



The Alaskan Way Viaduct & Seawall Replacement Program



Central Waterfront

Women's Transportation Seminar

Feb. 12, 2009

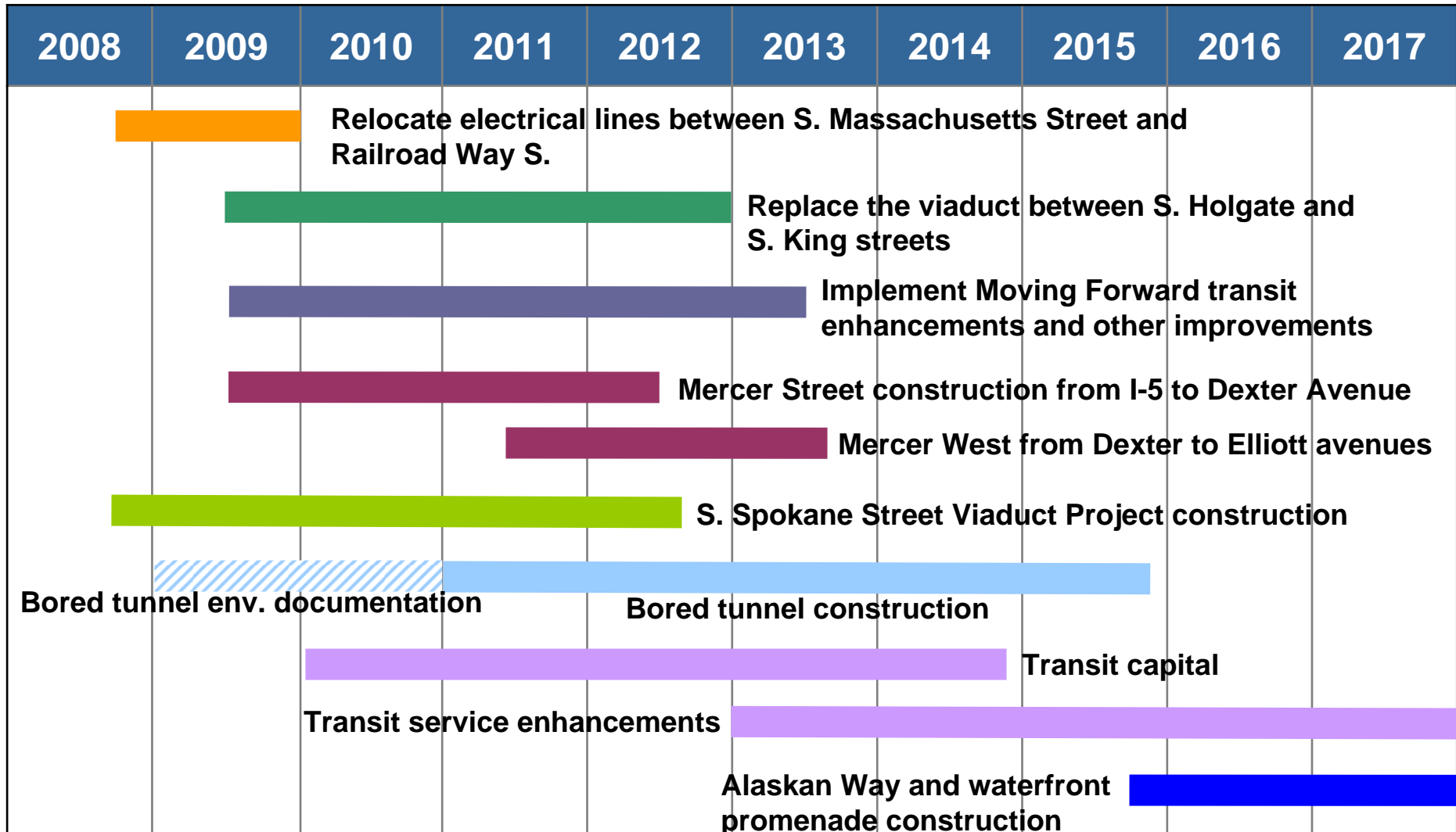
Bored Tunnel Hybrid Alternative

On Jan. 13, 2009, Governor Gregoire, King County Executive Sims and Mayor Nickels announced that the bored tunnel hybrid alternative was their preferred solution to replace the central waterfront portion of the viaduct.



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Program Timeline



*Seawall construction will take place before Alaskan Way and promenade construction



Guiding Principles

The three executives agreed that any solution for the Alaskan Way Viaduct needed to be grounded in a commitment and integration across six guiding principles:

- Improve public safety.
- Provide efficient movement of people and goods now and in the future.
- Maintain or improve downtown Seattle, regional, the port and state economies.
- Enhance Seattle's waterfront, downtown and adjacent neighborhoods as a place for people.
- Create solutions that are fiscally responsible.
- Improve the health of the environment.



Improve Public Safety

The bored tunnel alternative keeps the public safe by:

- Improving lane and shoulder widths.
- Installing modern fire protection safety equipment, including emergency exits.

Tunnels perform better in earthquakes than bridges.

- Structural engineers agree that tunnels are one of the safest places to be during an earthquake because a tunnel moves with the earth.



Efficient Movement of People and Goods

- The tunnel will carry 85,000 vehicles through downtown Seattle each day at year of opening (with room to grow). Surface Alaskan Way will carry about 25,000 vehicles per day.
 - Viaduct carries approximately 110,000 vehicles each day.
- Maintains today's travel times for trips through downtown.
- Accommodates in-city trips through new investments in local streets and transit.
 - New bus service will carry approximately 17,000 additional daily riders, primarily serving northwest and southwest Seattle.
- Improvements to I-5 further expand north-south vehicle capacity and provide improvements in travel times.

