work on the viaduct twice although with a ten year reprieve between the two
- This near term solution could create the time to build a true public consensus and prepare the MBTA for potential long-term service disruptions and might be necessary to undertake a potentially lengthy permitting process that would be necessary should the Modified All-At-Grade alternative become the preferred alternative

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Critical path for the project going forward

- All of the time and attention focused on selecting a Preferred Alternative for the throat may have created the mis-impression that the "critical path" for the project simply involves identifying a Preferred Alternative
- In order for the project to proceed, MassDOT must take the lead on the following activities over the next 6-8 months (and beyond)
  - Advancing project design and analysis and moving the project through the NEPA and MEPA processes
  - Accelerating development of a Multimodal Transportation Mitigation Plan
  - Accelerating development of a Finance Plan in advance of board approval of the FY22-26 CIP/STIP

Next Step: Return to "standard" MEPA and NEPA review for the remainder of the project review process

- For nearly six years MassDOT has shown flexibility in its use of the state MEPA and federal NEPA review processes in order to advance public discussion and design of this complicated project
  - Agreeing to proceed through the MEPA Draft Environmental Impact Review process carrying three alternatives, two developed by outside stakeholders
  - Pausing the MEPA process to spend more than a year undertaking an Independent Review of the throat designs in response to concerns raised after the delayed publication of that DEIR
  - Pausing the MEPA process and delaying the start of the NEPA process to advance the then-preferred alternative developed through the Independent Review process
  - Adding extra steps and public engagement opportunities to the NEPA process before identifying a Preferred Alternative
- While this additional process and public engagement has added real value to project development, the project is at a point where the standard MEPA and NEPA processes can proceed and will ensure both that needed analyses are conducted and that public engagement occurs at appropriate times
- MassDOT is considering options for "unpausing" the MEPA process and aligning the remaining MEPA and NEPA processes and schedules but has not yet made a decision; the Board and other stakeholders will be updated once the new process and schedule are in place

Next Step: Accelerate development of a multimodal transportation mitigation plan for commuters and users during the construction period

- Many commenters raised the issue of how Mass. Pike commuters, Worcester commuter rail riders and others will commute and travel to and from communities west of Boston during the project's 6-7 year construction period
- MassDOT agrees that we need to have a plan in place that addresses all forms and types of travel during the construction period in advance of the project in order to identify and implement needed early actions and investments
- The plan needs to include (but is not limited to)
  - Maintenance of maximum number of travel lanes on I-90 and Soldiers Field Road
  - Maintenance and, if feasible, expansion of commuter rail service on the Framingham/Worcester line
  - Development and implementation of additional strategies to encourage telework/remote work and provide additional transit options
  - Bicycle and pedestrian access through the project site during construction
- MassDOT also agrees with commenters who suggested the need for a separate group focusing on the travel needs of Metrowest and central Massachusetts travelers during construction
- MassDOT will advance work on the multimodal transportation mitigation plan and set up the new stakeholder group early in 2021

Next step: Accelerate development of a Finance Plan

	Modified At-Grade	Modified Highway Viaduct	SFR Hybrid
Construction Cost	**$1.3 Billion +$300M MBTA maintenance facility**	**$1.3 Billion**	**$1.6 Billion + $300M MBTA maintenance facility**

- Design-build procurement of this project would require full identification/availability of funding sources before selection of a design-build team. Even with the schedule changes caused by the decision to postpone identification of a preferred alternative at this time, the FY2022-26 Capital Investment Plan and STIP that will be adopted by the MassDOT Board and FMCB in June 2021 need to include funding for the I-90 Multimodal Project if it is to proceed as a Design-Build process during that timeframe
- As of November 2020 there are few identified sources of funding for the project
  - Even the portions of the project involving construction of I-90 and related facilities cannot be funded with cash flow from tolls as the toll reserve account for the Metropolitan Highway System (assuming the "medium" case for toll loss due to lower traffic volumes) has only about $200 million over the next five years not committed to other projects
  - The bond bill now in conference committee would only authorize a "down payment" of $300M which was included in the filed bond bill, meaning additional bond authorization (either General Obligation bonds or special purpose bonds) is needed
  - The Boston Metropolitan Planning Organization has not programmed any federal funding for the project in its five year Transportation Improvement Plan for FY21-25; Boston MPO programming would be required if any federal funding is to be applied
  - No tax increment financing or revenue sharing has been offered even though the project substantially increases the value of Harvard University's land and future tax collections by the City of Boston

Committee Discussion: What should be included in a policy framework for development of a Finance Plan?

- The finance plan for this project must address the issue of toll equity: Metrowest and Central Massachusetts commuters will experience the most disruption from construction of the project while seeing fewer of the benefits and so cannot also be expected to be the primary financers of the project
- Toll revenue should be used only to fund those portions of the project which involve construction on the Mass. Pike or its approaches and exits, consistent with state law restricting use of toll funding to the tolled facility
- As was the case with the policy framework adopted by both the MassDOT board and FMCB for the Green Line extension, all stakeholders who benefit from the I-90 Multimodal Project have a responsibility to contribute their fair share to the cost of its construction. Unlike the Green Line extension – which was developed largely on the assumption that the entire project would be financed with state and federal funds – this "fair share" expectation should be established now and the project finance plan should reflect substantial contributions from all entities who benefit financially from the project (for example, the City of Boston, Harvard University)
- Because the MBTA has clearly indicated that it would not build a south side commuter rail maintenance facility but for the closure of the Grand Junction bridge necessitated by two of the three throat options, all costs associated with the design, construction and operation of that facility should be provided to the MBTA from sources that are not already programmed in the MBTA's capital plan 5 year capital plan
- No additional elements should be added to the project (for example, Cambridge Street Bypass Road or Grand Junction-related track and facilities) without simultaneous provision of funding for those project elements

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Other project-related issues requiring resolution

- Many commenters in both the most recent and earlier public engagement rounds assume that the Allston I-90 Multimodal Project should drive policy and investment decisions that go well beyond the project parameters, ranging from development at Beacon Park Yards to climate change strategy to the future of the Charles River Basin and the Paul Dudley White Path to the future service model for the MBTA's commuter rail system including service planning for West Station.
- The I-90 Allston Multimodal Project is in danger of collapsing under the weight of the expectations for the project. *The Allston project should accommodate and* should never preclude decision making more properly in the hands of other actors, but MassDOT should not and will not make those decisions through its design of the Allston project.
- In addition to the steps that MassDOT must take in the coming months and years, other actors must also step up if the project is to address many of the issues raised by stakeholders and members of the public.
- MassDOT will partner in these "outside" efforts when appropriate and when staffing and resources allow, but should not be in the lead.
- Before publishing the DEIS and at other critical junctures for the project, MassDOT will assess and update the Board on related efforts by other actors that are relevant to the project.

Examples of next steps outside of MassDOT's responsibility

- Land Use and Development of Beacon Park Yards: Harvard University has a responsibility to make its development plans and timetable public and the City of Boston has a responsibility to work with Harvard and other nearby landowners such as Boston University to air development plans so that stakeholders can properly assess the consistency of the Allston Multimodal Project with those plans. To the extent that this development benefits financially from the infrastructure created by the Allston project, both the developers and City of Boston have a responsibility to contribute to the cost of that infrastructure.
- Charles River Reservation and Paul Dudley White Path: The Department of Conservation and Recreation owns and operates the Charles River Reservation and Paul Dudley White path and is responsible for planning for those assets. The "throat" portion of the project is roughly a half mile (2,500 feet), constituting only a small portion of the Charles River reservation and Paul Dudley White path. Widening and grade-separating the path will provide relatively few benefits to users unless other portions of the path to the west and east of the project site are similarly upgraded; the same is true for restoration or enhancement of the bank of the Charles River.
- Climate Change: The Executive Office of Environmental Affairs is the lead agency for planning for greenhouse gas reduction strategy and resiliency. All MassDOT projects (not just this one) will incorporate increased resiliency and be consistent with state greenhouse gas reduction plans, which are unlikely to call for reducing the number of lanes on existing highways as part of the Commonwealth's strategy for reducing transportation greenhouse gases. Reducing the number of lanes for a less-than-one-mile stretch of I-90 is not a carbon reduction strategy; such a "lane drop" risks creating congestion, slowing traffic, and increasing emissions.

