

SR 520

Catastrophic Failure Plan

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Parametrix

Catastrophic Failure Plan (CFP)

Presentation Agenda

- SR 520 vulnerabilities
- CFP Phase 1 & 2
- Vulnerable Structures
Recovery Plan
- Next steps

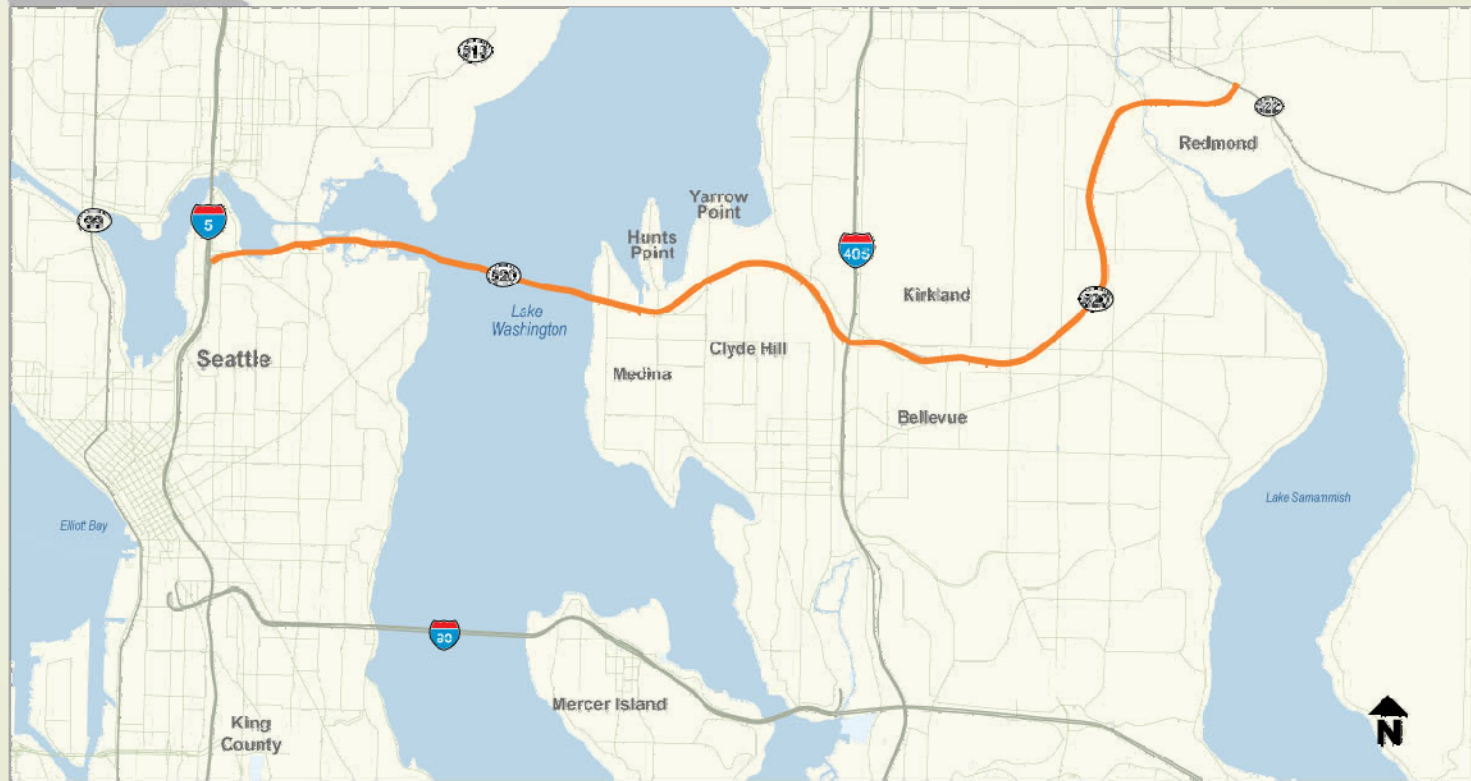


CFP - Partners

- **WSDOT** – Sponsor
- **Parametrix** – Task leader, transportation planning
- **EnviroIssues** – Communications
- **PB** – Transportation planning, tabletop exercise
- **PNWER** – Tabletop exercise
- Local jurisdictions and emergency responders
- **Mn/DOT**



Where is SR 520?



SR 520 Vulnerabilities

- The SR 520 bridge is vulnerable to earthquakes and windstorms
- WSDOT is addressing SR 520 vulnerability
 - Accelerating the project schedule
 - Advancing pontoon construction
 - Developing a CFP