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Support a Strong State and Regional Economy

The bored tunnel alternative:

- Maintains capacity in the SR 99 corridor.
- Preserves I-5 for state and regional through trips.
- Provides room for freight and port traffic to grow.
- Minimal impacts to waterfront businesses and the local community.
- Maintains and creates 10,000 jobs each year over the course of the project.



Enhance Seattle's Waterfront, Downtown and Adjacent Neighborhoods

The bored tunnel alternative:

- Moves SR 99 underground and eliminates noise, shadowing and view blockage from the existing viaduct.
- Reconnects downtown with the natural environment in Elliott Bay.
- Creates a memorable place for people to live, work and play.



Improve the Health of the Environment

The bored tunnel alternative:

- Creates a new system to improve and handle storm water runoff.
- Creates new transit, bike and pedestrian connections.
- Adds one million hours of new transit service.



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Fiscal Responsibility

	Proposed Project Implementation Responsibility				Costs
	State	King County MVET	City of Seattle	Port of Seattle ***	
Moving Forward and Prior Expenditures	\$600 million			\$300 million	\$900 million*
SR 99 Bored Tunnel	\$1.9 billion**				\$1.9 billion
Alaskan Way Surface Street and Promenade	\$290 million		\$100 million		\$390 million
Central Seawall			\$255 million		\$255 million
Utility Relocation			\$250 million		\$250 million
City Streets and Transit Pathways		\$25 million	\$190 million		\$215 million
Transit Infrastructure and Services		\$115 million	\$135 million		\$250 million
Construction Transit Service	\$30 million	\$50 million			\$80 million
Total	\$2.82 billion	\$190 million	\$930 million	\$300 million	\$4.24 billion
Transit Operations Annual Cost		\$15 million			\$15 million

*Reflects cost savings from Moving Forward program realized by not repairing the viaduct from Lenora to Battery Street Tunnel and not completing the second phase of fire and life safety upgrades to the Battery Street Tunnel.

**Reflects the most likely cost based on a conceptual design. The potential cost range is between \$1.2 billion and \$2.2 billion.

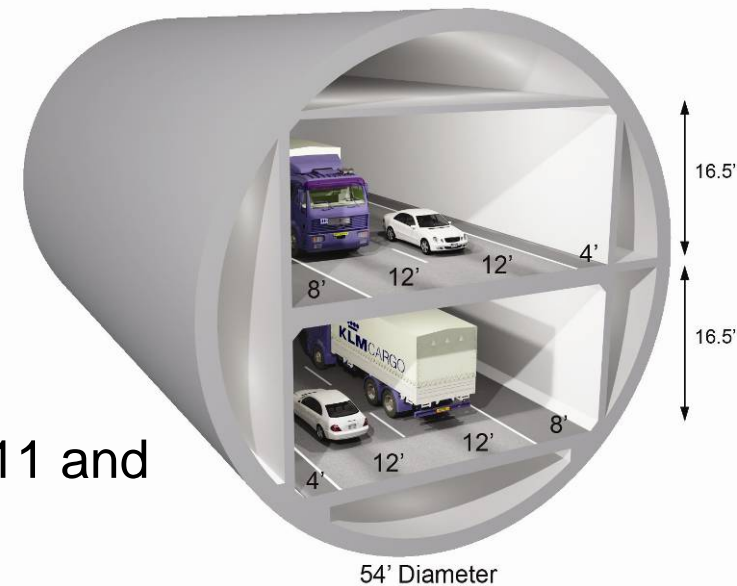
***Agreement in concept for up to \$300 million subject to Port of Seattle Commission review and approval.

State Projects

Bored Tunnel Hybrid Alternative

SR 99 Tunnel:

- 54' diameter, single bore tunnel.
- Two lanes of traffic in each direction.
- Approximately 1.7 miles long.
- Between 30 and 200 feet underground.
- Construction is expected to begin in 2011 and be open to drivers in 2015.



Alaskan Way surface street:

- Four-lane roadway with two lanes in each direction.
- Carries approximately 25,000 vehicles per day.

SR 99 Bored Tunnel Cost

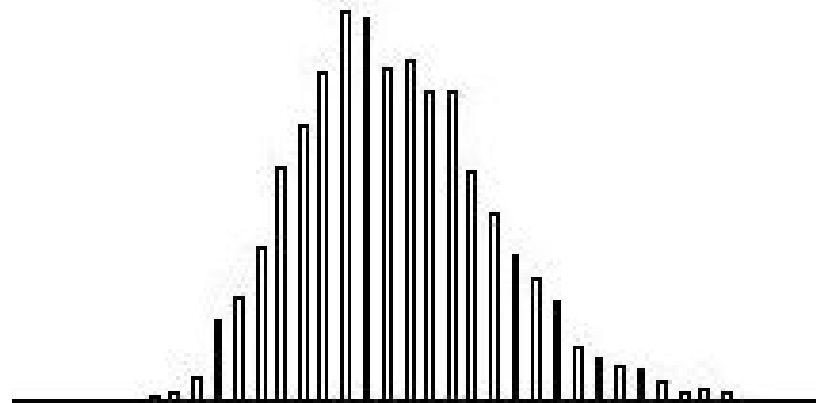
Risk-based estimating nationally recognized as a best practice for mega-projects

Cost
(Millions)

Construction Estimate (bored tunnel only)	\$944
Construction Management and Administration	\$118
Preliminary and Final Design	\$118
Contingency	\$150
Risk	\$268
Escalation (per Global Insight)	\$166
Right-of-Way Costs	\$149
TOTAL	\$1,913



