



Board of Park Commissioners

Neal Adams, Vice Chair
John Barber
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Jackie Ramels, Chair

April 14, 2010

Jenifer Young, Environmental Manager
 SR 520 Project Office
 600 Stewart Street, Suite 520
 Seattle, WA 98101

RE: The Arboretum and Botanical Garden Committee's Comments to the
 SR520, I-5 to Medina: Bridge Replacement and HOV Project Supplemental
 Draft Environmental Impact Statement (SDEIS)

Dear Ms. Young,

At its April 8, 2010, meeting the Seattle Board of Park Commissioners unanimously adopted the attached resolution as its official response to the SR520, I-5 to Medina: Bridge Replacement and HOV Project SDEIS. Please add these comments to the official record.

Sincerely,

Jackie Ramels, Chair
 Seattle Board of Park Commissioners

Attachment: The Seattle Board of Park Commissioner's Comments to
 the SR520, I-5 to Medina: Bridge Replacement and HOV Project
 SDEIS

cc: Mike McGinn, Mayor, City of Seattle
 The Honorable Richard Conlin, Chair, Seattle City Council
 The Honorable Sally Bagshaw, Seattle City Council
 The Honorable Mike O'Brien, Seattle City Council
 The Honorable Nick Licata, Seattle City Council
 The Honorable Jean Godden, Seattle City Council
 The Honorable Tom Rasmussen, Seattle City Council
 The Honorable Sally Clark, Seattle City Council
 The Honorable Bruce Harrell, Seattle City Council
 The Honorable Tim Burgess, Seattle City Council
 Mark Emmert, President, University of Washington
 Tim Gallagher, Superintendent, Seattle Parks
 Peter Hahn, Director, Seattle Department of Transportation
 Stephanie Brown, Seattle Department of Transportation

RESOLUTION

A RESOLUTION expressing the position of the Seattle Board of Park Commissioners regarding the SR 520, I-5 to Medina: Bridge Replacement and HOV Project.

WHEREAS, the Seattle Board of Park Commissioners has been in continuous existence since 1887 and acts in an advisory capacity to the Mayor, City Council, Seattle Parks and Recreation and other City departments; and

WHEREAS, State Route 520 has been, since its completion in 1963, and continues to be to this day, a blight on the Washington Park Arboretum; creating noise and visual intrusions into the park; encouraging cut-through traffic along Lake Washington Boulevard in much higher volumes than was originally intended for the boulevard, disturbing the serenity of the Japanese Garden, and affecting the passage of people and wildlife between Marsh and Foster Islands and the remainder of the Arboretum; and

WHEREAS, the Washington Park Arboretum is Washington State's official State Arboretum and contains internationally recognized woody plant collections and North America's largest collection of *Sorbus* and Maple, the second largest collection of species Hollies and significant collections of oaks, conifers and camellias; and

WHEREAS, a new Master Plan for the Arboretum was adopted in 2001 that was the culmination of five years of planning work undertaken by Seattle Parks and Recreation, the University of Washington, the Arboretum Foundation, community groups and members of the general public; and that will guide improvements to the Arboretum for the next 20 years, including many specific projects to enhance the physical and natural characteristics of the Arboretum such as increasing habitat diversity by restoring the natural function of Arboretum Creek and the northern shoreline; and

WHEREAS, the Washington Park Arboretum contains the largest freshwater wetland complex of its type in the Seattle region, and the Master Plan, in conjunction with the existing wetlands, includes the restoration, enhancement, and creation of new wetlands by restoring the ecological and wildlife function of the former garbage dump surrounding existing SR Route 520 ramps, and creating a Pacific Northwest Marshland collection along the shoreline of Union Bay; and

WHEREAS, implementation of the SR 520, I-5 to Medina: Bridge Replacement and HOV Project, as currently proposed, will forever compromise the aesthetic setting, biological diversity, educational opportunities, and physical connections for people and wildlife within the Washington Park Arboretum:

NOW, THEREFORE, BE IT RESOLVED BY THE SEATTLE BOARD OF PARK COMMISSIONERS THAT:

The Board cannot endorse any of the alternatives identified in the Supplemental Draft Environmental Impact Statement for the SR 520, I-5 to Medina: Bridge Replacement and HOV Project, issued on January 22, 2010, due to the profound negative environmental impacts the project would have on the Washington Park Arboretum and the other City of Seattle Parks along the SR 520 corridor. The Board makes the below recommendations

The preferred alternative chosen must be consistent with the following principles:

- The structure should minimize the impacts on the Washington Park Arboretum, especially the Japanese Garden and Foster and Marsh Islands, and other adjacent and nearby parks such as East Montlake and McCurdy Parks;
- The structure should have the least number of travel lanes possible;
- The structure width should be the minimum necessary for safe passage;
- Any structure should be designed to have the least amount of coverage and shadow impacts on park land below;
- Any structure should be designed to have the least amount of impact to wetlands, aquatic resources and fish, in particular Federally protected salmonids that travel through Portage and Union Bays to and from their spawning grounds and the Pacific Ocean;
- All construction activities must be sited and timed to have the least impact on park users and the natural environment;
- Clear, open, and safe access for people and wildlife under the structure must be provided to reconnect severed components of the Arboretum; and,
- Any required wetland mitigation must occur within the Arboretum first; if the area within the Arboretum is insufficient to accommodate the required mitigation, Park sites within Seattle on or adjacent to Lake Washington must be considered.

Mitigation of the continuing highway and future project impacts must be considered, regardless of the alternative/option chosen, to re-establish the Arboretum experience. As a starting point, the following should be considered in any mitigation package:

- Address the traffic impacts to the Arboretum caused by increased traffic along Lake Washington Boulevard (LWB) including prohibiting access to and from SR 520 to LWB; repaving LWB with "quiet" pavement; incorporating other traffic calming measures in LWB to discourage through traffic movements;

- Completely fund the Arboretum Master Plan, including wetland and shoreline restoration and planting (approximately \$60 million);
- Develop the stormwater pond in East Montlake Park for educational use;
- Provide a park-like lid at Montlake (depending on the option, the lid should extend as far as possible given the geography) which will create a strong connection between the neighborhood and the Arboretum;
- Replace (at WSDOT's expense) all of the functions served by the Museum of History and Industry (MOHAI) building; and,
- Design and provide access and parking at East Montlake Park for access to the Arboretum Waterfront Trail and for hand-launched boats.

L-001-001 | The Board also respectfully submits the following comments in response to the Supplemental Draft Environmental Impact Statement (SDEIS) for the I-5 to Medina: Bridge Replacement and HOV Project issued on January 22, 2010:

- **Bagley Viewpoint** - Bagley Viewpoint is a well visited viewpoint along Delmar Drive East which provides views to the east of Lake Washington, Montlake Cut, the University of Washington and the Cascade mountain range. No other viewpoint in Seattle provides this unique view to the east. The viewpoint was redeveloped following the construction of the access freeway to the Evergreen Point floating bridge in 1963. The freeway cut the viewpoint off from its previous connection to Interlaken Park.
 - Loss of this unique viewpoint must be mitigated. The SDEIS indicates that a lid is proposed in this area that will provide similar view functions and also serve to reconnect the neighborhood through the triangle between 10th Avenue East, East Roanoke Street and East Delmar Drive. WSDOT must ensure that this lid remains part of the project and does not get removed due to funding concerns. Absent the lid, WSDOT must provide a view opportunity similar to the one now provided by Bagley Viewpoint and work to reconnect this viewpoint to Interlaken Park as it was originally constructed.
- **Montlake Playfield** - While the physical impacts to the playfield associated with the SR 520 project will be minimal, the visual impacts and noise associated with the project, both during construction and after it is completed will be significant. Every effort must be made to limit the potential for noise from the freeway to impact users of the playfields, members of the public who come to the area to take advantage of the newly reconstructed hand-carried boat launch, and the public and fauna that use the newly enhanced wetland areas.
 - During construction, any temporary work bridges and/or barges must not restrict canoe/kayak access between the Montlake Playfield boat launch and Portage Bay.
 - Seattle Parks is just completing a large wetland restoration project along the perimeter of Montlake Playfield. There are additional wetland

L-001-004

enhancement opportunities available. Montlake Playfield should be considered for any required wetland mitigation/enhancement as part of the projects mitigation requirements.

L-001-005

- **Lake Washington Boulevard** - Lake Washington Boulevard is referred to as a city street throughout the SDEIS. The 4f evaluation fails to identify Lake Washington Boulevard as either a historic resource or a park and recreation resource. This officially designated park boulevard is a 204-acre, 9.2-mile-long linear park wholly owned by the City and under the jurisdiction of Seattle Parks and Recreation. It is a crucial element in the 1903 Olmsted Plan for Seattle's boulevard system, sometimes referred to as the "Emerald Necklace." Decisions about the future design of the SR 520 improvements must be made with the understanding that Lake Washington Boulevard was never designed to function as an extension of direct-access ramps to and from SR 520. Where Lake Washington Boulevard serves as a corridor through the Arboretum, vehicles and bicycles must be able to travel on it in a manner consistent with the design and intent of the surrounding Arboretum.
 - There should be no direct access from SR 520 to Lake Washington Boulevard. From the day it opened, SR 520 and the access ramps to and from Lake Washington Boulevard have encouraged and facilitated traffic through the Arboretum which would not otherwise be there. This increased traffic through the heart of the Arboretum limits access to the Japanese Garden from the rest of the Arboretum, reduces the air quality due to vehicle emissions, increases noise from traffic and makes crossing Lake Washington Boulevard unsafe.
- **Lake Washington Boulevard Access** - If direct access to and from Lake Washington Boulevard to SR 520 is a component of the final design of the project then the following must be considered:
 - Lake Washington Boulevard has become an extension of the on/off ramps to SR 520. Had existing environmental laws been in place, mitigation for the impacts on the Arboretum of the original 520 project would have been significant or more likely, the project would have been redesigned. If direct access to and from SR 520 to Lake Washington Boulevard remains a part of the future project, exacerbating the current condition, the Arboretum should be duly compensated for the use of the boulevard in the future.
 - As mitigation for the increased traffic on Lake Washington Boulevard directly attributable to SR 520, traffic calming measures must be implemented on the boulevard.
 - If the SR 520 project includes direct access ramps to and from Lake Washington Boulevard to SR 520, additional tolls should be included on these ramps. Tolls should be included as a way of travel demand management to discourage people from using Lake Washington Boulevard to access SR 520. Also, the revenue from these tolls should be dedicated to the Arboretum to help mitigate the impacts of the increased noise, air emissions and vehicular distraction on the physical

L-001-005

nature, educational value and visitor experience of the Washington Park Arboretum.

- The most recent data from the Seattle Department of Transportation indicates that Lake Washington Boulevard carries 16,100 vehicles.¹ The SDEIS indicates that the ramps to and from Lake Washington Boulevard to SR 520 carry 3,000 vehicles in the AM and PM peak hours. Given 3,000 vehicles during two hours, the total amount of traffic that uses Lake Washington Boulevard exclusively to access SR 520 could be as high as 10,000 vehicles per day. Taken together, these traffic numbers indicate that as much as 62% of the traffic which uses Lake Washington Boulevard is directly related to SR 520. While Lake Washington Boulevard is a park boulevard, it is available for City residents to use as they travel throughout the City. However, this direct use of the boulevard as an access ramp to and from SR 520 is a highway use for which the boulevard was never intended. If WSDOT intends to continue to use Lake Washington Boulevard for a highway on and off ramp, then WSDOT must compensate the City annually in the range of \$1 - \$2.1 million, based on present value and an 8% rate of return, for the use of the property in a proportional share to the percentage of traffic which uses the boulevard to access SR 520.

L-001-006

- **Washington Park Arboretum** - The Washington Park Arboretum, State Arboretum for the State of Washington, is a stunning gem in Seattle's park system. It provides respite, scenery, recreation and solace to thousands of visitors in every season of the year. It provides educational, recreational, conservation and volunteering opportunities to those who seek it out. The City of Seattle and the University of Washington have been cooperatively managing this park since the original 1934 agreement.
 - Since the SR 520 highway was opened, the Arboretum has been fractured by the highway structure itself and the noise, pollution and visual intrusion of the structure on the physical nature, educational value and visitor experience of the Washington Park Arboretum. A percentage of the tolls collected on the main line of SR 520 should be dedicated to improvements in the Arboretum as mitigation for past current and future impacts of siting a transportation facility in the heart of a natural area and arboretum.
 - The physical nature, educational values and visitor experience within the Washington Park Arboretum should be enhanced by the construction and operation of the SR 520 I-5 to Medina: Bridge Replacement and HOV project if properly designed with sensitivity to the park.
 - All efforts must be made to avoid any adverse impacts to the Arboretum, both during construction and through the long term operation of the SR 520 facility.

¹ Average Annual Daily Traffic (AAWDT) (5-day, 24-hour)

L-001-006

- To the extent that there will be adverse impacts to the Arboretum, every impact must be thoroughly mitigated.
- Unavoidable adverse impacts must be mitigated. Those of shorter duration must be addressed during the construction phase. Long term impacts of facilitating increased traffic through the Arboretum which has a direct impact on the physical nature, educational value and visitor experience in the Washington Park Arboretum need to be avoided through sound design or mitigated appropriately.
- Design of the new structure should address the potential for increased noise through the Arboretum as a result of the increased traffic. The project must be designed such that noise levels decrease from the levels experienced today.

L-001-007

- The project must be designed such that the visual impact of the structure complements and does not detract from the physical nature, educational value and visitor experience of the Washington Park Arboretum. Designing a “signature” bridge does not reduce the visual impact of a concrete and/or steel structure in the heart of a 230-acre arboretum.