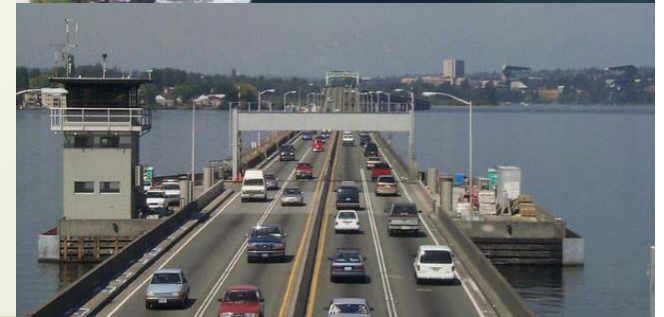
*Portage Bay
Bridge
– Facing West*



*West Approach
– Facing
Northwest*



*Midspan of the
Floating Bridge
– Facing West*



SR 520 Catastrophic Failure Animations



**Washington State
Department of Transportation**

SR 520 Bridge Replacement and HOV Project

Earthquake
Catastrophic Failure Simulation

SR 520 Catastrophic Failure Animations



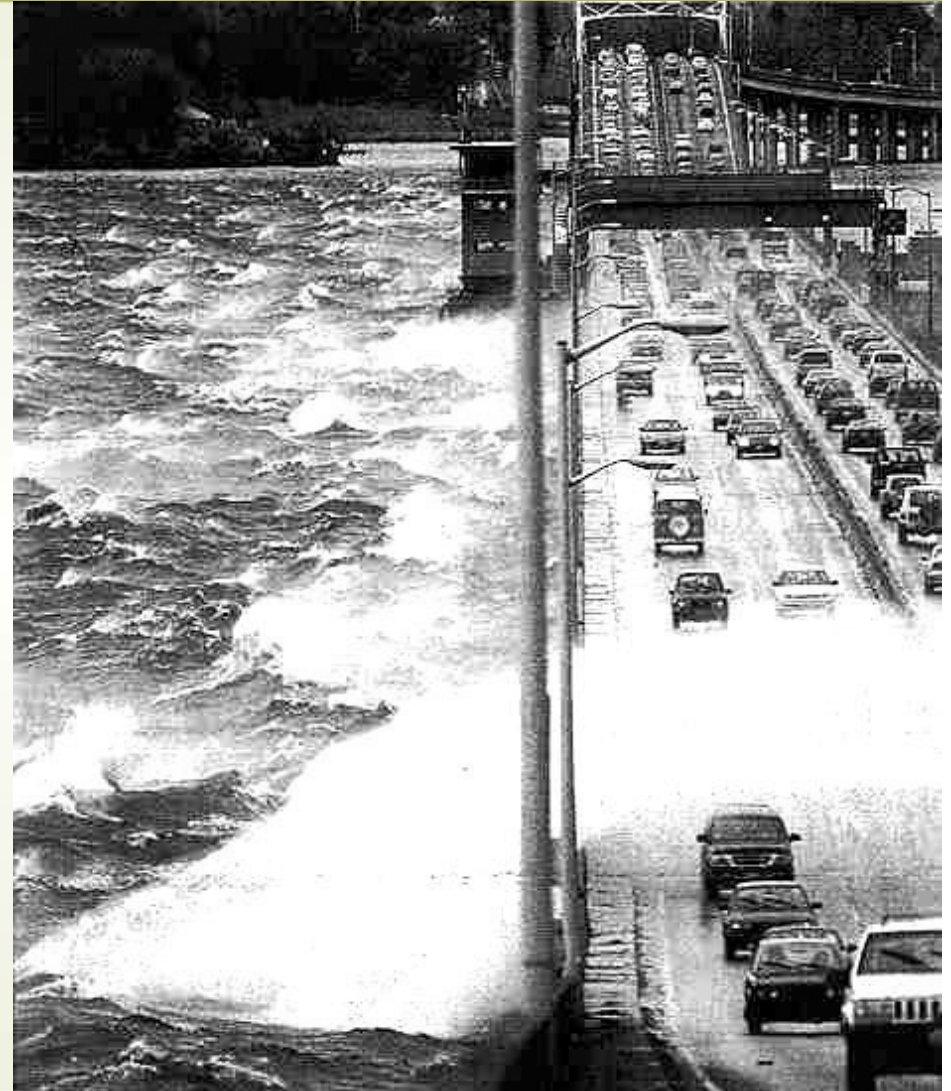
**Washington State
Department of Transportation**

SR 520 Bridge Replacement and HOV Project

Wind Storm
Catastrophic Failure Simulation

Phase 1 CFP

- Failure scenarios
- Traffic management
- Initial response
- Bridge replacement strategy
- Permitting
- Funding options



Phase 1 CFP Scenarios



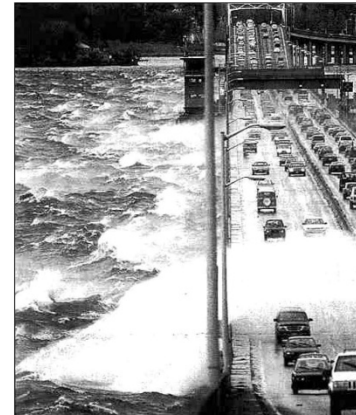
Phase 2 CFP

- Builds on established emergency management procedures
- Highlights short-term and long-term traffic management and communications strategies
- Was developed in collaboration with emergency responders, jurisdictions, transit agencies, businesses and Mn/DOT



SR 520 Catastrophic Failure Plan

Summer 2008



Jurisdiction and Agency Collaboration

Overall CFP

- Catastrophic failure planning kick-off
- Tabletop exercise
- Action strategy workshop

Transportation management plan

- Level 1 evaluation – development of packages
- Level 2 evaluation – development of strategies
- Level 2 evaluation review

Communications plan

- Public information officer work session

Tabletop Exercise

- Why a tabletop exercise
- Scenario development
- Tabletop exercise play

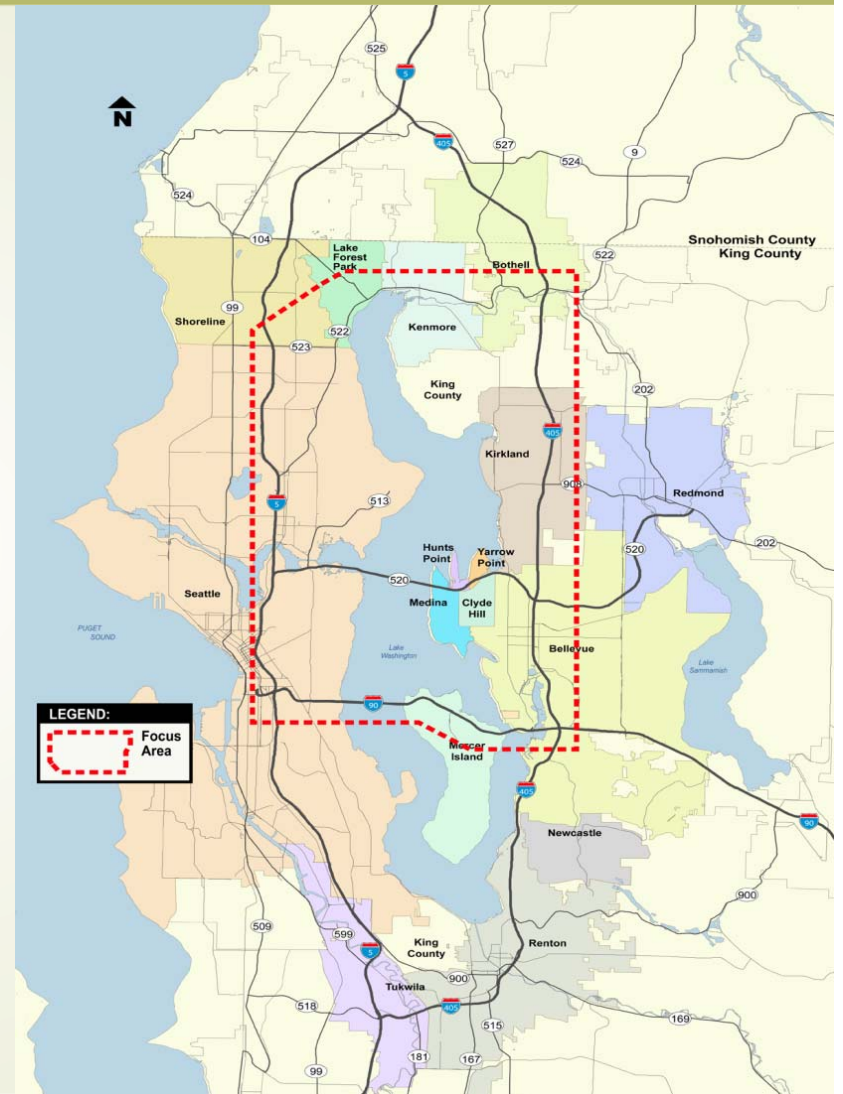


Transportation Management Plan Goals

- Identify a list of strategies to:
 - Move people
 - Manage congestion
- Provide a starting point for managing our transportation system during reconstruction of the bridge
- Facilitate coordination between state and local transportation agencies