CEVP-Type Cost Range



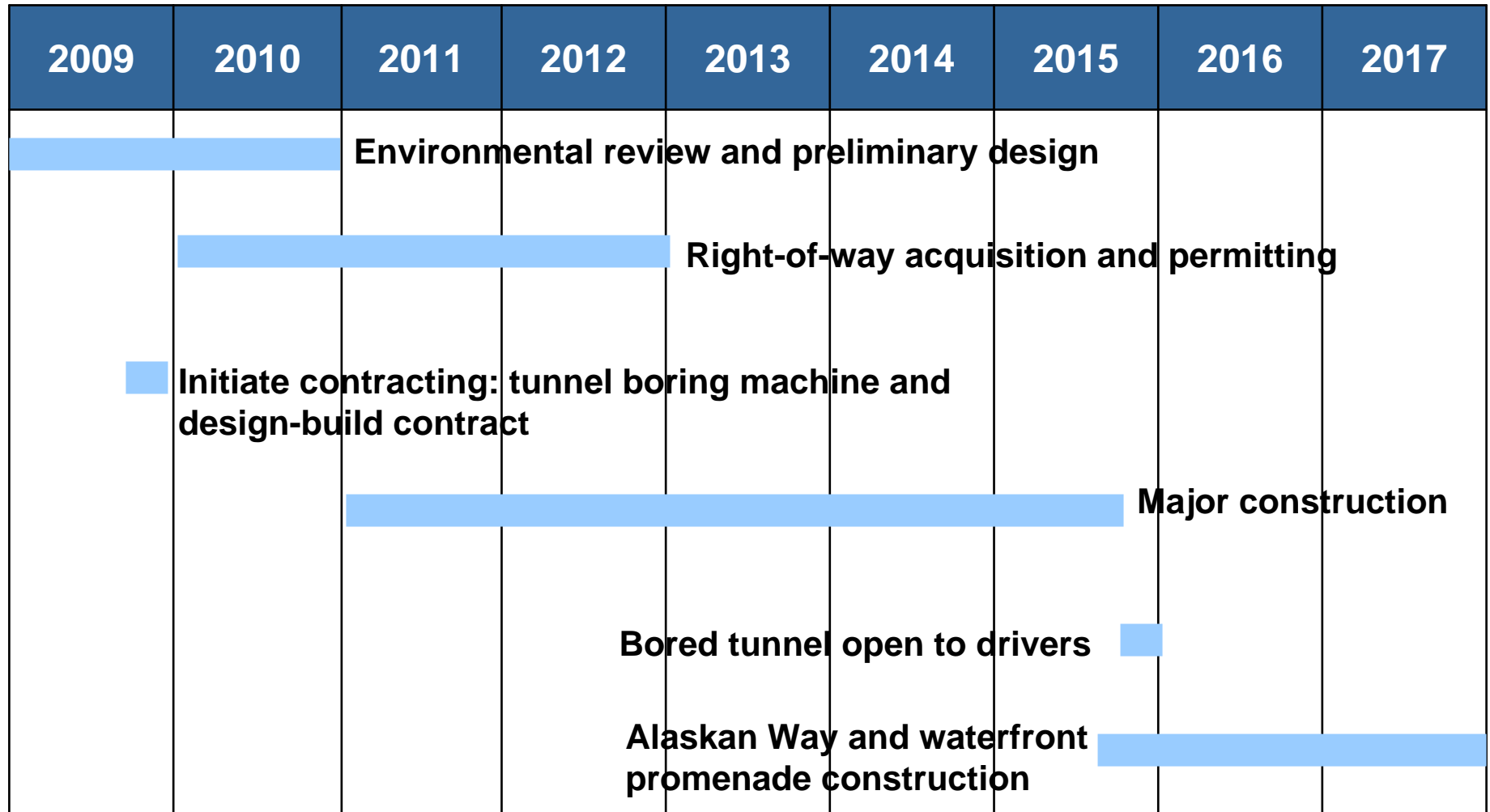
Most Probable Cost (Range)

- **20%** chance the cost is less than **\$1.2 billion**
- **60%** chance the cost is less than **\$1.9 billion**
- **80%** chance the cost is less than **\$2.2 billion**



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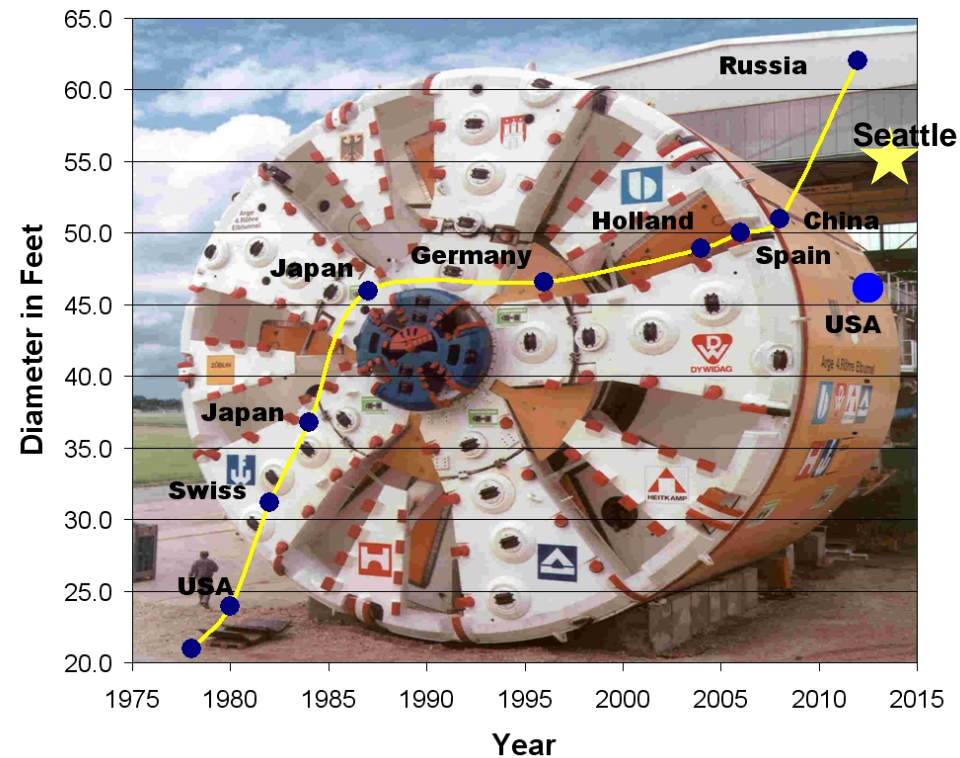
Bored Tunnel Project Timeline