L-001-008

- **Washington Park Arboretum Master Plan** - In May 2001, the Seattle City Council approved the long-range master plan for the Washington Park Arboretum, creating a road map for Arboretum improvements over the next 20 years. The master plan ensures the Washington Park Arboretum will effectively fulfill three primary purposes—conservation, recreation and education—for decades to come. Together, University of Washington Botanic Gardens and Seattle Parks and Recreation, with support from the Arboretum Foundation, are working to implement the master plan. Substantial public and private funds have recently been raised and spent to improve the visitors’ experience. The newly created Pacific Connection Gardens have been created, the Japanese Garden Gatehouse has been redeveloped and a number of other park improvements have been made. All these contributions will likely be negatively impacted by the proposed SR 520 project.
 - The Master Plan adopted in 2001 made note of the fact that there would be limited new buildings built within the Washington Park Arboretum. Instead, UW, the Arboretum Foundation and Seattle Parks and Recreation would address their long term need for additional educational, maintenance and classroom space by expanding into the building which currently houses the Museum of History and Industry (MOHAI), once MOHAI vacated the building. The City of Seattle owns the building which MOHAI currently occupies. Since all of the options in the SDEIS involve expansion of the roadway such that the MOHAI will be demolished, WSDOT must provide replacement space as envisioned in the Master Plan.
 - There are four significant projects at the north end of the Arboretum which are identified in the Arboretum Master Plan: complete the Waterfront Trail as a loop all the way around Duck Bay; add access,

L-001-008

sitting and viewing areas on the west side of Duck Bay; daylight Arboretum Creek; and, create an entry at the west/north end of the Arboretum with the same grand character as the south entry. The redevelopment of SR 520 has the potential to negate the potential to undertake some or all of these projects to the detriment of the Arboretum and contrary to the goals set out in the Master Plan. To the extent mitigation measures are necessary as a result of unavoidable significant impacts associated with the SR 520 project, these identified Arboretum Master Plan project should be fully funded by WSDOT for implementation by Parks and/or UW.

Adopted by the Seattle Board of Park Commissioners the 8th day of April, 2010 and signed by me in open session in authentication of its adoption this ____ day of _____, 2010.



Chair of the Seattle Board of Park Commissioners

From: Kinast, Valerie [mailto:Valerie.Kinast@seattle.gov]
Sent: Wednesday, April 14, 2010 4:22 PM
To: SR 520 Bridge SDEIS
Cc: O'Brien, Mike; Bagshaw, Sally; Godden, Jean; Licata, Nick; Rasmussen, Tom; Clark, Sally; Harrell, Bruce; Burgess, Tim; Conlin, Richard
Subject: SR-520 DEIS comments from Seattle Design Commission

Please accept the attached memo as the Seattle Design Commission's comments on the DEIS for the SR-520 project. The memo is written to the Seattle City Council in response to the Nelson/Nygaard report that they commissioned, and it contains comments that speak to issues that are evaluated within the DEIS. We hope the recommendations the Design Commission sets out in the memo can inform the process and design of the SR-520 replacement project as it moves forward.

Valerie Kinast
Design Commission Coordinator

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Seattle
design
Commission

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Seattle design Commission

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Marshall Foster
Planning Director, DPD

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MEMORANDUM

To: Richard Conlin, President, City Council

From: Mary Johnston, Chair, Design Commission

Date: April 14, 2010

Subject: SR-520 Nelson/Nygaard Report

CC: Mayor Mike McGinn
Diane Sugimura, Director, DPD
Marshall Foster, Planning Director, DPD
Peter Hahn, Acting Director, SDOT
Barbara Wilson, Executive, Planning Commission

Dear Council President Conlin,

The Seattle Design Commission has reviewed the Nelson/Nygaard report on the SR-520 project.

We have provided recommendations in the past. From 2002 to 2006 the Commission provided feedback to WSDOT at seven briefings as design ideas evolved. In 2006 the Commission, in its review of the DEIS, expressed support of a four-lane alternative over a six lane alternative because of impacts to the Arboretum, surrounding neighborhoods, and the University of Washington. It asked that future alternatives provide: dedicated transit ramps at key junctures, lids that offer improved surface connectivity, a direct intermodal transportation connection at the University of Washington, and aggressive traffic management and congestion pricing tools. In recent years, a member of the Design Commission served with the deputy Mayor on the mediation group work, which finished its work in 2008. The Commission also provided comment on the results of the State Legislative Workgroup late last year.

The following recommendations on the ideas expressed in the recently released Nelson/Nygaard report continue our input on this project, which will be a strongly defining element of our city for many more decades to come.

Engage an Urban Design Consultant Soon

First, the Design Commission recommends that an urban design firm with experience in knitting large scale infrastructure projects into existing

L-002-001

L-002-002



L-002-002

urban fabric be brought under contract by WSDOT as soon as possible. It is imperative that there be a strong conceptual approach to how the SR-520 corridor design will fit into the well-established neighborhoods that it runs through. The Design Commission's experience reviewing the SR-519 and viaduct - tunnel portal planning endeavor have shown us the superior results that can be achieved when WSDOT engages urban designers early in the process. Instead of waiting and considering urban design as an afterthought, well thought through guiding principles can inform later stages of the project design.

L-002-003

Provide Better Visual Communication of the Project

Two of the main challenges of weighing the possibilities in this project are its scale and scope. Visual communication tools must be used to the fullest extent possible to break the project down to a level that people can grasp and meaningfully provide comment on it. Visual simulation videos, colorful plans, rich renderings that include realistic lighting, landscaping and signage conditions are all avenues that are becoming the standard even for highway projects in urban areas now. When creating the visual informational materials, it should be considered that Seattle's topography will make the bridge, intersections, lids etc. visible from a variety of distances and vantage points. Selection of an appropriate Urban Design consultant can greatly aid in the development of appropriate visual communication tools for the project.

L-002-004

Support a Second Bascule Bridge Over the Montlake Cut

The Commission supports building a second, bridge across the Montlake Cut just east of the existing bridge. In the past the Commission did not support a second bridge because of the visual impacts, but the idea proposed in the Nelson/Nygaard report is to provide for expanded transit/HOV operations and increased pedestrian and bicycling throughput across the cut in comparison to the bridge proposed in option A+.

Along with the second bridge, the Commission supports providing HOV lanes on Montlake Blvd. between SR 520 and Pacific Street and providing queue jumps for buses. One of the highest goals of the Commission since it began reviewing the project has been to provide good transit, bike and pedestrian connections between the SR-520 interchange and the University of Washington light rail station. The second bridge as proposed in the Nelson/Nygaard report would contribute significantly toward this goal and would create an important linkage between a new SR-520 bike route and the Burke Gilman trail.

L-002-005

Support a More Urban Montlake Interchange

The Commission supports the idea of a more urban type interchange at Montlake proposed in the Nelson/Nygaard report. This proposal adds transit lanes between SR-520 and the University of Washington, which would improve bus speeds and reliability. The idea of tightening the ramp terminal intersections shortens crosswalks, and allows for more open space and opportunities this brings. It slows vehicles, reducing noise and making the intersection more pleasant to pedestrians and bicyclists. Eliminating slip lanes makes it easier for pedestrians to negotiate the interchange.

L-002-005

Of the two "tightened" intersections, the Design Commission supports the "Transit-HOV only Ramps at E 24th" option. Although it adds vehicular traffic to the E 24th bridge over SR-520, which is now used primarily by bicyclists and pedestrians, this design reduces the amount of traffic and conflicts in the Montlake interchange shifting transit-HOV traffic from the busy intersection. The "Transit-HOV only Ramps at E 24th" option allows for larger, more contiguous lidding than the other tightened intersection proposed in the report.

Support Shifting Access to Lake Washington Blvd. West and Traffic Management Measures to Limit Traffic Through Arboretum

The Commission supports shifting access to Lake Washington Blvd. west of where ramps currently exist today. The location and configuration for this connection between SR-520 and Lake Washington Blvd. should be designed so that it balances the need to provide access to/from SR 520, with the goal of having a minimal design footprint and visual impact. The Commission recognizes that if this connection were removed altogether, it would result in traffic volumes being added to the Montlake interchange, which is counter to the goal of creating an interchange that is more amenable to pedestrians and bicyclists. The design of this connection should avoid impacting the arboretum and adjacent neighborhoods and utilize connections that result in minimal visual and noise impacts, and accommodate pedestrian and bicycle volumes to the greatest extent possible.

Traffic management measures should be explored to limit the volume, and speed of traffic through the Arboretum.

L-002-006

Support Exploring a Narrower Portage Bay Viaduct

The Commission supports continuing to explore the idea of a narrower Portage Bay segment of SR-520 as compared to the A+ option. This could include an option of narrowing to four lanes and another of providing a managed shoulder instead of a seventh lane. A smaller structure has less visual and environmental impact in this very visually sensitive location.

Support Narrowing the Overall Width of the Corridor

The Design Commission supports narrowing the width of the mainline bridge over Foster Island as laid out in the Nelson/Nygaard report. Narrowing the shoulders would not allow for the lanes to be used as travel lanes if the need arises, but it would lessen the overall impact of the structure. In its 2006 review of the SR-520 project, the Design Commission was strongly in favor of a four lane as opposed to six lane alternative. It should be noted that if a decision is made to add light rail along the SR 520 corridor, the width of the corridor may need to be slightly expanded for this purpose. We support designing the corridor with enough width, and structural support to allow for light rail to be added in the future with a minimal level of investment. An agreement should be drafted that states that any extra width on the newly constructed corridor cannot be used for additional traffic lanes, and instead be permanently reserved for high capacity transit.

L-002-007

Support Exploring Noise Reduction Measures

In its October 31, 2006 letter to WSDOT, the Design Commission

L-002-007

recommended maximizing the amount of lidding and assessing the optimal location of sound walls. It recommends sound walls be used sparingly and approached more aesthetically as design elements of the corridor. There are many attractive sound walls of glass and even including solar panels that have been built in recent years in Europe that can serve as examples for this.

The Commission would like to support the Council in encouraging the State to explore reducing the speed of traffic in all or part of the corridor as a noise reduction measure as brought up in the City Council SR 520 Committee meeting on April 5th. This might also allow for narrower lane widths and thus a narrower bridge footprint, a goal expressed by the Commission in previous reviews of the project.

Explore the use of smart highway applications, such as those being planned on the eastside and on I-5 south of downtown, that would adjust speeds to the volumes of traffic, optimizing flow.

L-002-008

Montlake Triangle

The Commission supports an at grade solution at the Montlake Triangle. At the time of its review of the University of Washington light rail station, the option of an at grade crossing was not a possibility that was on the table and the Commission recommended the pedestrian bridge over a tunnel. The Rainier Vista plans have been reviewed by the Commission and the idea of reconnecting the upper part of the axis to the triangle is supported. The Rainier Vista plans provide an important link to and between the various transit modes that will be concentrated in the area.

Support for Montlake Triangle State Workgroup Process

The Commission offers its support to Council on the Montlake Triangle workgroup process. A member of the Design Commission was active in the State SR 520 mediation group process and we hope that Council will see us as a resource in this new workgroup, legislated by the Governor last month. The Design Commission has a broad span of expertise; its membership includes a transportation engineer, urban planners and designers, a civil engineer, landscape architects, an artist, and architects.

L-002-009

Conclusion

The SR 520 project is an exciting endeavor and a great opportunity to create a state highway that is at the cutting edge of what urban infrastructure projects can be in this millennium. Seattle with its gritty history, natural beauty, and international acclaim for technology and sustainable thinking should have a highway that is beyond the ordinary. The Design Commission will continue to provide ideas that will help us achieve this.

From: Joe Willis [mailto:jwillis@medina-wa.gov]
Sent: Thursday, April 15, 2010 2:03 PM
To: SR 520 Bridge SDEIS
Cc: Donna Hanson; Robert Grumbach; Bret Jordan; Doug Dicharry; Janie Lee; Mark Nelson; Shawn Whitney; Patrick Boyd; dspkep@msn.com
Subject: SR 520 Supplemental Draft EIS comments

Attached are City of Medina comments on the SR 520, I-5 to Medina, Bridge Replacement and HOV Project Supplemental Draft EIS document.
Thank you for the opportunity to comment.

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CITY OF MEDINA

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April 14, 2010

Jenifer Young
Environmental Manager
SR 520 Project Office
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Seattle, WA 98101

RE: City of Medina Comments on SR 520, I-5 to Medina Supplemental Draft EIS

Dear Ms. Young,

Thank you for the opportunity to comment on the Supplemental Draft EIS for the SR 520 Bridge Replacement and HOV Program. The City of Medina has the following comments:

According to the Supplemental EIS document (Chapter 1 page 1-35) and recent discussions with WSDOT and design team consultants the SR 520 project is divided into two separate projects (Medina to SR 202 Eastside Transit and HOV Project and I-5 to Medina Bridge Replacement and HOV Project), interface between the two projects occurs at Evergreen Point Road in Medina. This unfortunate circumstance subjects the City, contractors, utility managers, transit, and other agencies to scheduling and coordination headaches that are not presently defined or well

L-003-001

L-003-001 | conceived in the document. For example, closing the Evergreen Point Road Park & Ride lot and the transit stop for 4 to 6 months (Chapter 3 page 3-45) without consideration being given to the affects to local users, transit operations, and necessary bus transfers between bus routes and bus schedules is not adequately addressed, especially when two separate projects are impacting the corridor. The placement of a temporary transit stop west of the ultimate freeway lid is described in the eastside project. The completion of the transit access from the new Evergreen Point Road freeway lid to the roadway center lanes is described in the westside project. When is the Evergreen Point Road lid constructed? It is not adequately provided for in either document.

L-003-002 | Construction guidance documents that are to be drafted and provided to the design-build contractors need to define the parties, who has the authority to make decisions that override the contractors, and how those decisions are to be made in a timely manner so that all affected parties have input, are aware of the issues, and have time to prepare for the implementation. Project design oversight and processes and construction management is not defined in any of the Supplemental Draft EIS documents. Each municipality affected by the east and west side projects need the authority and avenue for affecting changes to the contractor(s) proposed methods of construction and implementation as they impact local traffic, traffic control, streets, utilities, park lands, including but not limited to construction noise, dust, and disruption of services.

L-003-003 | Comments on specific items:

1. Chapter 3 Bridge Maintenance Facility (page 3-44). The operation of the maintenance facility is not consistent with the residential character of the surrounding land uses. This is reflected in the Medina Shoreline Management Master Program which states its primary goal is to preserve Medina's shoreline for single-family residential use. There does not appear to be much of an analysis in the EIS about how the maintenance facility might affect this residential nature. While the EIS states the facility will be buried in the bank slope, comments from WSDOT staff have indicated this may not be the case. In any case, compatibility with residential uses will need to be demonstrated at the time a shoreline conditional use permit application is submitted. 150 to 200 temporary support piles mentioned in this chapter are not evaluated for impacts to the shoreline zone.

Maintenance dock. The Medina SMP states piers should be the minimum length (not to exceed 100 feet) and width necessary for reasonable use, and that the overall square footage of the pier is compatible with adequate depth of water and length of piers on similar adjacent properties. The proposal for a 100-foot in length dock is consistent with the Medina SMP, but the proposed width and overall square footage will require further analysis for its reasonableness. Near shore impacts for the proposed dock and wave barrier are not evaluated or provided in the document. The discipline reports indicated construction on the maintenance facility and dock will last 24 months. The report indicates during construction, contractors would be required to use best management practices to avoid construction effects that could harm fish habitat. However, the City would request that this be expanded to take into consideration the city's construction mitigation program where construction effects on neighboring properties are addressed.