Focus Area and Coordinating Agencies

- Ongoing coordination with local agencies and jurisdictions
 - City planners and public works directors
 - Transit agencies
 - WSDOT Public Transit Division
 - WSDOT Freight Systems Division



Preliminary Options Development

Current Cross-Lake Washington Traffic Patterns



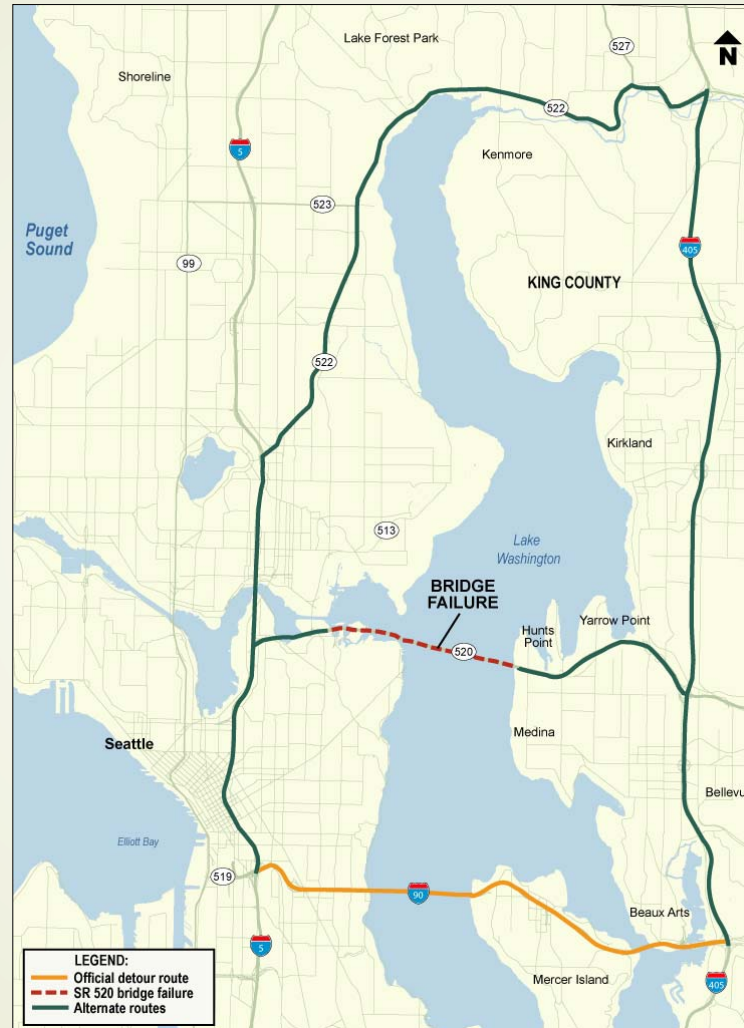
Preliminary Options Development

Projected Cross-Lake Washington Traffic Patterns Following a SR 520 Bridge Failure



Preliminary Options Development

SR 520 Closure Detour and Alternate Routes



Preliminary Options Development

Central Puget Sound Regional Chokepoints Affected by a SR 520 Bridge Failure



I-90 Corridor

- 148th Avenue/150th Avenue ramps
- Richards Road on-ramp
- E Mercer Way weave
- Exit ramps to I-5
- Rainier on-ramp
- SR Baker tunnel
- Approaching I-405
- Richards Road
- Approaching 148th Avenue/150th Avenue

I-5 Corridor

- Reversible lanes entrance (HOV)
- Reversible lanes entrance (general purpose)
- SR 522
- Ship Canal Bridge
- SR 520 on-ramp
- Mercer Street
- Reversible lanes - Mercer Street/ Stewart Street ramps
- Downtown Seattle ramps
- Reversible lanes east
- I-50 collector-distributor
- Approaching I-90
- Reversible lanes entrance
- I-90 collector-distributor
- Olive Way on-ramp
- Mercer Street
- To eastbound SR 520
- Reversible lanes - HOV start
- Reversible lanes end

SR 522 Corridor

- I-5 interchange
- 15th Avenue/10th Street signals
- NE 146th Street Intersection
- SR 104 intersection
- 61st Avenue NE
- 106th Avenue NE
- 96th Avenue NE
- SR 527/Main Street

SR 520 Corridor

- I-5 ramps merge
- Montlake Interchange
- Lake Washington Boulevard on-ramp
- 108th Avenue NE to 124th Avenue NE
- 146th Avenue NE Interchange
- NE 40th Street/NE 51st Street Interchanges
- Redmond Way
- Avaldale Way (SR 520 ends)
- NE 40th Street/NE 51st Street Interchanges
- 124th Avenue NE to I-405
- SR 520 Interchange
- Outside HOV lane
- Outside HOV lane ends
- Montlake interchange
- I-5 Interchange

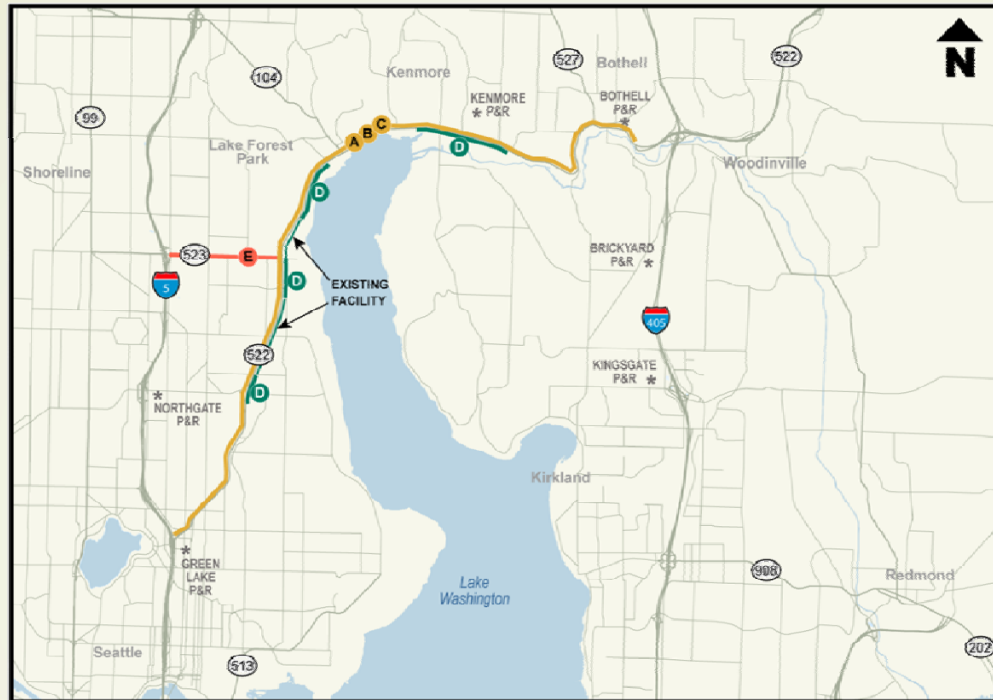
I-405 Corridor

- SR 522 merge
- NE 86th Street
- NE 70th Street
- SR 520 Interchange
- SR 520 eastbound on-ramp
- NE 8th Street
- SE 9th Street
- I-90
- Coal Creek Parkway
- Coal Creek Parkway
- I-90 on-ramps
- SE 8th Street
- NE 8th Street weave
- NE 70th Street
- Approaching SR 522