Examples of next steps outside of MassDOT's responsibility (cont'd)

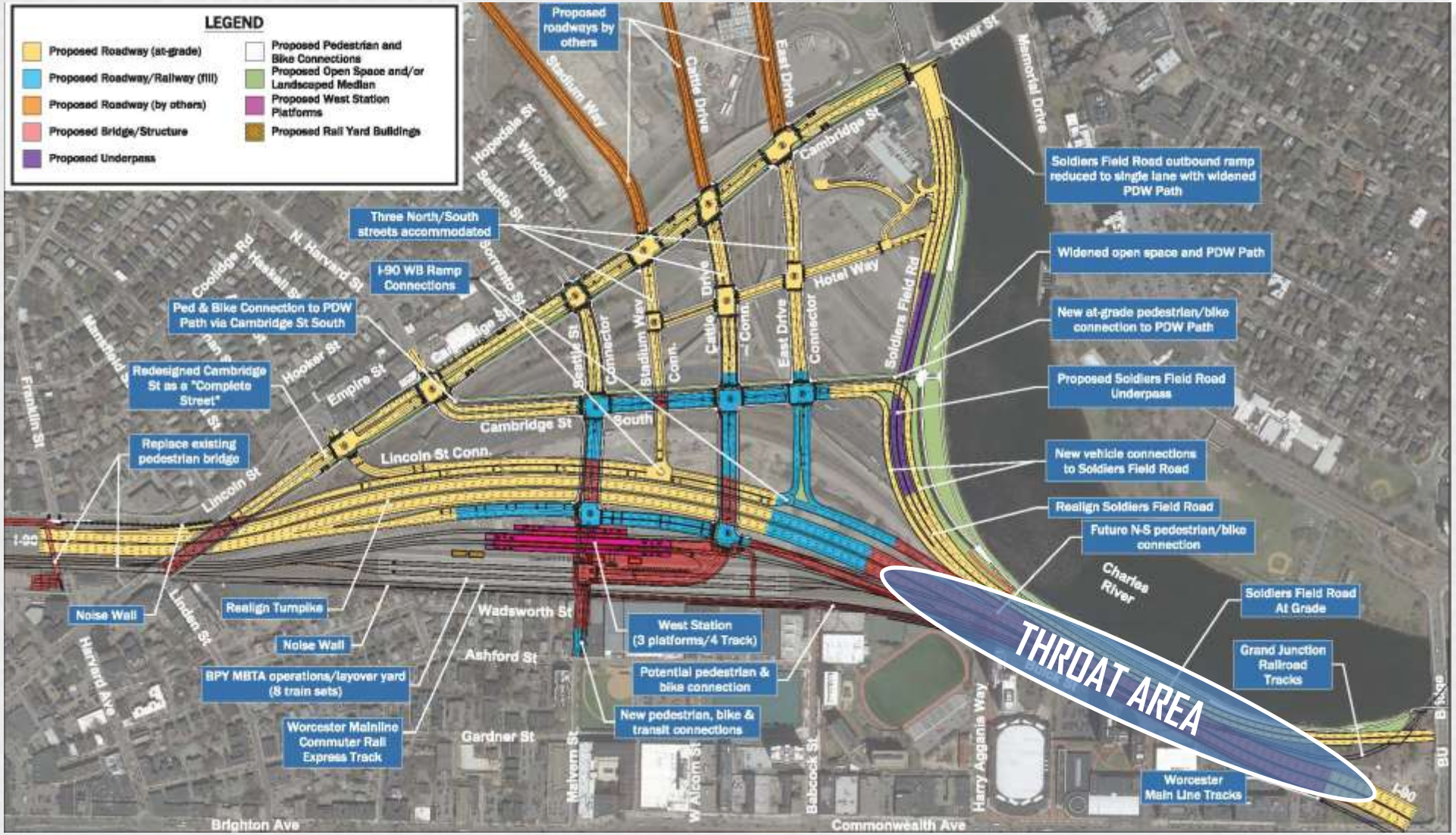
- Transit Access for Allston: The City of Boston and Metropolitan Area Planning Council have undertaken planning studies that can help inform future service. The Allston project will not assume any new service changes, especially when considering the timing of West Station and the value of an early action West Station, unless the MBTA or another transit provider has committed to providing such service.
- Commuter Rail Operating Model and Capital Projects: The MBTA and its Fiscal and Management Control Board have lead responsibility for all decision making (including funding) relating to commuter rail. The I-90 Allston Multimodal Project will not drive decisions about West Station, Commuter Rail Vision or a Grand Junction service but will rely on decisions made by the MBTA. The Allston project will not assume any capital or operating changes to commuter rail not yet adopted as part of a capital plan or other planning process (such as Commuter Rail vision) that has been finalized and funded.
- MBTA Layover: The MBTA has the responsibility to establish the service model for commuter rail, particularly as it moves toward a reprocurement of the operating contract. MassDOT will rely on the MBTA to define its layover needs. The City of Boston has the responsibility for working with the MBTA to ensure that those needs are met at a combination of sites including Beacon Park Yards, Readville, and/or Widett Circle as identified in the South Station FEIR and in the MBTA's Rail Vision Study.
- MBTA South Side Maintenance Facility: Because the MBTA has clearly indicated that it would not build a south side commuter rail maintenance facility but for the closure of the Grand Junction bridge necessitated by two of the three throat options, any costs associated with the design, construction and operation of that facility will need to be provided to the MBTA.
- Grand Junction Railroad: While the Allston project will not preclude Grand Junction as a future project, there is no effort currently underway by the Boston MPO, the MBTA or anyone else to plan for or advance that project and it is not a part of the Allston project nor will it be added to the project.

Appendix:
Additional Information for Comparing Throat Options

Project Location: Beacon Park Yards

Project Location: The Elevated Viaduct in the "Throat"