L-003-004 | Evergreen Point Road Transit Station. (See comments above). The paragraph states that the station would be relocated to the lid in the interim. How can that happen if the lid is not yet in place either by failure of the Medina to SR 202 project to be built or by a funding short fall that delays its construction?

L-003-005 | 2. Construction Staging Areas and Haul Routes (Chapter 3): Temporary construction offices will require building permits and utility connections (no overhead services are allowed). Staging areas should be screened from residential neighboring properties. Temporary erosion control needs to installed, monitored, and maintained throughout the construction. Any work within the City rights-of-way will require permits, City inspections, and approval. Haul routes over City streets will require permits, documentation of conditions prior to use, sweeping, patching, timely repairs of any damage, and full restoration following the project.

L-003-006 | 3. Project Area's Environment (Chapter 4). Fairweather Park is described on page 4-34 and includes the an "Unnamed Stream" through the park (as described in the Medina to SR 202 Eastside Transit HOV Project) as a spring-fed stream. The spring-fed stream is primarily fed by runoff from a sizable drainage area south of SR 520 that passes under the freeway in a culvert (the present SR 520 toll plaza area also drains to this same culvert). On March 1, 2010, WSDOT made a request to me that the City replace an existing 24-inch diameter high flow storm water bypass constructed by the City in 1996 within the north margin of the WSDOT right-of-way within the northerly portion of the highway right-of-way to avoid adverse impacts to the nature preserve.

The bypass pipeline was constructed to prevent erosion of the natural unnamed stream bed within the easterly Nature Preserve portion of the park. The SR 520 existing cross culvert is proposed by the WSDOT design team to be extended to accommodate the relocated Regional Bike Path and sound walls, but no mention is made in the environmental document regarding the importance of retaining a high flow bypass that reduces the peak flows to the stream through Fairweather Preserve. Extension of the cross culvert by itself (as proposed by the WSDOT design team) without the relocation of the high flow bypass pipeline will subject the Fairweather Preserve stream to uncontrolled flows that prior to 1996 resulted in significant stream bed down cutting, sediment transport, and stream bank erosion.

The bypass pipeline was installed under Franchise Agreement No. 10240 within the northerly portion of the highway right-of-way that was already cleared and occupied by the Points Loop Trail to avoid damage to the nature preserve. Relocation now will require removal of significant trees and vegetation in order to place it outside of the proposed freeway improvements that also includes a proposed highway stormwater runoff treatment facility in that portion of the preserve next to 80th Ave NE described on page 5-122 of the document. If WSDOT truly desires to minimize adverse impacts to the Fairweather Park and Preserve, then the cross culvert diversion manhole and the relocation of the high flow bypass should be included in the Eastside SR 520 construction contract work and be completed in conjunction with the highway stormwater runoff treatment facility.

L-003-007 | Geologically Hazardous Areas: The City's critical areas regulations set forth in chapter 18.12 of the Medina Municipal Code is utilized to protect critical areas within the shoreline

L-003-007 | jurisdiction. The SDEIS does not provide enough information to determine what affects the construction of the maintenance facility and east approach project will have on the surrounding steep slopes. This will need to be evaluated as part of the shoreline permits.

L-003-008 | East Approach & Bridge Construction. Medina's shoreline jurisdiction reaches to the mid point of Lake Washington. A substantial development permit is required for this development to occur within the shoreline jurisdiction.

L-003-009 | 4. Project Operation and Permanent Effects (Chapter 5). Development of Interchange Forecasts – We are concerned about using a general growth rate to prepare the interchange forecasts. Operations at the interchanges and the adjoining intersections are directly impacted by specific intersection turning movements. Assuming general growth rates and similar turning movement ratios in developing the forecasts is an overly simplistic approach for such a detailed operations analysis. The City is concerned that growth from specific travel patterns and movements were not directly accounted for in the analysis.

L-003-010 | Economic Impact page 5 - 41 mentions parcel purchases in Medina. The City of Medina Comprehensive Plan (as amended in March 2005) in the Parks and Open Space Element includes goals and policies to acquire additional waterfront access and to develop view parks in the City. In concert with that vision, the City desires to create more park space and waterfront access by acquiring the excess portions of the State purchased parcels following completion of the freeway project to enlarge Fairweather Park and Preserve and link it with the Regional Trail, maintain existing connections with the Points Loop Trail, and to provide access to Lake Washington shoreline.

L-003-011 | Eastside Landscape Unit (page 5-77). No mitigation is proposed or described in the document for the removal of a swath of mature trees and understory on the north side of SR 520 associated with both SR 520 projects (bridge and stormwater treatment ponds adjacent to Fairweather Park and Preserve). Contrary to the statement on page 5-82 of the document, the City considers the removal of trees as a major activity that requires mitigation (Municipal Code Chapter 12).

L-003-012 | Groundwater. At present under the Medina to SR 202 project a 0.06 acre portion in the southwest corner of Fairweather Park playfield is proposed to be acquired and permanently converted to the relocated Regional Bike Path merged with the park. WSDOT recently requested an additional 0.63 acre for construction of the Evergreen Point Road lid on a temporary basis to accommodate subterranean tiebacks to support temporary shoring walls. The area requested is presently under consideration for the siting of wireless communications facilities, has trees along the frontage of Evergreen Point Road, is an active playfield, and has tennis courts in the easterly portion of the area. The document does not address these impacts. At a minimum, WSDOT must demonstrate that the temporary shoring wall and subterranean tieback supports in the upper portion of the park will not adversely affect the hydrology and groundwater contribution to the Fairweather Preserve forest and wetland ecosystem (exclusive of the high flow stormwater bypass mentioned above).

L-003-013 | 5. Effects during Construction (Chapter 6). Evergreen Point Transit Station closure (see comments in the second paragraph of this letter) will adversely affect transit ridership. Maintaining one eastside station open at all times fails to recognize the function and use of the individual transit stations. The 92nd flyer stop provides the central location for Prep School students to board buses bound for Seattle while the Evergreen Point Road transit station provides a host of diverse users and functions as a major transfer point for riders. The transit stops require greater study and attention than provided in the document.

L-003-014 | Effects on Neighborhood Streets. The projected number of truck trips (Table 6.1-4) will significantly affect the speeds of traffic and result in increased congestion on the freeway and thus result in significant backups on on-ramps and surface streets feeding to them. Since vehicles will be backed up in the NB inside lane of 84th Avenue, analysis should be given to the blocking and safety impacts problem of vehicles trying to ingress and egress from Medina Circle. In addition, vehicle queuing may at times extend past NE 24th Street and block NB left turns from 84th Avenue NE to NE 24th Street. These possible impacts are not disclosed or discussed in the analysis, and no mitigation considerations are provided to address the ultimate lane configurations and interchange operation. The City is concerned that solutions to these problems are not reflected in the proposed design or for the interim phases of the projects.

L-003-015 | Construction affecting public services and utilities (page 6-36). Utility relocation and replacement required by the project need to consider maintenance of existing services during construction and accommodate upgrades to those services as provided for in the utility comprehensive plans. Water mains for example in Medina are undersized, were constructed of AC materials that are past their projected service life, and require replacement with larger mains to provide adequate domestic and emergency fire flow demands. The SR 520 ultimate design lids will require additional irrigation water. Landscape areas along the corridor will require irrigation water. The Evergreen Point Bridge design needs to consider emergency fire protection on the bridge; none of this is addressed in the document.

Stating that franchise agreements will be utilized to relocate utilities forces utility agencies to absorb the impacts of relocating their facilities. This attempts to shift the fiscal responsibility for the relocation work from the State to the local agencies that are already taxed in a difficult financial climate, have not anticipated the cost or manpower allocation required to accommodate the freeway construction on a short time table. This will force the agencies to pass the costs onto the local rate payers. These impacts have not been addressed in the document.

L-003-016 | Construction Equipment Impacts. Medina has strict requirements on construction equipment including but not limited to weight restrictions, parking restrictions, mobilization of oversized equipment, etc. (municipal code chapter 10). These and associated construction requirements in the code will apply to all operations outside of the WSDOT right-of-ways.

L-003-017 | Be assured, the City of Medina supports the completion of the SR 520 Eastside and Westside Bridge Replacement and Transit and HOV Projects for the benefit of all, provided it is designed and accomplished in a manner that considers the impacts to local residents, mitigates the

L-003-017 | negative impacts to the greatest extent possible, taking into account the overall needs of the community of Medina no more and no less than larger municipal participants in the project.

Again, thank you for the opportunity to comment. If you have any questions, please contact me at (425) 233-6439 or jwillis@medina-wa.gov.

Sincerely,

Joe W. Willis Sr. P.E., P.L.S.
Director of Public Works
City of Medina

cc: City Council, Donna Hanson, Robert Grumbach



Seattle City Council

April 15, 2010

Governor Christine Gregoire
Office of the Governor
PO Box 40002
Olympia, WA 98504-0002

Paula Hammond, Secretary
Washington State Department of Transportation
Transportation Building
501 Maple Park Avenue SE
PO Box 47300
Olympia, WA 98504-7300

Jenifer Young
SDEIS Environmental Manager
600 Stewart St., Suite 520
Seattle, WA 98101

Dear Governor Gregoire, Secretary Hammond, and Ms. Young:

Thank you for the opportunity to provide comments and recommendations on the SR 520, I-5 to Medina: Bridge Replacement and HOV Project. We appreciate the support you have given to our involvement, and the structure of the work groups that were created in ESSB 6392. This letter communicates our perspective as we move into the next stage of cooperative efforts involving the State, the region, and the City of Seattle.

Our comments on the Supplemental Draft Environmental Impact Statement (SDEIS) for the SR 520, I-5 to Medina: Bridge Replacement and HOV Project fall into four categories:

- 1) An overview of our policy approach to the project in this cover letter.
- 2) A set of formal recommendations for the SDEIS (Attachment 1) to improve the project, particularly in the Westside interchange area.
- 3) Additional recommendations for the SDEIS that include phasing the decisions relating to the construction of two specific project components (Attachment 2). The two components are the second Montlake Bridge and the 24th Avenue (Lake Washington Boulevard) ramps.
- 4) An additional recommendation for a future project to be analyzed (Attachment 3).

We are committed to moving this project forward towards a 2014 opening for the new bridge and to keeping the project within the projected \$4.65 billion budget. We support the vision of the project as a six lane corridor between Medina and I-5 that includes two dedicated high occupancy vehicle (HOV)/transit lanes. Dedicated HOV/transit lanes will immediately improve transit in the corridor and are consistent with the state legislative requirement "to accommodate light rail in the future".

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L-004-002

The project should be designed and constructed to be ready for conversion from HOV/transit to Bus Rapid Transit (BRT), with a clear and legislatively mandated performance standard for increasing the minimum number of passengers per vehicle in HOV lanes and ultimately the conversion of the HOV/transit lanes to dedicated BRT, as envisioned in the SR 520 High Capacity Transit Plan. Such a performance standard has already been articulated in ESSB 6392, but it is an imperative that the Legislature and Governor take this standard to a level of certainty by adopting additional legislation requiring that action will be taken when appropriate thresholds are reached. It is also critical that the state identify committed revenue to fund transit for the SR 520 corridor.

L-004-003

As we noted in our January 28 letter, "neither Alternative A+ nor M adequately meets the needs and priorities of the City of Seattle and our residents." We oppose designating Alternative A+ as the Preferred Alternative for this project, and recommend that the state identify a new alternative that includes our design alternatives.

The relatively short comment period for the SDEIS precludes the possibility of a full exploration of all possible design options and refinements for the SR 520, I-5 to Medina: Bridge Replacement and HOV Project. If accepted by WSDOT, some of the recommendations included in this letter will also require additional design work in order to determine the scale of their potential impacts and costs. Although WSDOT intends to identify a preferred design alternative for the SR 520 Bridge by April 30, 2010, it is our sincere hope that, in the weeks and months ahead, WSDOT will continue to work with the City of Seattle, Metro, ST, and UW as they refine and finalize their plans and prepare to issue a final EIS in late 2010.

Thank you for considering our comments. As the SR 520, I-5 to Medina: Bridge Replacement and HOV Project continues to move forward, we look forward to working in partnership with you to ensure the final design for the corridor is sensitive to the needs of the Seattle communities that surround it.

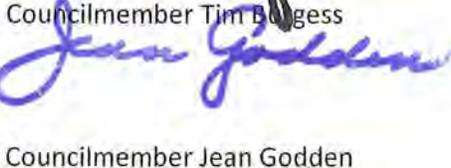
Sincerely,


Council President Richard Conlin


Councilmember Sally Bagshaw


Councilmember Tim Burgess


Councilmember Sally J. Clark


Councilmember Jean Godden


Councilmember Bruce Harrell


Councilmember Nick Licata


Councilmember Mike O' Brien


Councilmember Tom Rasmussen

ATTACHMENT 1: COMMENT LETTER FOR THE SUPPLEMENTAL DRAFT ENVIRONMENTAL IMPACT STATEMENT (SDEIS)

Following the Washington State Department of Transportation's (WSDOT) release of the SDEIS in January 2010, the Seattle City Council initiated a two month review and assessment process that was intended to inform the content of this letter. As part of that effort, we hired transportation consultants from Nelson\Nygaard and also worked closely with the Seattle Department of Transportation (SDOT), WSDOT, Sound Transit (ST), King County Metro (Metro), and the University of Washington (UW). Our key goals for the review and assessment process were to develop specific design recommendations for the new SR 520 Bridge that would help improve transit service and connectivity, the pedestrian and bicycle environment, neighborhoods, traffic operations, and open space in the vicinity of the corridor. We also identified the following four assumptions to help guide the development of any new design elements and/or system-level alternatives that might emerge from our SDEIS review process:

- 1) Between Medina and I-5, SR 520 will have a total of six travel lanes, including four general purpose lanes (two in each direction) and two high occupancy vehicle (HOV) or transit lanes (one in each direction);
- 2) The total budget for SR 520 corridor improvements, including mitigation, will not exceed \$4.65 billion;
- 3) No additional environmental impact assessments, including the publication of an additional SDEIS, will be necessary; and
- 4) The design alternatives evaluated as part of this process will generally be within the scope of either the DEIS or SDEIS that WSDOT has already completed for the SR 520, I-5 to Medina: Bridge Replacement and HOV Project.

We believe that most of the recommendations included in this letter are substantially within the framework and intent of these baseline assumptions. Each of our recommendations is designed to significantly improve the portion of the SR 520 corridor that extends through the City of Seattle. Consistent with the ongoing design refinement process described in ESSB 6392, we would welcome an opportunity to continue working with the State to analyze the potential outcomes of the policy and design options we are supporting in this letter.