Toolbox of Traffic Management Strategies

- Pre-screened strategies for moving people safely and efficiently
 - Prioritize transit and HOV travel
 - Maintain reliability and travel times
- Special considerations
 - Strategies are temporary, not long-term solutions
 - All have operational benefits and reasonable tradeoffs
 - Require further review prior to implementation
 - Need to consider context in which strategies may be implemented

SR 522 Traffic Management Strategies



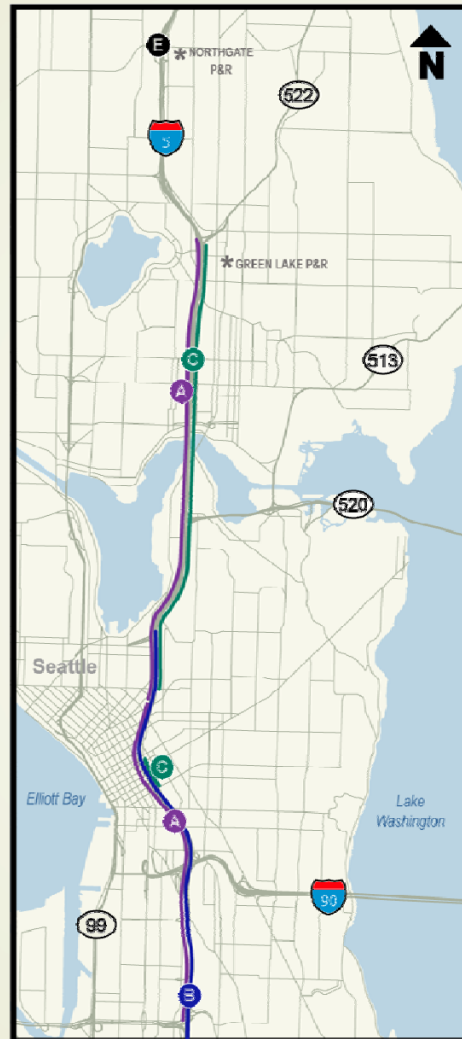
Strategies for Immediate Implementation (Within One Month of SR 520 Bridge Failure)

- A B C** Implement intersection spot improvements and some access restrictions to balance regional throughput and local circulation along SR 522:
 - Modify signal timing and phasing to prioritize through trips on SR 522.
 - At intersections with principal arterials – Apply spot improvements to reduce conflicts and/or give priority to SR 522 through movements. This includes signal timing adjustments and channelization changes.
 - At intersections with minor arterials – Allow right-in/right-out access only to SR 522 or implement no left-turn restrictions at minor arterial legs.
 - At intersections with collector arterials – Provide right-in/right-out access only or close minor roadway approaches to SR 522.
 - At intersections with local streets – Close minor roadway approaches if other local circulation options exist. If few or no other routing options are available, access to and from SR 522 should be revised to allow right-in and right-out movements only.
- D** Add business access transit (BAT) lanes in one direction on SR 522:
 - Provide southbound-only BAT lane between 29th Avenue NE and NE 145th Street, with a short gap between NE 143rd Street and NE 145th Street.
 - Provide northbound-only BAT lane between 28th Avenue NE and NE 170th Street.
- E** Implement left-turn restrictions on NE 145th Street (SR 523) and prohibit left-turns at intersections without left-turn lanes.

Other Strategies to Consider (Within Six Months of SR 520 Bridge Failure)

- D** Add business access transit (BAT) lanes in both directions on SR 522 between 20th Avenue NE and NE 145th Street.

I-5 Traffic Management Strategies



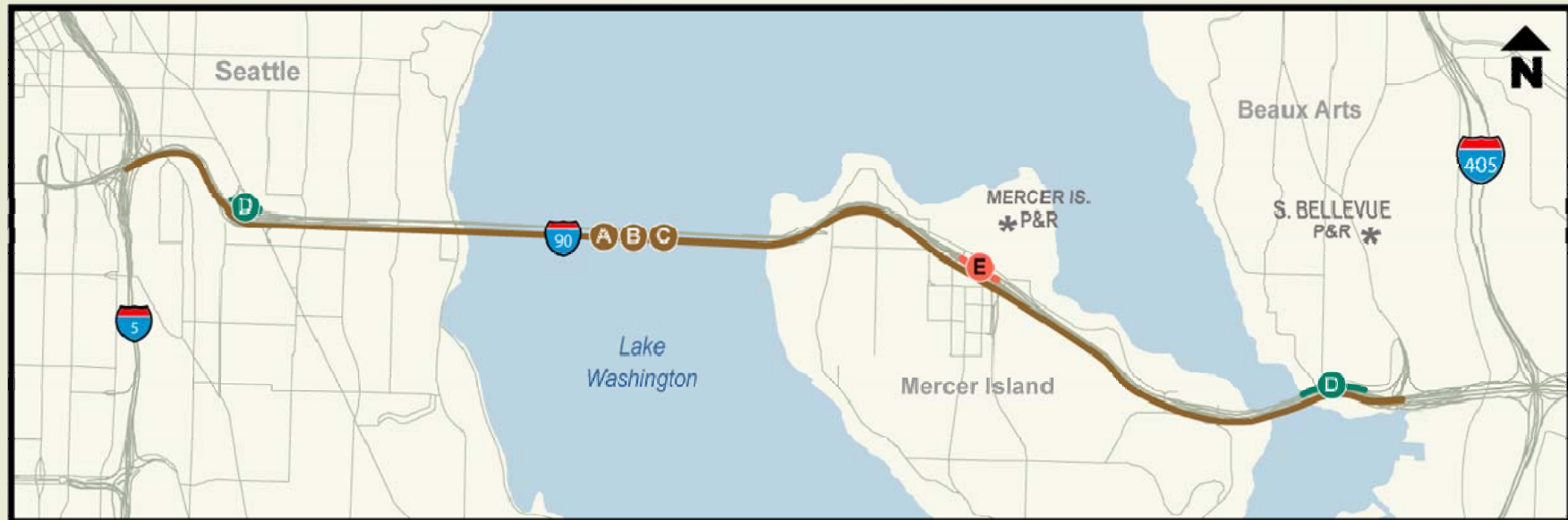
Strategies for Immediate Implementation (Within One Month of SR 520 Bridge Failure)

- A** Add a southbound mainline through lane between NE 70th Street off-ramp and Boylston Avenue. Create a ramp add/drop configuration at NE 45th Street/50th Street interchange.
- B** Remove HOV designation from Mercer Street on-ramp to south of the I-90 collector-distributor off-ramp.
- C** Add a northbound mainline through lane between Seneca Street and the NE 70th Street on-ramp without an additional through lane would not be provided between the University Street on-ramp and the Olive Way on-ramp.

