Table of Contents

LIST OF FIGURES

APPENDICES

CHAPTER 1

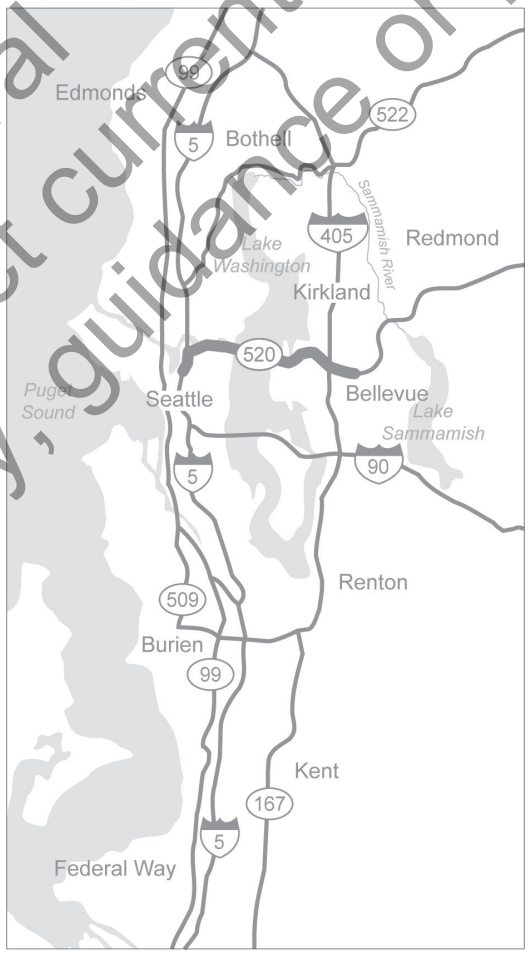
Introduction and Summary

Accelerated Construction Technology Transfer (ACTT) is a strategic process that brings together experts from both the private and public sectors to identify innovative techniques, methods, approaches, and technologies to reduce construction time on major highway projects while enhancing safety and improving quality.

The Federal Highway Administration (FHWA) and the Washington State Department of Transportation (WSDOT) selected the SR 520 Bridge Replacement and HOV Project (SR 520 Project) for review within an ACTT workshop. The project was selected based on the urgent need to replace the bridge, its complexities, lengthy estimated construction duration, and overall regional magnitude. As shown in Figure 1, SR 520 is one of only two crossings of Lake Washington that link Seattle to east King County including the cities of Kirkland, Bellevue, and Redmond. The SR 520 Project includes the Evergreen Point Bridge and it is the replacement of the floating pontoon section, fixed approach structures, and adjacent highway sections that are the subjects of the ACTT workshop. Figure 2 illustrates the project limits and highlights key project elements within the corridor.

The SR 520 Project's ACTT Workshop was held March 16-18, 2004, in Seattle, Washington, and brought together nearly 100 experts from around the country.

Figure 1. SR 520 Project Location



1.1 PROJECT SCOPE

The scope of the SR 520 Project is to replace the Evergreen Point Bridge, including the fixed approach structures and floating pontoon sections, and to improve the highway sections and interchanges on SR 520 between Interstate 5 (I-5) and Bellevue Way NE.

This section of SR 520 currently has an Average Daily Traffic (ADT) of 114,000 vehicles and operates near capacity for over 13 hours during each weekday. SR 520 is a critical corridor for commuters traveling in both directions across the lake with both morning and evening peak period auto volumes split evenly between those traveling to Eastside cities and those coming to Seattle.

An average of one accident per day occurs on the Evergreen Point Bridge. Since the facility does not have shoulders, any incident poses high safety concerns and congestion costs. Additionally, the SR 520 floating and fixed structures are vulnerable to both wind and seismic events, respectively. Figure 3 depicts these vulnerabilities. It is the vulnerability of these critical structures, coupled with the functional obsolescence of the corridor's infrastructure that has made this project a high priority for WSDOT and subject of this ACTT Workshop.

1.2 ACTT WORKSHOP MODIFICATION

The workshop began with comments from Rick Smith, WSDOT's Director of Innovative Project Delivery, who spoke of the differences between this and previous ACTT workshops. Previous workshop formats divided attendees into discipline-specific "skill sets" such as structures, soils and foundations, roadway, and traffic. These "skill set" groups typically met for two half-day working sessions to identify and evaluate opportunities to expedite design and construction, and accelerate project delivery. For the SR 520 Project's ACTT Workshop, skill set groups met only on the first day. On the second day, skill set groups were re-organized into geographical focus groups. This approach allowed multidisciplinary teams to tackle issues and make recommendations in each of three distinct geographic areas.

1.3 WORKSHOP PRIORITIES AND PROJECT OVERVIEW

Dan Mathis, FHWA Washington Division Administrator; John Conrad, TRB A5T60 Task Force Member and WSDOT Assistant Secretary of Engineering and Regional Operations; and Pete Rahn, TRB A5T60 Task Force Member and former Director of the New Mexico State Highway Department, also gave opening remarks. John Conrad identified the following priorities for the ACTT Workshop:

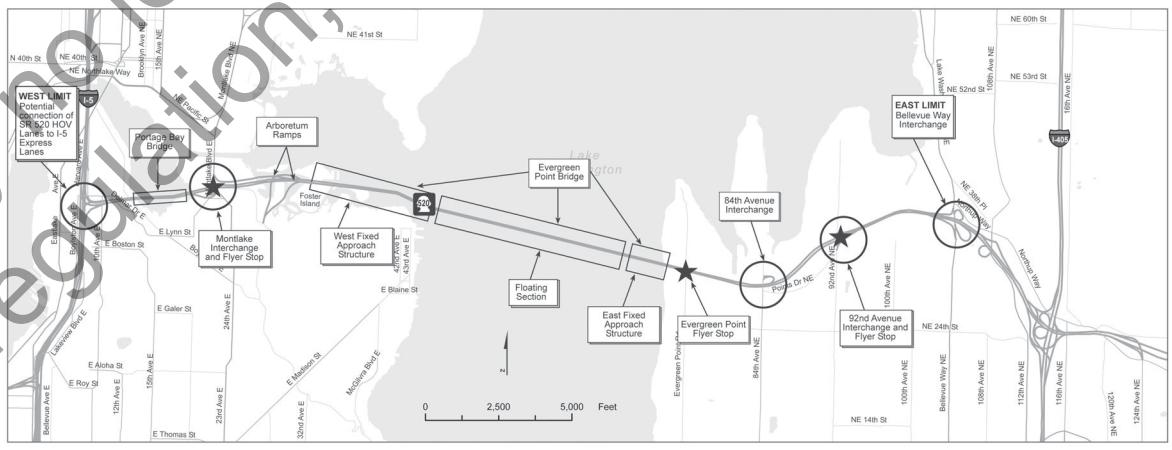
- Maximize customer satisfaction.
- Minimize environmental and socioeconomic impacts.
- Minimize traffic congestion.
- Enhance safety and mobility.
- Reduce construction time.
- Improve quality of product.

Maureen Sullivan, WSDOT SR 520 Project Director, discussed the project history and described the goals of the project. Julie Meredith, WSDOT SR 520 Engineering Manager, provided an overview of the components of the project alternatives and gave a current project development status report.

1.4 SKILL SETS AND GEOGRAPHIC GROUPS

Participants were taken on a tour of the project area to see first hand the current facility, environmental setting, today's congestion, and locations of possible opportunities or problems. Skill Set groups included: Innovative Contracting and Finance, Environmental and Right-of-Way, Construction, Geotechnical/Materials, Roadway/Geometric Design, Structures, and Traffic/ITS/high-occupancy vehicle (HOV)/Transit. At the end of

Figure 2. Overview of Existing Project Elements



the afternoon, each Skill Set group reported back with "First Thoughts" on findings. These "First Thoughts" provided direction to the Geographical Focus Group efforts the following day. The Geographical Focus Groups met for the entire second day. The Groups included: Westside, Floating Bridge and Approaches, and Eastside. At the beginning of the second day, participants were given an additional challenge to consider issues surrounding a possible first construction phase (or Phase 1) of the project to replace the most vulnerable bridge structures and provide an HOV facility at least across the lake if not the full length of the corridor. At the close of the morning session, each Group reported back with their "Preliminary Findings" to help direct the afternoon sessions' efforts toward developing "Final Recommendations." The "recommendations" were presented on the third and last day of the workshop.

1.5 RECOMMENDATIONS

Maureen Sullivan, WSDOT SR 520 Project Director, closed the workshop proceedings on the third day recognizing and commending the participants for their enthusiastic engagement and comprehensive contributions to the process. She commented on the creativity and usefulness of the ideas and stated that a number of them will help the project team's thinking in design and construction. She summarized the major findings of the workshop in the areas of construction, the scope of major project elements, traffic control, contracting methods, and overall project funding strategies that WSDOT will take under consideration.

Project Elements:

- The current planned alignment of the east touchdown of the lake crossing should be retained and right-of-way north of the east touchdown should be purchased.
- Use Portland Cement Concrete Pavement (PCCP) rather than Asphalt Concrete Pavement (ACP).
- Consolidate flyer stops on the Eastside.
- Accommodate bicycle facilities on the lids.
- Examine phasing opportunities and/or facility consolidation for the Montlake Flyer Stop and Portage Bay HOV lanes that may be presented by final decisions on Sound Transit's North Link alignment and possible LRT station near Husky Stadium.

Contracting Issues:

- Design/Bid/Build as the preferred contracting method for floating bridge.
- Establish early in the process a project delivery, procurement, and contracting committee.
- Divide construction of the floating bridge into two or more contracts.
- Identify opportunities for Design/Build contracts for the east and west approach sections.
- Conduct pre-design workshops with contractors.
- Incorporate constructability reviews as part of the annual Cost Estimation Validation Process (CEVP) update.
- Establish a risk management team to review, manage, and re-assess identified and new risks and opportunities for each project element and phase.
- Evaluate additional techniques to provide contractors greater flexibility.
- Evaluate a range of accelerated construction opportunities.
- Expedite the geotechnical investigations.

Maintenance of Traffic and Construction Traffic Control Issues:

- Review the benefits, impacts, and mitigation requirements of different closure options, including

lane reductions, weekend and night closures, and longer periods of total bridge closure.

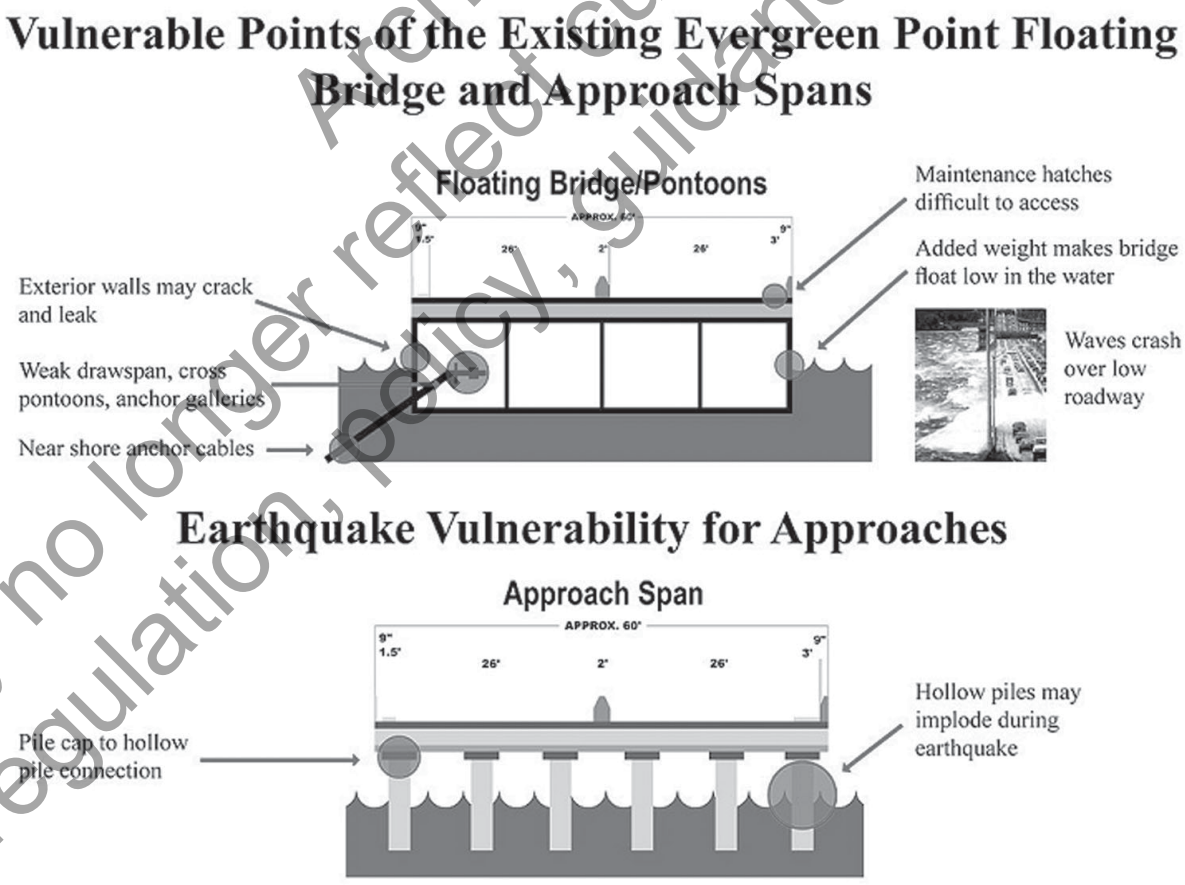
- Review the opportunities, impacts, and mitigation requirements of a temporary roadway between Montlake and the floating bridge.
- Review the effects of the temporary closure of Lake Washington Boulevard off- and on-ramps through the Arboretum.

Funding Strategies:

- Expand and perhaps redefine the tolling subcommittee as a "funding strategy group."
- Develop minimal goals and long-term plans for funding.
- Connect cash flow needs to funding mechanisms and sources.
- Implement an accelerated "Phase 1" project. Cost savings and accelerated toll collection resulting from the accelerated implementation of a "Phase 1 Project" focused upon replacement of the Evergreen Point Bridge could potentially save 1-2 years in construction time.
- Incorporate a testing of cost reductions and new cash flow in the CEVP process.
- Explore the array of existing and new funding sources suggested by participants.

Finally, it was noted that projections made by workshop participants indicated an opportunity to save 1-2 years in construction time.

Figure 3. Floating Bridge/Pontoons and Approach Span



CHAPTER 2

ACTT Background & Purpose

2.1 WHAT IS ACTT?

ACTT is a strategic process that brings together experts from both the private and public sectors to identify innovative techniques and technologies to reduce construction time on major highway projects while enhancing safety and improving quality. The ACTT concept was originated by a joint American Association of State Highway and Transportation Officials (AASHTO) and Transportation Research Board (TRB) task force known as A5T60 and is now an adopted and encouraged process sponsored by the FHWA and AASHTO's Technology Implementation Group (TIG).

TRB's A5T60 Task Force found that the combination of unprecedented increases in traffic volumes, decreased funding levels, heightened public concerns, and the significant problems of preserving and managing an aging infrastructure demands new tools for dealing with highway construction needs. Historically, highway construction has taken too long, further compounding traffic congestion.