Our recommendations are as follows:

Design Recommendations

- ***Construct the replacement corridor in a six-lane configuration.***
We reaffirm our position that the replacement corridor should be designed to accommodate no more than six lanes of traffic, including two lanes for transit and HOV and four lanes for general purpose traffic.
- ***Locate Westside interchange at Montlake, with conditions.***
More than 50 percent of the current daily traffic on SR 520 uses the existing Montlake interchange. The interchange, which is located just south of the Montlake Cut, offers convenient access to several institutions and amenities that draw visitors and employees from across the region, including UW and the Washington Park Arboretum. However, the interchange is also sited in the heart of Seattle's historic Montlake neighborhood, where it abuts the community's commercial district on 24th Avenue East. If a new, replacement interchange is to be sited in Montlake, the following elements should be incorporated into its design:
 - 1) The interchange must be redesigned to reduce the overall footprint, to be more compatible with the Montlake community, scaled to its location within a neighborhood, and organized to promote the most effective pedestrian, bicycle, and transit connections. We request that continued collaboration occur between WSDOT, SDOT, and if appropriate, consultants to redesign the interchange to operate as an urban intersection, not a

L-004-005

highway interchange. Options for a redesigned interchange should include a tightened intersection, a diverging diamond configuration, and loop ramps under the east end of the Portage Bay Bridge.

Ramp intersections should also be tightened and slip ramps eliminated. These design refinements will help to improve bicycle and pedestrian safety along Montlake Boulevard and support creating an interchange that is more suitable for a neighborhood setting like Montlake.

L-004-006

- 2) New HOV/transit-only ramps should be located at 24th Avenue East rather than at Montlake Boulevard. Placing the HOV/transit-only ramps at 24th Avenue East would require buses and carpools traveling between SR 520 and the UW and Montlake areas to drive about two blocks farther in order to utilize a direct access ramp. However, locating the HOV/transit-only ramps at 24th Avenue East would create an opportunity to construct a large lid over SR 520, between Montlake Boulevard and 24th Avenue East that would not be bisected by any vehicle lanes.

L-004-007

- 3) A new lid over SR 520, between Montlake Boulevard and 24th Avenue East, would create a buffer between the Montlake neighborhood and SR 520. It would also enhance the bicycle and pedestrian environment on Montlake Boulevard. Bus stops should be included on this lid.

L-004-008

- 4) Priority signals for transit should be provided at key intersections in the vicinity of the Montlake interchange. These include the intersection of Northeast Pacific Street and Montlake Boulevard, and intersection at the north end of the Montlake interchange. This form of signalization, also referred to as a "queue jump," would allow buses to clear busy intersections before other traffic is allowed to move.

L-004-009

- 5) Dedicated HOV/transit lanes should be provided on Montlake Boulevard. At a minimum, these lanes should extend from the intersection of Northeast Pacific Street and Montlake Boulevard to the intersection of 23rd Avenue and Lake Washington Boulevard.
- 6) WSDOT should also commit to working with SDOT to consider extending the dedicated HOV/transit lanes on Montlake Boulevard to the north, and on 23rd Avenue to the south. The southern corridor should be reviewed as far as the intersection of Madison and 23rd Avenues.

L-004-010

- 7) The High Capacity Transit Plan for SR 520 lacks specificity with regard to service availability, particularly mid-day, over the phase-in of new transit service on SR 520. WSDOT should work with Metro and ST to ensure that there will be an adequate base level of mid-day service between the UW/Montlake area and the Eastside when the current flyer stop is closed. A specific transit service plan for the ramp up to and duration of construction of the corridor should also be developed. A reduction in frequent and reliable service is unacceptable. WSDOT is heavily dependent upon the implementation of new transit service in order to meet the corridor's purpose of improving mobility for people across Lake Washington. As a result, we believe more specific commitments to transit service investments need to be sought from Metro and ST.

L-004-011

- 8) WSDOT should set a goal of identifying design alternatives that would reduce the number of general purpose lanes exiting westbound SR 520 at Montlake Boulevard from two to one.

L-004-012

- ***Direct project mitigation funds to the Montlake Triangle area.***

The Montlake Triangle, at the intersection of Montlake Boulevard and Northeast Pacific Street, is a heavily traveled area that will be significantly impacted by the replacement and expansion of the SR 520 corridor. As such, the Montlake Triangle, which is a major pedestrian and transit hub and will soon be home to the U-Link light rail station, should be a strong candidate for project mitigation funds. Consistent with ESSB 6392, we also look forward to convening a work group to study and make recommendations about transit connections in this area. One of the Council's primary goals for this work is to identify ways to reduce the walking distances between all the transit modes that will serve the Montlake Triangle into the future and to improve the pedestrian environment in this area.

L-004-013

- **Minimize the height of the cross-lake bridge deck.**

The SDEIS considers a 32-foot high bridge deck on the cross-lake, floating portion of the SR 520 Bridge. At more than 20 feet higher than the existing bridge deck, 32 feet is unacceptable. A bridge height of 32 feet would have significant, negative visual impacts and degrade important scenic and historic viewsheds from the Washington Park Arboretum, UW, and along Lake Washington Boulevard. We recommend that the height of the replacement bridge deck be lowered to as close to 20 feet as possible without compromising the safety of the corridor.

L-004-014

- **Split the bridge corridor and narrow shoulders through the Arboretum.**

To minimize impacts on the Arboretum and provide for the daylighting of the area underneath the bridge, the eastbound and westbound lanes on SR 520 should be split through Foster Island and as much of the Arboretum as possible. This design modification is important to ensure that the corridor can accommodate light rail in the future. The gap should be as wide as feasible without interfering with traditional cultural property. The amount of pavement should be reduced by narrowing the shoulder width by two feet on each side of both eastbound and west bound lanes, for a total pavement reduction of 8 feet through the Arboretum.

L-004-015

- **Reduce the width of the Portage Bay Bridge.**

In the SDEIS, Option A+ calls for a seven lane configuration across Portage Bay from Montlake to I-5. This configuration includes four general purpose lanes, two HOV/transit lanes, and one westbound auxiliary lane. We support eliminating the auxiliary lane and replacing it with a managed shoulder that could be used as a traffic lane during peak travel times. Adoption of this concept could reduce the footprint of the Portage Bay Bridge.

L-004-016

- **Ensure that the new bridge is designed and constructed to accommodate high capacity transit.**

In 2008, average weekday transit ridership on the SR 520 Bridge was about 15,000. By 2020, that figure is expected to increase to 25,000 daily riders. As the demand for transit service along the SR 520 corridor continues to climb, the new bridge should be designed and constructed in a manner that will accommodate appropriate new modes of high capacity transit, including dedicated BRT and/or light rail.

With regard to accommodating light rail along the SR 520 corridor, we support maintaining flexibility for the region to make this decision at a later date. We also encourage WSDOT, ST, and the Federal Highway Administration (FHWA) to evaluate the potential for a future cross-section for the floating bridge that could accommodate four lanes of vehicular traffic (two in each direction), two lanes of light rail (one in each direction), and a bicycle and pedestrian pathway within a 115-foot wide right of way.

A report by Nelson/Nygaard that was commissioned by the Seattle Mayor's Office identified three possible issues that could compromise the ability of SR 520 to accommodate future light rail:

- 1) A gap between the eastbound and westbound lanes on SR 520 would need to extend through the Arboretum in order to allow light rail. The Council has already recommended this gap and we endorse this element, which could be included under the current SDEIS and without delaying the project.
- 2) The roadway on the bridge deck would have to be expanded to 125 feet in order to allow for light rail. The Council and the neighborhoods adjacent to SR 520 have worked for years to narrow the bridge design to minimize its footprint and impacts and to minimize the possibility of restriping the bridge for additional vehicle lanes. We note that light rail is being added to the I-90 corridor through design modifications with the approval of FHWA, WSDOT and ST that allow for narrower shoulders than the cross section of SR 520 in the Mayor's report. Given this precedent, as well as information from WSDOT that adding additional width would be feasible if desired, the Council does not support widening the bridge deck to 125 feet at this time. It appears that the current floating bridge design with the addition of the split corridor design modification would be compatible with light rail. The Council is committed to minimizing the footprint and avoiding significant delay of the project.

L-004-016

- 3) Additional pontoons would be required to support the weight of light rail on the bridge. WSDOT has indicated that the design would support the additional pontoons and that there are no technical reasons that require adding them at the current time. Adding pontoons now would require additional environmental work and delay the project. Given that the region has not decided to construct light rail on the corridor, it would not be an appropriate use of limited public funds to include the pontoons in the current project or delay the project to complete the required environmental analysis.

There is no current plan for light rail on this corridor. That option was deferred by the ST Board through the ST planning process. The ballot measure that passed in November 2008 includes significant increases in funding for bus operations on the SR 520 corridor. Additionally, the Lake Washington Urban Partnership is funding the capital costs for 45 new buses dedicated to this corridor and Metro is dedicating funding for expansion of bus service. Buses may provide a more flexible and effective form of high capacity transit for this project area.

If the region were to proceed with light rail on the SR 520 corridor, there would have to be additional environmental assessment, routes determined for light rail to traverse after leaving the corridor, a funding plan approved by voters, and design and engineering work.

We therefore recommend that the design for the SR 520 corridor accomplish the following in order to meet the legislative requirement to accommodate light rail:

- 1) Ensure that no substantial element of the corridor, such as overpasses or highway portions, would have to be demolished and rebuilt in order to construct light rail.
- 2) Include the recommended gap between the eastbound and westbound lanes in the Arboretum area.
- 3) Have a design plan that includes light rail on the current 115-foot wide bridge corridor and/or that permits adding additional width without demolishing or rebuilding the bridge deck.
- 4) Ensure that the pontoons are designed so that the additional stabilization pontoons can be added without major disruption of the corridor or significant modification of the existing pontoons.

L-004-017

- ***Enhance the streetscape along Montlake Boulevard and in the vicinity of the Montlake interchange.***
Montlake Boulevard is a heavily traveled arterial that is also an important corridor for pedestrians and bicyclists. Improving lighting, signage, landscaping, and bicycle and pedestrian facilities along Montlake Boulevard and in the vicinity of the Montlake interchange would help to make this area more "human scale" and enhance its safety for those who are traveling by foot or by bike. This area should be designed in accordance with the Olmsted plan for Montlake Boulevard and Montlake Boulevard should have a fully landscaped median.

- ***Design bicycle and pedestrian facilities along the SR 520 corridor to City of Seattle standards at all locations.***
The planned bicycle and pedestrian route along the SR 520 corridor, from Seattle to Medina, is an important component of the design for the new bridge. This new facility will expand recreational and commuting opportunities for residents on both sides of Lake Washington and complete a critical link in our region's expanding network of bicycle and pedestrian paths. New connections on Montlake Boulevard, connections west of Montlake Boulevard to the Montlake Playfield and bicycle corridors to Capitol Hill, and connections north of the Montlake Boulevard/Pacific Street intersection to the Burke Gilman Trail and the University of Washington should include minimum widths of 16 feet for major pedestrian routes and 12 feet for major bicycle routes. Design modifications should be identified, if needed, for these routes.

L-004-018

- ***Develop a noise mitigation plan for SR 520 in partnership with nearby residents.***
We fully support WSDOT's plans to develop a noise mitigation plan for SR 520. Residents of the neighborhoods adjacent to the corridor should have an opportunity to participate in this planning process. In addition to federally recognized noise mitigation measures, the plan should include new and innovative practices that have the potential to effectively reduce noise impacts. We also encourage WSDOT to fully

L-004-018

implement the recommendations from the Health Impact Assessment that was completed for SR 520 in 2008 by Seattle-King County Public Health and the Puget Sound Clean Air Agency.

L-004-019

- ***Review and improve plans for managing the impacts of construction in the new SR 520 corridor in partnership with nearby residents, institutions, and businesses.***

The impacts of construction, including truck traffic, will be significant in neighborhoods around the 520 corridor. WSDOT should carefully review the construction management plan for SR 520 and coordinate with the agencies that are managing other nearby projects (such as University Link) to minimize impacts.

Policy Recommendations

L-004-020

- ***Develop and implement a corridor management plan that includes minimum performance standards for transit/HOV and general purposes lanes with triggers for mandatory actions to maintain those standards.*** Consistent with ESSB 6392, we concur that WSDOT should develop performance standards for the HOV/transit lanes on SR 520. We recommend that WSDOT develop a corridor management plan, to be adopted by the Legislature and approved by the Governor that states a minimum performance standard that ensures speeds in the HOV/transit lanes do not fall below 45 miles per hour more than 5 percent of the time during peak hours as measured and reported quarterly. If the performance standard is not met, mandatory triggers should be in place to increase the minimum number of passengers per vehicle in the HOV lanes or conversion of the HOV lanes to transit only lanes should occur. We also recommend that as part of the corridor management plan, performance standards be developed for the general purpose lanes on SR 520. We support the potential use of dynamic variable tolling along the entire corridor that would allow for increasing toll rates in order to achieve specific performance standards for general purpose as well as HOV/transit lanes. To ensure that these standards are enforced, legislation needs to be adopted mandating the triggers for actions to meet these performance goals.

ATTACHMENT 2: COMMENT LETTER FOR THE SUPPLEMENTAL DRAFT ENVIRONMENTAL IMPACT STATEMENT WITH PHASING RECOMMENDATIONS

L-004-021

- ***Phase the decision on construction of the proposed second bascule bridge at Montlake Boulevard and test measures that may eliminate the need for construction. Require that the bridge be designed to provide priority for transit, pedestrian, and bicycle traffic if it is constructed.***

We continue to have reservations about the potential construction of a second bascule bridge across the Montlake Cut at Montlake Boulevard. Building a parallel bascule bridge at Montlake will likely necessitate the removal of two residential properties and further divide the Shelby-Hamlin neighborhood, which is already bisected by a 4-lane Montlake Boulevard that is traveled by more than 50,000 vehicles each day. If a second bascule bridge is to be constructed at Montlake, we recommend it be built to meet the following conditions:

- 1) The second bridge should be built to accommodate no more than two lanes of traffic and include dedicated bicycle and pedestrian facilities. In order to reduce additional negative impacts on the Shelby-Hamlin neighborhood, the footprint of the new bridge should be as narrow as possible without compromising the safety of Montlake Boulevard, transit operations, or Seattle standards for bicycle and pedestrian facilities.
- 2) The existing Montlake Bridge should remain a 4-lane roadway.
- 3) If the second bridge is completed, the two crossings should operate in a 4+2 configuration, with four general purpose lanes and two dedicated HOV/transit lanes. If possible, the dedicated HOV/transit lanes should be located on the original bridge, with the northbound lane operating as a counterflow. This will allow center line operation, permit the use of existing electric wires, and avoid the installation of new electric wires on the new bridge.