Tunneling Technology

- Tunneling technology is rapidly advancing, with tunnel boring machines as large as 62 feet in diameter on order.
- Successful tunnel boring machine projects:
 - Sound Transit Beacon Hill: 21 feet in diameter
 - Hamburg and Moscow: 46.6 feet in diameter
 - Madrid: 50 feet in diameter
 - Shanghai: 50.6 feet in diameter

Increasing Size of Bored Tunnels



Tunneling in Seattle Soils

Numerous tunnel machines, including several in Seattle, have successfully excavated ground conditions similar to those anticipated. Over 150 tunnels have been constructed in Seattle since 1890, mostly in glacial soils.

Examples include:

- Sound Transit Beacon Hill:
 - Glacial sand, silt, clay and till up to 160-ft depth.
 - Soils were similar to the hard/dense soils along most of proposed alignment.
- Denny Way CSO:
 - Glacial sand, silt, clay and till up to 160-ft depth.
 - Soils were similar to hard/dense soils along most of proposed alignment.



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How is the bored tunnel different from the cut-and-cover tunnel?

Bored Tunnel Hybrid Alternative	Previous Cut-and-Cover Tunnel Alternative
<ul style="list-style-type: none">• Stacked with two lanes in each direction.• Constructed under First Avenue.• Top of tunnel is 30 to 200 feet below the surface.• Viaduct can stay open to traffic while the tunnel is being built.• Construction is estimated to take 4.5 years.• Limits impacts to waterfront businesses.	<ul style="list-style-type: none">• Stacked with three lanes in each direction.• Constructed along the waterfront.• Top of tunnel is 10 feet below the surface.• Viaduct would have been closed for 3.5 years under the “short” construction plan.• Construction was estimated to take 7 years under the “short” construction plan.• Would cause major impacts to waterfront businesses.

Successful Delivery of Bored Tunnel Projects

Examples of Tunnel Excavation in Urban Areas

1. 4th Elbe River, Hamburg: Successfully excavated 1.6 miles at 46.6-ft-diameter.
2. Lefortovo Tunnel, Moscow: Rebuilt Elbe TBM successfully excavated 2 bores each 1.4 miles long at 46.6-ft-diameter. Same machine refurbished for another 2 tunnels in Moscow.
3. Madrid M30 EPB: Successfully excavated 2 bores each 1.3 miles long at 50-ft-diameter by 2 closed-face TBMs built by different manufacturers. M30 diameter was about 10 ft larger than previous TBMs (~50% greater face area).
4. Shanghai Yangtze River Mixshield: Successfully excavated 2 bores each 4.6 miles long at 50.6-ft-diameter. This TBM is the current record holder for diameter. Tunnel completed about a year ahead of original schedule.

Pending Record Holder

Moscow Road/Rail Tunnel: A 62-ft-diameter Mixshield has been ordered. This diameter is 11-ft larger than Shanghai TBM, the current record holder.

Elbe Tunnel Slurry Machine



Madrid Calle M30



Seven tunnel boring machines will be used in the Madrid Calle 30 project

Alaskan Way Bored Tunnel vs. Boston's Big Dig

More differences than similarities

Boston's Big Dig Central Artery/Tunnel

Substantially larger and more complex including:

1. Very disruptive cut-and-cover tunnel through the central city under the existing elevated roadway and 2 subway lines.
 2. A signature cable-stayed bridge over the Charles River, cut-and-cover through South Boston.
 3. Two sets of immersed tubes under the harbor to the airport and the complex interchange with very poor geotechnical conditions.
- Project was disruptive and required extensive traffic management and mitigation.
 - The initial project cost number did not include added scope, mitigation and environmental requirements, inflation and appropriate allowance for risk and escalation.
 - The Central Artery/Tunnel did not have a strong agency management or consistent leadership throughout the course of the project.
 - As a result, the project was delivered grossly over budget and years behind schedule.

	Bored Tunnel & South End Project	Big Dig Projects
Total Project Length	2.8 miles	8 miles
Number of tunnels*	1	3
Length of tunnels*	2 miles	5 miles
Total lane miles	12.8 miles	>161 miles

*Boston Big Dig tunnels included cut-and-cover, immersed tubes, jacked tunnel and other special tunneling methods.

SR 99 Bored Tunnel

- Project will run 30-200 feet underground minimizing traffic disruption and impacts to the waterfront and downtown
- WSDOT uses the CEVP® process on all state projects over \$100M to ensure costs are complete, reasonable, defensible and appropriately represent risk and uncertainties.
- WSDOT is a strong owner in policy, management and technical capability and Governor Gregoire is project authority
- WSDOT will maintain this strength over the life of the project, assisted by eminent private-sector engineers and contractors
 - Accountable to the public, Governor and Legislature



County Projects

Transit Investments

- Provide more frequent and direct service, available to more people.
- Utilize regional rail and bus investments.
- Create more access to transit and information that helps people use transit.
- Protect of our economic vitality, our environment and quality of life.
- Increase daily transit ridership by 17,000 riders a day.