The ACTT workshop initiative began in 2002 with two pilot workshops held in Indianapolis, Indiana, and Pittsburgh, Pennsylvania. The workshops brought together staff from the host department of transportation (DOT) and experts from other state DOTs, transportation agencies, private industry, academia, and the FHWA. In addition to design and construction, these experts' skill areas typically included innovative financing, right-of-way, utilities, innovative contracting, work zone traffic control, and worker safety reflecting the many disciplines required to accelerate construction of a highway project.

Following the successful completion of the Indiana and Pennsylvania ACTT pilot workshops, the following states have conducted workshops:

- Texas, Project Pegasus ~ Reconstruction of IH-30 and IH-35 SE;
- California, French Valley Parkway Interchange;
- Louisiana, mini-workshop;
- Montana, US-93 Eva to Polson; and
- New Jersey, mini-workshop.

Additional 2004 workshops are scheduled in (also indicated in Figure 4):

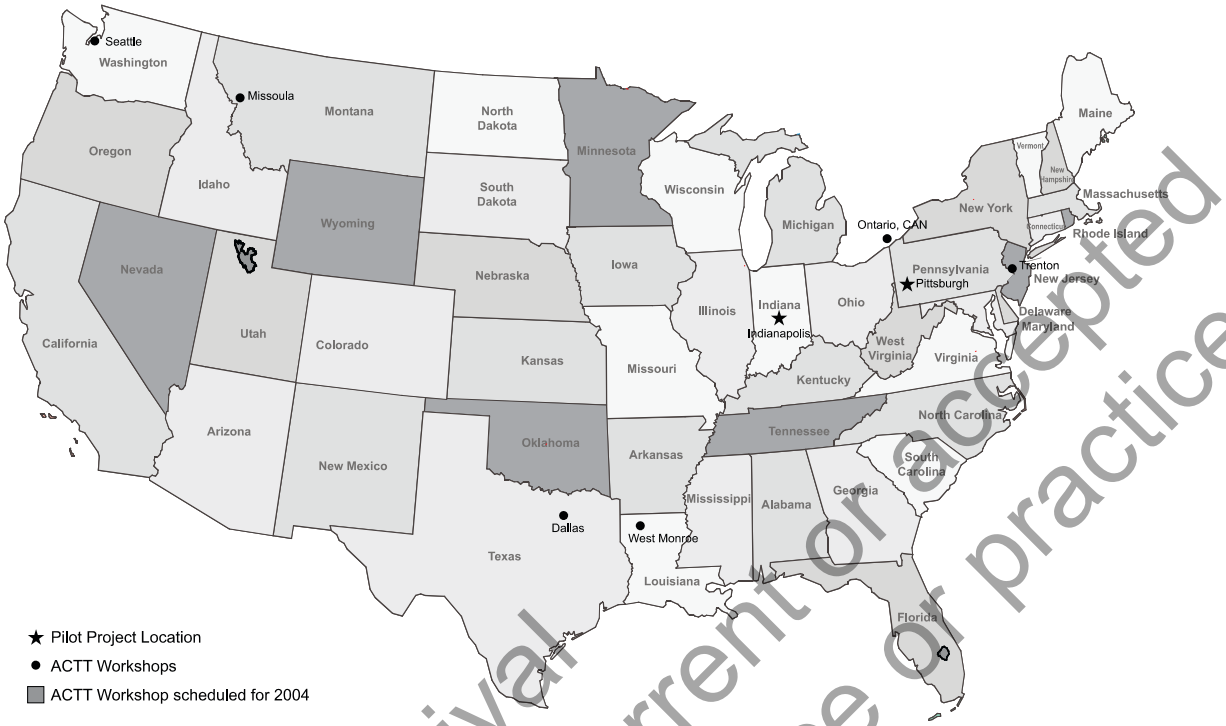
- Tennessee
- Minnesota
- Oklahoma
- New Jersey

Due to ACTT workshop success, many states are interested in using this process, including (also indicated in Figure 4):

- Utah
- Georgia
- Rhode Island
- Hawaii
- Massachusetts
- Wisconsin
- Nevada
- Maryland
- Idaho
- Virginia

More information on the ACTT program is available at:
www.fhwa.dot.gov/construction/accelerated/index.htm

Figure 4. ACTT Workshop Locations



2.2 WHY WAS THE SR 520 PROJECT CHOSEN FOR AN ACTT WORKSHOP?

The SR 520 Project was chosen for an ACTT workshop because of its magnitude and complexities. SR 520 is one of only two major state highways that cross Lake Washington between Seattle and the suburban communities of Bellevue, Redmond, and Kirkland connecting the regions two north/south interstate freeway of I-5 and I-405. SR 520 ADT is 114,000 vehicles per day (2002) and 2030 traffic forecasts predict 128,000 vehicles per day. SR 520 includes the Evergreen Point Bridge and it is the replacement of the main floating portion, its fixed approach structures, and adjacent freeway sections that are the subject of the ACTT workshop. The Evergreen Point Bridge is a 4-lane facility (two general purpose lanes in each direction with no shoulders) that is already operating at or beyond capacity for significant periods each day. The bridge structures are vulnerable to both windstorms and seismic events. Adequate funding is not available in the State's preservation program to replace the bridge, requiring innovative solutions for bridge replacement. Additionally, the public is watching this project closely, especially those living on each side of the bridge and along the corridor.

2.2.1 PROJECT PURPOSE

The purpose of the SR 520 Project is to replace the aging and functionally obsolete Evergreen Point Bridge with a modern transportation facility and undertake other corridor improvements. Depending on the alternative chosen for construction, the bridge and highway corridor improvements may include provisions for HOV traffic. The project is currently in the draft Environmental Impact Survey (EIS) stage and is expected to complete all environmental reviews leading to a Record of Decision (ROD) by the summer/fall of 2006.

2.2.2 PROJECT HISTORY

The current project is a continuation of previous studies that examined mobility and environmental issues in the corridors crossing Lake Washington. WSDOT's Urban Planning Office (formerly the Office of Urban Mobility) conducted the Trans-Lake Washington Study in 1998 and 1999 and began the Trans-Lake Washington Project in 2000. In 2001, the project moved from planning to the SR 520 Project Office in the newly formed Urban Corridor's Office (Region 8).

The Trans-Lake Washington Study was focused on travel across and around Lake Washington in a study area bounded by the Snohomish-King County line on the north and the confluence of I-5 and I-405 to the south. A variety of options were developed and evaluated to determine their overall effectiveness in improving cross-lake mobility. The most attractive options were combined into "solution sets." The solution sets were not intended as optimal, but instead to be illustrative and educational, showing the effectiveness, impacts, and costs of different approaches to improving mobility, and illustrating how different transportation methods and modes interact with one another. Based on the evaluation of the solution sets those elements that seemed to work well and which found widespread support were identified. The Trans-Lake Washington Project carried the early studies forward and eventually led to the current SR 520 Project.

2.2.3 PROJECT ALTERNATIVES

The alternatives under consideration in the Draft EIS include:

- No Build Alternative – SR 520 would remain as it exists today.
- 4-Lane Alternative–replaces the Portage Bay Bridge and the Evergreen Point Bridge (including both the fixed approaches and floating pontoons), improves the existing 4-lane facility of SR 520 with lanes and shoulders redesigned to current WSDOT and FHWA design standards, and adds a bicycle and pedestrian pathway from Montlake Boulevard to Points Loop Drive. In addition, a westbound-to-southbound only connection from SR 520 to the I-5 Express Lanes would be provided to enhance vehicular movement for HOVs and bus transit during the morning peak period. This alternative would also include aggressive transportation demand management (TDM) strategies and noise mitigation. This alternative includes two options for the floating bridge—one with pontoons that would accommodate the future addition of High Capacity Transit (HCT), and one with pontoons that would not provide for future widening options.
- 6-Lane Alternative – includes facilities mentioned above and adds one HOV lane in each direction, making SR 520 a six-lane facility. Floating bridge pontoons would be designed to accommodate the future addition of HCT to the corridor. Because of the addition of HOV lanes to the corridor, a reversible HOV/transit connection from SR 520 to the I-5 Express Lanes is also included.
- 8-Lane Alternative – includes facilities described in six-lane alternative and adds one additional general purpose lane in each direction, making SR 520 an eight-lane facility. Floating bridge pontoons would also be designed to permit future widening for the potential addition of HCT to the corridor.
- All build alternatives are assumed to be tolled, using electronic toll collection (ETC) only.
- The anticipated construction time for the project alternatives ranges from 6 to 10 years dependent upon funding availability.

2.3 HOW WAS THE SR 520 WORKSHOP CONDUCTED?

WSDOT, in association with FHWA and AASHTO, hosted a two and a half day long ACTT Workshop for the SR 520 Bridge Replacement and HOV Project on March 16-18, 2004, in Seattle, Washington, at the Seattle

Sheraton Hotel. Over 80 professionals from 14 states and the District of Columbia attended the workshop and actively contributed to the process. A list of workshop attendees is provided in Appendix A.

A pre-workshop planning and strategy session was conducted on February 11, 2004, at the Washington Division of the FHWA in Olympia, Washington. During that meeting with WSDOT Office of Innovative Project Delivery (IPD) and the FHWA ACTT Management Team, it was decided to modify the format of the workshop breakout sessions with the intent to capture both discipline-specific and project area issues. The workshop was extended from 2 days to 2-1/2 days to allocate a half-day to discipline-specific discussions and to allocate a full day to multi-disciplined groups focused upon the three major project areas. For the first half-day breakout session, members were grouped into "skill sets" to identify discipline-specific issues, concerns, and opportunities related to accelerating project delivery (including both project development and construction). WSDOT selected the following skill set areas most applicable to the project for the ACTT Workshop:

- Innovative Contracting and Finance
- Environmental and Right-of-Way
- Construction
- Geotechnical/Materials
- Roadway/Geometric Design
- Structures
- Traffic/ITS/HOV/Transit

For the second full-day breakout session, participants were grouped into multi-disciplined teams focused upon one of three project areas. Areas selected by the SR 520 Project Team included:

- Westside (generally from I-5 to the west bridge approach structure).
- Floating Bridge and Approaches (generally west shore of the lake to the east shore including both the fixed approach and floating pontoon structures of the Evergreen Point Bridge).
- Eastside (generally from the east bridge approach structure to just east of the Bellevue Way NE interchange).

2.4 WHAT WERE THE GOALS OF THE SR 520 WORKSHOP?

The goals that ACTT workshop participants were asked to address were established by the SR 520 Project Team and the workshop sponsors prior to the beginning of the process and were provided to participants to guide their work. These goals included the following:

- Identify strategies to shorten the design and construction duration of the overall project. Existing project elements (see Figure 2) were considered as the participants identified strategies to shorten the design and construction duration of the overall project.
- Reduce construction time of Phase 1 (at a minimum, defined as the floating portion and fixed approach spans) and subsequent phases of the project. Phase 1 as defined for the ACTT Workshop is shown later in Figure 6.
- Identify options for construction staging, sequencing, and phasing beyond Phase 1.
- Minimize construction impacts to abutting neighborhoods and sensitive environmental resources.
- Analyze and recognize constructability during the project development and design phases.
- Obtain contractor innovation and involvement during the project development and design phases.

- Maximize maintenance of traffic within the corridor during construction and minimize impacts to local traffic.
- Identify construction elements resulting in near-term benefit to the users (e.g., HOV and Transit).
- Establish and define environmental, community, and other public constraints early.
- Identify and evaluate alternative project delivery methods including applicability, benefits, and disadvantages.
- Identify creative financing strategies (including tolling) and assess annual cash flow needs.
- Conduct risk assessment of potential project impediments and develop risk management strategies.
- Suggest efficient organizational structures and required teams to ensure corridor-wide project delivery (e.g., program management, financing implementation, quality assurance).

2.5 WHAT WERE THE OBJECTIVES OF THE SR 520 WORKSHOP?

Based on the adopted workshop goals the following key objectives were established:

- Shared Understanding – Ensure a common understanding of discipline-specific design challenges associated with project alternatives.
- Collaboration – Provide an early venue for information exchange and innovation between owners, designers, contractors, and project partners.
- Brainstorming – Promote free exchange of ideas, concepts, techniques, and methods applicable to specific skill sets, multidiscipline design approaches, and innovative construction techniques and methods.
- Integration – Establish initial relationships and foster ongoing development of concepts, ideas, and strategies focused on accelerated project delivery via multidisciplined teams.

2.6 WHAT WERE THE BASELINE ASSUMPTIONS FOR THE SR 520 WORKSHOP?

In addition to establishing the goals and objectives for the workshop, a set of baseline assumptions or "ground rules," designed to focus participant's efforts, were also established. These baseline assumptions included the following:

- All project alternatives are currently being evaluated under the guidelines for the preparation of an EIS subject to the policies and procedures established under the National Environmental Policy Act (NEPA) and the State Environmental Policy Act (SEPA) for the State of Washington.
- A "Preferred Alternative" for the project has not been recommended nor adopted. The 6-Lane Alternative has been identified for consideration solely for the purposes of the ACTT Workshop. The information and ideas generated will be used to benefit the 4- and 8-lane alternatives as well.
- Significant changes to the definition of the alternatives will not be considered unless they reduce impacts, have distinctive cost advantages, or provide considerable quality enhancements. The "build" alternatives under consideration within the EIS are generally well defined and developed in collaboration with neighborhoods, jurisdictions, and regulatory agencies. These definitions recognize a number of environmental and neighborhood concerns and constraints and address various issues associated with the existing corridor.

CHAPTER 3

ACTT Background & Purpose

For the first half-day breakout session, members were grouped into skill sets to identify discipline-specific issues, concerns, and opportunities related to accelerating project delivery (including both project development and construction). WSDOT selected the following skill set areas most applicable to the project for the ACTT Workshop:

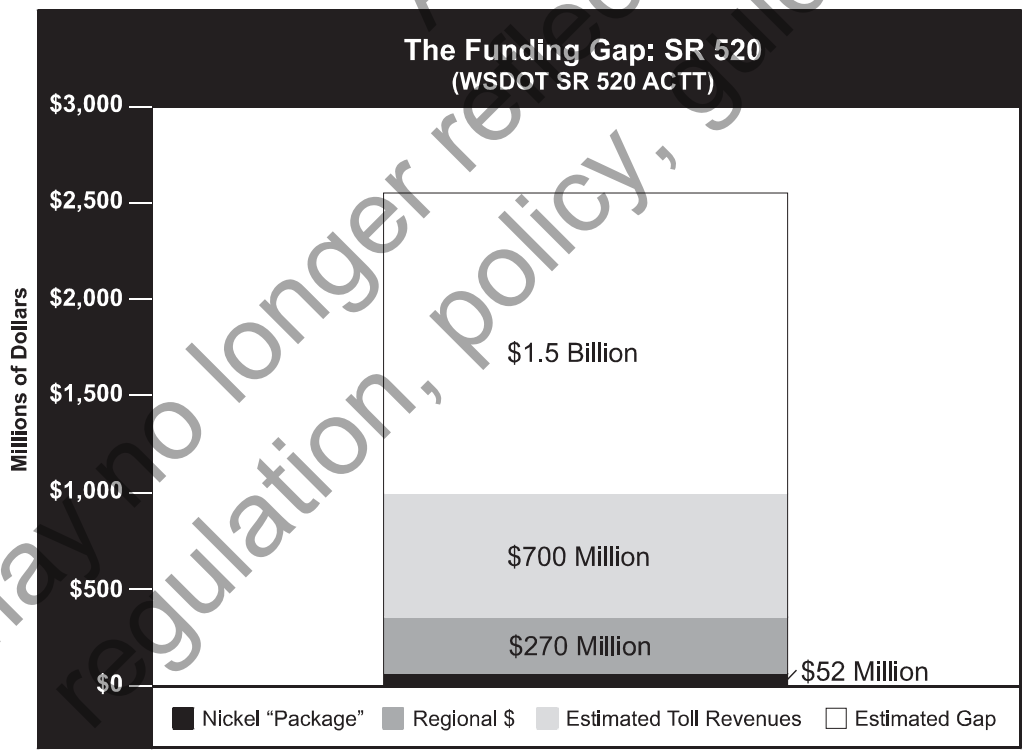
- Innovative Contracting and Finance.
- Environmental and Right-of-Way.
- Construction.
- Geotechnical/Materials.
- Roadway/Geometric Design.
- Structures.
- Traffic/ITS/HOV/Transit.