The Allston Multimodal Project



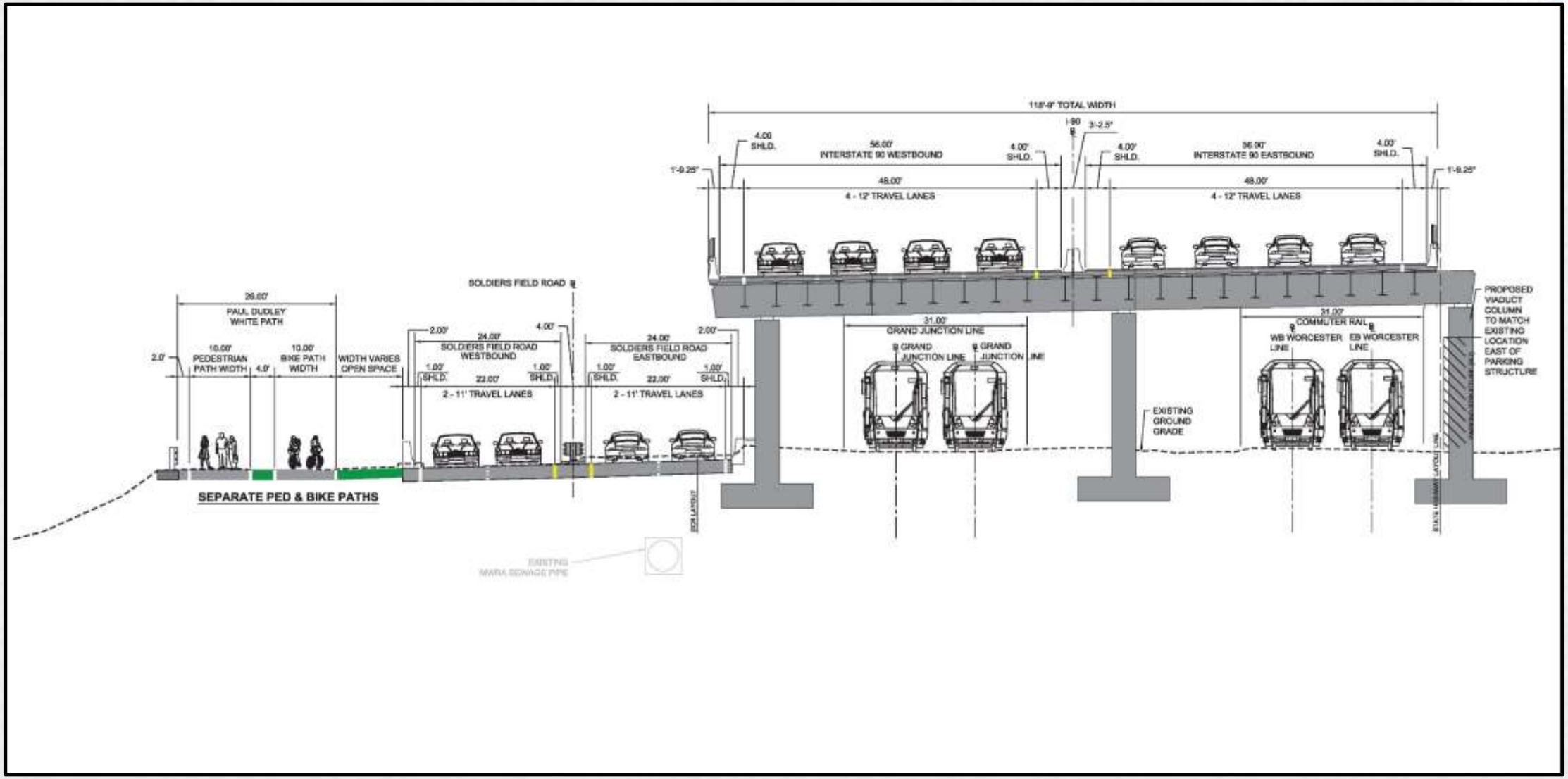
Identifying a Preferred Alternative

- Now that all state and federal concurring agencies have agreed on the alternatives carried into the Draft Environmental Impact Statement (CP2), the next step is concurrence on a Preferred Alternative
- Each Build alternative needs to be assessed against
  - Project purpose and need
  - Alternative selection criteria
- Concurrence Point 3 can take place at this point or can be deferred until as late as publication of the Draft EIS in summer 2021

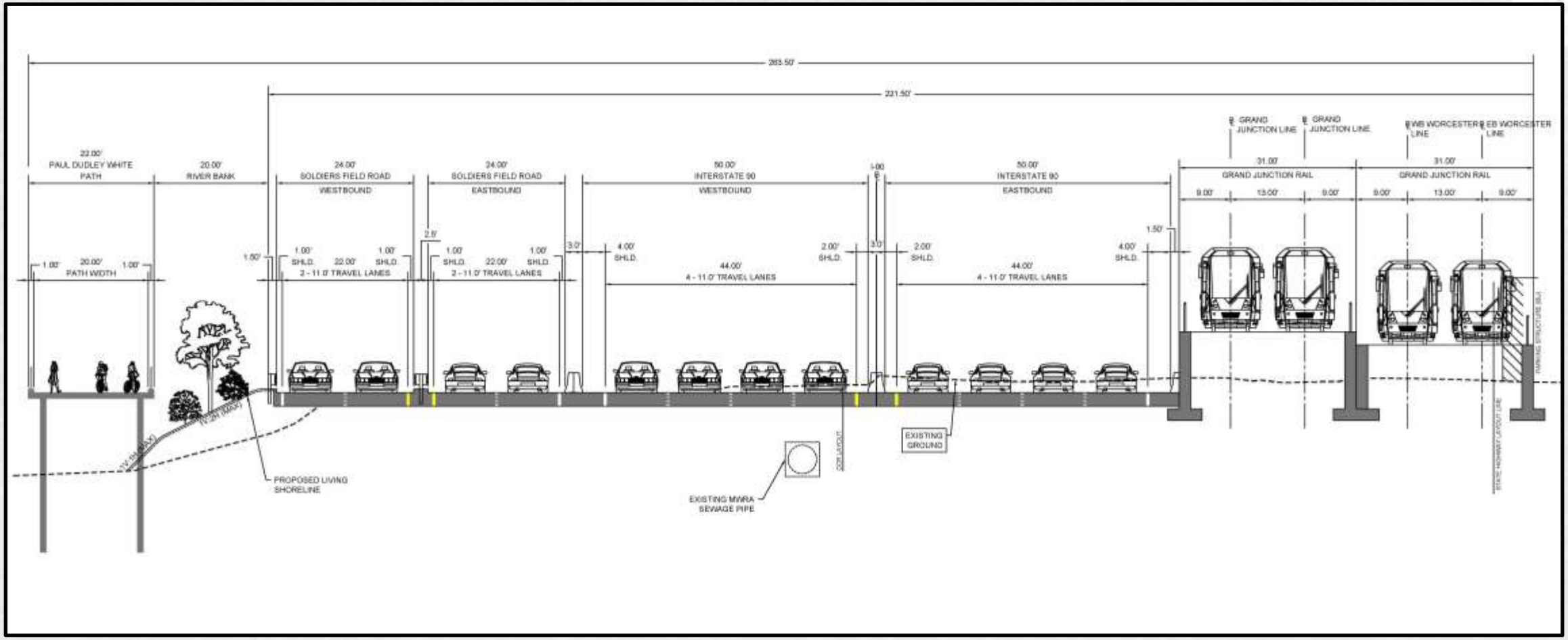
Select Alternative Evaluation Criteria

1. Construction Impacts/Duration
2. Highway Operations/Maintenance
3. Mobility/Accessibility
4. Environmental Effects
5. Land Use/Economic Development
6. Costs/Life Cycle Costs