Other Strategies to Consider (Within Six Months of Bridge Failure)

- E** Provide additional northbound express lane from the 104th Avenue off ramp to the I-5 Northgate Way bridge.

I-90 Traffic Management Strategies



Strategies for Immediate Implementation (Within One Month of SR 520 Bridge Failure)

- A** Provide HOV lanes in both directions on the outer roadway based on the (R-8A) configuration.
- E** Redirect Island Crest Way westbound on-ramp traffic to the reversible lane in the morning.

Other Strategies to Consider (Within Six Months of SR 520 Bridge Failure)

- B C D** I-90 Center Roadway Options:
 - Operate reversible lanes two-way transit only.
 - Consider ways for shared use of center roadway by general purpose/HOV/transit.
 - Improve access to center roadway at east and west termini.

SR 520 Traffic Management Strategies



Strategies for Immediate Implementation (Within One Month of SR 520 Bridge Failure)

- A** Create a temporary, additional westbound SR 520 access at the Montlake interchange using the eastbound on-ramp.
- C** Convert the eastbound on-ramp at 108th Avenue NE to two add lanes.
- H** Add a second lane on the westbound SR 520 to southbound I-405 ramp.

Transit Service During Recovery



Current Cross-Lake Connections



Post-Failure Cross-Lake Connections

Communications Plan

- Phases
 - Pre-storm
 - Response
 - Recover and restoration
- Roles and responsibilities
 - Field staff
 - Within WSDOT
 - Suggestions for jurisdictions and agencies
- Activities and strategies
 - Key questions
 - Basic messages

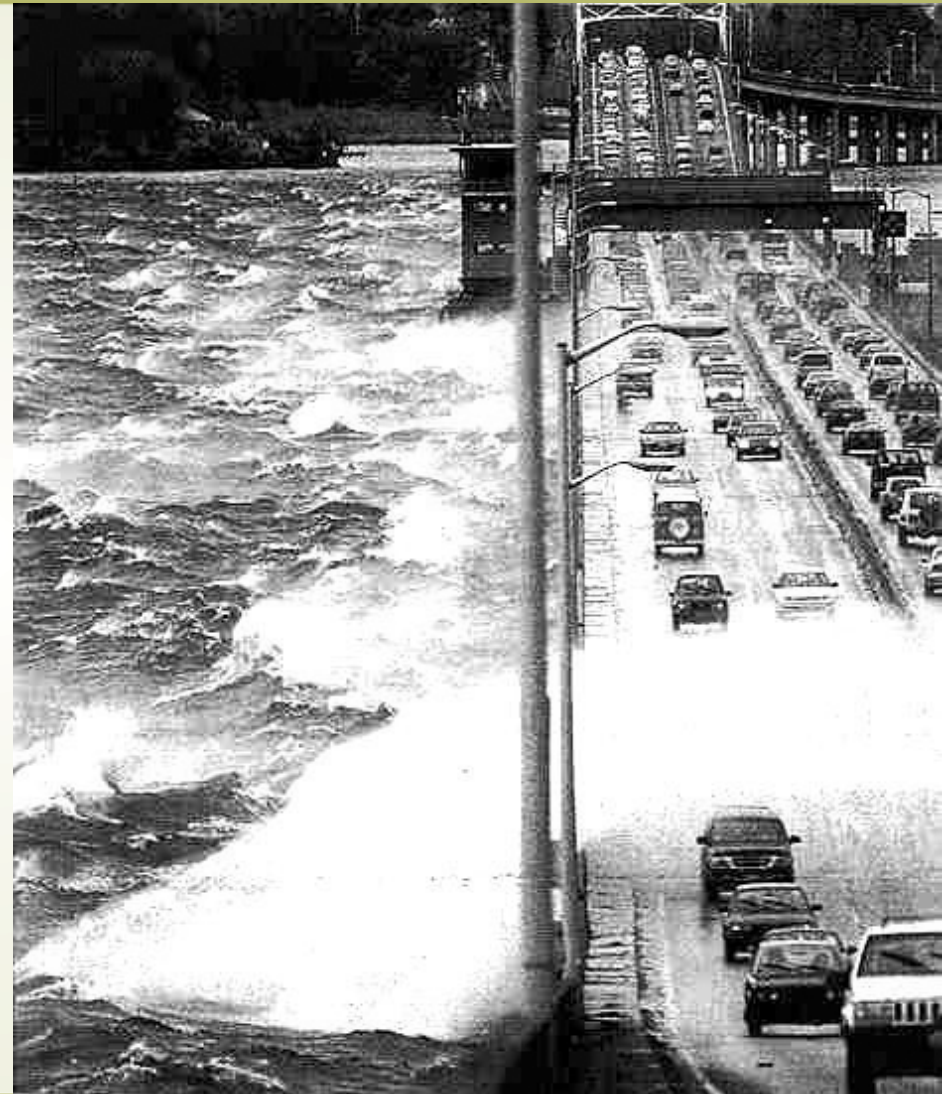
CFP Next Steps

- Tool for jurisdictions
- Regional readiness and response
- Address vulnerable structures
- Accelerate SR 520 program construction