Skill set "First Thoughts" were presented to all participants at the end of the first day. These "First Thoughts" provided an overview of the issues and direction to the Geographical Focus Groups meeting on the second day.

3.1 FIRST THOUGHTS – INNOVATIVE CONTRACTING AND FINANCE

The group presented a summary of current financing requirements for the project. The group assumed the full 6-lane alternative would be selected for implementation, with a range in costs of $2.1 to 2.6 billion (based on 2003 CEVP cost opinions). Figure 5 illustrates the current funding gap assumed by the group, accounting for available funds under the current "Nickel Gas Tax Package," modest regional funding, and potential revenues generated from project tolling.

Figure 5. The Funding Gap



Next the group identified a number of general categories of potential funding sources that would be pursued during the balance of the workshop. These included the following:

- Tolling Concepts.
- Land Development Concepts.
- Partnerships.
- State Revenue Sources.
- Federal Grant Funding Opportunities.
- Project Concessions.

3.2 FIRST THOUGHTS – ENVIRONMENTAL AND RIGHT-OF-WAY

The Environmental and Right-of-Way skill set reviewed the project alternatives and discussed the specific issues associated with each. Key ideas and suggestions associated with specific project elements were presented, and include the following:

Lake Washington Blvd On- and Off-Ramps

- Remove ramps from the Arboretum.
  - Provides environmental and park benefits.
  - Reduces traffic problems at these ramps.

Queen City Yacht Club Right-of-Way

- Consider new docks under the highway.
  - Dredging may be needed.
  - Security concerns regarding boats docked under the bridge.

Demonstrate Project as an Environmental Benefit to Resource Agencies

- Oregon has a very large bridge program that has successfully been characterized this way to the resource agencies – "green bridge program."
- Compensate resource agency for staff time spent on the project.
- Hold weekly meetings with resource agencies.
- Focus on functions resource agencies want and develop environmental performance standards to avoid prescriptive terms and conditions.
- Start at top of resource agencies and work down.
- Avoid and minimize impacts early during the planning and design phases.
- Help the permitting agencies see the advantages of accelerated construction. A faster schedule – reducing the construction period – in itself is a reduction in environmental impact.

4(f) Trade

- Bike and pedestrian trails to trade (mitigate) for 4(f) park impacts.
  - Would need to be negotiated with local jurisdictions.
  - Seattle requires equal function for replacement parklands.

Reduce the Project Footprint at East Bridge Touchdown

- Smaller footprint at eastern landfall.
- Build half of bridge, move traffic, build remainder.
- Build retaining walls to allow later lid construction.

- Local jurisdictions could pursue transportation enhancement dollars in the future.

Right-of-Way

- Start the right-of-way acquisition process early before EIS is complete.
  - Start negotiations over acquisitions early with cities and other major takings such as NOAA.
  - Try to buy Museum of History and Industry as soon as money is available.

Bike/Pedestrian Facilities on North Side through Medina

- Keep facility on the north side.
  - Might shorten the overall length of the bridge.

3.3 FIRST THOUGHTS – CONSTRUCTION

A group of experts focused upon construction techniques, methods, and approaches met for the initial breakout session. Key initial insights presented from the team included:

Issues Requiring Clarification

- Ask the Environmental Group for clarification on the work windows for in-water construction and the related turbidity requirements.
- Ask the Traffic Group for guidance on allowable work hours and whether night closures, weekend closures, or other long term closures are possible.
- Ask the Innovative Contracting and Financing Group whether CM/GC is available to WSDOT as contracting method.

Possible Construction Staging Areas

- Museum of History and Industry.
- Get Right-of-Way Group to look at other adjacent open areas.
- May be enough area from realignments.
- Nearby water access is critical for contractor.
- Ask the Environmental Group whether pontoons can be anchored temporarily near final alignment and worked on before moving them into place.
- Use the new bridge for materials storage.
- Leave it to the contractor to find staging areas.

Partial Funding Scenario—Construct Eastbound HOV Lane

- Keep flyer stops in current location on the outside of the roadway.
- The new eastbound (EB) HOV lane could be a converted shoulder or a lane designed to full standards (e.g., full shoulder).
- Addition of EB HOV lane on new bridge would provide EB HOV from new bridge to Redmond.

I-5/SR 520 Reversible Ramp to Express Lanes

- Project needs to get HOV lane benefit even with a partial completion, so consider six lanes to Montlake or reversible ramp into express lanes.
- Need to determine what is the minimum to operate safely and efficiently.
- Inquire of the Roadway and Traffic Group whether this configuration can work safely and efficiently given AM/PM peak traffic, design standards, etc.

Lease to Queen City Yacht Club for Moorage Under Portage Bay Bridge

- Provide a lease to Queen Anne Yacht club with dock space under the new structure to offset the impact of taking a dock.
- Inquire of the Structures Group as to whether boat moorage under the bridge presents a safety/ security issue or Homeland Security issue.
- Inquire of the Right-of-Way Focus Group whether an air rights lease is possible for this purpose.

3.4 FIRST THOUGHTS – GEOTECHNICAL/MATERIALS

Geotechnical engineers and contractors met to discuss project information needs and identify opportunities to accelerate overall project development and construction. Key issues and suggestions included:

Reuse of Excavation and Demolition Debris

- Most excavated soils will be weather sensitive, but may be reusable with cement treatment (roto-till in place).
- Recycling demolished Asphalt Concrete Pavement and Reinforced Concrete structures could result in substantial savings and reduce environmental affects.
- Timing, environmental perception may limit cement treatment.
- Potential environmental/regulatory hurdles and construction schedule/contracting issues could limit Asphalt Concrete Pavement and Reinforced Concrete recycling.

Stormwater Management

- On the Eastside MSE walls may appear to be the most economical, but would not allow use of linear stormwater treatment facilities.
- Stormwater must be integral to design at early stage.
- Project needs up-front coordination between structure, geotechnical, drainage, and maintenance prior to establishing right-of-way requirements.
- Get early regulatory agency coordination and document acceptance.

Short-Circuit Potential EIS-Challenge Delays

- EIS needs to consider seiche (tide-like rises and drops in lake level caused by prolonged winds or seismic activity), sub-marine landslides, and lateral loads due to liquefaction.
  - Pursue some type of seiche assessment
- Identify design seismic criteria early.
  - 500-year vs. 2,500-year event critical because of impact of Seattle Fault.
  - Pursue site-specific probabilistic seismic hazard assessment.

Floating Bridge Anchors

- Consider large capacity suction piles.
- Westside sub-marine landslide could influence anchor location.
- Check cost, restrictions on size of equipment and anchors passing through locks and elsewhere.

Foundations for Bridge Approaches, Portage Bay Bridge

- Use permanent steel casing, large diameter drilled shafts.
- Consider self-compacting concrete because of limited open space or increase diameter.

- Will shallow draft at approaches allow access by large barges? Determine draft requirements, get early permits for dredging or work bridge.
- Need work bridge on Foster Island – piles may be 100-feet long and could require permits.

Walls Near I-5 and to Support Lid at 10th Avenue East to Delmar Drive

- Wall needed to retain landslide-prone soils.
- Strength loss with deformation will require large tieback cylinder pile, tieback soldier pile walls, or tieback slurry wall.
- Design for residual strength and limit movement.
- Agency expertise in costing these walls is not great so this process is a good candidate for design/build.

Montlake Cut Tunnel Excavation (8-lane Alternative)

- No soils information as far to the east as the proposed tunnel location – could be getting into the soft soils found at bridge approaches. Soft soils could preclude cofferdam and dry excavation.
- Extremely difficult to build without dredging.
- Need discussion with agencies to define limitations for excavation.
- Need early exploration if it is to be considered.

Geotechnical Explorations

- Difficult to make quick decisions about depth to good soil.
- Many areas of unknown soil conditions, particularly east end of Montlake Cut where cut and cover tunnel would be located.
- Funding – Need to get "good" boring data on GIS or other system.
- Do geology borings soon.

Pavements

- PCCP preferred over ACP for least impact to "users" over long design life.
- If any asphalt rehabilitation required, strongly consider PCCP.
- Eastside is currently ACP.

3.5 FIRST THOUGHTS – ROADWAY/GEOMETRIC DESIGN

Roadway designers and contractors met to discuss overall project elements and construction related issues. A review of all project features was considered first as a means to reduce construction duration. Various design modifications were reviewed. Opportunities to accelerate overall project delivery, either through design refinements or construction methods and approaches, were considered. Significant initial suggestions presented include:

Potential Design Refinements

- Refine alignment to minimize piecemeal structures.
- Portage Bay Bridge: consider using Mechanically Stabilized Earth (MSE) wall construction and moving the abutment to the east to simplify staging of structure touchdown.
- Explore alternatives to Montlake direct HOV access.
- Adjust alignment to avoid conflicts.
- Look for independent project phases.

    - Can floating bridge be two separate structures?
- Determine local traffic staging concepts.
    - Use Lids for local street traffic during overcrossing construction.
    - Find a detour to permit closing of Lake Washington Boulevard ramps.

Roadway Risks

- Modify double HOV merge on Portage Bay.
- Modify mainline vertical alignment near 92nd Avenue NE to improve traffic operations.
- Accident location.
- Interchange proximity.
- Horizontal curve relationship.

3.6 FIRST THOUGHTS – STRUCTURES

A breakout session focused on structures and related construction advantages and disadvantages. While the group spent some initial time discussing bridge types for the main span, they came to quickly understand the logic of a concrete pontoon structure for this crossing. The following outlines key issues and suggestions identified by the group:

Build Superstructure in Place

- Build floating bridge superstructure in place instead of in the graving dock to increase pontoon production rate.

Double Shift

- Double shift in the graving dock to increase pontoon production rate.

Double Deck the Roadway

- Double deck the roadway on the floating bridge and transition at the fixed approaches.
    - Transition issues and maintenance access are concerns with this proposal.

Eliminate Horizontal Curves and Tapers on the Floating Bridge

- Provides more standard sections (pre-cast and pre-fabricated elements).
- Revisit transit flyer stop location at east roadway approach to bridge.

Use Precast Structures such as:

- Precast haunched beams.
- Precast beams, post-tensioned.
- Precast segmental.
- Precast balanced cantilever – matched cast.
- Precast full depth composite slabs.
- Precast full depth deck slabs made continuous with non-stressed prestressing.
- Precast columns, crossbeam, and footings.

Use Steel Plate Girder

- Evaluate considerations with painting over water.
- Consider using prestressed girder.

- Build lids first and use them for construction access and traffic staging.

3.7 FIRST THOUGHTS – TRANSIT/ITS/HOV/TRANSIT

A group of transportation planners, traffic analysts, and transit service providers reviewed the project alternatives and potential for reduction in construction time. At the conclusion of the breakout session, the following findings were presented:

Overview of Findings

- Assess advantages of providing a direct bus connection to the University of Washington and link to the proposed Husky Stadium LRT station that may be built as part of the Sound Transit North Link Project. This could eliminate the need for the Montlake flyer stop and in turn significantly reduce the scale and impacts of the Portage Bay structures.
- Examine the potential to consolidate the two existing flyer stops on the Eastside (Evergreen Point and 92nd) and/or relocate them to Bellevue Way where they can intercept local buses.
- Long-term closures (summer months preferred) would need to be coupled with enhanced transit service on alternate routes as well as park-and-ride capacity.
- Implement enhanced ITS travel information during construction.

Time Saving – Corridor Closures – When and How Long

- Summer traffic is lighter.
- Weekend traffic is lighter.
- Need public input on trade-offs between full closure and total construction time savings.
- Consider long-term closures for construction time and cost savings.
- If the bridge can be closed for 4-6 weeks – why not all summer?

Time Saving – Corridor Closures – Logistics

- Increase transit service in the corridor and on parallel routes.
- Focus on Interstate 90 (I-90) – make sure 2-way HOV/transit is in place on I-90 first.
- Possible use of passenger ferries.
- Extend I-5 reversible south and tie to I-90.
- Build temporary bypass facilities at hook-ups to new bridge – consider transit only use of the corridor as part of some closure scenarios.
- SR-522 may be a reasonable option for reverse commuters from North Seattle to Redmond.
- I-405 improvements in place between SR 522 and SR 520, as well as between SR 520 and I-90.
- Focus on transit on alternate facilities – add transit service.
- Number of additional buses available during peak periods is very limited.
- Plan ahead – maybe hang on to old buses to use during this period.
- Need more transit and buses during construction – some of additional transit demand likely to remain after construction with improved transit facilities.
- Need 2 years minimum lead time to purchase new buses.
- TDM options – corridor has several major employers to work with and carries mainly local trips, unlike I-90. Market flextime, vanpools, telecommuting, and satellite offices to major employers as part of closure strategies.
- Is partial closure to maintain transit on the corridor feasible? Do you lose any advantage? Could it be reversible?

- How do you deal with emergency services with full closure? Need to bring in all affected parties to discuss as early as possible.

Transit

- Seamless connection between SR 520 HOV lanes and possible UW Link LRT Station is highly desirable, if the later project goes forward.
- If no LRT station near Montlake, buses would still need to service downtown directly.
- If tie is made to LRT station near Montlake, buses do not need to go downtown.
- HOV Y-connector inside to Montlake Ramps.
- Transit lane to Montlake bridge.
- 2nd Bridge at Montlake may produce cost offset by savings in eliminating Montlake flyer stop and added Portage Bay structure.
- 92nd Avenue flyer stop at present time slows down buses looking for riders.

HOV Lanes

- When can you move them to the inside? Distinguish between transit and other HOVs.
- What's needed for transit to move to the inside lanes? Direct access on either end to/from express lanes, inside flyer stops.
- 92nd Avenue flyer stop has limited benefit. Could eliminate? Used by school routes.

ITS

- Make use of existing I-5/I-90 VMS for construction purpose of SR 520.
- Start tolling before construction for both traffic management and revenue. Could start project sooner if had an assured revenue stream.
- Under full closure, can help redirect traffic.
- Use mobile traveler information system.
- Use variable speed limit; adjust to conditions during construction.
- Implement dynamic lane merge – early/late merge.
- Use intrusion devices for work zones for worker safety.
- Use cone shooter (automatically dispenses and picks up cones – safer).
- Automated work zone information system provides real time information to traveling public.
- Smart park – information on park and ride capacity/availability.
- Don't over do it! Make sure all solutions, when pieced together, are still applicable.

