I-90 Homer M. Hadley Floating Bridge
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Joint Transportation Committee
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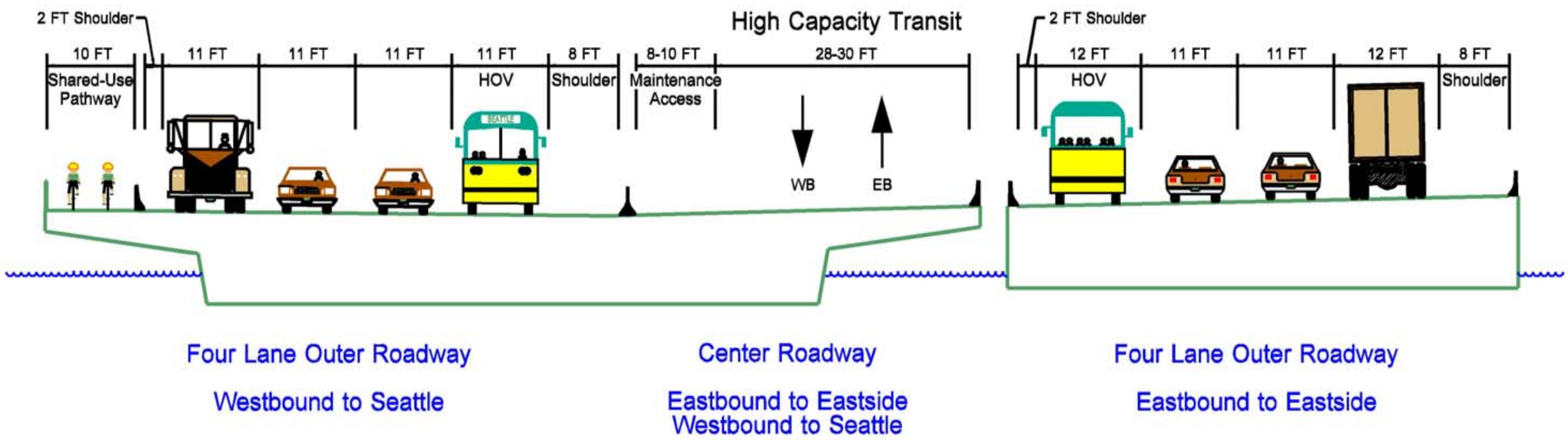
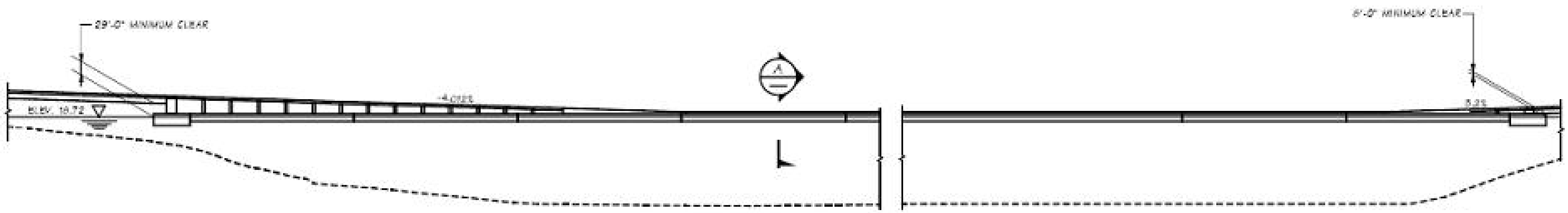
Washington State Department of Transportation

I-90 Homer M. Hadley Floating Bridge

Reconfigured with R-8A and LRT in the Center Roadway





EXISTING HOMER M. HADLEY BRIDGE

Historical Perspective – Policy

I-90 Homer M. Hadley Floating Bridge

1976 Memorandum Agreement

- Signatory agencies supported construction of a facility that:
  - accommodated no more than eight motor-vehicle lanes
  - three GP lanes in each direction
  - two lanes designed and committed to transit use
  - designs accommodate operation of two transit lanes in either reversible or two-way directional mode
- The transit lanes initially operate in a two-way direction at not less than 45 mph in a prioritized fashion:

  1) Transit, 2) HOV, and 3) Mercer Island Single Occupant Vehicles
- I-90 shall be designed and constructed so that all or part conversion of transit roadway to the fixed guideway is possible.

Historical Perspective – Policy

I-90 Homer M. Hadley Floating Bridge

2004 Amendment to the 1976 Memorandum Agreement

- 1976 Memorandum Agreement for I-90 was entered by Seattle, Mercer Island, Bellevue, King County, Metro and the Washington State Highway Commission for transit lanes in the center roadway with future conversion to fixed guideway; Mercer Island access to center roadway was provided in the agreement.
- Option R-8A was agreed to as the preferred alternative for the I-90 Two-way Transit HOV Operations project.
- High capacity transit, specifically light rail, monorail or other similar technology was identified for the ultimate configuration of the I-90 Homer M. Hadley Floating Bridge center roadway.