We will only consider supporting the construction of a second bridge across the Montlake Cut if the additional bridge is used to provide the capacity for dedicated facilities for HOV, transit, bicyclists, and pedestrians. We do not support the creation of additional roadway capacity along Montlake Boulevard for single occupant vehicles and other general purpose traffic.

In order to determine whether the second bridge is needed, WSDOT, SDOT, Metro, and ST must work together to design and test systems that will facilitate the movement of transit through the Montlake corridor, such as signalization, signal timing, signal queue jumping for HOV/transit, dedicated HOV/transit lanes, and other techniques. WSDOT, SDOT, and Metro should identify and analyze traffic management options/plans for the entire neighborhood, including specifically the corridor between University Village and 23rd and Madison, and assess their impacts on arterials and neighborhood streets. The goal of the testing program should be to determine whether a combination of strategies can ensure the reliable movement of both transit using the SR 520 corridor and north-south transit through the City of Seattle.

L-004-022

- ***Reconfigure the ramps between SR 520 and Lake Washington Boulevard and develop a traffic management plan for the Washington Park Arboretum. Phase the decision on the construction of these ramps, test the effectiveness of a traffic management plan and other measures to protect the Arboretum, and ensure reliable movement of transit and other vehicular traffic through the 23rd Avenue/Montlake corridor.***

The 230-acre Washington Park Arboretum is one of the most cherished parks in the Puget Sound region and protecting its character and fragile environment is one of the City Council's top priorities for the SR 520, I-5 to Medina: Bridge Replacement and HOV Project. In addition to serving as a "living museum" of diverse plant species that draws visitors from around the world, the Arboretum also provides needed open space and recreational opportunities for thousands of nearby residents. After carefully considering the trade-offs associated with including ramps between SR 520 and Lake Washington Boulevard near the western edge of

the Arboretum, we have concluded that if ramps are built in this area, they must meet the following conditions:

- 1) The ramps must be reconfigured to connect to Lake Washington Boulevard at 24th Avenue East, thereby supporting the goal of constructing a larger, uninterrupted lid over SR 520 between 24th Avenue East and Montlake Boulevard, and avoiding the presence of ramps in the Arboretum.
- 2) A partial lid that extends east over the eastbound lanes of SR 520, from 24th Avenue to the Arboretum, should be constructed to help improve pedestrian connections to the Arboretum trail system.
- 3) WSDOT must agree to work with the City of Seattle to develop and implement a traffic management plan for the Arboretum. Such a traffic management plan would apply to the area that is bounded by SR 520 to the north, Lake Washington Boulevard to the east, Madison Street to the south, and 23rd Avenue to the west. The traffic management plan may include, but need not be limited to, traffic calming, tolling, reduced speed limits, and ramp use restrictions.
- 4) As part of the traffic management plan, the existing on- and off-ramps in the Arboretum should be closed early in the SR 520 project's construction phase. The need for replacement ramps would then be reassessed once construction is nearing completion.

The Council wishes to implement this traffic management plan as quickly as possible and analyze the outcomes. Measurable goals should be set in consultation with the Arboretum Foundation, WSDOT, Metro, and SDOT, and sets of measures should be tested until the goals are effectively met. Implementation should proceed in conjunction with the work on 23rd and Montlake Avenues, and goals should include effective management of that corridor as well.

L-004-023

ATTACHMENT 3: RECOMMENDATION FOR A FUTURE PROJECT TO BE ANALYZED

Evaluate a HOV/transit fixed span bridge at a location east of Montlake Boulevard. This option is not included in the current SDEIS but offers potential future benefit and should be evaluated as a separate project.

There are still major concerns about whether the configurations included in the SDEIS will actually be able to successfully facilitate the movement of traffic through the Montlake area, especially transit. We recommend that the state begin a process to review a possible high bridge to the east of Montlake Boulevard, between the MOHAI building and Marsh Island. Such a bridge would be an important option to provide a future light rail or bus rapid transit connection to Pacific Street and the University Link light rail station. Completing an environmental assessment of this potential bridge crossing could be very useful in developing future transportation plans for this area, especially if this project ultimately does not proceed with some of the elements that have been identified for possible phasing and further study. We recommend that the environmental analysis for a high HOV/transit bridge east of Montlake Boulevard be undertaken before the construction plans for SR 520's west approach are finalized.



King County

Department of Transportation

201 South Jackson Street, M/S KSC-TR-0815
Seattle, WA 98104-3856
Phone: (206) 684-1481
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April 15, 2010

Jenifer Young
SR 520, I-5 to Medina Bridge Replacement and HOV Program
Environmental Manager
SR 520 Project Office
600 Stewart Street, Suite 520
Seattle, WA 98101

Dear Ms. Young:

L-005-001 | The King County Department of Transportation (KCDOT) is pleased to submit comments on the State Route 520, I-5 to Medina Bridge Replacement and High Occupancy Vehicle (HOV) Project Supplemental Draft Environmental Impact Statement (SDEIS). As a cooperating agency, we have provided comments on the internal SDEIS draft as well as each of the discipline reports, and appreciate that the majority of our previous comments have been adequately addressed in this document.

Currently, King County Metro Transit and Sound Transit carry over 14,000 people a day traveling on SR 520 and an additional 7,000 riders on Montlake Boulevard daily. In addition, bus service will be added to this corridor as part of the SR 520 Urban Partnership. Funding generated by the one-cent per one-thousand dollars assessed value property tax increase, approved by the King County Council, will implement 28,000 new service hours and the Sound Transit 2 (ST2) plan will fund an additional 20,000 new service hours; a total 20 percent increase in transit service in this corridor.

Regardless of mode, improving mobility for people and goods across Lake Washington remains a major purpose of this project, along with improving safety and reliability in the corridor. The preferred alternative should include elements that support transit operations in the SR 520 corridor and on Montlake Boulevard by minimizing travel times and maximizing reliability for both local and cross-lake transit service. Our highest priority interests are summarized below.

Light Rail and Bus Rapid Transit:

In the near term, bus service will be the primary mode of transit across SR 520, with the potential for light rail across the bridge in the future. The Washington State Legislature passed legislation for a design of the SR 520 Bridge that includes four general purpose lanes and two HOV lanes that accommodate high capacity transit, supporting a bus rapid transit system with the potential for future light rail. The current design of the SR 520 Bridge Replacement and HOV Project

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L-005-001 includes elements that support bus services, including completing the HOV lane system through the corridor and providing direct access ramps. The regional transportation plan, Transportation 2040, developed by the Puget Sound Regional Council, identifies SR 520 as a busway for regional express service. Voter approval of the ST2 plan in 2008 supports additional express bus service investments in the corridor and the study of light rail on SR 520, in addition to the construction of light rail on the Interstate 90 Bridge.

Additionally, the SR 520 High Capacity Transit (HCT) plan, developed by the Washington State Department of Transportation (WSDOT), the University of Washington, Sound Transit, and King County Metro Transit, calls for bus rapid transit on the SR 520 corridor beginning in 2016. The HCT plan includes five bus rapid transit lines with fast, frequent, reliable transit service including transit priority treatments and high quality passenger facilities. This increase in the corridor's transit service and capital investments exceeds current available transit funding. The service improvements on SR 520 from King County's property tax, ST2, and the WSDOT capital improvements in transit facilities, are an initial investment toward bus rapid transit in the corridor.

For the near term, buses will be the primary mode of transit on SR 520. The bridge design needs to include bus transit supportive features to assure effective transit operations. That said, design elements that facilitate future conversion to light rail across SR 520 should be considered. Improvements to accommodate light rail will need to be weighed against their effect on current transit operations and cost. The evaluation should include possible light rail impacts on bus operations in the corridor and identifying the potential facilities necessary to provide reliable connections between light rail and buses.

Montlake Corridor:

L-005-002 Montlake Boulevard is a crucial transit corridor with over 590 local and regional transit trips daily, connecting riders between the University District and other Seattle neighborhoods and Eastside communities. All SR 520 alternatives should maintain operating efficiency of regional and local transit operations on Montlake Boulevard by including measures that prevent increased travel times for over 12,000 regional and local transit riders in this corridor daily. Maintaining transit reliability in this corridor can best be achieved with a plan that considers the following elements:

- *A westbound auxiliary lane on the Portage Bay Bridge:* This would prevent delay on Montlake Boulevard as a result of SR 520 westbound on-ramp congestion.
- *HOV and transit priority treatments on 23rd Avenue and Montlake Boulevard:* Inclusion of transit lanes, transit signal priority, and queue jumps all could help keep local and cross-lake transit moving through the Montlake corridor.
- *Multiple access points for SR 520:* In order to manage the traffic on Montlake Boulevard, a major local and regional transit corridor, WSDOT should include multiple access points to and from SR 520 and a traffic management plan for the westside of Lake Washington as explained in our attached comments.

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L-005-002 | If any of these elements are not included, increased emphasis on other transit supportive measures is critical to maintain transit speed and reliability in this corridor.

Direct Access HOV Ramps at Montlake Boulevard:

L-005-003 | Direct Access HOV ramps connecting Montlake Boulevard and SR 520 are a critical component of the design. These ramps would improve the speed and reliability of transit connections between Eastside communities and the University District for bus riders on SR 520 cross-lake services. Without the ramps, buses would need to weave through general purpose traffic from the SR 520 HOV lanes to exit and enter Montlake Boulevard. These movements would not only negatively impact transit, but also obstruct general purpose traffic.

Montlake Triangle:

L-005-004 | Under each of the SR 520 alternatives, the Montlake Triangle is a crucial multimodal connection point. Traffic operations around the Montlake Triangle are critical because all modes of travel, including bicyclists, pedestrians, vehicles, and buses, converge at this point when traveling on Montlake Boulevard. With the loss of the Montlake Freeway Station, more buses, pedestrians, and cyclists will move through the Montlake Triangle to make connections to buses, light rail, and the University of Washington. The SR 520 project should include investments in the triangle to facilitate enhanced connections between transit and other modes of travel, improve the waiting environment for passengers, and provide safe and direct pedestrian connections between transit and the University of Washington health facilities and the main campus.

Loss of the Montlake Freeway Station:

L-005-005 | The removal of the Montlake Freeway Station will result in the loss of access to 355 daily bus trips for walkers, cyclists, and local bus riders. To preserve this critical transit connection, additional direct service between Eastside communities and the University District is needed, especially in the non-peak period. The cost of service to mitigate the loss of the Montlake Freeway Station is \$3 to \$5 million annually, which remains unfunded. This funding is needed in addition to revenues that will be generated by the one-cent per one-thousand dollars assessed value property tax increase the King County Council approved to implement SR 520 Urban Partnership service in 2010.

Part of the function of the Montlake Freeway Station can be replaced by enhancing the Eastside's Evergreen Point Freeway Station on SR 520, which is part of the SR 520 Eastside Transit and HOV Project. The KCDOT and the WSDOT continue to work together to ensure this station is designed to accommodate the expected increase in transfer activity due to the closure of the Montlake Freeway Station.

Mitigation:

L-005-006 | The Final Supplemental Environmental Impact Statement (FSEIS) should clearly state WSDOT's commitment to mitigate the effect of construction on transit operations, trolley infrastructure, and the impacts of increased transit demand and operating costs resulting from construction activities and system reconfiguration. The KCDOT is interested in working with WSDOT to determine the

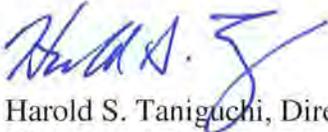
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L-005-006 | impacts and appropriate service additions needed to maintain the movement of people and goods in the corridor for inclusion in the preferred alternative.

The KCDOT will continue to be an active partner in the SR 520 Project as it moves forward, participating in work groups as identified in the approved Senate Bill 6392 to assess SR 520 design modifications, transit connections, and to identify a plan for financing high capacity transit in the corridor.

We hope these comments prove helpful as the FSEIS is finalized. We have attached additional technical comments regarding specific sections of the SDEIS for your consideration. We look forward to continuing to work with WSDOT to refine the project's design and improve its utility for optimizing regional mobility, especially the speed and reliability of public transportation.

Sincerely,



Harold S. Taniguchi, Director
King County Department of Transportation

Attachments

cc: Chris Arkills, Transportation Policy Advisor, Office of Executive Dow Constantine
Laurie Brown, Deputy Director, King County Department of Transportation (KCDOT)
Ron Posthuma, Assistant Director, KCDOT
Kevin Desmond, General Manager, Metro Transit Division, KCDOT

**SR 520, I-5 to Medina Bridge Replacement and HOV Project
King County Department of Transportation's Comments on Supplemental Draft EIS**

The following comments address suggested corrections and other remaining unresolved issues intended to make the document easier to understand and more useful as a decision-making tool.