Motor Vehicle Excise Tax (MVET)

What is it?

- Tax based on value of vehicle paid at the time of registration.
- Need Washington State legislative authority to impose MVET.
- Asking for a 1% MVET on all vehicles in King County (medium and heavy duty trucks exempt)

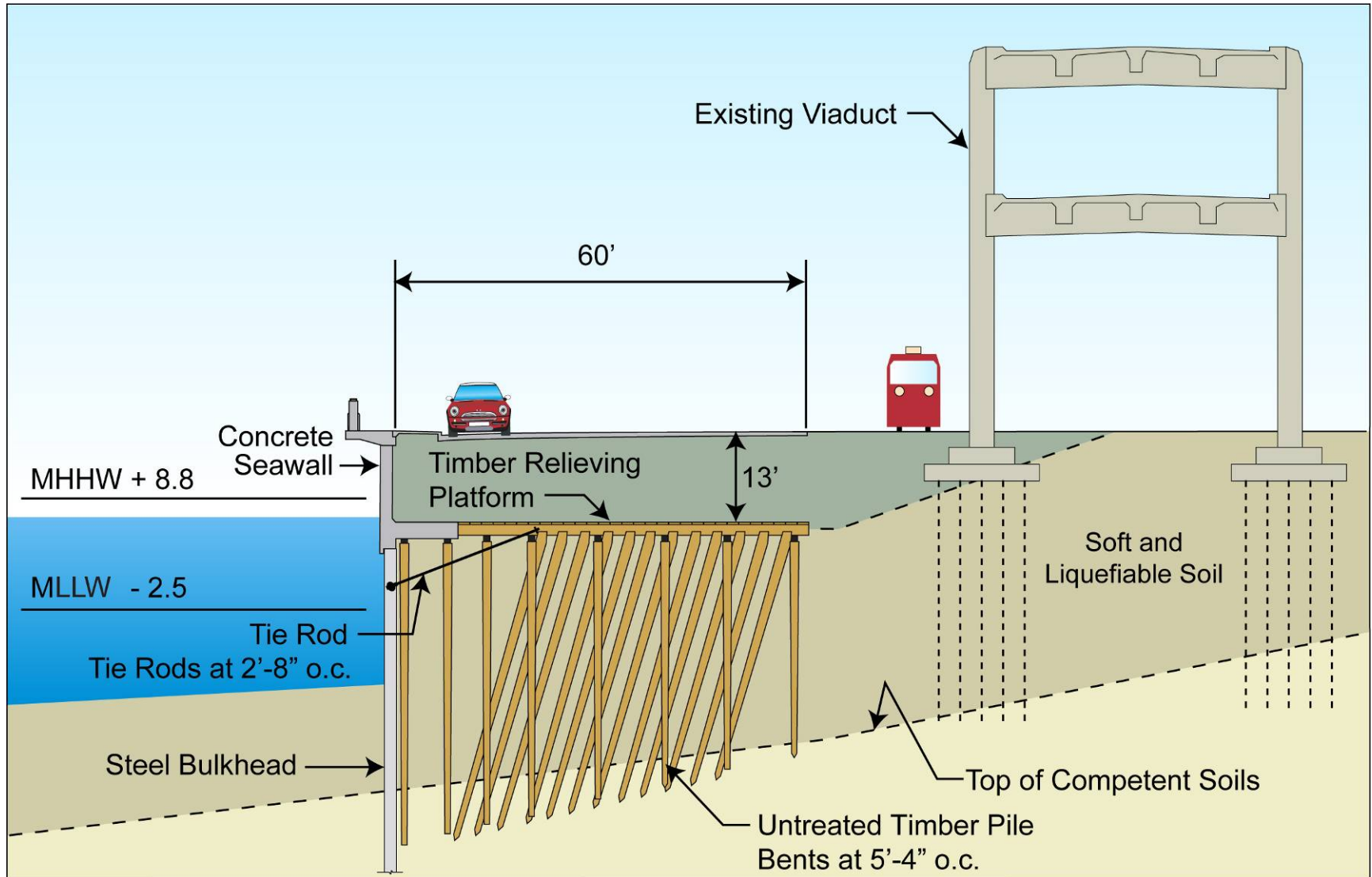
What can the 1% King County MVET do?

- Estimate annual yield of \$120-145 million.
- Approximately \$100/vehicle.
- Revenues will be used to:
 - Fund transit service associated with the project.
 - Fill the Metro sales tax shortfall.
 - Expand Metro's transit system.
- Provides stable revenue source to sustain ongoing transit service