Historical Perspective – Structural

I-90 Homer M. Hadley Floating Bridge

1991 Governor’s Blue Ribbon Panel

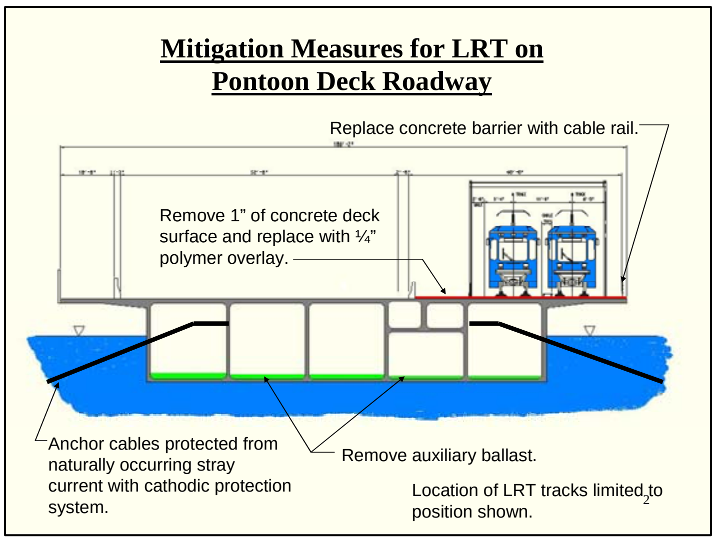
- Outlined special steps required if reconstruction or major rehabilitation occurs on the floating bridges as well as practices during inclement weather to assure watertightness of the bridges.
- Need to treat floating bridges like marine vessels and utilize marine construction practices which are not the same as road construction practices.
- Utilize third party review for any reconstruction or rehabilitation of floating bridges including the involvement of marine contractors.
- Modify contracting approach to ensure watertightness through ongoing surveillance, inspection, reporting and immediate rectification of discrepancies during construction.

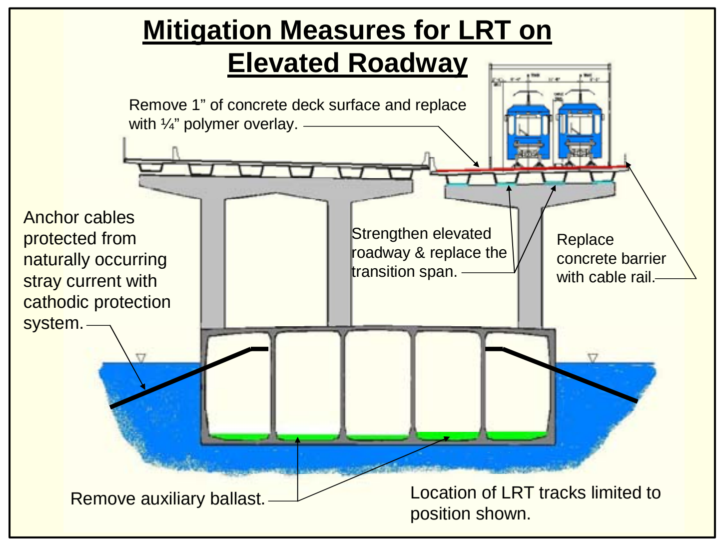
Historical Perspective – Structural

I-90 Homer M. Hadley Floating Bridge

2001 I-90 Floating Bridge Structural Review

- The engineering firm KPFF was retained to assess impacts of light rail in the center roadway and adding an HOV lane to the outer westbound roadway. This analysis showed LRT conversion modifications were necessary and initially found to be structurally feasible with weight mitigation measures on the bridge and limitations on track system weight and operations.





Historical Perspective – Structural

I-90 Homer M. Hadley Floating Bridge

2005 I-90 Load Test

- A “train” of 4 heavy semi trucks spaced to 370 feet simulated a four-car train to assess light rail weight and stresses across the I-90 Floating Bridge. The test assessed how the bridge responded when two “trains” passed midspan and at the transition span where the floating bridge transitions to an elevated structure on the ground. The test confirmed the findings of the 2001 KPFF study which modeled impacts to the bridge and identified ways to handle the heavier light rail cars.

Observations

The load test confirmed computer simulations that the bridge structure would support the weight and shifting from light rail trains and tracks.

State Interest

I-90 Floating Bridge Center Roadway Conversion Basics

Improved Transportation System

- Efforts should enhance people movement, preserve freight movement and provide a good plan to accommodate growth in the corridor.

Structural Integrity and Life Cycle of Bridge Maintained

- Converting the I-90 Floating Bridge center roadway is a challenging engineering task. We are working with Sound Transit and our collective teams know to preserve the expected life of the bridge and engineer a solution for light rail.
- The on-going iterative design process addresses issues like floatation/buoyancy, stray current and deck/rail connections.

State Interest

I-90 Floating Bridge Center Roadway Conversion Basics

Bridge Basics for Conversion

- Maintain systematic rebar and post tensioning
- Maintain existing freeboard
- Light rail project stays within structural limitations (original design criteria)
- Isolate stray current so there's no corrosion
- Transit operations may be affected due to loading limitations during certain storm events
- WSDOT stays “whole" on bridge maintenance costs related to conversion

We will continue to work with Sound Transit to navigate through design challenges as the engineering details are developed.

Questions?

For more information on
the I-90 Homer M. Hadley Floating Bridge
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