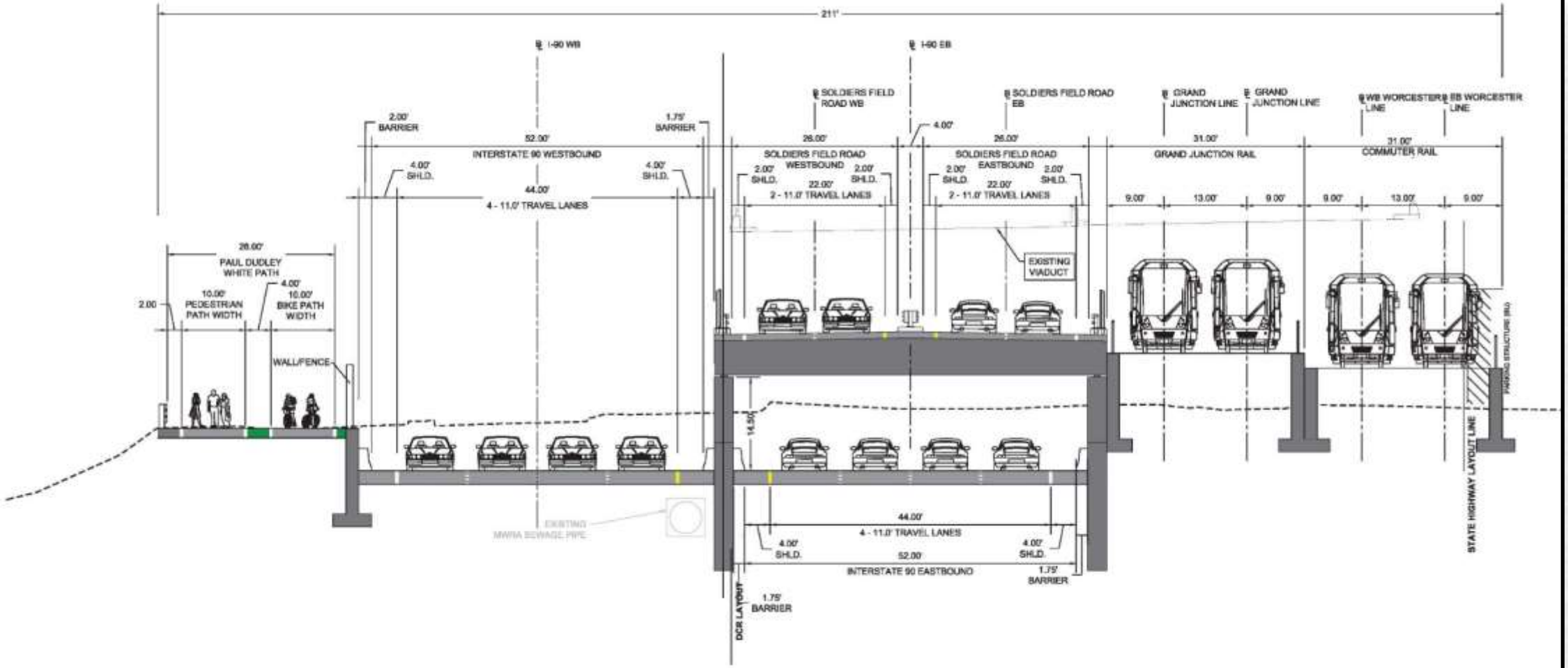
Modified Highway Viaduct (Section View)



Modified All-At-Grade (Cross Section)



.Soldiers Field Road Hybrid (Section View)



The No Build Option (Major Preservation)

Context: Identification of a Preferred Alternative

- In order to ensure the timely review, permitting and funding of the Allston Multimodal Project, MassDOT is using a NEPA process designed to accelerate the timeframe from Notice of Intent to Record of Decision by establishing "concurrence points" to facilitate the process across all of the agencies whose authorization is required for the project
- The next Concurrence Point addresses whether one of the Build alternatives should be considered the Preferred Alternative, given the criteria already identified for comparing alternatives
- Earlier identification of a Preferred Alternative will allow MassDOT to move ahead with the state permitting process and development of a finance plan prior to publication of the NEPA Draft Environmental Impact Statement in June/July 2021
- Regardless of concurrence on a Preferred Alternative this fall, all alternatives identified in the Scoping Summary Report will be thoroughly and equitably analyzed in the DEIS

Context: Purpose and Need of the Allston I-90 Multimodal Project

- Address Roadway Deficiencies
  - Replace structurally deficient viaduct and reconfigure the I-90 Interchange
- Address Safety Issues
  - Reconfigure the I-90 Interchange, including the viaduct
- Provide Rail Improvements
  - Reconfigure transit and commuter rail facilities
  - Construction of new West Station and infrastructure supporting mid-day commuter rail layover
- Improve Mobility and Transportation Access
  - Provide or allow for connections from Allston, Brighton, Brookline, and BU neighborhoods to the Charles River Reservation
  - Land use planning opportunities facilitated by a multimodal network of streets, paths, rail and transit facilities with Project Area
  - West Station designed to accommodate future rail connection to North Station via Kendall Sq.

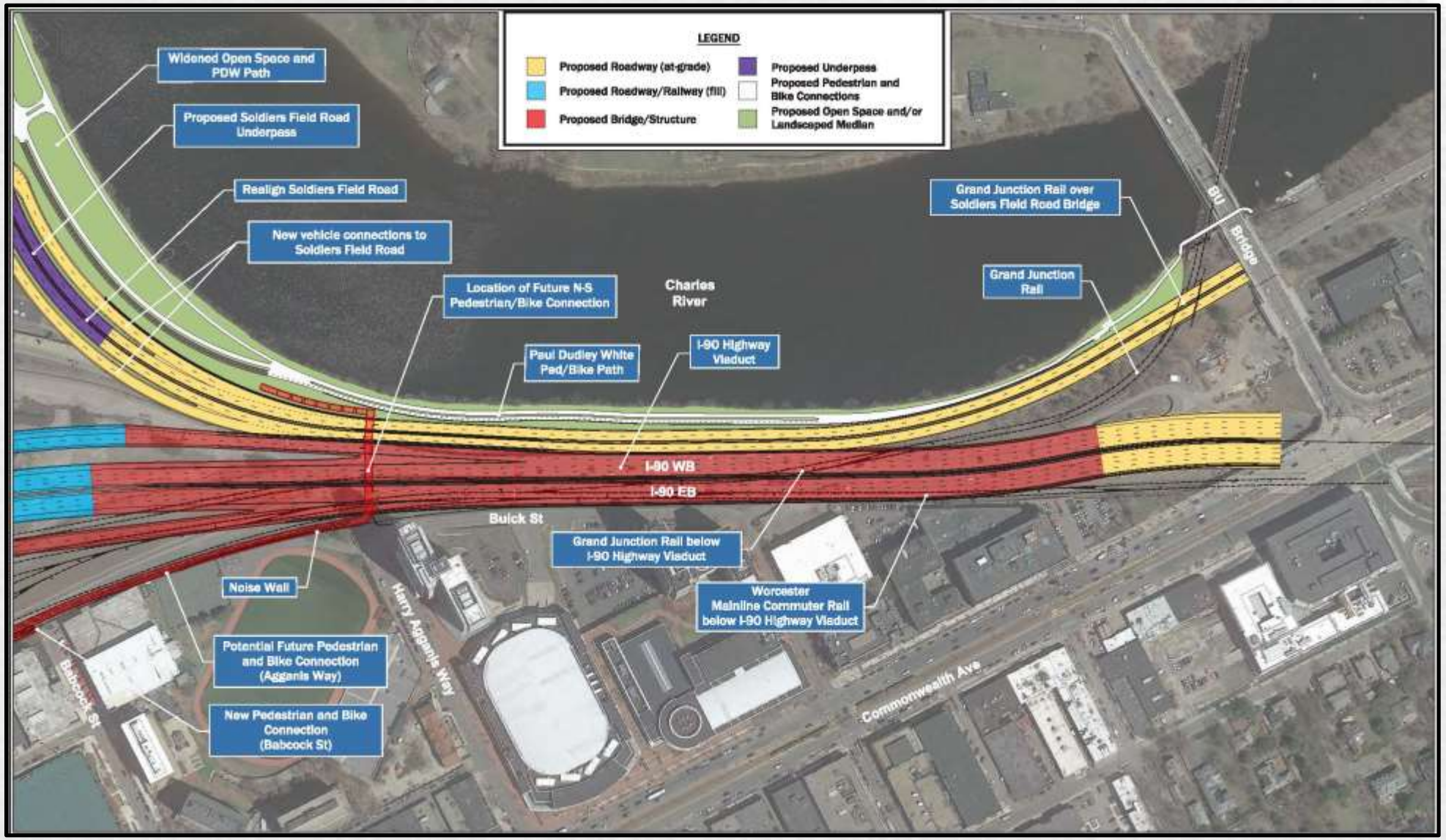
Context: Criteria Established for Evaluating Alternatives

- Purpose & Need
  - Does the alternative fully meet the Purpose & Need of the Project?
- Construction Logistics
  - Is the alternative feasible to construct with existing technologies?
  - What are the anticipated construction period impacts and overall duration?
- Environmental Impacts/Effects
  - Does the alternative cause excessive permanent environmental impacts to natural resources when compared to other alternatives?
  - Does the alternative result in permanent or temporary intrusion into the Charles River?
- Highway Traffic Safety, Operations, and Maintenance
  - Will the alternative improve safety?
  - Does the alternative adversely impact travel times within the Project Area due to congested conditions on existing or proposed roadways, or at existing or proposed intersections?
  - Does the alternative result in worse LOS at existing or proposed intersections, or long vehicular queues that impact operations at adjacent intersections?
  - Will the alternative improve maintenance operations?