City Projects

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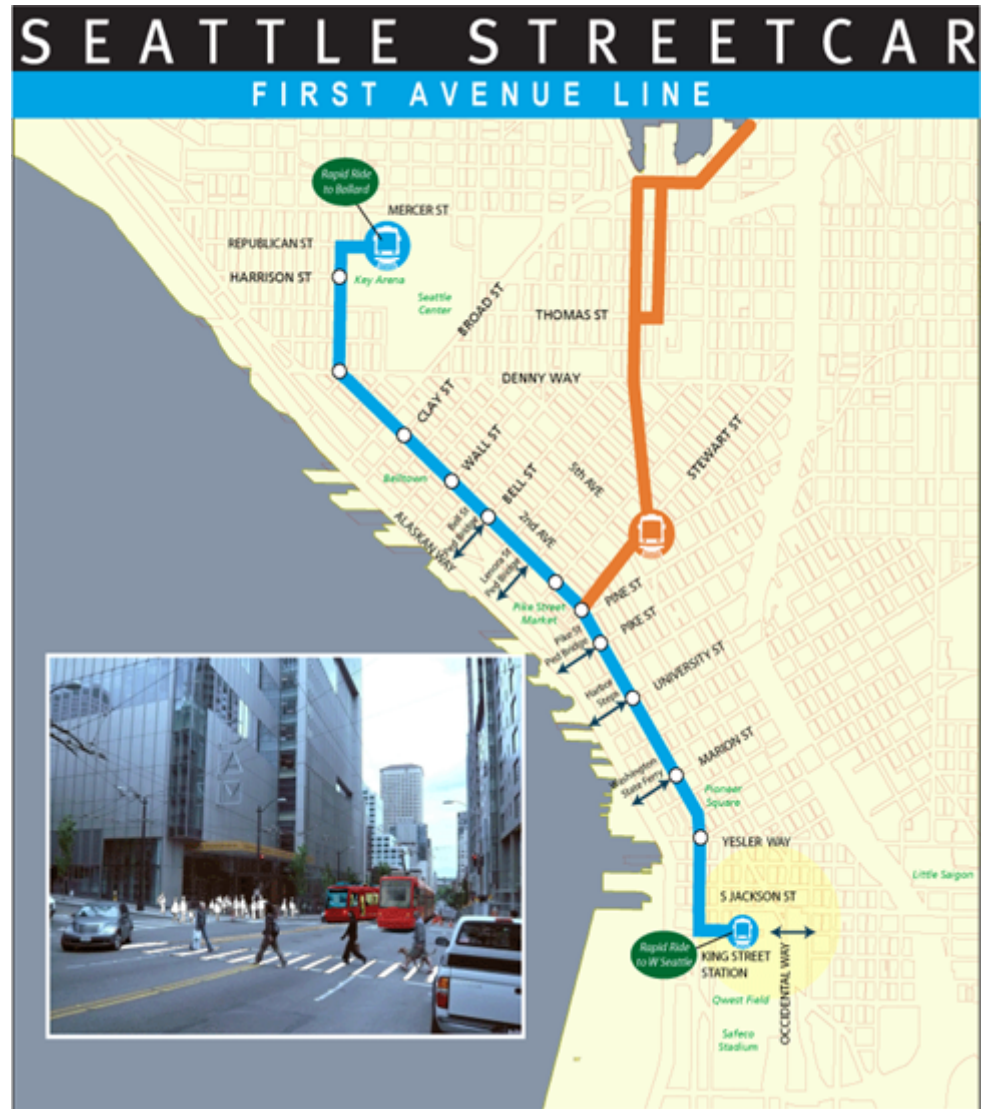
Replacing the Seawall (Washington to Pine)



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First Avenue Streetcar

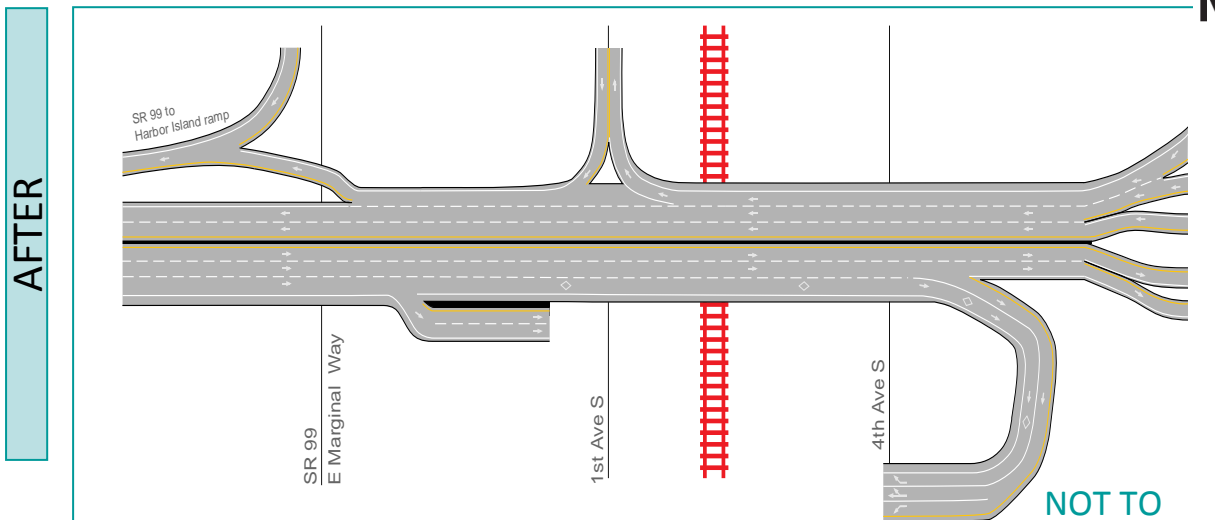
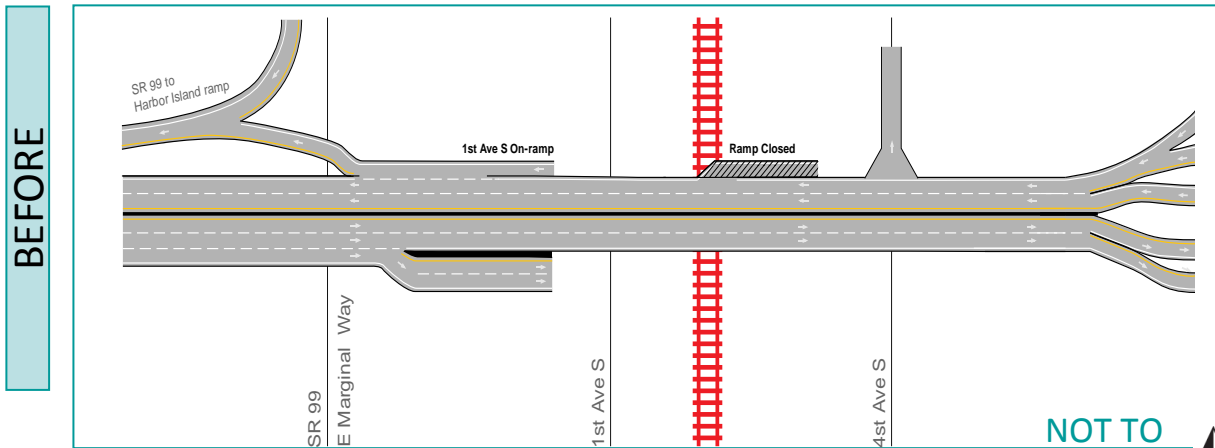
- Connects to the First Hill Streetcar.
- Connects to Ballard and West Seattle RapidRide lines.
- Connects to Amtrak, Commuter Rail and Light Rail at King Street Station.
- Provides easy access to Colman Dock.
- Connects major activity centers: Seattle Center, Pike Place Market and the stadium area.