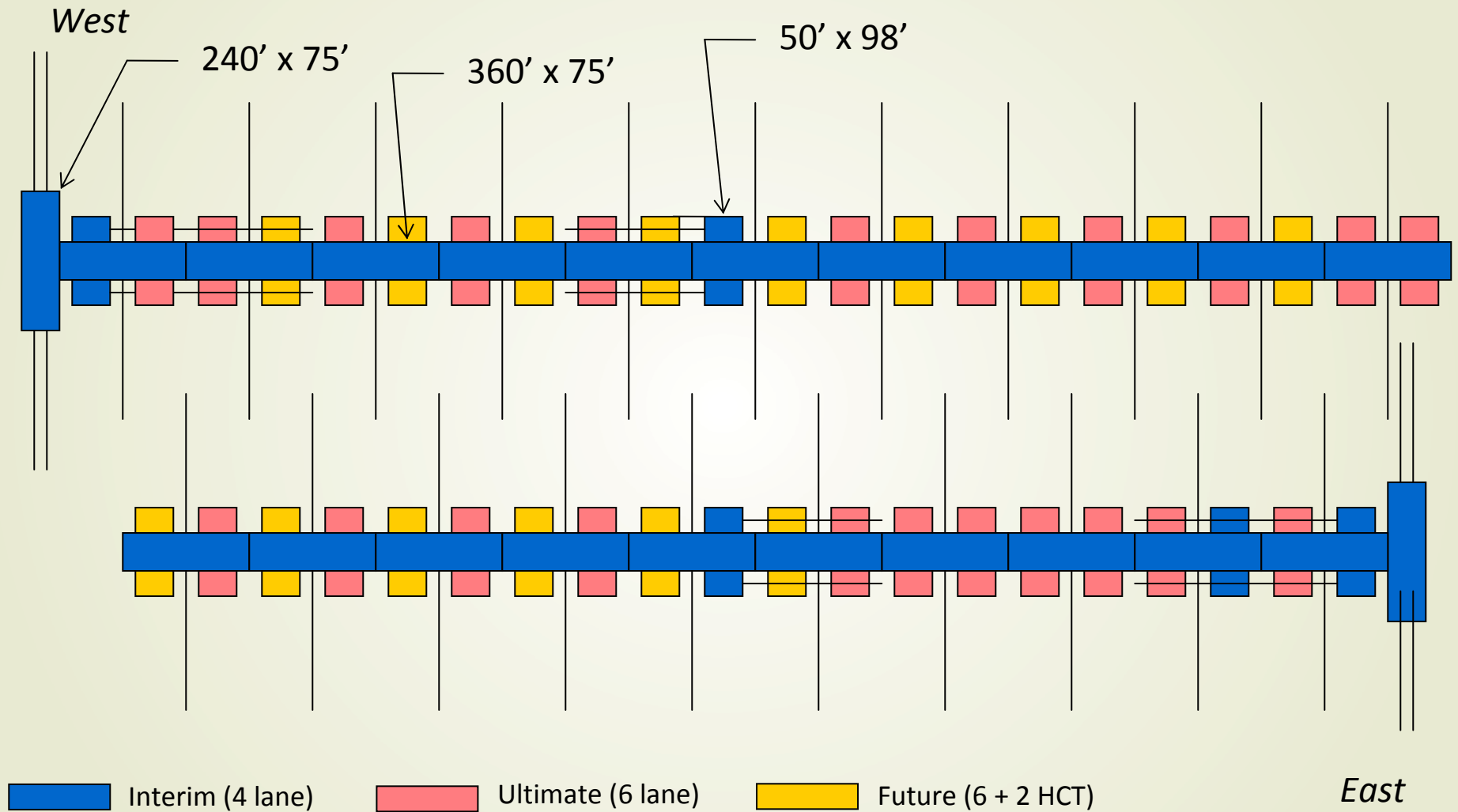


Vulnerable Structures Recovery Plan

- The floating bridge is the weak link
- Replace with a bridge that is expandable in the future
- Begin pontoon construction ASAP

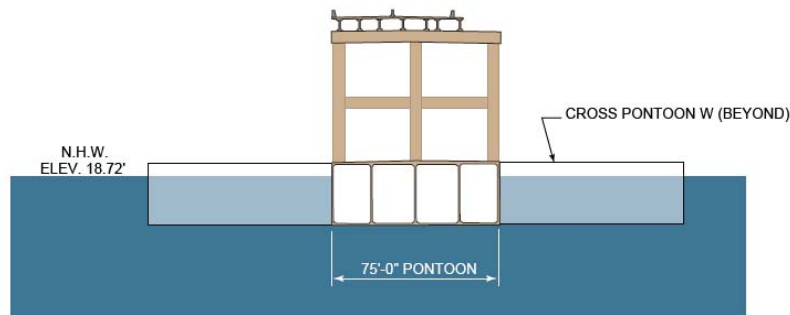


SR 520 Bridge Pontoon Configuration

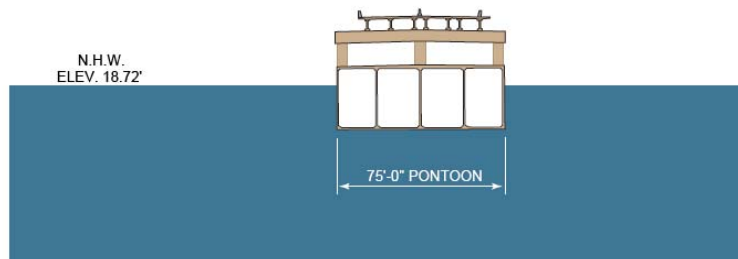


Floating Bridge Design Concepts

Interim 4 Lane

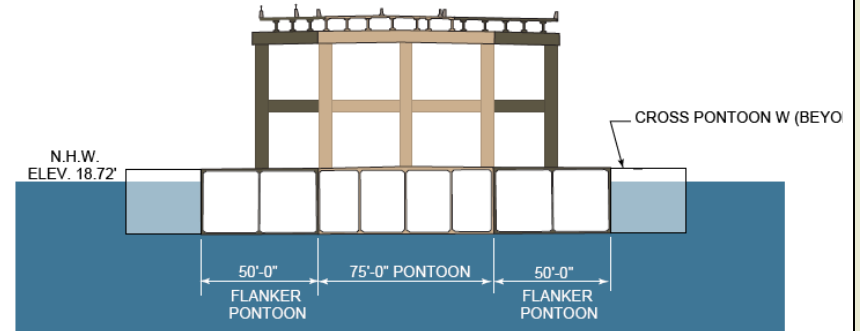


OPTION 1 (INTERIM - 4 LANE)
TYPICAL SECTION
SHOWN AT EASTEND (WEST END SIMILAR)