Context: Criteria Established for Evaluating Alternatives (cont'd)

- Rail Operations
  - Does the alternative support local and regional multi-modal (pedestrian, bicycle, bus, passenger vehicle, and transit) access to a future West Station?
  - Does the alternative support the rail operation needs of MBTA including providing operational flexibility between Worcester Main Line, layover, and Grand Junction Railroad?
  - Does the Alternative Require Construction of the South Side Maintenance Facility (MBTA) in advance of mobilization?
- Cost and Schedule
  - Does the alternative require an unreasonably high cost compared to other alternatives?
  - Does the alternative require an unreasonably complicated or lengthy project schedule?
  - Has cost/schedule of environmental performance commitments been considered?

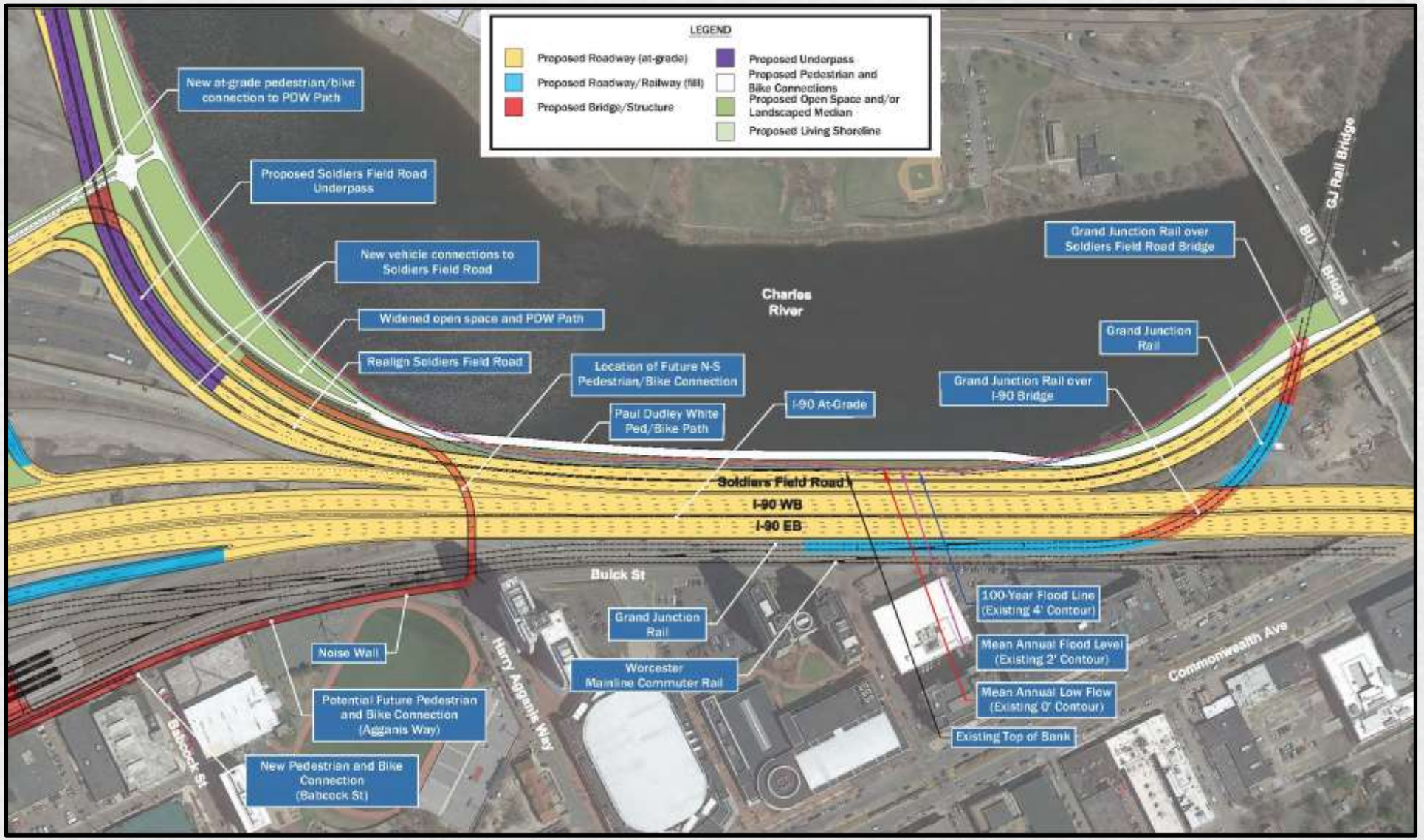
Option #1: Modified Highway Viaduct (Plan View)



Modified Highway Viaduct (Visualization)

- I-90 remains on a viaduct – new viaduct will include architectural improvement

Modified All-At-Grade (Plan View)



Modified All-At-Grade (Visualization)

- No viaducts, resulting in improved views of the Charles River from the south
- Improved views for users of the PDW Path

The SSR Version of the No-Build

- The current No-Build option is a $400M +/- rebuild of the existing viaduct which would extend the viaduct's life span by 30-40 years.
- The No Build option involves a major preservation of the existing viaduct, including replacement of the bridge deck, deck joints and bridge railings and repair of the substructure
  - The No Build does enable the layover of 8 train sets on 4 tracks with electric plug-ins
  - No other components of the Multimodal Project (straightening of I-90, the construction of West Station, bicycle and pedestrian improvements) are included
- It *would not* allow the construction of West Station, or layover space, or the replacement of the interchange which would allow Harvard's development of Beacon Yards.
- The No Build option in the Scoping Summary Report is what would be built if the Multimodal Project does not proceed
  - By definition a "no build" option does not meet the project's Purpose and Need but is built instead of the project under NEPA review

Data Analysis: The "Matrix"

- MassDOT prepared and posted on the project website a Summary Analysis Matrix for the Throat Area Options; this is a MassDOT document which was reviewed by the cooperating agencies.
  - It compares the three throat options and the No Build on eight major categories
- The slides that follow focus on a few of the most important "differentiators" between the Modified Highway Viaduct and Modified All-At-Grade; additional information from the matrix is included in the appendix to this deck

DRAFT Attachment 1 Throat Area Alternatives Analysis — PRE-DECISIONAL AND DELIBERATIVE — October 1, 2020