- | | | | |
|-----------|-----|----------|--|
| L-005-007 | 1. | p. 2-17: | On Exhibit 2-9, Option L cross-section 3 does not but should show the bike path. |
| L-005-008 | 2. | p. 2-19: | A graphic comparable to Exhibit 2-10 needs to show the Option A suboptions. |
| L-005-009 | 3. | p. 2-27: | The description of the Option A suboptions needs to mention that the eastbound direct-access ramp would eliminate the weave for eastbound buses, as this is important for function and safety. |
| L-005-010 | 4. | p. 2-19: | Exhibit 2-16 appears to illustrate that the added eastbound direct-access ramp (in Option A) would pass under Montlake Boulevard. |
| L-005-011 | 5. | p. 2-34: | <i>2.4 Could the project be built in phases?</i> Given that only floating bridge construction has been funded to date and the project suffers from a \$2.36 billion funding gap, the phased implementation scenario appears to be as or more likely than construction of the complete project for the foreseeable future. As a result, the FSEIS should provide a more detailed analysis of phased construction and associated impacts following selection of the preferred alternative. |
| L-005-012 | 6. | p. 2-39: | Exhibit 2-22 provides important information (see comment regarding page 5-153) but the map scale needs to be larger than 1"= 400' with appropriate labels in order to be legible. |
| L-005-013 | 7. | p. 4-5: | Text correctly references 2009 transit ridership data but there is a typo on the source citation listing "2007". |
| L-005-014 | 8. | p. 4-6: | Exhibit 4.1-4 should show trolley wire. (King County can provide this data layer.) |
| L-005-015 | 9. | p. 4-6: | Exhibit 4.1-5 shows that eastbound boarding's at the Montlake Freeway Station are high in both peaks. This demonstrates the importance of riders wanting to board buses in the University District to go to the eastside. It also explains why the eastbound direct access ramp as part of Sub-option A and the transit pathway from the Montlake Triangle to SR 520 are important. |
| L-005-016 | 10. | p. 4-8: | Is the Evergreen Point Station within the study area of this project? If it indeed is included in the study area, then it should also be mentioned as a second freeway station on page 4-5. |

- L-005-017 | 11. p. 4-9: Exhibit 4.1-7 needs to show the bus stop on the west side of Montlake Boulevard by the east-bound onramp as shown in Exhibit 4.1-4.
- L-005-018 | 12. p. 4-25: King County Wastewater Treatment Division's sewers run parallel with Montlake Boulevard, on the west side, and are of brick construction. No construction activity will be allowed over or immediately adjacent to these facilities. These pipelines must remain in service at all times and cannot be re-routed or relocated.
- L-005-019 | 13. Chapter 5: Option A with the sub-options needs to be fully represented and analyzed throughout the FSEIS, especially in the *Project Operation and Permanent Effects* chapter where the relative impacts and benefits of the sub-options should be better quantified. For example, inclusion of the replacement Lake Washington Boulevard ramps in Option A would significantly reduce traffic congestion on Montlake Boulevard and thus improve transit reliability, decreasing travel times for transit and general purpose traffic by almost 50%. Replacement of the Lake Washington Boulevard ramps would result in similar levels of traffic through the Arboretum as in the No Build Option, which assumes existing Lake Washington Boulevard ramp configurations.
- L-005-020 | 14. p. 5-1: The first sentence of the transportation analysis reads "The first step in analyzing traffic is to determine how much traffic is predicted to grow in the region." Is the transportation analysis about measuring traffic, i.e. cars or about travel, i.e. people throughput?
- L-005-021 | 15. p. 5-3 The description of RapidRide (under *King County Metro's Transit Now*) should be broadened. The Bellevue-Redmond RapidRide B-Line provides connections between Downtown Bellevue and Downtown Redmond, via NE 8th Street, 156th Avenue NE, and 148th Avenue NE, including intermediate destinations of Crossroads and Overlake.
- L-005-022 | 16. p. 5-4: The information on pedestrian connections at the Montlake Triangle should be updated according to the University of Washington's Rainier Vista plan, which is anticipated to start construction in 2011. The Rainier Vista project and its final design should be considered as the baseline condition for the Montlake Triangle since construction is expected to be completed in 2012.
- L-005-023 | 17. p. 5-6: Under all options, traffic volumes will still exceed capacity, even after full build out. The Final SEIS should indicate the need for more aggressive TDM activities and additional transit services to be implemented to further help manage the excess demand over the long term.
- L-005-024 | 18. p. 5-10: The preferred alternative needs to include a westbound auxiliary lane at Portage Bay, on and off ramps to and from Lake Washington Boulevard and transit priority or other elements that will reduce traffic congestion impacting key intersections.
- L-005-025 | 19. p. 5-19: *How would the project affect transit facilities and service?* This section should also discuss the transit facilities included with the A sub-options (Option A+),

- L-005-025 | which includes an HOV/transit direct access ramp in the eastbound direction, in addition to the westbound transit-only off ramp at Montlake Boulevard included in Option A.
- L-005-026 | 20. p. 5-21: *Option A Suboptions:* This discussion should quantify the significant savings in transit travel times that would result from the Lake Washington Boulevard ramps and the transit direct access ramp.
- L-005-027 | 21. p. 5-23: The analysis of transit performance should quantify impacts to address the number of impacted routes, riders, trips and amount of additional service hours to mitigate these impacts. At a minimum, the parameters addressed in Exhibit 4.1-5 should serve as the basis of this analysis.
- L-005-028 | 22. p. 5-24: *University District Service:* This section notes that King County Metro routes 261 and 271 will not longer be accessible from Evergreen Point Freeway Station. This section should include language that Metro will be evaluating routing options related to these routes serving Evergreen Point Freeway Station. Metro will be considering routing options to allow both these routes to serve the Evergreen Point Freeway Station.
- L-005-029 | 23. p. 5-26: How would westbound bus riders cross Montlake Boulevard to transfer to southbound local bus service? A map or diagram is needed to clarify the description of these circulation patterns.
- L-005-030 | 24. p. 5-27: *Bikes and Transit* section – The document does not mention the permanent removal of existing bicycle parking facilities (bike racks and lockers) at the Montlake/SR 520 intersection.
25. p. 5-28: Discussion of the Montlake Multimodal Station should include a specific reference to bicycle parking. We suggest that accommodations to replace the 54 bike locker spaces and 53 bike rack spaces that will be lost at the Montlake Freeway stop be made at the Montlake Triangle. King County also urges WSDOT to work with University of Washington and Sound Transit to coordinate a full-service bike station facility at or near the Montlake Triangle (although this could also be located at or in the vicinity of University of Washington Link Light Rail Station). This has been proposed by UW staff and by members of Sound Transit's Bicycle Advisory Group. The existing Montlake Freeway Stop bike parking area was initially expected to be a bike station, but lack of resources and WSDOT regulations on that property eliminated that concept from consideration.
- L-005-031 | 26. p. 5-28: An appropriately-scaled map or diagram is needed to illustrate bike connections between the SR 520 trail and the Montlake Triangle.
- L-005-032 | 27. p. 5-30: *Effects of Suboptions:* The first bullet should clarify that the traffic volumes applies to the Arboretum and provide more explanation of this issue. This is a significant issue considering the controversy surrounding the Lake Washington Boulevard ramps. (At the February 23 SDEIS hearing, citizens who voiced opposition to

these ramps had also voiced support for transit. If citizens understood the benefit that these ramps would have on transit, there might be more acceptances of these ramps.

28. p. 5-31: The FSEIS should evaluate a comprehensive traffic management plan comprised of potential strategies intended to reduce arboretum traffic without significantly affecting transit performance, especially during peak ridership times. Examples of such strategies that have been suggested include closure of the Lake Washington Boulevard ramps during certain time periods, limiting their use to peak commute hours, or limiting their use to High Occupancy Vehicles; traffic calming; police emphasis patrols; and transportation demand management strategies including tolling, minimum vehicle occupancy requirements at certain times of day, and street closures for special events. The FSEIS, should also evaluate the relative impacts and benefits of alternatives to the Lake Washington Boulevard ramps that enhance transit such as additional transit priority treatments on Montlake Boulevard. The FSEIS needs to clarify the performance of such approaches relative to community concerns and project goals.

29. p. 5-32: *Transit:* King County Metro will continue to work with WSDOT to identify appropriate measures to mitigate impacts to transit facilities and service.

30. p. 5-153: A map or diagram similar to Exhibit 2-22 but in a legible scale is needed to illustrate how and where the 6-lane section tapers into the 4-lane section of the SR 520 mainline as well as show how the regional bicycle/pedestrian path on the new pontoons would connect to comparable facilities on the west side of the lake.

31. p. 5-154: The analysis of the Phased Implementation Scenario needs to address impacts to cross-lake pedestrian and bicycle travel.

32. p. 5-155 Traffic performance under the Phased Implementation Scenario should be illustrated by diagrams like Exhibits 5.1-7 and 5.1-9.

33. p. 5-155 Does the "Persons per Hour" in Table 5.15-3 include transit passengers?

34. p. 5-158: Discussion of Phased Implementation states that traffic operations would be similar to the No Build Alternative. Under this scenario, the need for aggressive and effective TDM to manage demand may be more severe, as travel times for both transit and general purpose travel would be negatively affected. The Final SEIS should address additional TDM mitigation for long term operations if Phased Implementation is pursued.

35. p. 5-167: Table 5.16-1 *Summary Comparison of Operation Effects of the 6-Lane Alternative Options / Montlake Freeway Station:* This description of the impact of the loss of the station should address that the function of the station will be replaced by an eastside transit station at Evergreen Point, designed to accommodate increased passenger transfer activity. Additionally, the description should note that replacement of the function of the station also requires additional transit service, estimated at \$3-5 million annually, to provide more direct service between UW and Eastside communities.

- L-005-039 | 36. p. 6-10: *Montlake Freeway Station*: Further clarity on rider connections once the Montlake Freeway Station is removed. Sound Transit UW Link is not scheduled for operation until 2016. In the interim, riders who currently use the Montlake Freeway Transit Station to access buses to downtown Seattle will either be using local buses on Montlake Blvd. to reach downtown via Capitol Hill or they will need to access downtown-bound buses at Campus Parkway by either walking or transferring from local service on Montlake Boulevard.
- L-005-040 | 37. p. 6-11: As Metro has shared in previous comments on the SDEIS and several discipline reports; Metro is not considering operation of a shuttle service between Evergreen Point Freeway station and the transit stop at 92nd Ave NE. Metro is open to further discussion with WSDOT and Sound Transit of possible measures to mitigate the impacts to riders when only one eastside transit station is necessary.
- L-005-041 | 38. p. 6-11: Mitigations for the impacts summarized under each subheading need to be addressed under *How can the project minimize negative effects on transportation during construction?* Beginning on page 6-15.
- L-005-042 | 39. p. 6-15 (see page 5-32/ transit subsection also): Discussion of potential methods to minimize negative effects on transportation should also include further discussion on mitigation funding by WSDOT to offset the impacts anticipated to transit operations and facilities. Metro and Sound Transit will continue to work diligently with WSDOT to identify construction impacts and provide cost estimates related to the impacts on transit operations and facilities and WSDOT needs to commit the necessary funds.
- L-005-043 | 40. p. 6-15: Impacts to transit facilities, including temporary and permanent bus stop closures, temporary loss of transit priority lanes, and impacts to existing transit layover and electric trolley bus overhead wire, are adequately described earlier in this chapter. However, more specificity is desirable in the discussion of TMP measures dealing with the approach to working with affected agencies in mitigating these impacts, i.e. *“Measures to minimize effects on transit operations and access to/from transit facilities (in coordination with transit service providers)”* seems insufficient.
- L-005-044 | 41. p. 6-15: The description of the Traffic Management Plan (TMP) references a “Public outreach communication plan”. This should include not only information regarding construction status and daily impacts, but should include information on transit service options and other TDM programs that are available. This campaign should be coordinated with affected jurisdictions, major employers, and employer networks.
- L-005-045 | 42. p. 6-17: *Special Events*: Further clarification is needed regarding shuttle services and discounts for the transit shuttle. Are transit agencies expected to provide these services?
- L-005-046 | 43. p. 6-17: We are pleased that the SDEIS includes a discussion of TDM activities, and agree that it can be effective to support existing TDM programs implemented by affected jurisdictions. However, local jurisdiction funding for these activities is largely

L-005-046 | grant-funded and there is no assurance regarding the level these programs will be funded at the time of SR 520 construction activities. The Final SEIS should address funding support for ensuring the continuation/expansion of TDM information and incentive programs to effectively manage travel demand in the SR 520 corridor. In addition, the document should reference the existing commute management programs at major institutions, such as University of Washington, Children's Hospital, and Microsoft, in addition to those of local jurisdictions, as other programs that the project should coordinate with to maximum TDM effectiveness during construction. The Final SEIS should also assess the need for additional transit services as mitigation, and address cost and funding to support these services.

L-005-047 | 44. p. 6-18: The Final SEIS should discuss need for coordination with King County Metro, Sound Transit, the City of Seattle and the University of Washington to locate temporary bicycle parking when the Montlake freeway stop is closed. Until the cross-lake bike lane is open, the demand for bike parking is likely to remain at current levels. Plans for outreach need to include bicycle commuters that will be affected by construction activities. Specific route planning, bike parking or other assistance may also be required.

L-005-048 | 45. p. 6-113: Table 6.16-1 *Summary Comparison of Construction Effects of 6-Lane Alternative Options/ Transit Element*: This section should include additional information on the impacts of transit operations that are described in pages 6-10 to 6-11. In particular, a brief discussion of the impacts to the Montlake Triangle and electric trolley bus impacts should be included in this table.

L-005-049 | p. 7-17: The Indirect and Cumulative Effects chapter should also include discussion on the impacts of construction on transit operations. The section touches on temporary changes to transit facilities, but does not discuss these expected effects further and does not discuss potential need for transit reroutes due to lane closures, road detours, etc.



Memorandum

Date: March 22, 2010
To: Stephanie Brown, SR-520 Project Manager, SDOT
From: Nancy Ahern, Deputy Director, Utility Systems Management Branch
Re: SR-520 Interests and Concerns 

Per your request, the purpose of this memo is to summarize at a high level SPU's interests and concerns with the proposed SR-520 project, so that a joint City position can be developed. Our interests and concerns fall into two broad categories, as described below.

L-006-001

Protection or Replacement of Existing Pipelines

SPU owns several water and wastewater pipelines that cross SR-520, including:

- **The Maple Leaf Pipeline** – a 54-inch water transmission pipeline that crosses under SR-520 about 100 feet east of the existing Montlake Bridge and was relocated and replaced in the early 1960s to accommodate SR-520. Up to 750 feet of this pipeline will need to be lowered if SR-520 is expanded.
- **The 430 Pipeline** – a 42-inch water transmission pipeline that crosses under SR-520 between the 10th Ave E and Delmar Ave E overpasses and was relocated and replaced in the early 1960s to accommodate SR-520. Up to 500 feet of this pipeline may need to be lowered or relocated if SR-520 is expanded.
- **The Boylston Avenue Feeder** – a 20-inch pipeline that is located in Boylston Ave E west of I-5 in the I-5 – SR520 interchange area and pre-dates the freeways. Approximately 800 feet of this feeder may need to be relocated due to potential conflict with the new interchange lid.
- **The Roanoke Street Feeder** – a 12-inch pipeline located in E Roanoke Street, extending from the Boylston Ave Feeder (located west of I-5, see above) to 11th Ave E. Up to 1,200 feet of this feeder may need to be relocated due to potential conflict with the new interchange lid.
- **The Boyer Avenue Feeder** – a 20-inch water main that crosses under SR-520 at Boyer Avenue underpass, pre-dates SR-520, and will need to be protected in place if SR-520 is expanded.
- **The Montlake Boulevard Feeder** – a 12-inch water main that crosses SR520 in the Montlake overpass and supplies the area between SR-520 and the Ship Canal. Up to 1,100 feet of this main may need to be replaced if SR-520 is expanded. Distribution mains in E Shelby and E Hamlin Streets crossing Montlake Boulevard may also be impacted.