CHAPTER 4

Preliminary Recommendations

On the second day of the workshop, members of the various skill set groups were re-organized into project area focus groups. Each group was assigned a specific section of the project corridor. These project areas are shown in Figures 6 through 8 and are described as follows:

- Westside: from I-5 to the Evergreen Point west approach structure.
- Floating Bridge and Approaches: west approach structure to the east approach structure.
- Eastside: from where the bridge would touch down on the Eastside to the vicinity of Bellevue Way.

Each group had a representative or two from each skill set. The Innovative Contracting and Finance Skill Set remained intact and continued their discussions throughout Day 2.

Prior to starting work on each segment, workshop participants were asked to also address a possible first phase scenario for the project in which the primary focus was replacement of the floating bridge and its immediate approaches while improving HOV operations in the corridor.

The first half of the morning was dedicated to brainstorming ideas and developing preliminary recommendations. These preliminary recommendations were presented to all participants at the close of the morning session. Preliminary recommendations were refined in the afternoon sessions into Final Recommendations. During the refinement process, cross-group discussions facilitated the development of recommendations that would work together across the corridor. Final recommendations were presented on Thursday morning.

4.1 PRELIMINARY RECOMMENDATIONS – WESTSIDE

- Build half of floating bridge in Phase 1.
- Realign new approach structures so that existing bridges can be used for work bridges.
- Leave columns under water for fish habitat.
- Use lightweight structures.
- Raise Portage Bay structure to construct full width over existing bridge.
- Eliminate Lake Washington Blvd ramps.
- Eliminate Montlake flyer stop.
  - Reduces width at Montlake, Portage Bay, and west approach.
  - Improve connections to north (second bascule bridge?).
  - Possible future stage of HOV connection to I-5.

Figure 6. Westside and Phase 1 Project Elements

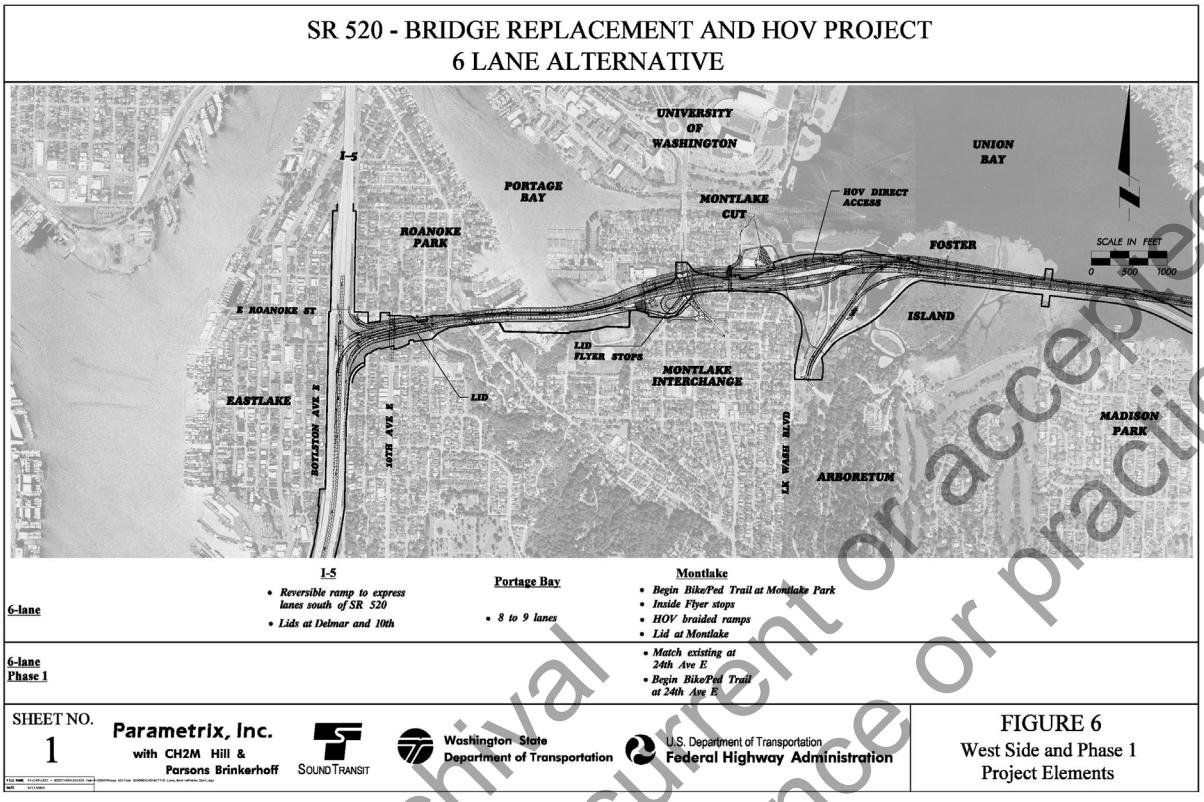


Figure 7. Floating Bridge, Approach Structures, and Phase 1 Project Elements

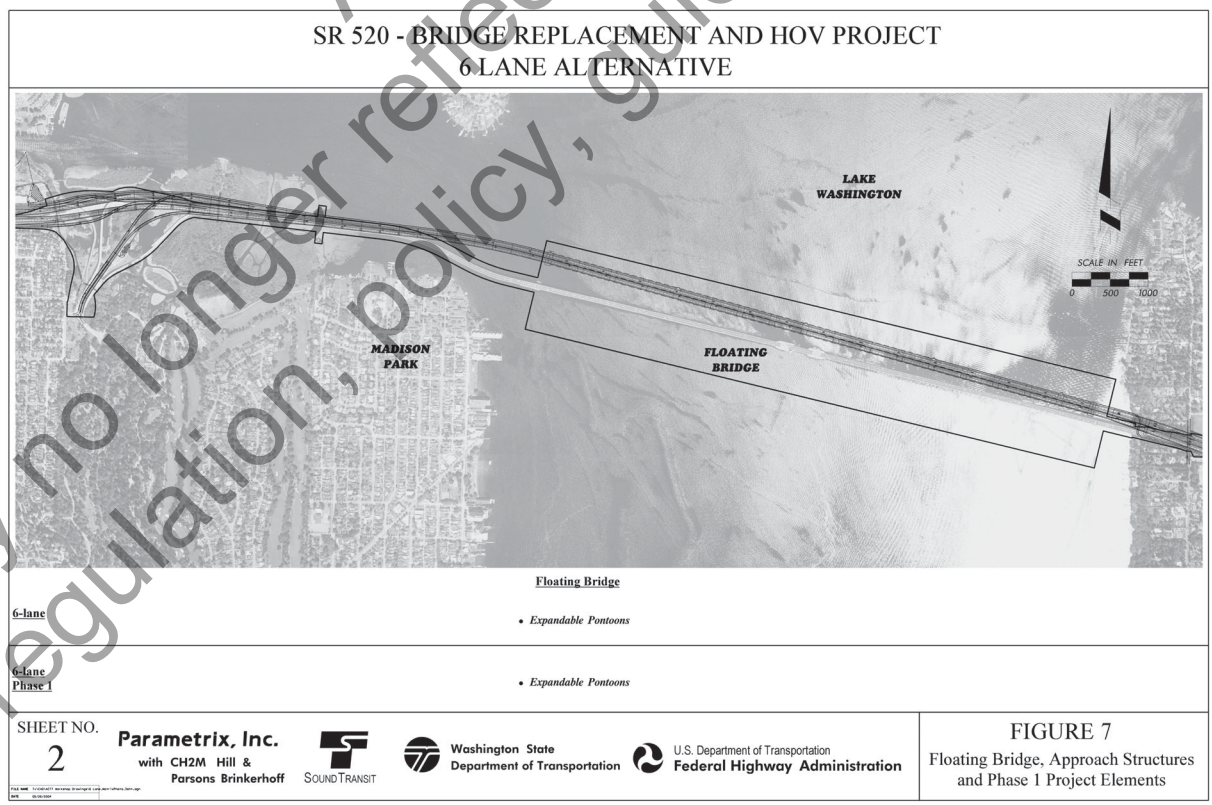
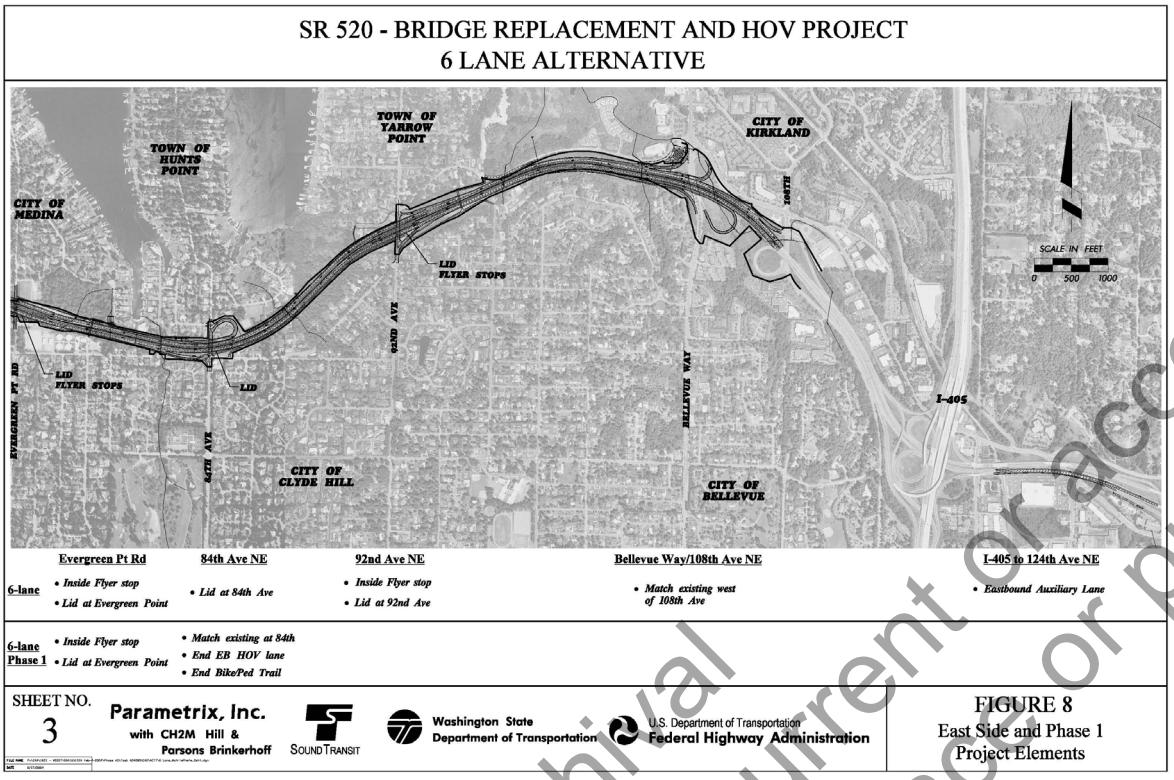


Figure 8. Eastside and Phase 1 Project Elements



4.2 PRELIMINARY RECOMMENDATIONS – FLOATING BRIDGE AND APPROACHES

Accelerated Pontoon Construction

- Determine the design and fabrication details early. Run double shifts at Port Angeles graving docks, have second graving dock through contract with Concrete Tech.
- Discuss with contractors what is possible, based on their experience. Could have pontoon fabrication broken into type, specialty marine contractors capabilities, etc. Overlap design and construction of pontoons. Use as many "stock" pontoons as possible.

Modification of Existing Graving Dock

- Cover the graving dock, allow for gantry crane, better lighting, concrete pumps on the crane system. Use of self-consolidating concrete may eliminate need to repair and repatch pontoons. Could also have rebar prefabricated, ready to drop in with gantry crane. Talk to Port of Port Angeles, about a covered graving dock.
- Another alternative: May want to have a temporary/removable cover, rather than fixed. Make cover the contractor's responsibility. Give incentive to the contractor to get these done ASAP. Need to discuss these issues with contractor representatives.

Anchor System Fabrication

- Utilize a separate contract for this portion. Look at alternate anchor types, suction piles, etc. Set at final position in Lake Washington before pontoons arrive. Need to have early geotechnical borings.

Column Fabrication on the Pontoons

- Build the pontoons with the column rebar protruding from the deck or construct a "short" column. Should not hold up the time at the graving docks, and it will allow a square and plumb column to be built later in the field.

Alignment of the East End

- Build the east end as now planned. Building the east touchdown as now conceived has many benefits. It is more cost effective to purchase the needed properties than to try and hold the alignment of the existing bridge touchdown. Acquiring the properties to the north and realigning the bridge will expedite the overall project schedule, save money, and be least disruptive to traffic when the final traffic switch over is made.

4.3 PRELIMINARY RECOMMENDATIONS – EASTSIDE

- Defer Eastside to later phase, tie in floating bridge ASAP.
- Reduce traffic on SR 520 to two lanes, consider possible couplet with I-90 reversible roadway.
- Build noise walls early.
- Consider nighttime and weekend closures.
- Combine and/or eliminate some of the eastside flyer stops.
- Keep bike path on north side, utilize lids for crossings.
- Minimize cast-in-place concrete work on structures (deck, noise panels, retaining walls on lids).
- Develop common precast elements that can be used on all lids.
- Evaluate combining 108th Avenue and Bellevue Way interchange.
- Look at modified design/bid/build for critical path items.
- Consider tolling entire facility (e.g., tolling by segment instead of just the bridge crossing the lake).

4.4 PRELIMINARY RECOMMENDATIONS – INNOVATIVE CONTRACTING AND FINANCE

The group used the second day to focus on innovative contracting methods and identified the following areas for consideration:

Project Delivery Methods

- Design-Bid-Build is baseline, but consider the following:
  - Design-Build.
  - General Contractor/Construction Manager.
  - Alliance Contracting.
  - Indefinite Delivery/Indefinite Quantity (IDIQ).

Procurement Methods

- Low Bid is baseline, but consider the following:
  - A+B (Time plus cost).
  - A+B+Q (Time plus cost plus quality).
  - Best Value.
  - Qualification-Based Selection (QBS).
  - Additive Alternates.
  - Alternate Design Concepts.

Contracting Methods

- Unit price is baseline, but consider the following:
  - Lump sum.
  - Incentive/disincentive.
  - Lane rental.
  - Active Management Payment Mechanism (AMPM).
  - Award fees.
  - Cost Reduction Incentive Proposals.
  - Flexible Start Dates/Milestone Dates.
  - Maximum payment curve.
  - Contractor Quality Control/Quality Assurance.
  - Warranty.
  - Performance-related specifications.

CHAPTER 5

Final Recommendations

On Thursday morning, each group presented their final recommendations to all workshop participants.

5.1 FINAL RECOMMENDATIONS – WESTSIDE

Recommended Phase 1

- Build north half of Portage Bay section and operate as temporary five lanes (three westbound, and two eastbound).
- Construct westbound (WB) to southbound (SB) HOV to I-5 Express Lane connection.
- Match to existing Montlake Interchange and outside Flyer Stop.
- Build a 4-lane section with flyer stops through Montlake.
- Construct temporary WB off-ramp to Montlake Boulevard.
- Change configuration from the floating bridge westward to:
  - 6-lanes on new floating and approach structures.
  - 4-lanes through Montlake Interchange, add and drop a lane in each direction.
  - Five lanes across Portage Bay on new structure, add lane westbound from Montlake Boulevard.
  - WB to SB HOV connection from SR 520 to I-5 Express Lanes.