Summary Analysis of Throat Area Options within the I-91 Re-Alignment Alternative

Impact Categories		Modified Highway Viaduct	Modified At-Grade	Soldiers Field Road (SFR) Hybrid	No Build
Summary of Construction Impacts	Charles River	• **River Users:** No impacts to Charles River user groups during or after construction. • **Navigation/Encroachment:** Limited contractor impact (equipment) for construction of outfalls in the Charles River. • **Resource Area Impacts (Temporary):** Limited impacts to the Charles River associated with outfalls. • **Ecological Impacts:** No temporary impacts to fisheries, no disturbance of sediment or production of silt. • **Noise:** No temporary construction noise due to work in the Charles River. • See Construction Section of this table for further detail	• More study is required for the following categories: • **River Users:** Construction of PDW path on boardwalk will likely require use of a barge and the contractor to occupy the watersheet, potentially impacting river users. • **Navigation/Encroachment:** Temporary encroachment of +/-40 ft plus barge and construction work zones in the Charles River. • **Resource Area Impacts (Temporary):** Temporary impacts and permanent impacts expected to have similar footprint. See Wetlands and Waterways sections of this table. • **Ecological Impacts:** Construction of living shoreline requires placement of unconsolidated fill along the banks and within flowed waters of the Charles River producing silt and disturbing river sediment. Pile driving in Charles River will disturb river sediment and produce silt and will be subject to fish run time of year restrictions. • **Noise:** Increased pile driving for PDW path may result in elevated construction noise. • See Construction Section of this table for further detail	• **River Users:** Temporary trestle into Charles River required for SFR and PDW Path during construction. Impacts to river users during construction due to narrowing of the watersheet by 110-ft, for trestle. Would temporarily take path and from river users for maintenance of traffic on SFR and PBW Path via temporary trestle. • **Navigation/Encroachment:** Temporary impact on navigation due to the trestle in the Charles River, narrowing the watersheet by 110-ft. • **Resource Area Impacts (Temporary):** • Requires dredge in the Charles River for the temporary trestle. • Impacts to Federal WOTUS/US. '91 Waterway for temporary I-90 and trestle. • Impacts to state land under water, inland bank, and bordering land subject to flooding for temporary I-90 and trestle. • **Ecological Impacts:** Temporary impact to fisheries during construction, installation of trestle may disturb river sediment and produce silt. • **Noise:** Operation and installation of trestle may increase noise at receivers in Cambridge. • See Construction Section of this table for further detail	• No impacts anticipated
	Commuter Users	• **Worcester Mainline:** WML may either be shielded, shifted and a reduction to a single-track operation for certain periods of time. • **Grand Junction Rail:** Grand Junction RR remains open throughout most of the construction period. Does not necessitate construction of a South Side Maintenance Facility. Supports continuity of operations and a reliable fleet of well-maintained equipment using existing facilities. • **I-90:** Limited opportunity to maintain 4 lanes on I-90 for certain stages exists. Minimum 3 lanes of I-90 maintained in each direction throughout construction, approximately 6-7 years. • **Soldiers Field Road:** 2 lanes of SFR maintained in each direction throughout construction, approximately 6-7 years. • **Paul Dudley White Path:** PDW Path maintained throughout construction on existing alignment for majority of construction and relocated to temporary alignments for construction of final path alignment during the final stage of construction. • See Construction Section of this table for further detail	• **Worcester Mainline:** Additional study is required. WML may either be shielded, shifted and a reduction to a single-track operation for certain periods of time. • **Grand Junction Rail:** Grand Junction RR must be closed early on during construction and remain closed throughout much of construction, necessitating construction of a South Side Maintenance Facility. A 100+ mile detour would be required to transfer equipment to the BET in Somerville for heavy maintenance. • **I-90:** Additional study is required. Greater opportunity to maintain 4 lanes on I-90 for certain stages exists. Minimum 3 lanes of I-90 maintained in each direction throughout construction, approximately 6-7 years, except for short durations to lower I-90 profile in the vicinity of the Comm. Ave. overpass. • **Soldiers Field Road:** Additional study is required. 2 lanes of SFR in each direction maintained throughout construction, approximately 6-7 years, except for short durations to lower SFR profile to accommodate new GI Bridge. • **Paul Dudley White Path:** PDW Path maintained on existing, temporary and permanent alignments. • See Construction Section of this table for further detail	• **Worcester Mainline:** WML may either be shielded, shifted and a reduction to a single-track operation for certain periods of time. • **Grand Junction Rail:** Grand Junction RR must be closed early on during construction and remain closed throughout much of construction, necessitating construction of a South Side Maintenance Facility. A 100+ mile detour would be required to transfer equipment to the BET in Somerville for heavy maintenance. • **I-90:** Limited opportunity to maintain 4 lanes on I-90 for certain stages exists. Minimum 3 lanes of I-90 maintained in each direction throughout construction, approximately 6-10 years, except for short durations to lower I-90 profile in the vicinity of the Comm. Ave. overpass. • **Soldiers Field Road:** 2 lanes of SFR in each direction maintained throughout construction, approximately 6-10 years, except for short durations to switch over to trestle and then to new SFR Viaduct and to also lower SFR profile to accommodate new GI Bridge. • **Paul Dudley White Path:** PDW Path temporary intermittent closures for path relocation onto trestle. • See Construction Section of this table for further detail	• More study is needed to determine level of impacts

1

Major Differentiator: Construction Impacts to the Charles River

	Modified At-Grade	Modified Highway Viaduct	SFR Hybrid
River Users	Construction of PDW path on boardwalk will likely require use of a barge and the contractor to occupy the watersheet, potentially impacting river users	No impacts to Charles River user groups during or after construction	Temporary trestle into Charles River required for SFR and PDW Path during construction. Impacts to river users during construction due to narrowing of the watersheet and would temporarily take parkland from river users for maintenance of traffic on SFR and PDW Path via temporary trestle.
Navigation/Encroachment	Temporary encroachment of +/-40-ft plus barge and construction work zones in the Charles River	Limited contractor impact (equipment) for construction of outfalls in the Charles River	Temporary impact on navigation due to the trestle in the Charles River, narrowing the watersheet by 110-ft.
Resource Area Impacts (Temporary)	Temporary impacts and permanent impacts expected to have similar footprint	Limited impacts to the Charles River associated with outfalls	• Requires dredge in the Charles River for the temporary trestle • Impacts to Federal WOTUS/Ch. 91 Waterway for temporary I-90 and trestle • Impacts to state land under water, inland bank, and bordering land subject to flooding for temporary I-90 and trestle

Major Differentiator: Construction Impacts to the Charles River (cont.)

	Modified At-Grade	Modified Highway Viaduct	SFR Hybrid
Ecological Impacts	Construction of “living shoreline" requires placement of unconsolidated fill along the banks and within flowed waters of the Charles River producing silt and disturbing river sediment. Pile driving in Charles River will disturb river sediment and produce silt and will be subject to fish run time of year restrictions.	No temporary impacts to fisheries, no disturbance of sediment or production of silt	Temporary impact to fisheries during construction. Installation of trestle may disturb river sediment and produce silt
Noise	Increased pile driving for PDW path may result in elevated construction noise.	No temporary construction noise due to work in the Charles River	Operation and installation of trestle may increase noise at receivers in Cambridge

Major Differentiator: Environmental/Historic Resources

Historic Resource	Modified Highway Viaduct	Modified At-Grade	SFR Hybrid
Charles River	No change from existing	Permanent bank impacts and PDW on structure in river	Temporary SFR in the Charles River
Soldiers Field Road	Shifts onto isolated greenspace, toward I-90	Shifts onto useable greenspace, toward the river	Shifts onto viaduct away from the river and outside the historic district boundary
Parkland	Eliminates isolated inaccessible parkland greenspace; increases green space adjacent to PDW	Eliminates accessible greenspace adjacent to PDW; eliminates isolated green space; extends PDW under GJR & BU Bridges	Eliminates isolated green space; extends PDW path under GJR & BU Bridges
Grand Junction Bridge Over Soldiers Field Road	No change from existing	Replaced	Replaced
I-90 shifted into historic district	500 sq. ft. of I-90 columns/piers within historic district; overhang of 4,900 sq. ft.; Area of Grand Junction Rail shifted into historic district: 3,000 sq. ft.	Area of I-90 shifted into historic district: 57,000 sq. ft.	Area of I-90 shifted into historic district: 66,250 sq. ft.

Major Differentiator: Environmental/Resiliency & Floodplain

Modified At-Grade	Modified Highway Viaduct	SFR Hybrid
Expected to be less resilient than the Modified Highway Viaduct due to sections of I-90 depressed below the water table and narrow shoulders on I-90.	Expected to be the most resilient option as I-90 would be elevated and resilient to storm surge associated with sea level rise.	While modeling results are not available for the SFR Hybrid Throat Area, it is expected to be the least resilient option due to I-90 depressed below water table.