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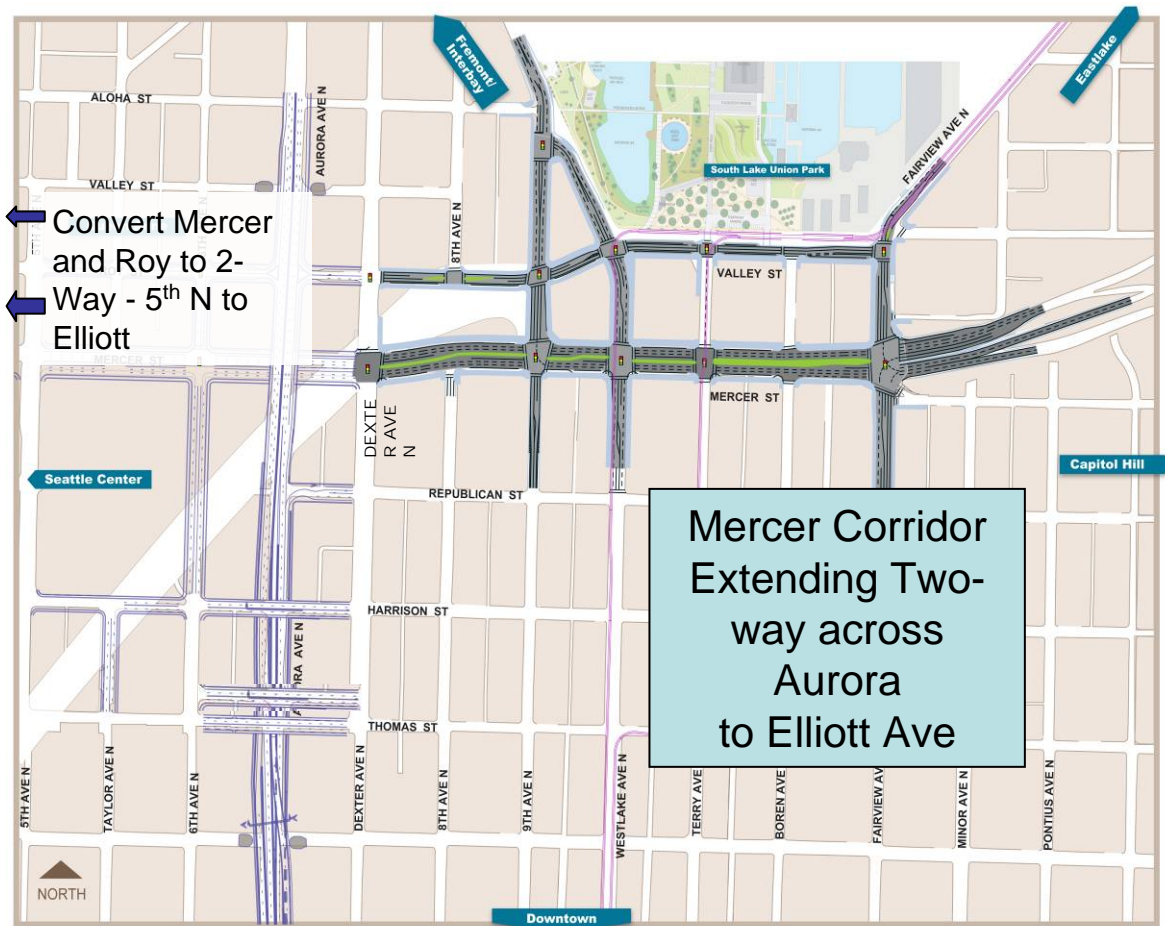
Spokane Street Project

- Provides critical connections between the Port, West Seattle, I-5, I-90 and SR 99.
- Improves westbound traffic flow and safety.
- Minimizes conflicts between freight, rail, commuters and ferry traffic.



Mercer Corridor Project

- Creates enhanced east-west connections.
- Improves connections from Ballard/Magnolia/Interbay to I-5 and the bored tunnel.
- Removes barriers, such as turn restrictions, and makes it easier to get around by car, truck, foot or bike.
- Enhanced connections between high density neighborhoods as well as the Seattle Center.