Accelerated Construction is Possible with the Following Considerations

- Pre-cast segmental (save ¾ superstructure time).
- Steel girders.
- Pre-cast deck.
- Consider short spans with pipe columns and pre-cast slab (environmental issues).
- Build all foundations at once (offset outside existing structure).
- Move alignments north to use existing structure for work bridge.
- Roll touchdown spans into place.

5.2 FINAL RECOMMENDATIONS – FLOATING BRIDGE AND APPROACHES

Recommended Phase 1

- New Evergreen Point Bridge (floating pontoon section and the west and east fixed approach structures).
- Full Eastside project construction from east shore of Lake Washington to the project easterly limits at Bellevue Way NE Interchange vicinity.
- Construct temporary on/off-ramps from Montlake Boulevard east to the new west approach structure of the Evergreen Point Bridge.

Shorten Project Delivery Time

- Overlap design and construction contracts.
- Build Evergreen Point Bridge in four segments:
  - Montlake to Foster Island.
  - Foster Island to west transition span.
  - Floating bridge.
  - East approach.
- Hold a workshop/charette with resource agencies, tribes, and partners.
- Use an In-Water Curtain.
  - Eliminates juvenile salmon from work area.
  - Locate between Marsh Island and Foster Island.

- Consider temporary roadway from Montlake to Floating Bridge transition span on the south side.
  - Cost would be $15-$30 million.
  - Maybe more costs for mitigation of this temporary structure.
  - Close the Lake Washington Boulevard ramps while the temporary roadway is in place.
  - Potential benefit of temporary roadway is construction time of 36-48 months versus 42-54 months.
- Consider short spans and staging span-by-span up to 140-feet maximum length.
  - Use flexi-floats to advance pier construction.
- Accelerate Pontoon Construction.
  - Consider double shifts, or additional facilities.
  - Pontoon fabrication broken into separate contracts depending on type.
  - Overlap design and construction of the various pontoons.
  - Use as many "stock" pontoons as possible.
- Consider Graving Dock Alternatives.
  - Two alternatives:
    - Covered with crane, lighting, pumping ability.
    - Non-covered, more flexibility.
  - Allow contractor to decide this.
  - Consider self-consolidating concrete, less repair and patching.
- Utilize separate contract for anchor system fabrication.
  - Look at other anchor types, suction piles, etc.
  - Consider installing in Lake Washington before pontoons arrive.
- Build the pontoons with the column rebar sticking out or a "short" column, and fabricate the columns on the pontoons.
  - Provides for a more square and plumb column later.
- Maintain east touchdown alignment as now conceived to provide best possible final alignment to save time/money/minimize traffic impacts:
  - Phased half bridge construction is very costly compared to the cost of the additional right-of-way.
  - Additional construction stages adds more construction time.
  - Requires fewer traffic switches, which improves public safety.
  - Opens new bridge sooner.
  - Provides more flexibility in the design of the east high-rise structure.

Finance Options

- Consider early tolling during construction to manage traffic.
- Form a focus team to resolve issues.
- Are federal programs available?
- Consider starting program now.

Conduct Early Pre-Design Workshops

- Explore anchor types/options.
- Consider expansion and other joint design.
- Consider other structure details.
- Expedite geotechnical investigations.

Use Prefabricated Elements and Systems

- Maximize use of pre-cast and pre-stressed concrete elements.
- Consider standardized elements in structures wherever possible.

5.3 FINAL RECOMMENDATIONS – EASTSIDE

Recommended Phase 1

- Construct the new Evergreen Point Bridge and begin tolling on opening day.
- Hold other project elements until adequate funding is available.

Analyze Closure Options in Light of Their Impact on Construction Time

- Current schedule, with four lanes open to traffic during construction = 4 years.
- With weekend and night closures = 3 years.
- Construction duration with total traffic closure as scoped = 1½ years.
- Total closure = 30 percent cost savings, and 50 percent time savings.
- Spring start of contract.
- The following recommendations could save an additional four months:
  - Use of pre-cast instead of cast in place.
  - Eliminate Eastside flyer stops.
  - Eliminate two bicycle bridges.

Eastside Flyer Stop Recommendations

- Eliminate flyer stop at Evergreen Point Bridge.
  - Transition lanes would not be needed on bridge.
- Approach and transition built at same time.
- Eliminate flyer stop at Clyde Hill due to lack of use.
- Have only one transit stop on Eastside: Bellevue Way or 84th Avenue NE.
- No flyer stops under the lids (due to noise, security, constructability).

Bike Path Recommendations

- Eliminate bicycle only crossovers.
  - Keep bike path on north side.
  - Two parallel paths on north side (bike path separated from local trail).
  - Potentially use lids for crossovers.

Lids & Structures Recommendations

- Utilize design/build with performance specifications.
- Consider fewer lids.
- Allow maximum flexibility for pre-cast, common elements, or other innovative techniques.
- Possible pre-cast lid elements: deck, noise wall panels, retaining walls.

5.4 FINAL RECOMMENDATIONS – INNOVATIVE CONTRACTING

Utilize Design-Bid-Build for the floating bridges.

- The traditional design-bid-build system is suggested for the floating bridges because the risk of failure is high, WSDOT has the design expertise, and the design should be able to be completed before the project needs to start.

- However, the team is suggesting the use of innovative procurement methods and contracting methods in conjunction with design-bid-build such as A+B, two-step best-value, active management payment mechanism, and mandatory Cost Reduction Incentive Proposals (CRIP) workshop, as discussed below.

Utilize Design-Build for the bridge approaches.

- This could save substantial time if the permitting, funding, and other risk issues will facilitate a cost effective delivery.
- If the project is packaged as a "larger" or more "complex" project, design-build may have distinct advantages in construction management resources.
- There is a risk of prescribing the construction methods. The team strongly suggests discouraging any suggestions of construction methods.

Considerations for Various Procurement Methods

Best-Value

"Best-value" is the procurement process where the contract is awarded considering price and other prescribed factors. Other factors can be time, qualifications, alternate technical designs, etc.

- The team recommends that two-step best value be used in conjunction with the design-bid-build of the floating bridge.
- They can then propose on the project with innovative ideas for compressing time, adding quality to material or design, and safer construction.
- Unsuccessful proposers will be awarded a stipend for their time.

A+B Bidding (Time Plus Cost)

- Procuring a project on the basis of cost plus time. Time is assigned a dollar value and subtracted from the bid cost for award purposes.
- This is already in use at WSDOT and should be applied to this project when appropriate, where the design and quality control are tightly defined and straightforward.
- It could potentially be used for the pontoon construction.

Additive Alternates

- The owner includes most of the work in the base bid.
- The owner specifies priority of alternates if base bids come in under budget.
- This is already in use at WSDOT and should be applied to this project when appropriate, such as when cost estimates are in question.

Alternate Technical Concepts

- Design-builders are allowed to submit alternate designs to save time or money that the Agency evaluates before accepting.
- This will only be available for design-build contracts.

Qualifications Based Selection

- Procuring a contract on only technical or performance items. Cost is not a factor.
- Only use for GC/CM or Alliance.

- New contract vehicles will need to be developed and new legislation may need to be put in place.

Lump Sum Bidding

- This is already in use at WSDOT and should be applied to this project when definable payment milestones are available to reduce WSDOT administrative costs.
- It is an incentive to the contractor to complete a section of work.

Contractor Quality Control/Quality Assurance

- This is already in use at WSDOT and should be applied to this project when appropriate.

Incentive/Disincentive

Incentives or disincentives based on opening of new lanes, other open-to-traffic dates, and/or opening ramps. This is already in use at WSDOT and should be applied to this project when appropriate.

- Mandatory CRIP/Scheduling Workshop Combined with Flexible Start Date.
  - Cost reduction incentive proposals are prepared by the Contractor and reflect an innovative approach to a specific construction activity typically offering a project cost reduction.
  - Mandatory workshops after award.
  - The contract start date would be flexible after the innovations are agreed upon.
  - CRIPs include a 50/50 percentage split.
- Requires the development of new contract language.
- Increases contractor risk because they are pursuing ideas without assurance of success.
- AMPM.
  - An incentive based on lane availability or travel times. This includes the use of a performance based traffic control plan.
  - The team recommends AMPM for the project.
  - New contact language.
  - Management of traffic on adjacent roads.
  - Incident response.
  - WSDOT Maintenance.
  - Integrate requirements into NW Region traffic management plan.
- Lane rental.
  - Charge contractor for each lane closure.
  - This is already in use at WSDOT and should be applied to this project when appropriate.
- Award fees.
  - Pool of incentives for performance related issues.
  - This is already in use at WSDOT and should be applied to this project when appropriate.
  - The team recommends this for new items such as environmental stewardship and maintenance.

Max Payment Curve

- Established cash flow for maximum contractor payment.

Performance-related Specifications

- Quality assurance specifications that describe the desired levels of key materials and construction quality characteristics that have been found to correlate with fundamental engineering properties that predict performance.

- Apply this in conjunction with AMPM and traffic operations.
- Where possible, develop performance specifications in addition to existing manuals.

Constructability Reviews

- Use of a third party for design review with a specific focus on the construction of the project.
- The team strongly recommends this for all phases of the project.

Risk Management Committee

Assemble a team of experts to identify and manage critical risk issues such as schedules, potential claims, etc. The team strongly recommends this for all phases of the project. The risk management committee must have adequate decisionmaking authority.

5.5 FINAL RECOMMENDATIONS – FINANCE OPTIONS

The Contracting and Finance Skill Set Group identified a menu of possible sources of funds to finance the project including user fees, as well as local, state, and federal sources. In addition, the group came up with a number of "out-of-the-box" ideas.

Tolls

- Look at benefits of starting tolls early if project is accelerated.
- Examine the use of a bridge district that would include both SR 520 and I-90.

Shared Funding

- Transit agency – pay for incremental cost of strengthening bridge for future accommodation of HCT.
- Transit agency participation in other elements such as flyer stops.
- Charge life-cycle warranty cost back to maintenance.

Federal Funding

- Flex local funds to transit.
- Utilize transit funding.
- Seek grant under the Transportation and Community and System Preservation (TCSP) Pilot Program.
- Seek funding under innovative bridge and discretionary bridge funding programs.

Miscellaneous Out of the Box Ideas

- Utilize naming rights of floating bridge.
- Sell off the old bridge.

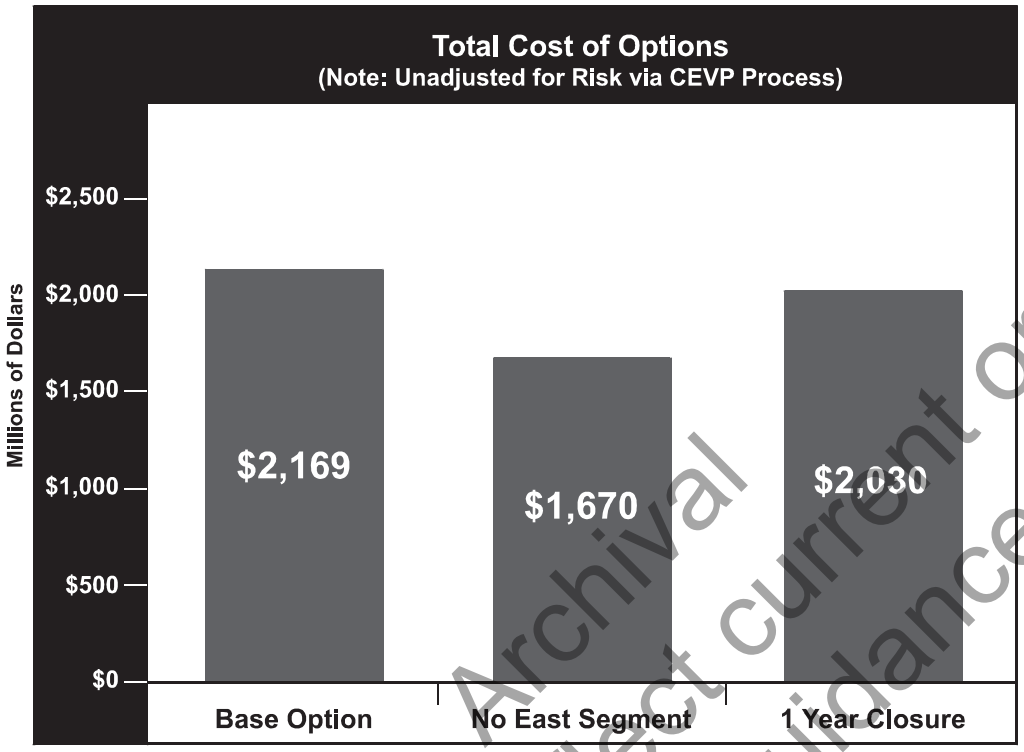
Financing Construction Scenarios

The Contracting and Finance Skill group also presented the following estimates for different construction scenarios.

The estimated total cost by alternative is presented in Figure 9. The Base Option is for the 6-Lane Alternative as identified at the time of the ACTT Workshop and without accelerated construction. The total cost of the Base Option is approximately $2.2 billion. If the project segment that is east of the lake is constructed at a later date and/or as a separate project, the initial project cost would be reduced by $500 million to approximately $1.7

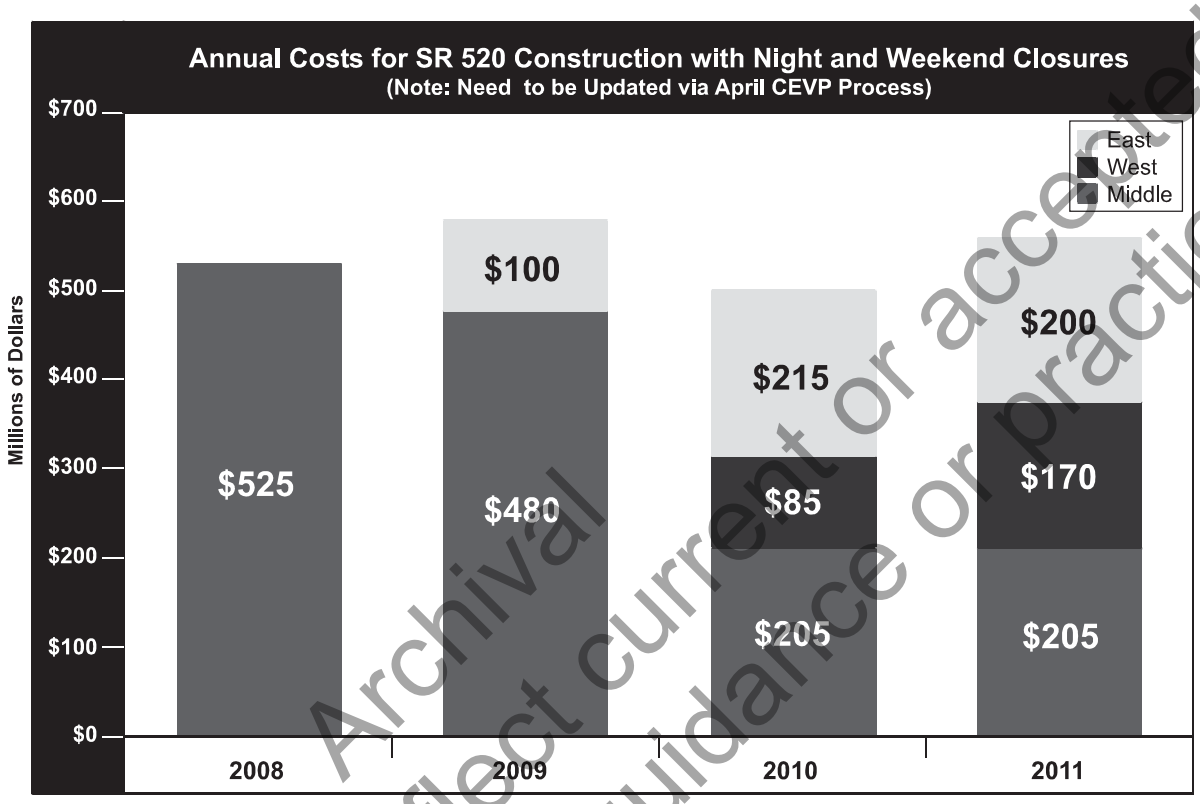
billion. Finally, building the 6-Lane Alternative as identified for the ACTT Workshop with complete closure of the SR 520 bridge for 1 year would reduce the cost of the project by nearly $139 million to just over $2.0 billion. This estimate is exclusive of costs for any additional mitigation determined necessary to deal with traffic during the period of complete closure.