Major Differentiator: Environmental/ Noise and Vibration

Modified At-Grade	Modified Highway Viaduct	SFR Hybrid
Similar to Modified At-Grade as described in Scoping Summary Report (SSR) with slight differences noted below: Without walls: (Modeling in progress) - PDW Path – likely low 60s to mid-70s dBA (increased setback distance from SFR, compared to SSR Modified At-Grade) - Magazine beach – likely 63 to 67 dBA or slightly higher (SFR EB lower than SSR Modified At-Grade) - Cambridgeport – likely 52 to 63 dBA or perhaps very slightly higher (SFR EB lower than SSR Modified At-Grade)	Highway Viaduct without walls: - PDW Path – 63 to 76 dBA - Magazine Beach – 62 to 65 dBA - Cambridgeport – 54 to 63 dBA	SFR without walls: - PDW Path – 61 to 76 dBA - Magazine Beach – 60 to 64 dBA - Cambridgeport – 50 to 62 dBA

Major Differentiator: Parkland Creation and Impacts

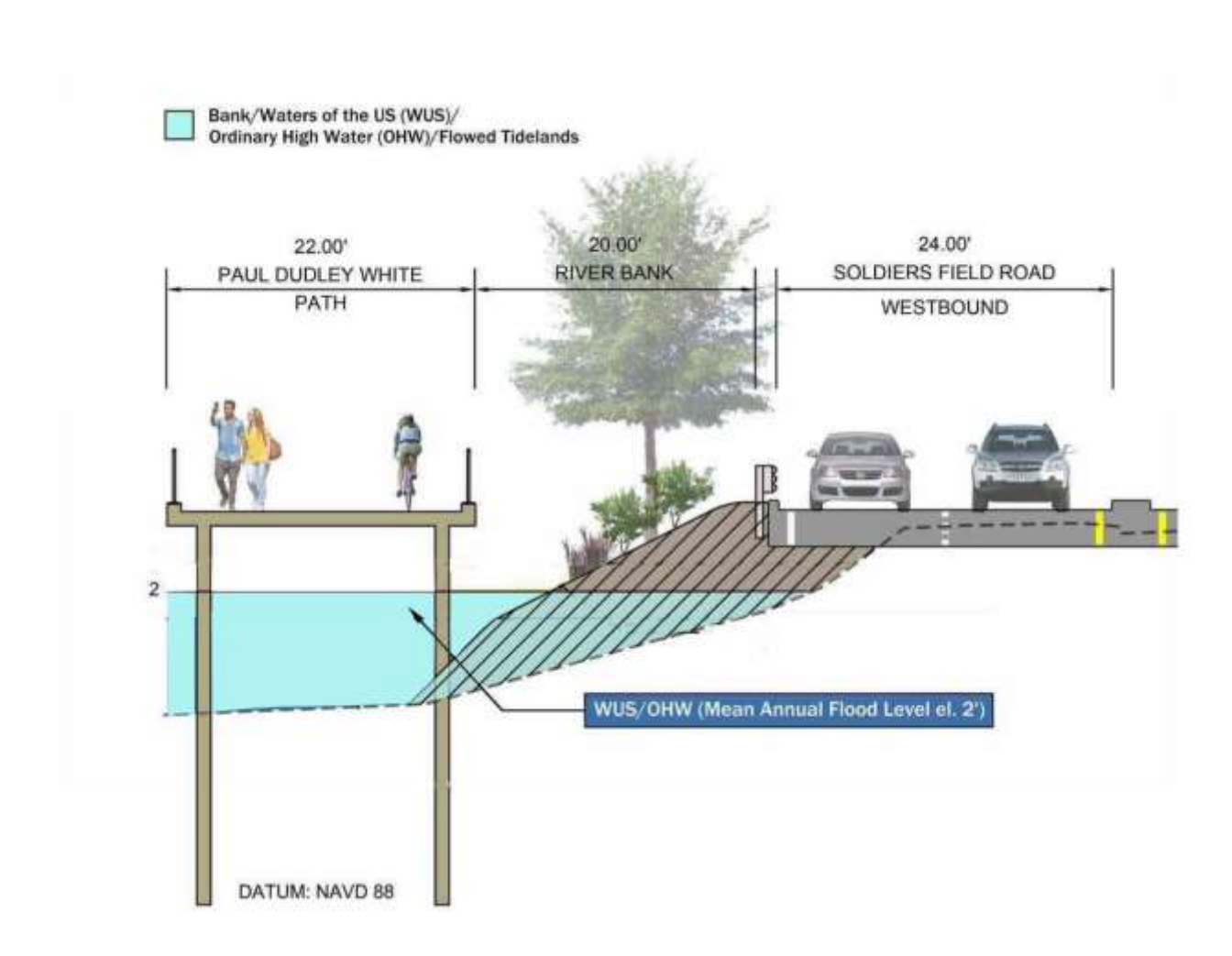
	Modified At-Grade	Modified Highway Viaduct	SFR Hybrid
Parkland Creation	Results in 7.3 acres of publicly accessible parkland which is a net increase of 3.9 acres in new useable greenspace; Would take 1.1 acres from river users and replace it with parkland for pedestrians	Results in 7.1 acres of (publicly accessible) parkland, of which 4.5 acres is new useable greenspace	Results in 8.7 acres of (publicly accessible) parkland, of which 6.1 acres is new useable greenspace
Impacts of I-90 & GJR	57,000 sq. ft. of parkland impacts from I-90 at grade	500 sq. ft. of parkland impacts from I-90 piers and 4,900 sq. ft. from I-90 overhang; 3,000 sq. ft. of parkland impacts from realignment of GJR	66,250 sq. ft. of parkland impacts from I-90 at grade
PDW Path	PDW Path widened from existing conditions. Separated bike/ped path along the PDW Path on boardwalk	PDW Path widened from existing conditions. Separated bike/ped path along the PDW Path for the majority (but not all) of the length of the Throat	PDW Path widened from existing conditions. Separated bike/ped path along the PDW Path for the entire length of the Throat

A critical scheduling consideration: Need to repair the viaduct

All of the Build options would necessitate repairs and other measures as the viaduct would remain in place, at least in part, for another 5-7 years; all carry a risk that further deterioration of the viaduct during the planning/permitting period would require weight posting.

These pictures are from a recent 2020 Inspection of the Allston Viaduct and depict advanced deterioration of concrete and steel structural members