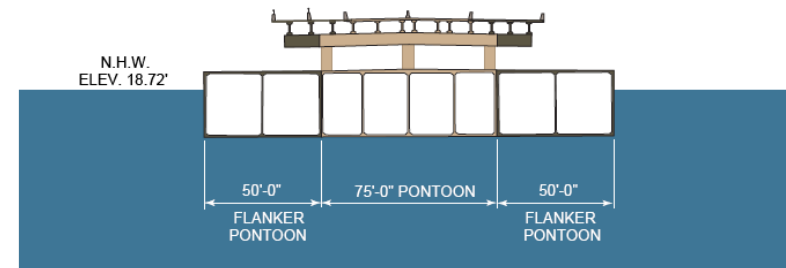


OPTION 1 (INTERIM - 4 LANE)
TYPICAL SECTION
SHOWN NEAR MID-SPAN

Interim 6 Lane



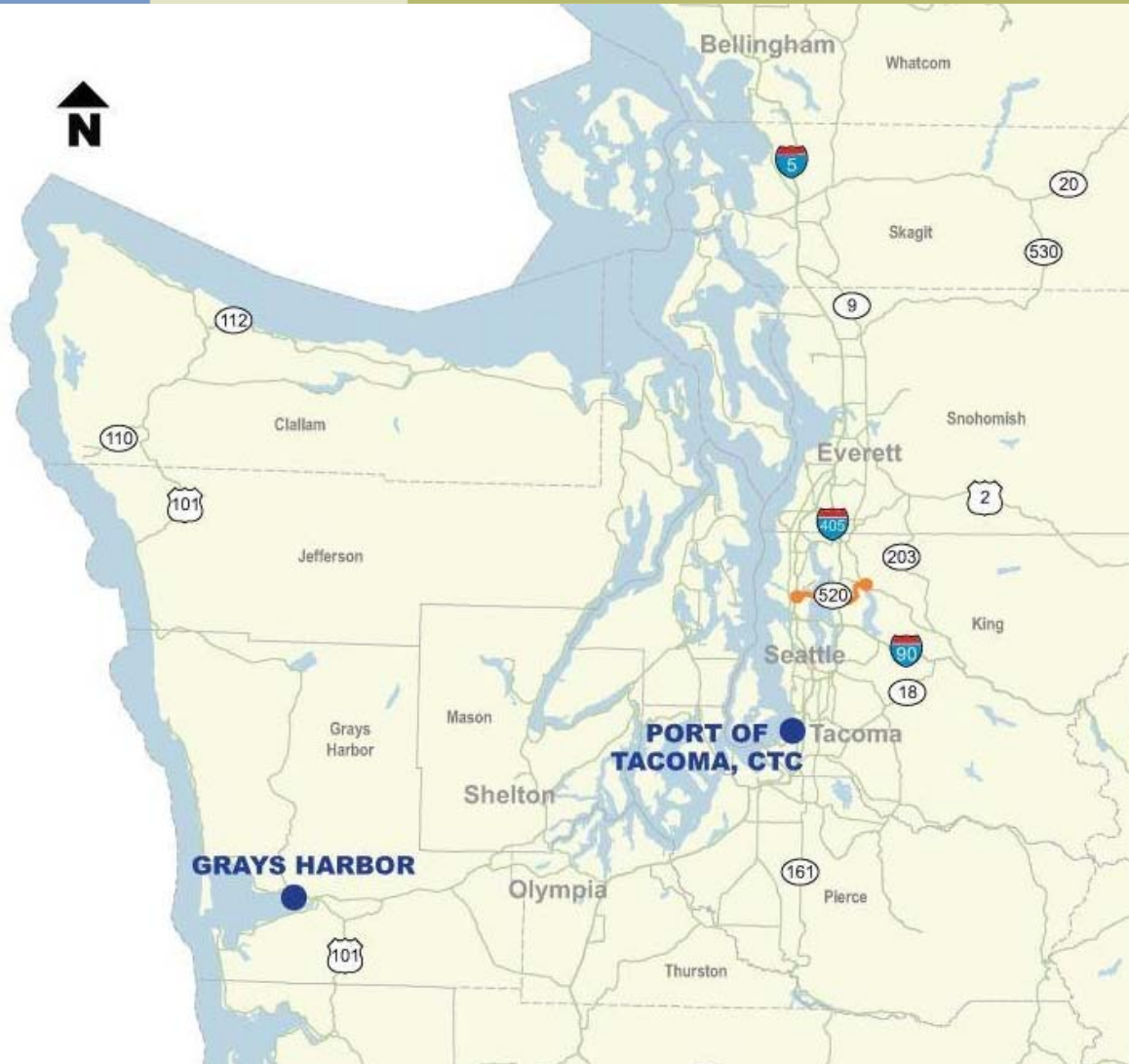
OPTION 1 (ULTIMATE - 6 LANE)
TYPICAL SECTION
SHOWN AT EAST END



OPTION 1 (ULTIMATE - 6 LANE)
TYPICAL SECTION
SHOWN AT MID-SPAN

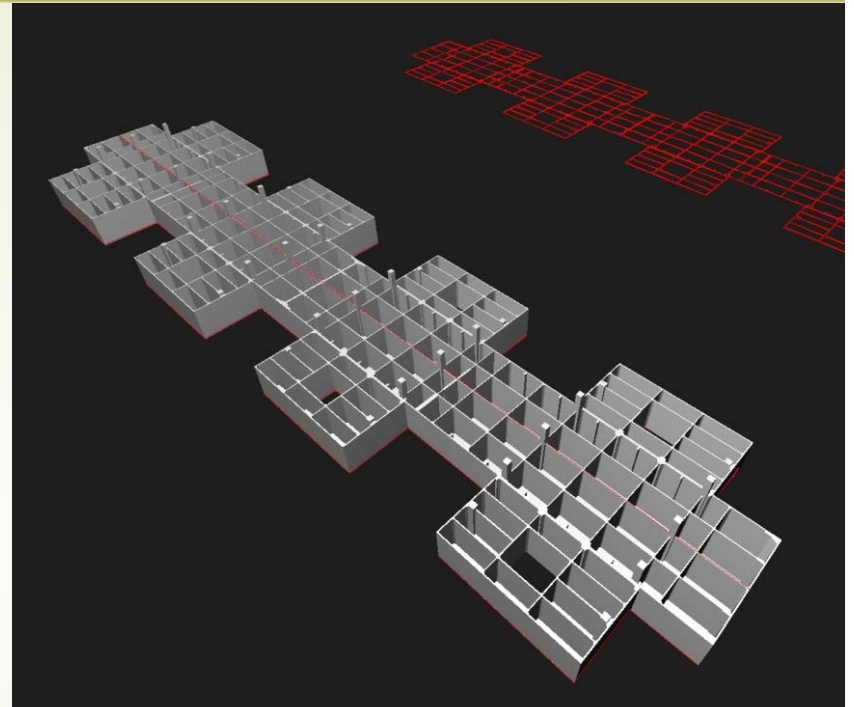
Illustrations are conceptual only

Building Pontoons in Washington



Pontoon and Casting Facility Design

- Pontoons
 - Geometry
 - Minimum in-service reinforcement
 - Construction specifications for bare pontoon sections
- ACME - Phase I & II
- Pontoon casting and launch facility



Pontoons – Design-Build Project Description

- Develop new casting facility in Grays Harbor
- Design and fabricate new pontoons
- Temporarily moor pontoons
- Requires means and methods to facilitate precise concrete casting



What is Proposed for the New SR 520 Corridor?