Figure 9. Total Cost of Options



Assuming night and weekend closures on the Eastside project segment only will permit faster construction, the annual costs of construction are presented in Figure 10. Under this scenario, no work would be done on the east segment in 2008, but a total of $515 million would be spent between years 2009 and 2011.

Figure 10. Annual Costs for SR 520 Construction with Night and Weekend Closures



Without night and weekend closures on the Eastside segment, the annual costs of construction for SR 520 are presented in Figure 11. Under this scenario, construction on this segment would begin one year earlier (in 2008), conclude at the same time (2011), but cost exactly the same only with construction spread out over more years. While the overall cost appears the same, the annual cash flow under the night and weekend closure option is slightly more balanced.

Figure 11. Annual Costs for SR 520 Construction without Night and Weekend Closure for East Segment

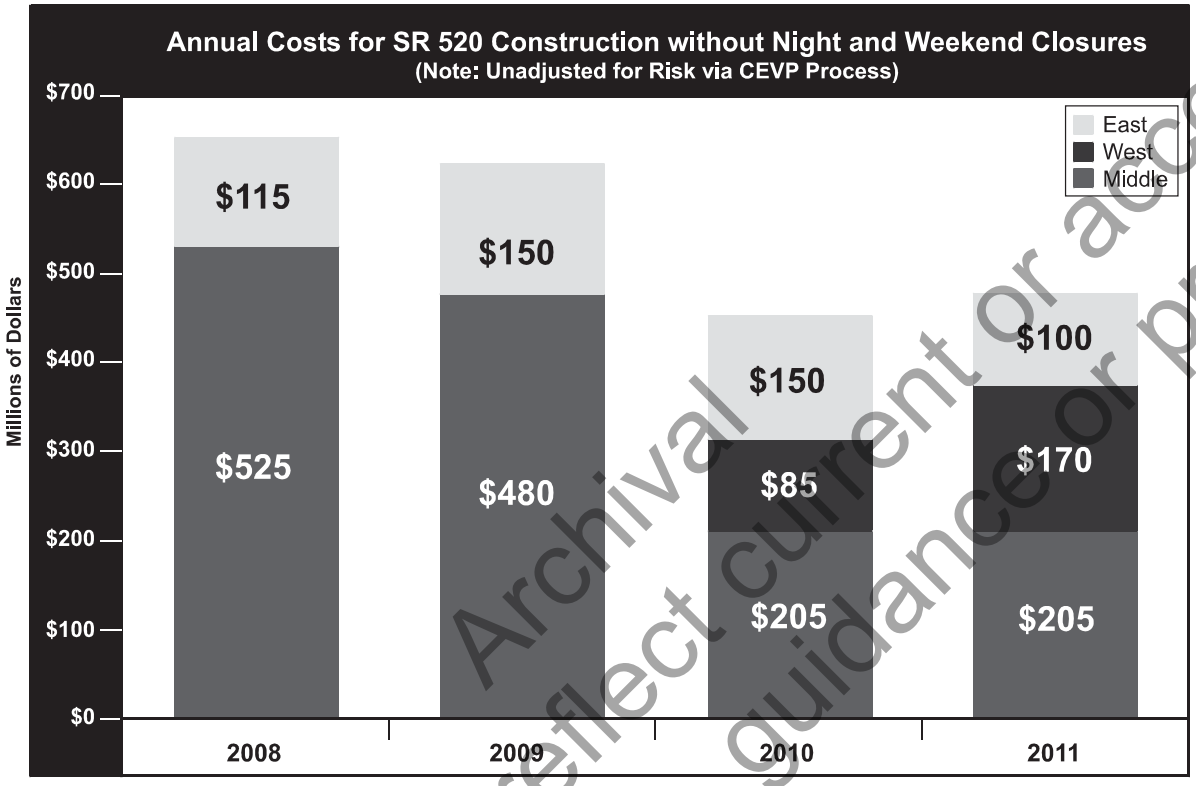
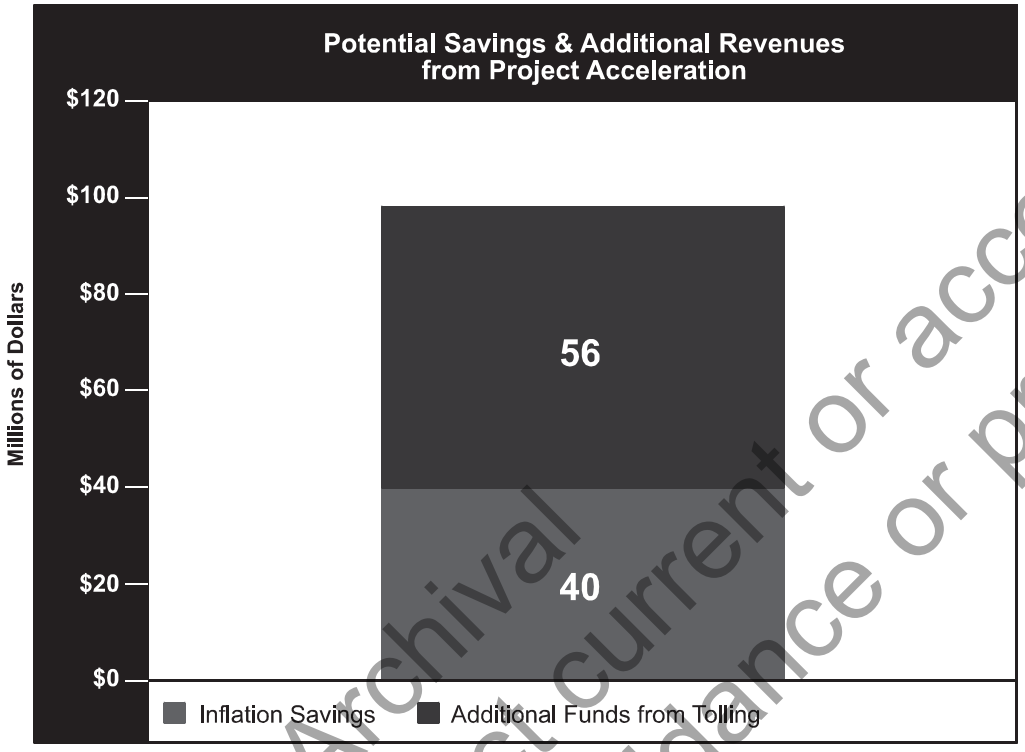


Figure 12 demonstrates an estimate of the potential financial savings available of nearly $100 million through project aceleration. The cost for any mitigation is not included in these figures.

Figure 12. Potential Savings and Additional Revenue from Project Acceleration



CHAPTER 6

Next Steps

WSDOT and the SR 520 Project Team will be evaluating the recommendations from each of the Skill Set Teams and the Project Area Breakout Groups. Each recommendation will be defined and developed sufficiently to evaluate the potential benefits and value to overall project delivery.

Additionally, it is anticipated that future working sessions between WSDOT and FHWA will be conducted to assess the long-term benefits of the workshop and the ultimate decision regarding each recommendation. Working sessions are suggested twice during the coming year.

APPENDIX A

Workshop Attendees

Bob Adams
Atkinson Construction
600 Naches Avenue SW, Suite 120
Renton WA 98055
TEL: 425.255.551
EMAIL: raa@atkn.com

Steve Aisaka
Parametrix, Inc.
5808 Lake Washington Blvd, Suite 200
Kirkland WA 98033
TEL: 425.828.4202 x3331
FAX: 425.889.8808
EMAIL: saisaka@parametrix.com

Dick Albin
Assistant State Design Engineer
Northwest Region
WSDOT
P O Box 47330
Olympia WA 98504-7330
TEL: 360.705.7451
EMAIL: albind@wsdot.wa.gov

Archie Allen
NWR Bridge Maintenance Office
WSDOT MS 82-49
Bellevue WA 98004
TEL: 425.739.3700
EMAIL: allenar@wsdot.wa.gov

Linda D. Anderson
Real Estate Services
WSDOT
P O Box 47338
Olympia WA 98504-7338
TEL: 360.705.7306
EMAIL: anderli@wsdot.wa.gov

Tom Baker
State Materials Engineer
Materials Laboratory
WSDOT
P O Box 47365
Tumwater WA 98504-7365
TEL: 360.709.5401
EMAIL: bakert@wsdot.wa.gov

Jennifer Balis, P.E.
FHWA
Contract Administration Group, HIPA-30
400 7th Street, SW, Room 3134
Washington, DC 20590
TEL: 202.493.7302
FAX: 202.366.3988
EMAIL: jennifer.balis@fhwa.dot.gov

Mark S. Bandy
Northwest Region
WSDOT MS 82-120
P O Box 330310
Seattle WA 98133-9710
TEL: 206.440.4451
EMAIL: bandym@wsdot.wa.gov

Harry Bennetts
Assistant Division Administrator
FHWA
711 Capitol Way South, Suite 501
Olympia WA 98501-1284
TEL: 360.753.9480
EMAIL: harry.bennetts@fhwa.dot.gov

Barry Brecto
Bridge Engineer
FHWA
711 Capitol Way South, Suite 501
Olympia WA 98501-1284
TEL: 360.753.9482
EMAIL: barry.brecto@fhwa.dot.gov

Jennifer Brown
Innovative Project Delivery
WSDOT
P O Box 47371
Olympia WA 98504-7371
TEL: 360.705.7413
EMAIL: browjen@wsdot.wa.gov

Jeff Carpenter, P.E.
Construction Engineer, Non Traditional Delivery
WSDOT
P O Box 47354
Olympia WA 98504-7354
TEL: 360.705.7804
FAX: 360.705.6809
EMAIL: carpenj@wsdot.wa.gov

Vijay Chandra
Parsons Brinckerhoff
250 West 34th Street
New York NY 10119
TEL: 212.465.5377
EMAIL: chandrav@pbworld.com

Eric Chipps
Project Manager
Sound Transit
401 South Jackson
Seattle WA 98104
TEL: 206.398.5020
EMAIL: chippse@soundtransit.org

Margaret Clancy
Parametrix, Inc.
5808 Lake Washington Blvd NE, Suite 200
Kirkland WA 98033
TEL: 425.822.8880
FAX: 425.889.8808
EMAIL: mclancy@parametrix.com

Patrick Clarke, P.E.
Floating Bridge & Special Structures Design Manager
Bridge and Structures Office
WSDOT
P O Box 47340
Lacey WA 98504-7340
TEL: 360.705.7220
FAX: 360.705.6814
EMAIL: clarkep@wsdot.wa.gov

John F. Conrad
Assistant Secretary
Engineering & Regional Operations Division
WSDOT
P O Box 47315
Olympia WA 98504-7315
TEL: 360.705.7032
EMAIL: conradj@wsdot.wa.gov

Bob Crim, P.E.
State Environmental Programs Engineer
Environmental Management Office MS-37
Florida Department of Transportation
605 Suwannee Street
Tallahassee FL 32399-0450
TEL: 850.410.5891
EMAIL: bob.crim@dot.state.fl.us

Michael Cummings
Urban Planning Office
Goldsmith Building
WSDOT MS TB55-130
401 2nd Avenue South, Suite 300
Seattle WA 98104
TEL: 206.464.1223
EMAIL: cumminm@wsdot.wa.gov

Karen Dawson
CH2M Hill
777 108th Avenue, Suite 800
Bellevue WA 98004
TEL: 425.233.3340
FAX: 425.468.3100
EMAIL: karen.dawson@ch2m.com

Kevin Dayton
State Construction Engineer
WSDOT
P O Box 47354
Olympia WA 98504-7354
TEL: 360.705.7821
EMAIL: daytonk@wsdot.wa.gov

Dave Dickson
Financial Manager
FHWA
711 Capitol Way South, Suite 501
Olympia WA 98501-1284
TEL: 360.753.8078
EMAIL: dave.dickson@fhwa.dot.gov

Dave Dye
Administrator
Urban Corridors and Northwest Coordination
Goldsmith Building
WSDOT MS TB85-95
401 2nd Avenue South, Suite 560
Seattle WA 98104
TEL: 206.464.1221
FAX: 206.464.1190/1189
EMAIL: dyed@wsdot.wa.gov

Bob Ferguson
ERF
78-467 Sterling Lane
Palm Desert CA 92211
TEL: 760.360.4945
EMAIL: erfpaf@aol.com

Gerry Gallinger
Director, Real Estate Services
WSDOT
P O Box 47338
Olympia WA 98504-7338
TEL: 360.705.7305
EMAIL: GallinG@wsdot.wa.gov

Hal Gard
Environmental Program Manager
Oregon Department of Transportation
1158 Chemeketa St NE
Salem OR 97301
TEL: 503.986.3508
EMAIL: howard.a.gard@odot.state.or.us

John Garner
Florida Department of Transportation
605 Suwannee Street
Tallahassee FL 32399-0450
TEL: 850.414.4558
FAX: 850.488.5671
EMAIL: john.garner@dot.state.fl.us

Ben C. Gerwick, Jr.
Honorary Chairman & Senior
Technical Consultant
Ben C. Gerwick, Inc.
20 California Street, Suite 400
San Francisco CA 94111
TEL: 415.398.8972
DIRECT: 415.288.2730
FAX: 415.398.0433
EMAIL: bcg@gerwick.com

Jon Higgins
Urban Corridors Office
Goldsmith Building
WSDOT MS TB85-95
401 2nd Avenue South, Suite 560
Seattle WA 98104
TEL: 206.464.1184
EMAIL: higginj@wsdot.wa.gov

Dale Himes
Southwest Region
WSDOT
PO Box 1709
Vancouver WA 98668-1709
TEL: 360.905.2006
EMAIL: HimesD@wsdot.wa.gov

Gene Hoelker
Construction & Contract
Administration Engineer
FHWA
National Resource Center
19900 Governors Drive Suite 301
Olympia Fields IL 60461
TEL: 708.283.3520
FAX: 708.283.3501
EMAIL: eugene.hoelker@fhwa.dot.gov

Michael Horntvedt
Parametrix, Inc.
SR 520 Project Office
414 Olive Way, Suite 400
Seattle WA 98101
TEL: 206.381.6409
FAX: 206.381.6442
EMAIL: horntvm@wsdot.gov