L-006-001

- **A 24-inch combined sewer** that carries flows under SR-520 in the vicinity of the Museum of History and Industry to a pump station for conveyance out of the Montlake area. This pipeline was installed in 1961 and may need to be lowered or relocated if SR-520 is lowered or expanded.
- **An 8-inch combined sewer** that carries flows under SR-520 in the vicinity of the Seattle Yacht Club to another pump station for conveyance out of the Montlake area. This pipeline may be impacted by the SR-520 project if supports for the new freeway need to be placed on or near the pipeline.
- **A 24-inch combined sewer** that carries flows under I-5, north of the I-5/SR-520 interchange near Boylston Avenue. The portion of the pipeline under I-5 was constructed in 1959, while the small portion in the City roadway was constructed in 1906. This pipeline may be affected by the treatment facilities for managing stormwater from the proposed interchange lid.

These SPU utilities across and along the SR-520 and I-5 corridors pre-date the freeways. SPU research of real property records for the Montlake area (where the 54-inch water pipeline and one of the 24-inch combined sewers cross SR-520) has so far shown that SPU has sufficient property rights to require WSDOT to bear the cost of any relocations that may be necessary in this area.

The other areas of possible impacts are in the process of being researched. Interactions with WSDOT on the Boylston Sound Walls project a few years ago, where the proposed WSDOT sound walls along I-5 were initially impacting the same Boylston Feeder that may now be impacted by the SR-520 project, have shown some real property peculiarities that were not fully resolved at the time. This issue is likely to come up in the SR-520 project.

Given that the SPU utilities existed before the freeways were built – in City streets or on other City-owned land or within easement on private property - SPU requests that the City take the position that **WSDOT should bear the cost of any water or wastewater pipeline relocations that are necessary.**

The estimated cost range of these impacts is up to \$5-7M.

Protection or Enhancement of Water Resources and Water Quality

SPU requests that the City express the following interests in the area of water resources and water quality:

1. The City expects that the SR-520 project will have no impact on the routing or the amounts of stormwater between the City's combined and separated drainage systems, unless it is possible to reduce the amount of flow to the City's combined system through on-site infiltration of stormwater;
2. The City expects that WSDOT will be responsible for constructing, operating and maintaining any water quality or flow control facilities associated with the stormwater treatment requirements of the SR-520 project;

L-006-002

L-006-003

- L-006-004 | 3. The City expects that the stormwater treatment for any SR-520 runoff entering the City's separated or combined drainage systems will meet the City's 2009 stormwater code requirements for water quality and flow;
- L-006-005 | 4. Protecting the water quality of Lake Washington is a shared concern of many jurisdictions, including Seattle. Stormwater runoff from roadways is a major source of pollutants entering receiving water bodies, and the City supports the proposed use of street sweeping, if done frequently and with high efficiency sweepers, as an appropriate method for decreasing pollutants discharged to Lake Washington from the SR-520 bridge deck;
- L-006-006 | 5. The City is interested in working with WSDOT on site selection and design of aquatic and wetland mitigation associated with the project; and
- L-006-007 | 6. The SR-520 project should be designed and constructed in a manner that avoids, minimizes or mitigates impacts to salmonids. Among the more important considerations include shielding the water surface from artificial lighting on overwater structures, avoiding impacts to adult migration through the SR-520 project area and minimizing the number and/or size of pilings.

Thank you for requesting SPU's input. Please call Betty Meyer at 206/386-1999 if you have any questions about the interests and concerns in this memo or need additional information.

cc: Betty Meyer, Special Projects, Utility Systems Management Branch (USM)
Dave Hilmoc, Drinking Water Division Director, USM
Trish Rhay, Drainage & Wastewater Systems Management Division Director, USM
Bruce Bachen, Drainage & Wastewater Quality Division Director, USM
Eugene Mantchev, Drinking Water Transmission Manager, USM
Jason Sharpley, Drainage & Wastewater Engineer, USM
Linda De Boldt, Deputy Director, Project Delivery Branch (PDB)
Liz Kelly, Project Management and Engineering Division Director, PDB
Charlie Madden, Water Engineering Manager, PDB



Michael McGinn
Mayor, City of Seattle

April 15th, 2010

The Honorable Christine Gregoire, Governor
State of Washington
PO Box 40002
Olympia, WA 98504-0002

Ms. Paula Hammond, Secretary
Washington State Department of Transportation
501 Maple Park Avenue SE
Olympia, WA 98504-7300

Ms. Jenifer Young
SDEIS Environmental Manager
SR 520 Project Office
600 Stewart Street, Suite 520
Seattle WA 98101

Re: **SR 520, I-5 to Medina: Bridge Replacement and HOV Project
Supplemental Draft Environmental Impact Statement (SDEIS)**

Dear Governor Gregoire, Secretary Hammond and Ms. Young,

Thank you for the opportunity to comment on the SDEIS for the SR 520 Bridge Project. This is a critically important project for our region. The 520 bridge serves as a vital transportation link between Seattle and the Eastside, while sharing a scenic corridor with highly-valued open space and park lands. The design of this bridge will affect generations to come. It should reflect current values and future transportation needs, not the priorities of the past.

The current SDEIS process fails in this regard. It does not provide a range of alternatives that speak to the priorities that are essential for our future — namely, the provision of high capacity transit in the form of light rail. The alternative that has received the most attention, the so-called "A+" option, is fundamentally flawed.

The recently released study by Nelson\Nygaard Consulting Associates documents this failure, concluding that the A+ plan would make future conversion to light rail very difficult, if not impossible. This conclusion suggests that the A+ design does not live up to state law, RCW 47.01.410, which mandates that the SR 520 bridge be designed to accommodate future light rail.

By prioritizing the movement of automobiles over the movement of people, the A+ option falls short in other important ways. If you don't have access to a car, or can't afford to pay for tolls and parking, then the A+ plan gives you poor choices for getting across SR 520. Moreover, in

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Ms. Jenifer Young
April 15, 2010
Page 2

L-007-001 | order to accommodate two more lanes for cars, the A+ plan creates a much larger footprint through much of the western approach, which includes sensitive park land as well as several residential neighborhoods. Preservation of green spaces and quality of life in neighborhoods is essential. The range of alternatives in the SDEIS does not adequately address these issues.

L-007-002 | Finally, the State's overall approach to the EIS process is flawed because the SDEIS examines the "I-5 to Medina" portion of the project in isolation, without considering the east side landing or the larger transportation network. Although this process may allow work to begin more quickly on the east side section, it also threatens to lock in a flawed overall project design. There should be a comprehensive plan for the whole project that integrates future light rail and is grounded in realistic cost and funding projections including all mitigation. This should be in place before any construction is started.

L-007-003 | Due to these and other flaws of the A+ plan detailed in our attached comments, we urge that you delay announcing a preferred alternative and begin to immediately evaluate other options that can accommodate light rail and minimize impacts on sensitive parks and neighborhoods. This SDEIS should clarify the technical considerations of designing for light rail, evaluate alignment options, and consider construction phasing needed to accommodate light rail. New options studied under this SDEIS could then be considered side by side with the current A+ option. We believe that this could be done within 12 months. It would give policymakers and the public a clear choice about how to most effectively invest limited resources for our future.

The replacement for the SR 520 bridge will have a life of 75 to 100 years. This is our one chance to "get it right" and to build a bridge that meets the needs of Seattle and the region for years to come. I look forward to working with WSDOT to ensure that the project does just that.

Sincerely,



Michael McGinn, Mayor
City of Seattle

Attachments: SR 520 Light Rail Alternatives Draft Report, Nelson\Nygaard Consulting Associates
SR 520 Project Comment memo from the Mayor's Office
SR 520 Project Comment memo from the Seattle Department of Transportation
SR 520 Project Comment memo from the Seattle Fire Department
SR 520 Project Comment memo from the Seattle Department of Parks and Recreation
SR 520 Project Comment memo from the Seattle Department of Planning and Development
SR 520 Project Comment memo from Seattle Public Utilities
SR 520 Project Comment memo from the Seattle Office of Arts & Cultural Affairs

Copy: Seattle City Council



City of Seattle
Office of the Mayor

Date April 15th, 2010
To Jennifer Young, Environment Manager, WSDOT
From Mayor Michael McGinn
Subject **SR 520 Project Comments**

L-007-004

Our comments address 1) changes that need to be made in order to accommodate light rail, and 2) Westside design characteristics.

There are three key changes that must be made to the current design of the bridge to accommodate light rail. More information on these design issues can be found the draft Nelson\Nygaard "SR 520 Light Rail Alternatives" (also included as an attachment).

- 1) The pontoons must be designed with additional floatation and stability necessary to support the weight and dynamic loading of light rail. WSDOT has stated that the additional cost to revise the design of the pontoons is \$150-200 million. Because the pontoon contract has already come in significantly under the engineer's estimate, it makes sense to build the pontoons now, as the current bidding and construction climate is likely to generate greater savings than waiting to do this at another time.
- 2) There must be a "gap" between the eastbound and westbound lanes as the floating bridge approaches Foster Island in order to allow the two lanes of light rail to leave the mainline to connect with Husky Stadium.
- 3) Adequate width must be maintained on the floating bridge to allow space for light rail operations, including emergency evacuation. There is no reason to build a bridge that is too narrow for light rail at this time. It is a waste of taxpayer resources to generate additional expense and construction impacts down the road when this relatively minor detail can be addressed through the current process.

L-007-005

Additionally, we have concerns about the design of the Westside of the project, the focus of Nelson\Nygaard's work for the City Council. The current design should address the following issues:

- 1) The Montlake Interchange should employ an urban intersection design, with tighter turning radii, safe pedestrian crossings, and signal priority for transit.
- 2) The project as a whole, and particularly the Montlake Interchange, should be designed to a human scale. Details such as pedestrian lighting, well-marked crossings, and landscaping are particularly important with a project of this size and scale.
- 3) The pedestrian and bicycle path must be designed to City of Seattle standards. The current design includes a number of switchbacks that are not ideal for cyclists.

L-007-006

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- L-007-007 | 4) The project's footprint and its course through Seattle neighborhoods must be as small as possible. The current design does not meet Seattle's needs.
- L-007-008 | 5) It is critical that the possibility of a four-lane replacement to the Portage Bay Viaduct is explored. With the departure of the center lanes from the mainline, it could be possible to reduce the number of lanes planned from Foster Island to I-5.
- L-007-009 | 6) The height of the floating bridge should be as low as possible.
- L-007-010 | 7) A legislative mandate should be established to manage the HOV/transit lanes on the bridge to a performance standard of 45 miles per hour 90% of the time.
- L-007-011 | 8) Arboretum on- and off-ramps should be eliminated to reduce the impact on neighborhoods and the Arboretum.
- L-007-012 | 9) If a second bascule bridge is part of the project design, this new facility should prioritize high capacity transit (including light rail), biking, and walking.

CITY OF SEATTLE MAYOR'S OFFICE

SR 520 Light Rail Alternatives

DRAFT Report

Nelson\Nygaard Consulting Associates
1402 Third Avenue, Suite 1200
Seattle, WA 98101

April 2010



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Executive Summary

Mayor Mike McGinn commissioned this study by Nelson\Nygaard Consulting Associates to explore the possibilities for building light rail transit (LRT) on the State Route (SR) 520 corridor. The intent is to assist the mayor and staff in providing comment on the Supplemental Draft Environmental Impact Statement (SDEIS) for the SR 520 I-5 to Medina Bridge Replacement and HOV Project issued by the Washington State Department of Transportation (WSDOT) and the Federal Highway Administration.

The mayor's goal is to ensure that the SR 520 project is designed and built from the outset to reasonably accommodate light rail and reduce the impact of the new facility. To that end, the report focuses on several specific issues:

- Consider and analyze possible LRT alignments that connect major transit markets along the SR 520 corridor;
- Determine whether existing plans for the SR 520 bridge replacement preclude LRT or present significant obstacles to LRT conversion;
- Identify the steps necessary to build LRT in the SR 520 corridor; and
- Consider how SR 520 can be phased from the existing facility to a facility with a narrow footprint that will carry LRT, including shoreside connections.

Potential Light Rail Alignments

Sufficient transit markets exist on the east and west sides of the SR 520 bridge to warrant formal analysis of LRT in the corridor. The focus of the formal analysis would be to determine the market(s), alignment(s), and mode(s) for an intensive transit network, including the potential for a second light rail alignment crossing Lake Washington, in addition to I-90. Changes in the location of jobs and economic activity have markedly impacted the travel market on SR 520 over the past decade. The 2010 Census will provide valuable insight into these changes and will form a new basis to assess future transit markets. Transit ridership on the corridor in 2020 is forecasted to be about 25,000 person trips per day, up from approximately 15,000 per day in 2008.¹ The SDEIS projects that daily transit ridership on the corridor will reach more than 27,500 trips by 2030.

This report identifies five possible corridors that appear to have sufficient demand to warrant further investigation, acknowledging that identification of corridors and mode (i.e., bus, bus rapid transit, or light rail) must involve the jurisdictions and stakeholders from those communities to ensure that their policies are applied and the community needs are served.

In Seattle, the most promising LRT corridors all share the University of Washington as an important anchor for an SR 520 alignment. The Westside corridors recommended for further evaluation either connect Ballard to the University or connect the Aurora Avenue corridor (from north of the Ship Canal to about Haller Lake) to the University.

¹ SR 520 High Capacity Transit Plan WSDOT, Sound Transit, King County Metro, University of Washington, 2008

Design and Construction Considerations

Both final design and construction should be done with a full understanding of future transit alignments, capacity, and mode split in the SR 520 corridor. The corridor between Foster Island and I-5 is sufficiently sensitive, environmentally and politically, that there will be but one opportunity to “get it right” in terms of construction for the next 75 to 100 years.

Option A+, the preferred alternative of the legislative work group, presents significant obstacles to converting the corridor to include light rail. While technically feasible, the costs involved with a subsequent retrofit (based on the design assumptions stated in the SDEIS) render the likelihood of conversion financially impractical, environmentally challenging, and/or require widening of the facility to an equivalent of eight lanes, which, from a policy perspective, is unacceptable to the City of Seattle. The primary changes needed to the current design in order to meet the mayor's goal of an SR 520 bridge that is readily convertible to light rail include the following:

- There must be sufficient space (i.e., a “gap”) between the eastbound and westbound lanes of the SR 520 mainline between Foster Island and Montlake Boulevard to allow an LRT alignment and/or transit/high occupancy vehicle (HOV) lanes to diverge from SR 520.
- Adequate width on the west approach and bridge deck must be maintained to ensure that light rail can be added without significant structural modification. This could require added width of up to 10 feet for the bridge and west approach from the western high rise to Foster Island and transition width for the divergence of the LRT alignment from the mainline between Foster Island and Montlake Boulevard.
- The pontoons must include sufficient flotation and stability to meet the loading imparted by LRT and avoid future in-water construction necessitated by adding pontoons at a later date.