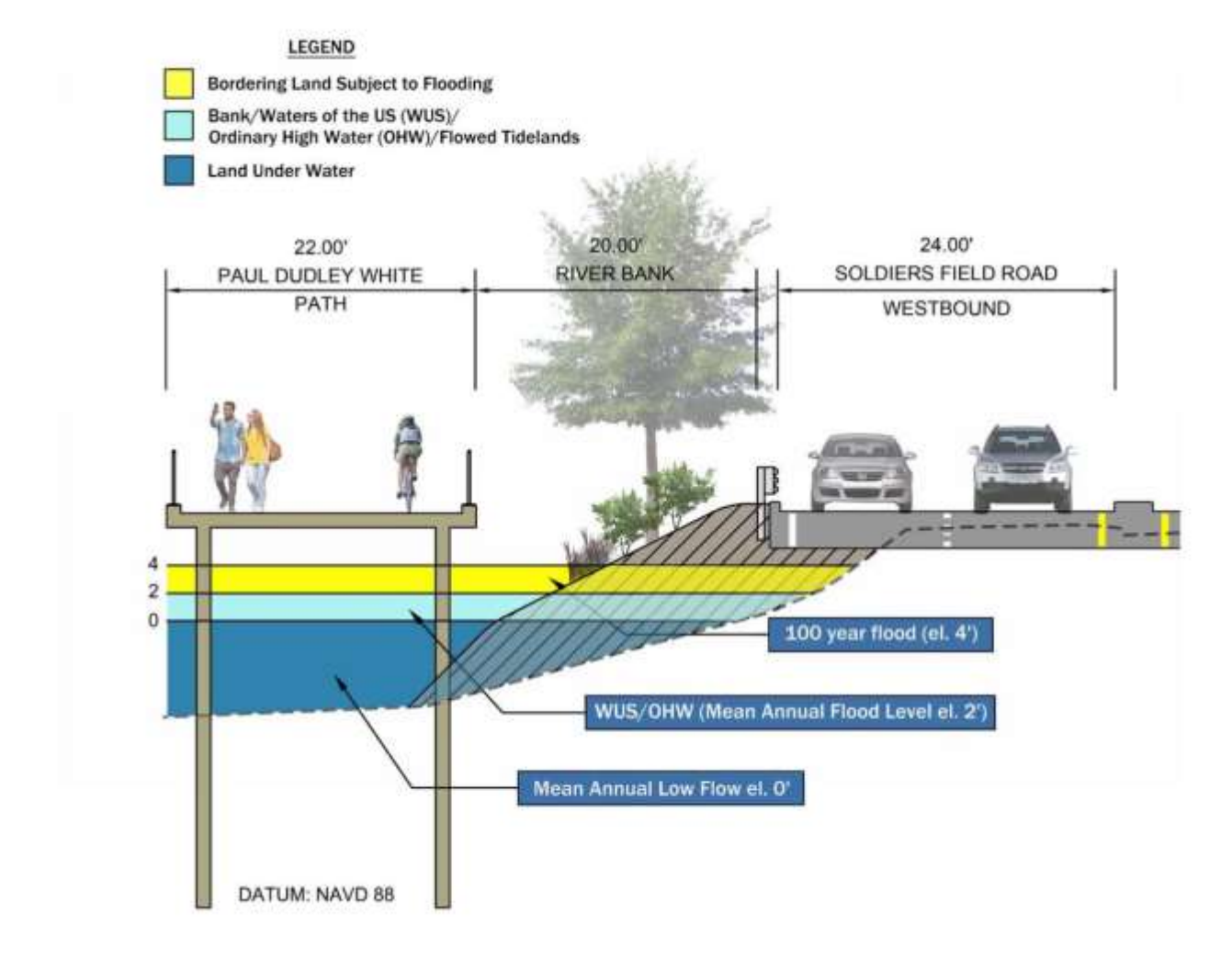
Federal Wetlands/State Waterways Impacts of the Modified At-Grade: Section View



Waters of the United States/Tidelands

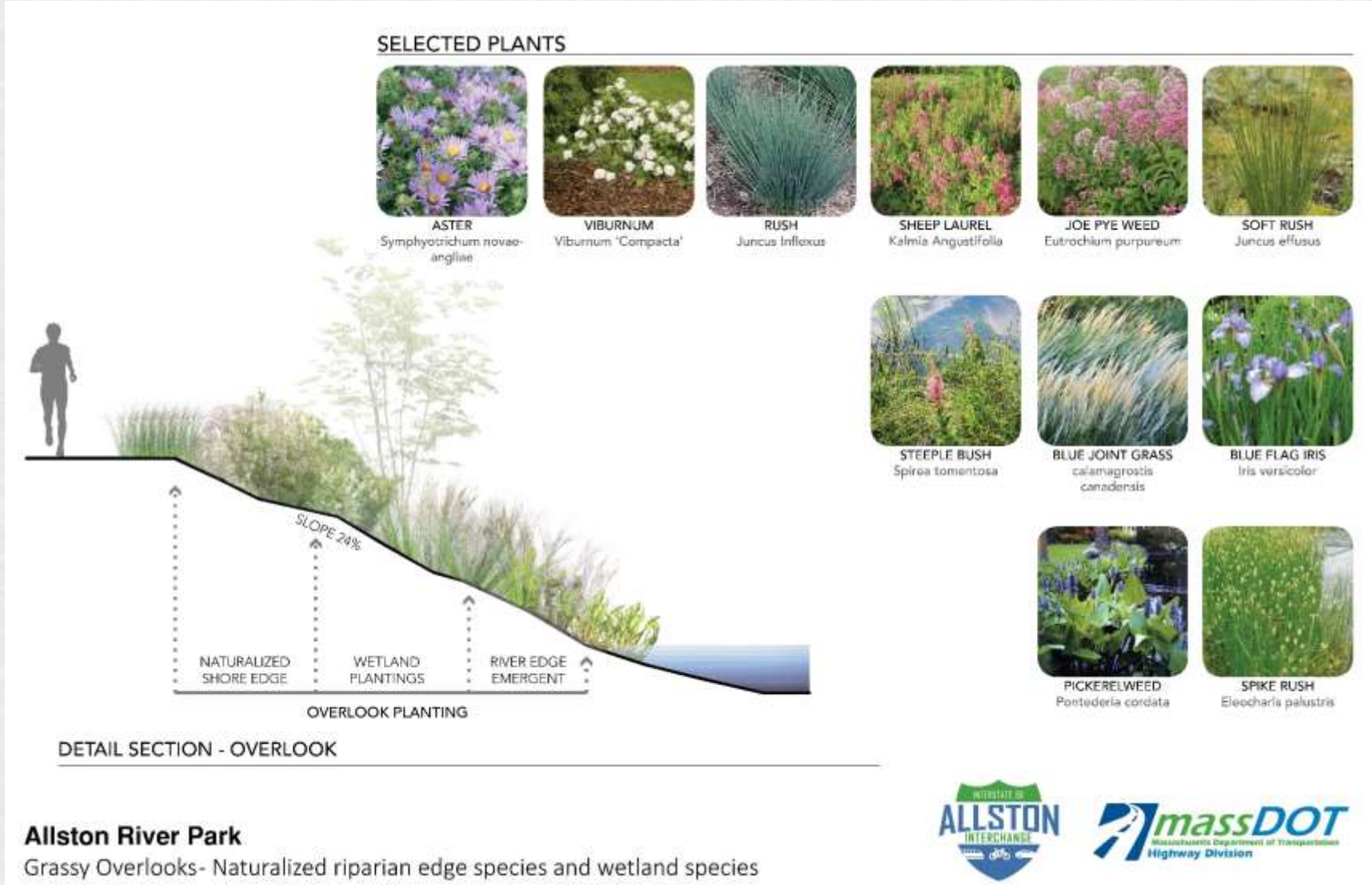
- PDW Pile Supported Walkway - 29,000 sf Piles - 500 sf (250 Piles)
- Bank Restoration 20,000 sf
- SFR Solid Fill – 600 sf

State Wetland Impacts of the Modified At-Grade: Section View



- Impact to Land Under Water (LUW)
  - PDW Pile Supported Walkway - 28,000 sf Piles - 500 sf (250 Piles)
  - Bank Restoration- 13,000 sf
- Impacts to Inland Bank
  - PDW Pile Supported Walkway - 200 lf
  - Bank Restoration– 1,000 lf
- Impacts to Bordering Land Subject to Flooding (BLSF)
  - PDW Pile Supported Walkway - 620 sf/620 cf
  - SFR Solid Fill - 1,000 sf/1,000 cf
  - Bank Restoration– 3,100 sf/3,100 cf

Riverbank enhancement is possible for all throat options



Allston River Park

Grassy Overlooks- Naturalized riparian edge species and wetland species

- All throat options allow for bank restoration / enhancement in throat area at end of Project
- Modified Highway Viaduct and Soldiers Field Road hybrid allow for bank restoration / enhancement with no additional fill in the River
- Modified At-Grade allows for bank enhancement if fill is deemed permittable by regulatory agencies