Joseph Huerta
Pavement Management Engineer
FHWA
National Resource Center, Suite 4000
10 South Howard Street
Baltimore MD 21201
TEL: 410.962.2298
CELL: 410.746.7660
FAX: 410.962.4586
EMAIL: joseph.huerta@fhwa.dot.gov

Dave Hull
Transportation Planner
King County Metro Transit Division
MS KSC-TR-0422
201 South Jackson
Seattle WA 98104
TEL: 206.263.4734
EMAIL: david.hull@metrokc.gov

Bryan Jarr
Enviro Office
101 Stewart St, Suite 1101
Seattle WA 98101
TEL: 206.269.5041
EMAIL: bjarr@enviroissues.com

David V. Jenkins
Materials Laboratory
WSDOT
P O Box 47365
Olympia WA 98504-7365
TEL: 360.709.5455
EMAIL: jenkind@wsdot.wa.gov

Jugesh Kapur
Bridge Design Engineer
Bridge and Structures Office
WSDOT
P O Box 47340
Lacey WA 98504-7340
TEL: 360.705.7209
FAX: 360.705.6814
EMAIL: kapurju@wsdot.wa.gov

Mike Katzer
Assistant Superintendent
Area 5 Maintenance
Northwest Region NB82-45
WSDOT
10833 Northup Way NE
Bellevue WA 98004
TEL: 425.739.3730
EMAIL: katzerm@wsdot.wa.gov

Helena Kennedy Smith
Urban Corridors Office
Goldsmith building
WSDOT MS TB85-95
401 2nd Avenue South, Suite 560
Seattle WA 98104
TEL: 206.464.1206
EMAIL: smith@wsdot.wa.gov

Bob Kimmerling
Principal Engineer
PanGEO, Inc.
3414 NE 55th Street
Seattle WA 98105
TEL: 206.262.0370
FAX: 206.262.0374
EMAIL: rkimmerling@pangeoinc.com

Ken Kochevar
Safety and ITS Engineer
FHWA
California Division
650 Capital Mall, Suite 4-100
Sacramento CA 95814
TEL: 916.498.5853
EMAIL: ken.kochevar@fhwa.dot.gov

Paul W. Krueger
Urban Corridors Office
Times Square Building
WSDOT MS NB82-99
414 Olive Way, Suite 400
Seattle WA 98101
TEL: 206.381.6432
EMAIL: kruegeP@wsdot.wa.gov

Dave Leighow
FHWA
711 Capitol Way South, Suite 501
Olympia WA 98501-1284
TEL: 360.753.9408
EMAIL: dave.leighow@fhwa.dot.gov

Jim Leonard
Urban Area Engineer
FHWA
711 Capitol Way South, Suite 501
Olympia WA 98501-1284
TEL: 360.753.9408
EMAIL: james.leonard@fhwa.dot.gov

Jeff Lewis
Field Operations Engineer
FHWA
650 Capital Mall, Suite 4-100
Sacramento CA 95814
TEL: 916. 498.5035
FAX: 916.498.5008
EMAIL: jeff.lewis@fhwa.dot.gov

Liana Liu
Safety and T2 Engineer
FHWA
711 Capitol Way South, Suite 501
Olympia WA 98501-1284
TEL: 360.753.9553
EMAIL: liana.liu@fhwa.dot.gov

Kinyan Lui
Urban Corridors Office
Times Square Building
WSDOT MS NB82-99
414 Olive Way, Suite 400
Seattle WA 98101
TEL: 206.381.6404
EMAIL: luik@wsdot.wa.gov

Myint Lwin
Director
FHWA
Office of Bridge Technology
400 Seventh Street SW, Room 3203
Washington, DC 20590
TEL: 202.366.4589
FAX: 202.366.3077
EMAIL: myint.lwin@fhwa.dot.gov

Douglas B. MacDonald
Secretary
WSDOT
P O Box 47316
Olympia WA 98504-7316
TEL: 360.705.7054
EMAIL: macdond@wsdot.wa.gov

Jennifer Martin
Urban Corridors Office
Wells Fargo Building
WSDOT MS NB82-30
999 Third Avenue, Suite 2424
Seattle WA 98104
TEL: 206.382.5286
FAX: 206.382.5291
EMAIL: martija@wsdot.wa.gov

Dan Mathis
Washington Division Administrator
FHWA
711 Capitol Way South, Suite 501
Olympia WA 98501-1284
TEL: 360.753.9480
EMAIL: daniel.mathis@fhwa.dot.gov

Jennifer Mayer
Innovative Financing Specialist
FHWA National Resource Center
201 Mission Street Suite 2100
San Francisco CA 94105
TEL: 415.744.2634
FAX: 415.744.2634
EMAIL: jennifer.mayer@fhwa.dot.gov

Raymond McCabe
HNTB Corporation
352 7th Avenue
New York NY 10001
TEL: 212.594.9717
FAX: 212.594.9638
EMAIL: rmccabe@hntb.com

Dave McCormick
Northwest Region
WSDOT MS NB82-119
P O Box 330310
Seattle WA 98133-9710
TEL: 206.440.4656
EMAIL: mccormd@wsdot.wa.gov

Julie Meredith
Urban Corridors Office
Times Square Building
WSDOT NB82-99
414 Olive Way, Suite 400
Seattle WA 98101
TEL: 206.381.6406
EMAIL: meredjl@wsdot.wa.gov

John C. Milton
Assistant State Design Engineer
Urban Corridors
WSDOT
P O Box 47330
Olympia WA 98504-7330
TEL: 360.705.7299
EMAIL: miltonj@wsdot.wa.gov

Keith R. Molenaar, P.E.
Department of Civil, Environmental and Architectural Engineering
University of Colorado at Boulder
Campus Box 428, ECOT 411
Boulder CO 80309-0428
TEL: 303.735.4276
FAX: 303.492.7317
EMAIL: keith.molenaar@colorado.edu

Bob Murray
Parametrix, Inc.
4301 S Pine St
Tacoma WA 98409-7264
TEL: 253.476.3300 x 304
EMAIL: bmurray@parametrix.com

Bruce Nebbitt
Northwest Region
WSDOT MS NB82-130
401 Second Ave South, Suite 300
Seattle WA 98104
TEL: 206.464.1363
EMAIL: nebbieb@wsdot.wa.gov

Don K. Nelson
Director
Environmental and Engineering Programs
WSDOT
P O Box 47321
Olympia WA 98504-7321
TEL: 360. 705.7101
FAX: 360.705.6803
EMAIL: nelsondo@wsdot.wa.gov

Timothy R. Neuman
Chief Highway Engineer
CH2M Hill
8501 West Higgins Rd, Suite 300
Chicago IL 60631
TEL: 773.693.3800 x233
FAX: 773.693.3823
EMAIL: tneuman@ch2m.com

Cathy Nicholas
Construction Materials Pavement Engineer
FHWA
711 Capitol Way South, Suite 501
Olympia WA 98501-1284
TEL: 360.753.9412
EMAIL: cathy.nicholas@fhwa.dot.gov

Karsten Olson
Max J. Kuney Construction
120 N Ralph St
Spokane WA 99202-4744
TEL: 509.535.0651
EMAIL: karsten@maxkuney.com

Martin Palmer
Environmental Programs Manager
Northwest Region
WSDOT MS 138
P O Box 330310
Seattle WA 98133-9710
TEL: 206.440.4548
EMAIL: palmema@wsdot.wa.gov

Lorie Parker
CH2M Hill
777 108th Avenue, Suite 800
Bellevue WA 98004
TEL: 425.233.3437
FAX: 425.468.3100
EMAIL: lorie.parker@ch2m.com

Jim Parsons
Parametrix, Inc.
5808 Lake Washington Blvd NE
Suite 200
Kirkland WA 98033
TEL: 425.822.8880
FAX: 425.889.8808
EMAIL: jparsons@parametrix.com

Shannon Patterson
Parametrix, Inc.
5808 Lake Washington Blvd. NE
Suite 200
Kirkland WA 98033
TEL: 425.822.8880
FAX: 425.889.8808
EMAIL: spatterson@parametrix.com

Harold Peterfeso
State Design Engineer
WSDOT
P O 47329
Olympia WA 98504-7329
TEL: 360.705.7231
EMAIL: peterfh@wsdot.wa.gov

Don Petersen
Senior Geometric & Roadside Design Engineer
FHWA
711 Capitol Way South, Suite 501
Olympia WA 98501-1284
TEL: 360.534.9323
EMAIL: don.petersen@fhwa.dot.gov

Brad Phillips, P.E.
Parametrix, Inc.
SR 520 Project Office
414 Olive Way, Suite 400
Seattle WA 98101
TEL: 206.381.6410
EMAIL: phillb@wsdot.wa.gov
bphillips@parametrix.com

Ellis Powell
Construction Engineer
North Carolina Department of Transportation
P O Box 24201
Raleigh NC 27611-25201
TEL: 919.733.2210
FAX: 919.733.8441
EMAIL: epowell@dot.state.nc.us

Pete Rahn
Vice President, Government Relations
Contech Construction Products
601 Tijeras Avenue SW, Suite 202
Albuquerque NM 87102
TEL: 505.842.8282
CELL: 505.463.4399
EMAIL: rahnp@contech-cpi.com

Mark Robinson, Ph.D., P.Eng.
Senior Transportation Engineer
SAIC
1710 SAIC Drive, MS T1-12-3
McLean VA 22102
TEL: 703.676.2384
FAX: 703.676.2432
EMAIL: mark.d.robinson@saic.com

Red Robinson
Vice-President
Shannon and Wilson
P O Box 300303
400 North 34th St, Suite 100
Seattle WA 98103-9703
TEL: 206.632.8020
EMAIL: rar@shanwil.com

Keith Sabol
Parsons Corporation
3212 50th St Ct, Suite D102
Gig Harbor WA 98335
TEL: 253.686.3931
EMAIL: keith.sabol@parsons.com

Jim Salter
Real Estate Services
WSDOT
P O Box 47338
Olympia WA 98504-7338
TEL: 360.705.7312
EMAIL: salterj@wsdot.wa.gov

Dan Sanayi, P.E.
Construction & System Preservation Engineer
Office of Asset Management, HIAM-20
FHWA
400 7th Street SW Room 3211
Washington, DC 20590
TEL: 202.493.0551
CELL: 301.802.3881
FAX: 202.366.9981
EMAIL: dan.sanayi@fhwa.dot.gov

Sidney Scott, III, P.E.
Vice President
Trauner Consulting Services, Inc.
One Penn Center, Suite 600
1617 JFK Boulevard
Philadelphia PA 19103
TEL: 215.814.6400
CELL: 610-909-4661
EMAIL: sid.scott@traunerconsulting.com

Barry Siel
Geotechnical Engineer
FHWA Resource Center
555 Zang Street, Room 401
Lakewood CO 80228
TEL: 303.716.2294
FAX: 303.969.5498
EMAIL: barry.siel@fhwa.dot.gov

William Sledge
Environmental Services
WSDOT
P O Box 47331
Olympia WA 98504-7331
TEL: 360.705.7483
EMAIL: sledge@wsdot.wa.gov

Ken Smith
Deputy State Design Engineer
WSDOT
P O Box 47329
Olympia WA 98504-7329
TEL: 360.705.7233
EMAIL: smithk@wsdot.wa.gov

Rick Smith
Director, Innovative Project Delivery
WSDOT
P O Box 47371
Olympia WA 98504-7371
TEL: 360.705.7150
CELL: 360.402.3588
EMAIL: smithrick@wsdot.wa.gov

Tim Smith, P.E.
Snohomish/King County Area Engineering Manager
Northwest Region MS NB82-221
WSDOT
P O Box 330310
Seattle WA 98133-9710
TEL: 206.440.4676
EMAIL: smitht@wsdot.wa.gov

Jim Sorenson
Senior Construction & Preservation Engineer
FHWA
Infrastructure
Office of Asset Management
HIAM, Room 3211
400 7th Street SW
Washington, DC 20590
TEL: 202.366.1333
FAX: 202.366.9981
EMAIL: james.sorenson@fhwa.dot.gov

Maureen Sullivan
Project Director
Urban Corridors Office
Times Square Building
WSDOT MS NB82-99
414 Olive Way, Suite 400
Seattle WA 98101
TEL: 206.382.5270
FAX: 206.382.5291
EMAIL: sullivm@wsdot.wa.gov

Beva Ubias
Innovative Project Delivery
WSDOT
P O Box 47371
Olympia WA 98504-7372
TEL: 360.705.7495
EMAIL: ubiasb@wsdot.wa.gov

Maliek van Laar
Meeting Planner
Woodward Communications
1420 N Street NW, Suite 102
Washington, DC 20005
TEL: 202.234.7162
FAX: 202.347.2129
EMAIL: mvanlaar@woodwardcom.com

Jerry Weigel
Bridge and Structures Engineer
Bridge and Structures Office
WSDOT
P O Box 47340
Lacey WA 98504-7340
TEL: 360.705.7207
FAX: 360.705.6814
EMAIL: weigelj@wsdot.wa.gov

Chris Wellander
Parsons Brinckerhoff
999 3rd Avenue, Suite 2200
Seattle WA 98104-4020
TEL: 206.382.5279
FAX: 206.382.5222
EMAIL: wellander@pbworld.com

Alene Wilson
CH2M Hill
777 108th Avenue NE, Suite 800
Bellevue WA 98004-5118
TEL: 425.233.3422
FAX: 425.468.3100
EMAIL: alene.wilson@ch2m.com

Greg Wornell
Urban Corridors Office
Times Square Building
WSDOT MS NB82-99
414 Olive Way, Suite 400
Seattle WA 98101
TEL: 206.381.6424
EMAIL: wornelg@wsdot.wa.gov

Lindsay Yamane, P.E.
Parametrix, Inc.
SR 520 Project Office
Times Square Building
414 Olive Way, Suite 400
Seattle WA 98101
TEL: 206.381.6405
CELL: 206.331.1647
FAX: 206.381.6442
EMAIL: lyamane@parametrix.com or
yamanel@wsdot.wa.gov

Terry Yuen
CH2M Hill
777 108th Avenue, Suite 800
Bellevue WA 98004
TEL: 425.233.3255
FAX: 425.468.3100
EMAIL: terry.yuen@ch2m.com

APPENDIX B

ACTT Skill Set Groups

Tuesday, March 16 Skill Set Groups

Innovative Contracting and Finance

1	Keith Molenaar	University of Colorado
2	Sidney Scott	Trauner Consulting
3	Jeff Carpenter	WSDOT Construction
4	Dale Himes	WSDOT SW Region
5	Helena Kennedy-Smith	WSDOT UCO
6	Jennifer Mayer	FHWA
7	Dave Dickson	FHWA WA Div.
8	Maureen Sullivan	WSDOT UCO
9	Jennifer Balis	FHWA DC

Environmental and Right-of-Way

1	Martin Palmer	WSDOT NWR Environmental
2	Paul Krueger	WSDOT UCO Environmental
3	Dave Leighow	FHWA Right-of-Way
4	Hal Gard	ODOT Environmental
5	Bob Crim	FLDOT Environmental
6	John Garner	FLDOT Right of Way
7	Jeff Lewis	FHWA CA
8	Lorie Parker	CH2M Hill
9	Margaret Clancy	Parametrix
10	Linda Anderson	WSDOT HQ Right-of-Way
11	Gerry Gallinger	WSDOT HQ Right-of-Way
12	Jim Salter	WSDOT UCO Right-of-Way