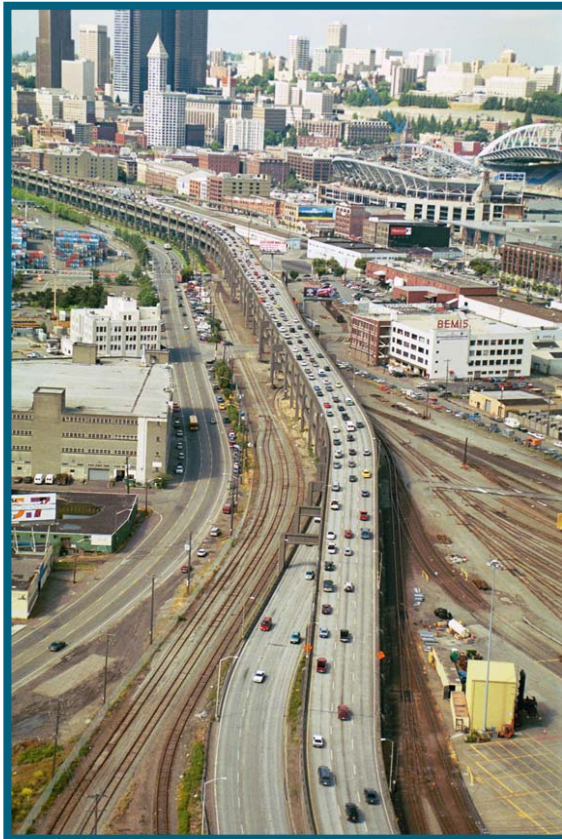


Next Steps

- Coordinate with freight community to ensure viable freight routes and connections.
- Get legislative approval for necessary funding.
- Work with the City, County and Port to coordinate project implementation.
- Complete environmental review process.
- Develop additional preliminary engineering and soils exploration.
- Meet with community groups and businesses to finalize design.

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Alaskan Way Viaduct and Seawall Replacement Program



Follow our progress: www.alaskanwayviaduct.org

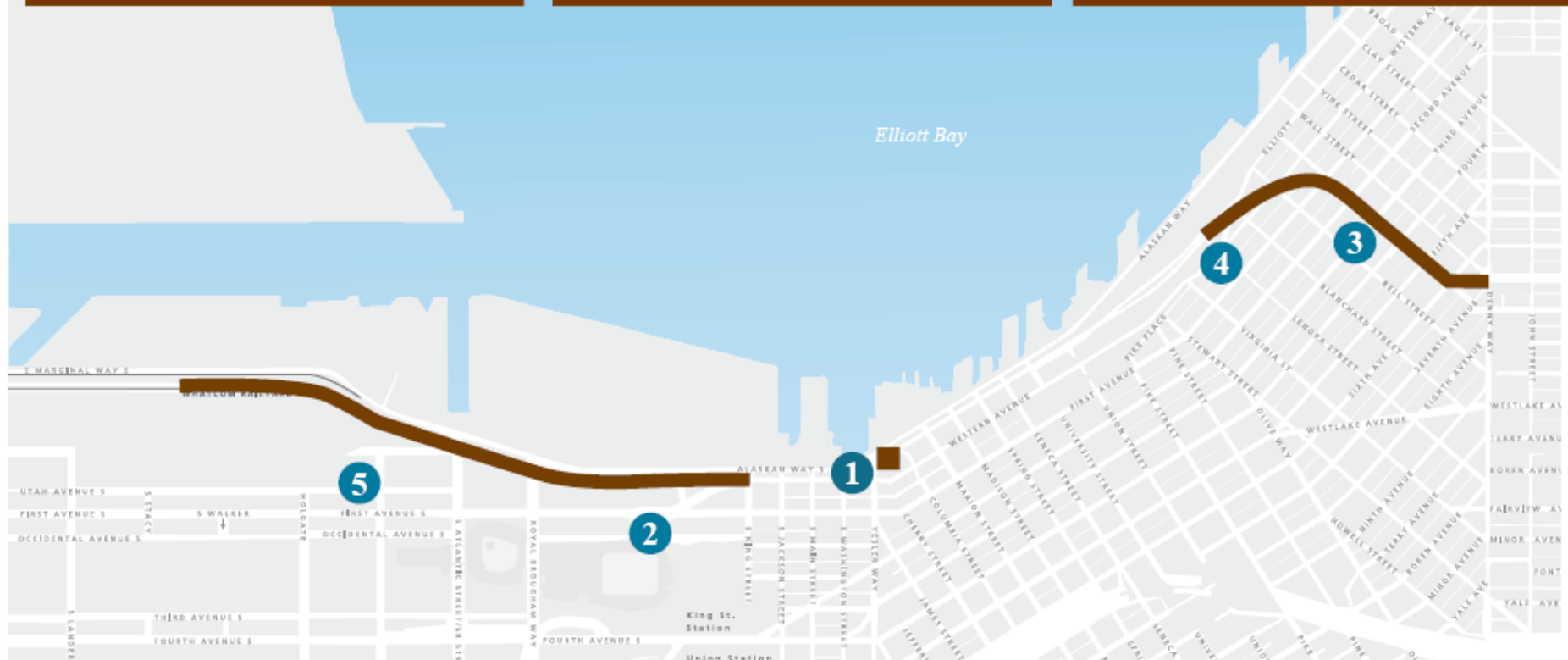
Back Pocket

Moving Forward Projects

1 Stabilize four columns foundations between Columbia Street and Yesler Way

2 Relocate electrical lines between South Massachusetts Street and Railroad Way South

3 Upgrade the fire and life safety systems in the Battery Street Tunnel



4 Stabilize the viaduct between Lenora Street and the Battery Street Tunnel

5 Replace the viaduct from South Holgate Street to South King Street

6 Implement transit enhancements and other improvements