WEST

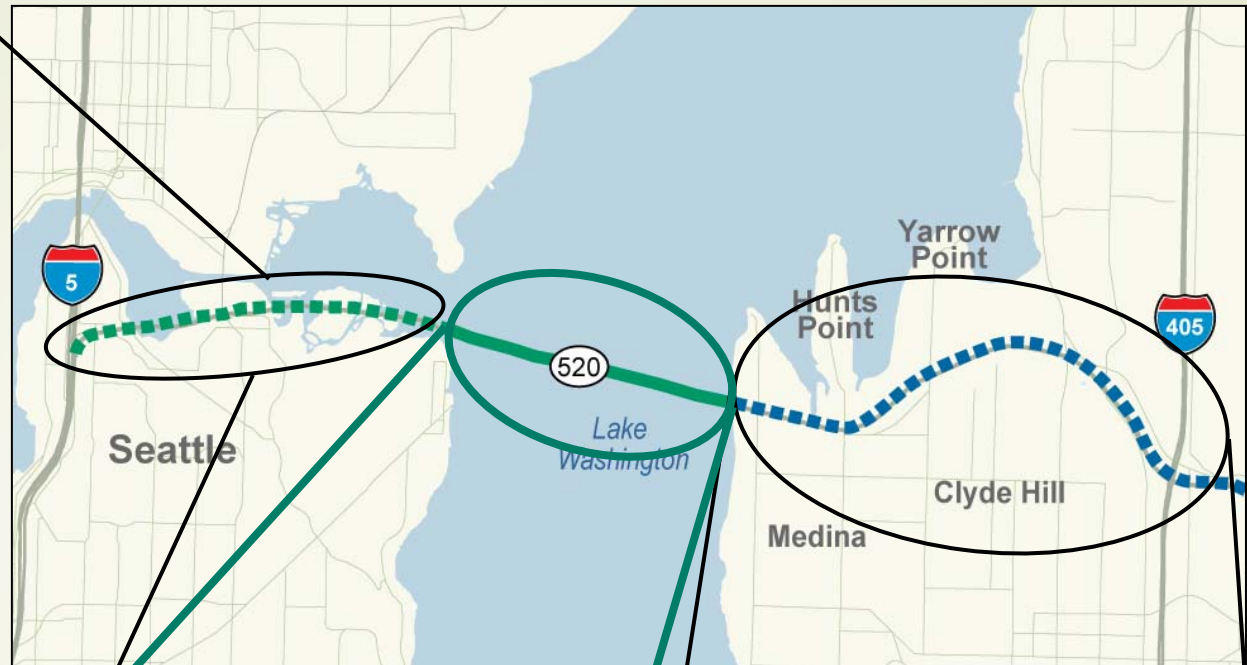
Replaces the approaches, roadway and interchanges and adds lids along SR 520 between I- 5.

**Cost: \$2.0 – 4.2 billion
(Unfunded)**

Option A: Most similar to today's configuration, with addition of a second Montlake drawbridge.

Option K: Includes tunnel under Montlake Cut and lowered single point urban interchange.

Option L: Includes diagonal bridge over Montlake Cut and surface single point urban interchange.



FLOATING BRIDGE

A pontoon construction casting basin in Grays Harbor, construction of 33 pontoons, and floating those pontoons into Lake Washington.

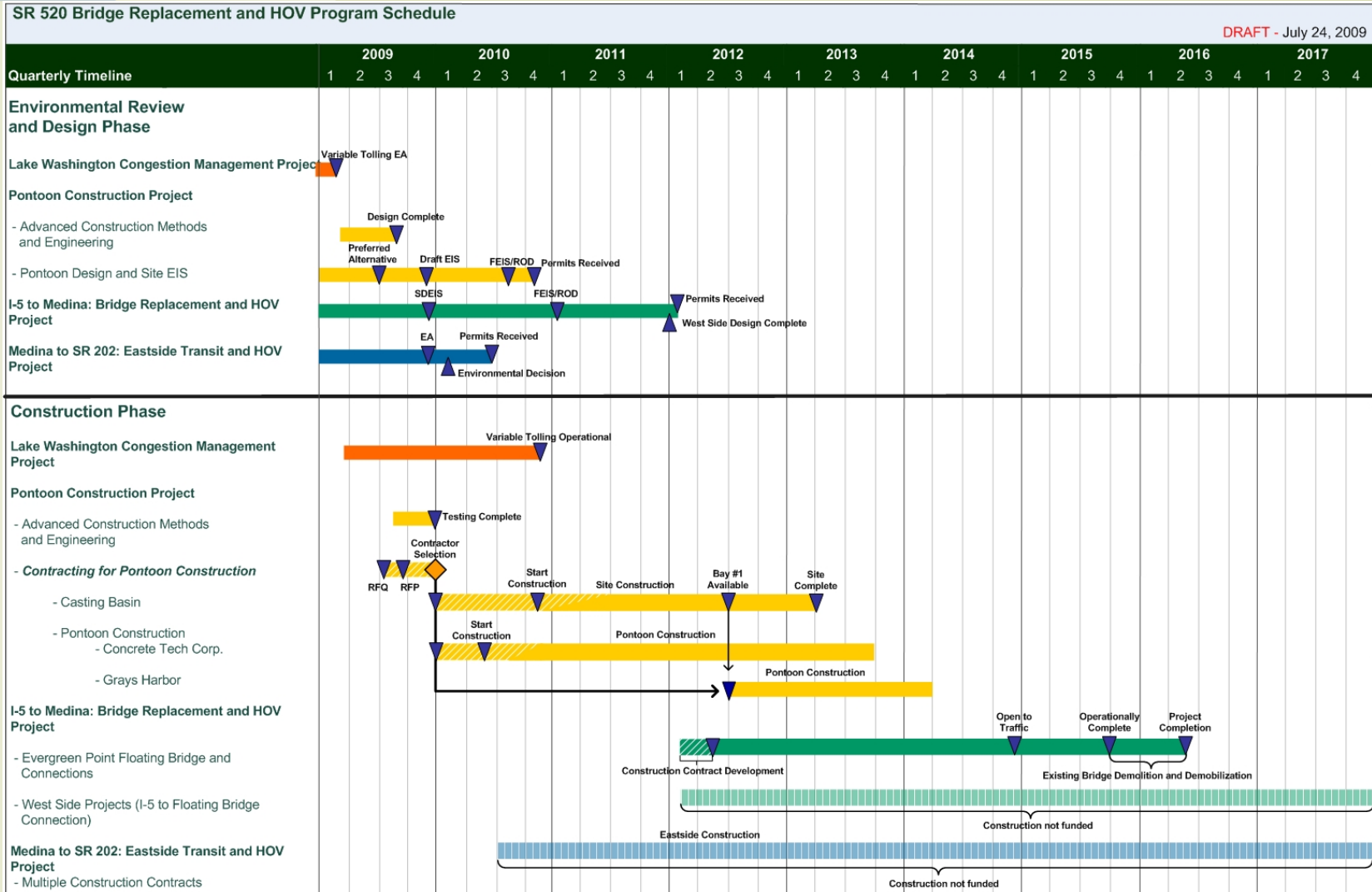
Cost: \$1.92 billion (FUNDED)

EAST

Completes and improves the transit and HOV system from Evergreen Point Road to SR 202

**Cost: \$776 million
(Unfunded – Applying for federal stimulus funds in fall 2009 to help close the gap)**

What is the SR 520 Program Schedule?



Questions?



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**For more information visit
the project website at:
[www.wsdot.wa.gov/
projects/SR520Bridge](http://www.wsdot.wa.gov/projects/SR520Bridge)**