Construction

1	Bob Adams	Atkinson Construction
2	Kevin Dayton	WSDOT Construction
3	Cathy Nicholas	FHWA
4	Mike Katzer	NWR Maintenance
5	Lindsay Yamane	Parametrix
6	Greg Wornell	WSDOT UCO
7	Bob Ferguson	ELF
8	Joe Huerta	FHWA
9	Gene Hoelker	FHWA
10	Ellis Powell	NCDOT
11	Jerry Weigel	WSDOT Bridge
12	Julie Meredith	WSDOT UCO

Geotech/ Materials

1	Barry Siel	FHWA Colorado Res Ctr.
2	Bob Kimmerling	PanGEO
3	Tom Baker	WSDOT Materials
4	Dave Jenkins	WSDOT Geotech
5	Tim Smith	WSDOT NWR
6	Red Robinson	Shannon Wilson
7	Karen Dawson	CH2M Hill

Roadway

1	Keith Sabol	Parsons Transportation
2	Harold Peterfeso	WSDOT Design
3	John Milton	WSDOT Design
4	Ken Smith	WSDOT Design
5	Jim Leonard	FHWA WA Div.
6	Don Peterson	FHWA WA Div.
7	Bruce Nebbitt	WSDOT UCO
8	Brad Phillips	Parametrix
9	Kinyan Lui	WSDOT UCO
10	Tim Neuman	CH2M Hill

Structures

1	Raymond McCabe	HNTB
2	Vijay Chandra	Parsons Brinckerhoff
3	Patrick Clarke	WSDOT Bridge
4	Barry Brecto	FHWA
5	Jugesh Kapur	WSDOT Bridge
6	Bob Murray	Parametrix
7	Steve Aisaka	Parametrix
8	Myint Lwin	FHWA
9	Karsten Olsen	Max Kuney and Co.
10	Ben Gerwick	Ben C. Gerwick Inc.
11	Archie Allen	WSDOT Maintenance

Traffic/ITS/HOV/Transit

1	Ken Kochevar	FHWA California
2	Dave McCormick	WSDOT NWR Traffic
3	Mark Bandy	WSDOT NWR Traffic
4	Michael Horntvedt	Parametrix
5	Jennifer Martin	WSDOT UCO
6	Mark Robinson	SAIC
7	Liana Liu	FHWA WA Div.
8	Jim Parsons	Parametrix
9	Chris Wellander	Parsons Brinckerhoff
10	Eric Chipps	Sound Transit
11	David Hull	King County METRO

Wednesday, March 17

Innovative Contracting and Finance

1	Keith Molenaar	University of Colorado
2	Sidney Scott	Trauner Consulting
3	Jeff Carpenter	WSDOT Construction
4	Dale Himes	WSDOT SW Region
5	Helena Kennedy-Smith	WSDOT UCO
6	Jennifer Mayer	FHWA
7	Dave Dickson	FHWA WA Div.
8	Maureen Sullivan	WSDOT UCO
9	Jennifer Balis	FHWA DC
10	Jim Parsons	Parametrix

Eastside

1	Greg Wornell	WSDOT UCO
2	Barry Siel	FHWA Colorado Res Ctr.
3	Red Robinson	Shannon Wilson
4	John Milton	WSDOT Design
5	Bruce Nebbitt	WSDOT UCO
6	David Hull	King County METRO
7	Vijay Chandra	Parsons Brinckerhoff
8	Barry Brecto	FHWA
9	Bob Ferguson	ELF
10	Joe Huerta	FHWA
11	Ben Gerwick	Consultant
12	Mike Katzer	NWR Maintenance
13	Tim Neuman	CH2M Hill
14	Tim Smith	WSDOT NWR
15	Ken Smith	WSDOT Design
16	Jennifer Martin	WSDOT UCO

Floating Bridge and Approaches

1	Bob Adams	Atkinson Construction
2	Lindsay Yamane	Parametrix
3	Bob Kimmerling	PanGEO
4	Tom Baker	WSDOT Materials
5	Jim Leonard	FHWA WA Div.
6	Cathy Nicholas	FHWA
7	Patrick Clarke	WSDOT Bridge
8	Kinyan Lui	WSDOT UCO
9	Mark Bandy	WSDOT NWR Traffic
10	Ken Kochevar	FHWA California
11	Ellis Powell	NCDOT
12	Myint Lwin	FHWA
13	Mark Robinson	SAIC
14	Bob Murray	Parametrix
15	Archie Allen	WSDOT Maintenance

Westside

1	Kevin Dayton	WSDOT Construction
2	Brad Phillips	Parametrix
3	Keith Sabol	Parsons Transportation Group
4	Harold Peterfeso	WSDOT Design
5	Don Peterson	FHWA WA Div.
6	Eric Chipps	Sound Transit
7	Jugesh Kapur	WSDOT Bridge
8	Raymond McCabe	HNTB
9	Karsten Olsen	Max Kuney and Co.
10	Gene Hoelker	FHWA
11	Dave Jenkins	WSDOT Geotech
12	Jerry Weigel	WSDOT Bridge
13	Liana Liu	FHWA WA Div.
14	Steve Aisaka	Parametrix
15	Chris Wellander	Parsons Brinckerhoff
16	Julie Meredith	WSDOT UCO

APPENDIX C

ACTT Skill Sets and Issues

The following skill sets were assembled for the SR 520 Bridge Replacement and HOV Project ACTT Workshop. They were asked to review, discuss, and recommend solutions for their identified issues. The skill set groups (see Appendix B) met on the first day of the workshop to talk through and brainstorm on the issues as they relate to the SR 520 Bridge Replacement and HOV project.

INNOVATIVE CONTRACTING AND FINANCING

This group was tasked with aligning the financing options with the goals of the project by matching anticipated cash flow with project management, while recognizing competing priorities for existing resources. This group was asked to consider the following issues specific to the SR 520 project:

- Financing
  - What lessons have national experts learned about forecasting toll revenue, both cash flow and total proceeds?
  - How can we structure toll bonds 5 years or more before the open-to-traffic date in order to finance construction?
  - Although the public seems to accept the notion of tolling, is acceptance based on a faulty premise - such as the toll would only be 35 cents? If so, what do we do? How have tolls been introduced successfully in other states, especially those that didn't have a history of tolling?
  - Can/should facility be tolled during construction? If so, why and how?
  - If project is constructed in phases, how will this affect ability to toll?
  - Current construction schedules — and the purpose of this workshop — are based on the notion of build as fast as you can. If, however, you have to build based on a "metered" funding package, construction might be delayed until 2011. How does that change things?
  - Which states and/or projects are doing the best job with financing mega-projects via tolling and/or other innovative financing? (Not concerned with project financing packages under $1B.)
  - There's an HOV free or not question for this skill set. What is being done nationally? How does the approach affect bond rating, overall debt service, public opinion of tolls, public opinion of HOV, etc?
- Contracting
  - Construction Duration
    - Environmental window limitations
    - A + B format?
    - Constraints on public closures and maintenance of traffic
  - Incentives
    - Early completion
    - Liquidated damages
    - Cost reduction incentive proposals (CRIPs)
    - System and resources to monitor, evaluate and respond
  - Delivery Methods
    - Design-Bid-Build (DBB)
    - Design-Build (DB)
    - Design-Build-Operate (DBO)
    - Prequalification and selection
    - Other methods
  - Oversight
    - Schedule and constructability reviews

- Budget accountability
- Biddability and claims audits

ENVIRONMENTAL AND RIGHT-OF-WAY (ROW)

This group was tasked with ensuring that the scope-of-work and construction activities reflect a comprehensive view of the environmental and ROW concerns. Environmental, right-of-way, and utility issues need to be given thorough consideration with up-front coordination with all affected parties (agencies, public, jurisdictions, etc.) in order to ensure the most accelerated construction possible as well as to provide the most accommodating and cost effective project while minimizing environmental and socioeconomic effects. This group was asked to consider the following issues specific to the SR 520 project:

- Environmental
  - Parks and 4(f)
    - 10th Avenue E and E Roanoke St
    - Bagley Viewpoint
    - Montlake Bike Path (Bill Dawson Trail)
    - McCurdy Park
    - East Montlake Park
    - Washington Park/Arboretum
    - Fairweather Nature Preserve
    - Points Loop Trail
    - SR 520 Trail (proposed)
  - Wetlands
    - Portage Bay/Union Bay
    - Washington Park Arboretum
    - Fairweather Creek
    - Cozy Cove
    - Yarrow Bay
    - Yarrow Bay Creek
  - Endangered Species Act
    - Chinook Salmon
    - Bald Eagle
  - Tribal Treaty Fishing Rights
    - Sensitive habitat
    - Negotiation strategy
  - Displacements
    - Residences in Medina
    - Commercial and government buildings in Montlake
  - Noise
    - Most of corridor exceeds FHWA criteria
    - Restricted noise levels during construction
  - Stormwater
    - Virtually no existing treatment
    - Location of facilities

- Right-Of-Way
  - Early acquisition process
  - Funding
  - Acceleration of title transfer
  - Business relocations
  - Air leases
  - Temporary easements

Construction (Techniques, Automation, and Constructability)
This group was tasked with how to provide accelerated construction while still ensuring that the contractor delivers a quality product within confined time frames and areas, often while maintaining traffic. This group also considered ways to allow contractors to have input on design elements that would impact time or quality during construction in order to improve the effectiveness and efficiency of the overall project completion. This group was asked to consider the following issues specific to the SR 520 Project:

- I-5 Interchange
  - Limited construction staging area
  - Existing traffic and staging work
  - Poor soil condition near I-5
  - Large cut on the south side
  - Reconstruction of city street bridges and staging local traffic
  - Girder placement over I-5
  - Construction of center piers
- Portage Bay Bridge
  - Phasing work with existing traffic
  - Work over water
  - Barges / work bridges
  - Work over existing facilities (e.g., Queen City Yacht Club)
- Montlake Interchange
  - Staging Montlake Blvd reconstruction
  - Existing south retaining wall to remain
  - Construction of center piers for Montlake Blvd OC and Lid
  - Staging mainline traffic
- West Approach Structure
  - Working in/over shallow water
  - Barges/work bridges
  - Construction staging
  - Use of existing "Ramp to Nowhere"
  - Access for delivery and placement of 250 ft girders
  - Closure of Lake Washington Blvd. ramps
- Floating Bridge
  - Graving dock availability (e.g., Port Angeles or private facility)
  - Pontoon delivery
  - Completion of pontoon superstructure (off-site or on-site)
  - Anchor Placement and conflicts with the existing bridge anchors

- East Approach Structure
  - SR 520 closure to make the tie in
  - Delivery and placement of signature truss transition span
  - Steep hillside above lake to Evergreen Pt Road
- Evergreen Pt Road to 108th
  - Traffic staging
  - Limited construction staging areas
  - Maintaining local traffic

Geotechnical/Materials/Accelerated Testing

This group was tasked with exploring subsurface conditions and issues and assessment of their impacts on the project. This group was asked to consider the following issues specific to the SR 520 project:

- Floating Bridge and Approaches
  - Anchor fabrication, shipping and placement
  - Drilled shafts and/or foundation
  - Seismic considerations
- Mainline Bridges and over/under-Crossings
  - Substructure and foundation types
  - Material considerations
  - Seismic considerations
- Tunneling
  - Cut and cover or boring
  - Materials types
  - Spoils
  - Seismic considerations
  - Fish window limitations
- Retaining Structures
  - Types and applications
  - Foundation considerations
  - Pool soil conditions near I-5
- Pavements
  - PCC or AC
  - Subgrade and structural section
  - Borrow sources

Roadway/Geometric Design

This group was tasked with considering the highway geometrics as they can greatly impact project funds and integrity. This group was asked to consider the following issues specific to the SR 520 project:

Design Standards and Guidelines

- 60 MPH design speed
- Full Shoulders (10 ft inside and outside)
- Provide required sight distance (west of floating bridge)
- Minimize ROW impacts
- Maintain mainline and local traffic to the fullest extent possible
- Construct north half outside of existing footprint

- Eastside roadway widening anticipated
- Reconstruct and establish new pedestrian/bike connections

Roadway and Geometrics

- Widen existing highway east of floating bridge
  - Super-elevation design
  - Vertical clearance
- Move HOV to inside
  - Rebuild transit stops on inside
  - What needs to be constructed to make HOV transition from outside to inside
- Are three transit stops needed
- Is flyer stop design appropriate for projected transit & passenger demand?
- Should project include direct access ramps at Montlake Blvd E and at 108th Avenue NE
- Should all ramps have metering and HOV bypass
- Flyer stop/HOV direct access acceleration and merge lengths
- Foster Island area mainline and LWB profiles
- Staging areas and haul routes

Structures (bridges, retaining walls, culverts, miscellaneous)

Accelerating the construction of structures requires deviation from standard practices for design and construction and needs to include early coordination between designers and contractors. As such, this group was tasked with exploring a systems approach from the "ground up" versus the traditional emphasis on individual components. This group was asked to consider the following issues specific to the SR 520 project:

- Range of Structures
  - Retaining walls and sound barriers
  - Bridges
  - Tunnels
  - Maintenance facility
  - Freeway lids (non-ventilated)
  - Bus transit facilities (in-line flyer stops)
  - Others
- Construction
  - Work trestle and construction access at Arboretum and wetland areas in both Lake Washington and Portage Bay areas
  - Eastside work trestle and access for constructing north half of east approach in Lake Washington
  - Barge and derrick access in shallow waters near shoreline and use of existing dredged channels near Foster Island and Arboretum
  - East Approach staging adjacent properties outside R/W
  - Temporary anchorage of east cross-pontoon on south side.
  - Staging areas for equipment and materials
  - Maintenance of traffic and switch-overs
- Environmental Concerns
  - Noise and event restrictions and their effect on work windows
  - Fish and other permit related windows

- Maintenance of Traffic
  - Future staging for HCT and lane transitions
  - Lane tapers from eastside flyer stop extending onto floating bridge.

Traffic Engineering/Safety/ITS

This group was tasked with considering enhanced safety and improved traffic management through corridor contracting. This group considered construction alternatives and their associated affects on traffic through the corridor. This group also considered ways to provide better information to the traveling public and politicians during construction. This group was asked to consider the following issues specific to the SR 520 project:

Traffic

- When and for how long can the corridor be closed?
- What bypass routes could be used during closures?
- How and to what extent should we consider event traffic in the analysis and design (e.g., UW games/graduation; Mariner, Seahawk, Sonic)?
- Can transit service be increased and subsidized during construction?
- How will cut-through traffic be handled during construction?
- No-build baseline network assumptions versus cumulative effects for this project; and then comparing to what I-405 has assumed.
- Project limits – primarily for the 8-lane – satisfy logical termini test?
- Reasonable short-term and long-term detour routes

Intelligent Transportation Systems (ITS)

- Ramp metering issues – adequacy of storage, need for HOV bypass, overall ramp design
- Variable message signs
- Corridor security and monitoring
- ETC

High Occupancy Vehicle (HOV)

- WSDOT HOV Policy
- HOV – tolled or free?
- Near-term HOV benefit vs. Long-term HOV benefit

Transit

- Near-term vs. long-term transit benefits
- Are three transit stops needed
- Is flyer stop design appropriate for projected transit & passenger demand?