Phasing

This report identifies a scenario to phase safety-sensitive portions of the SR 520 Bridge Replacement and HOV Project while preserving the ability to convert the floating bridge and approaches to carry light rail in the future.

Six-Lane Bridge — 4 GP + 2 HOV Lanes SR 520 Convertible to LRT Operation

Main Features:

- Initial six-lane replacement for floating bridge, with four general purpose (GP) lanes and two HOV lanes
- Six-lane western approach constructed to Montlake that is LRT convertible
- Four-lane Portage Bay Viaduct rebuilt to improved version of current structure
- SR 520 (Medina to Montlake) phased to intensive HCT following regional planning effort

The current budget for constructing the replacement project has a funding shortfall of about \$2.6 billion of the \$4.65 billion needed. Given this shortfall and the urgency of addressing the public safety issues associated with the floating bridge, it is highly likely that the project will be constructed in phases. The phasing scenario presented in this document would require modification to the current environmental analysis for the SR 520 corridor.

Connections on East and West Shorelines and Departure from the Mainline

The report finds that light rail connections to the east and west shorelines are feasible, but careful planning will be necessary to ensure the preservation of future design options.

On the east side of the floating bridge, an LRT alignment would remain within the SR 520 corridor as it reaches and passes through the Evergreen Point Road area. At Evergreen Point, it would not be possible for LRT and bus rapid transit (BRT) service to share center lane operations and use of the Evergreen Point transit station without substantial reconstruction of the station. The LRT alignment would diverge from the SR 520 corridor somewhere between Evergreen Point Road and I-405, depending on the final alignment selected.

On the Westside, an LRT alignment could diverge from the SR 520 mainline between Foster Island and Montlake Boulevard, depending on the alternative selected for reaching Husky Stadium. This report identifies four options for a crossing of the Montlake Cut to reach the University of Washington:

- High level bridge (with either 70 or 110 feet of clearance),
- Tunnel,
- Low level bridge, or
- Surface approach on Montlake Boulevard with a new bascule bridge parallel to the existing historic Montlake Bridge.

These four alternatives imply an opportunity for a serious policy discussion about the needed, and desired, width of SR 520 between Foster Island and I-5.

Necessary Steps to Build Light Rail on SR 520

The steps necessary to bring light rail to the SR 520 corridor involve planning, environmental analysis, policy decisions, and funding. Regional transportation planning documents do not identify light rail on SR 520; however, to successfully build light rail in this corridor, these documents must be modified to reflect LRT and the intended alignment. Putting the necessary steps in perspective, consider that 20 years ago Central Link, now operating in Seattle, was in a similar situation—it was not included in regional transportation plans, environmental work had not been completed, and funding was uncertain, at best. Before the first passenger boarded Central Link, regional voters agreed to expand the system north to Lynnwood, south to Federal Way, and east to Bellevue and Overlake. This parallel is applicable to SR 520: if the region moves forward to formally consider plans for light rail on SR 520 today, light rail could be a reality in the corridor. On the other hand, if current plans for SR 520 remain unaltered, there are significant, perhaps insurmountable obstacles, to building light rail in the corridor, even if formal planning efforts identify light rail as the preferred option.

Chapter 1. Introduction

Need for this Study

Each day there are approximately 191,000 local and regional trips on the SR 520 corridor. In the future, the number of people making daily trips along this route between Seattle and the Eastside will grow. Mayor McGinn believes that the corridor must provide as many people as possible with the accessibility they want and need while preserving and improving the environment of Seattle. To meet the mayor's vision, the corridor must include light rail transit (LRT). To that end, the mayor commissioned this study to explore the possibilities for constructing light rail on the SR 520 corridor. This report, prepared for Mayor McGinn by Nelson\Nygaard Consulting Associates, accomplishes the following:

- Consider and analyze possible LRT alignments that connect major transit markets along the SR 520 corridor;
- Determine whether existing plans for the SR 520 bridge replacement preclude LRT or present significant obstacles to LRT conversion;
- Identify the steps necessary to build LRT in the SR 520 corridor; and
- Consider how SR 520 can be phased from the existing facility to a facility with a narrow footprint that will carry LRT, including shoreside connections.

Background

Seattle places a premium on the use of space. When space functions for people, the use supports a city that is both sustainable and livable. Decisions on how to use the SR 520 corridor to maximum advantage for the future of the region are being made at a time of changing perspectives on transportation. For the mayor and for many citizens of Seattle, thinking only about how to move cars is no longer acceptable; rather than focusing on vehicles, the transportation conversation must be about moving people and goods, providing access to the jobs, schools, goods and services, and recreational opportunities of Seattle and the region.

Under the leadership of Mayor McGinn, Seattle continues to expand its emphasis on transit, walking, and bicycling as the primary modes of transportation to and around the city. Therefore, the design and function of SR 520 must be based on this future of transportation and not on the traditions of the past. The mayor seeks to create an alternative solution for the SR 520 project that supports a more socially just, environmentally sound corridor that reflects the needs of Seattle residents. The mayor believes that future trends—considerably higher energy prices, focused efforts to reduce greenhouse gas emissions, and an aging population—imply a transportation system different than the status quo as well as changing market forces that will reshape land uses. Population centers will grow closer together, the distance between people and their jobs will shrink, technology will improve access, and people will be anxious to live in places where the grocery store is an easy walk or bike ride away.

This is the context in which the mayor views a multi-billion dollar investment that will last for the next 75 to 100 years. To that end, Mayor McGinn's goal is to ensure that the SR 520 project is built in such a way as to be fully designed for and convertible to light rail, with a maximum of six mainline lanes, on the day the project opens to traffic. The mayor expects light rail to become one

of the corridor's modes of transportation sooner rather than later, although light rail operations are likely to be phased into the corridor's operations at some time following the project's opening.

The mayor believes that Option A+, described as "preferred" by the legislative work group, does not adequately support people of lower income. Without high quality transit service (light rail, bus rapid transit, and bus) on the corridor, people traveling across the SR 520 floating bridge are "forced" into cars that must pay tolls. The implications for a person of low income are simple: to cross SR 520, you must have enough money for a car, for the toll to cross the bridge, and for parking when you arrive at your destination. To equitably connect the east and west sides of the SR 520 corridor, high quality, efficient transit service must be available for all people.

By state law, Washington has established targets for reducing transportation-related greenhouse gas emissions through a reduction in vehicle miles traveled (VMT) per capita. These targets require civic leaders and planners to consider VMT when developing projects such as SR 520, and the mayor's goal is to reduce VMT and impacts from greenhouse gas emissions for the SR 520 project. However, the mayor believes that Option A+ will increase VMT and seeks a design for the SR 520 corridor that will move people out of single occupancy vehicles and onto transit. Light rail is one important way that the corridor can move toward a reduction in VMT and toward a reduction in greenhouse gas emissions.

Three assumptions underlie this work:

1. The SR 520 bridge and approaches need to be replaced to promote public safety and security.
2. The design of SR 520 must be more sensitive to the needs of Seattle's citizens 20 years from now.
3. Maintaining the livability and integrity of Seattle neighborhoods is of paramount importance.

Chapter 2. Background and History

Overview of High Capacity Transit Planning to Date

Planning for high capacity transit (HCT) services—such as light rail transit (LRT) and bus rapid transit (BRT)—and other options for improving transit service in the SR 520 corridor have been included in many of the regional transit and transportation plans and corridor-specific studies and environmental analyses completed to date.

Transit service along the SR 520 corridor has been greatly expanded since the Trans-Lake Washington Corridor planning process began in 1998, yet additional improvements, including the development of HCT, are integral to fulfilling the SR 520 Bridge Replacement and HOV Project purpose of improving mobility for people and goods in the corridor. To date, the majority of transit enhancement options for the corridor have been evaluated only at a conceptual level. Moreover, these HCT options have not been analyzed with all possible combinations of roadway configurations, tolling scenarios, and transportation demand management (TDM) programs that might increase demand for transit services and ultimately optimize the movement of both people and goods across Lake Washington.

This section summarizes planning for and analysis and evaluation of transit modes and associated transit levels of service in the SR 520 corridor completed to date as part of the SR 520 Bridge Replacement and HOV Project as well as previous corridor plans and studies led by the Washington State Department of Transportation (WSDOT), Sound Transit, and King County Metro (Metro). Recommendations, proposals, and findings that are relevant to the City of Seattle's current interest in transit opportunities in the SR 520 corridor are highlighted for each of the following plans and studies, along with an assessment of key assumptions and/or limitations where appropriate.

Trans-Lake Washington Study

In 1998, the State Legislature initiated the Trans-Lake Washington Study to explore ways of improving mobility across and around Lake Washington. Two of the key goals of the study were to improve both transit operations and the mobility of people and goods. The study evaluated various modes of transportation including HCT, types of crossings and potential crossing alignments, and options for managing travel demand in the corridor, such as tolling and changing land use patterns. The following findings of the Trans-Lake Washington Study are relevant to the City of Seattle's interest in transit opportunities in the SR 520 corridor:

- Four, six, and eight-lane roadway alternatives were evaluated for a new crossing in the same alignment as the existing SR 520 bridge. However, only the six-lane and eight-lane alternatives were evaluated with and without HCT in the same alignment.²

². The Supplemental Draft Environmental Impact Statement (SDEIS) for the SR 520 I-5 to Medina Bridge Replacement and HOV Project notes that the Lake Washington Study "recommended that the 6- and 8-Lane Alternatives be evaluated with and without high-capacity transit in the corridor, because no regional decision had yet been made on whether SR 520 or I-90 would be the initial corridor to carry HCT;" however, no explanation was provided for why the project team did not evaluate an alternative with a 4-lane roadway configuration implemented concurrently with HCT.

- According to travel forecasts developed for the Trans-Lake Washington Study, only one HCT corridor across Lake Washington was thought necessary to satisfy transit demand through the year 2020.
- The Trans-Lake Study noted that “at some point beyond the planning horizon of Sound Transit’s Long Range Vision, it is possible that travel demand by transit could grow to a level that would justify a second trans-lake HCT corridor in addition to the I-90 corridor. Since both development of a third corridor across Lake Washington or expansion of the I-90 corridor is unlikely, the SR 520 corridor is the most viable option for the second corridor.”

In August 2002, the Trans-Lake Washington Project Team published the Final HCT Accommodation Report with the intent to facilitate “policy-level discussions regarding what actions should be taken to preserve or accommodate future development of HCT facilities on the SR 520 corridor.” This study addressed (1) HCT technology choices, (2) the range of options available for preserving, accommodating, and facilitating possible future construction of HCT in the corridor³, (3) logical alignment locations and line configurations for a future SR 520 HCT line, and (4) costs and implications of this range of options for the roadway project. The study did not include an evaluation of the feasibility, costs, or impacts of implementing HCT concurrently with the roadway improvements planned for the SR 520 corridor, due to the fact that the regional transit agencies have determined that rail would not be incorporated in the corridor until after SR 520 is constructed. Relevant findings include the following:

- While a range of HCT technologies may be appropriate for the corridor, using the LRT-type envelope and design requirements would provide a good general basis for accommodating future fixed guideway HCT in the SR 520 corridor.
- In the short to medium term, an SR 520 HCT line could be merged into the Central Link LRT corridor to serve Capitol Hill and downtown Seattle. However, “when Central Link is extended beyond Northgate, the segment between the University of Washington and downtown Seattle will be capacity constrained and another HCT line between the University and downtown will be required.”

SR 520 High Capacity Transit Plan

As required by ESSB 6099 (2007), WSDOT, Sound Transit, King County Metro, and the University of Washington (UW) collaborated to produce the SR 520 High Capacity Transit Plan, detailing (1) possible approaches to providing HCT service in the Redmond to Seattle SR 520 corridor, including LRT and BRT, and (2) options for improving multimodal access to and connectivity with the University Link light rail line and University of Washington LRT station currently under construction near Husky Stadium. Specified goals and objectives for the plan included “responding to projected travel demand forecasted for 2030,” and identifying a “vision for the ultimate development of the SR 520 HCT system which may include exclusive, dedicated lanes in the corridor.”⁴

The HCT Plan was submitted to the Governor and members of the Legislative Working Group in December 2008 and made the following findings and recommendations:

- ³ The range of HCT scenarios evaluated for the corridor included (1) no HCT accommodation, (2) HCT accommodation on the floating bridge, (3) HCT accommodation on the entire Lake Washington crossing and at key structures, and (4) HCT envelope preservation for the full corridor (from Redmond to Seattle), but did not evaluate the option of implementing HCT in the corridor concurrently with the reconstruction of the SR 520 bridge.
- ⁴ SR 520 HCT Plan, p. 21

- BRT service is identified as the “near-term HCT service in the SR 520 corridor.” The full BRT service is identified in the plan initially as “HOV/Bus Rapid Transit,” which utilizes:
 - Inside high occupancy vehicle (HOV) lanes (shared with carpools and vanpools) and direct-access ramps to avoid weaving across congested general-purpose lanes to reach stations and park and ride facilities,
 - Low-floor hybrid buses,
 - Off-board fare collection to expedite boarding, and
 - Real-time schedule information at stations, including next bus arrival times.
- The BRT concept proposed in the HCT Plan calls for service with 10-minute frequencies during peak hours on five routes, including three initial lines to be started in 2016 when the SR 520 corridor bridge and HOV improvements are complete:
 - Redmond/Overlake to the University District
 - Redmond/Overlake to downtown Seattle
 - Eastgate/Bellevue to the University District
- BRT service is proposed for implementation after 2022 from:
 - Totem Lake/Kirkland to downtown Seattle
 - Canyon Park/Woodinville to the University District
- In 2008, approximately 160,000 hours of bus service were provided in the SR 520 corridor. The proposed BRT plan calls for increasing service in the corridor by 130,000 hours at a cost of \$16.5 million (2008 dollars) per year. (Note that Sound Transit’s ST2 Plan anticipated the need for additional service hours in the corridor to support the HCT Plan. The hours funded by ST2 will be implemented in fall 2010 and account for the new ST 542 route as well as additional service on ST 545. King County has designated a \$0.01 per thousand property tax to fund expanded transit operations in the SR 520 corridor. This is not sufficient to fund the entire \$16.5 million per year estimated in the HCT plan, but makes substantial progress toward filling the gap.)
- Funding for the purchase of 45 new buses to serve these SR 520 BRT routes is identified in the Lake Washington Urban Partnership agreement between WSDOT, Metro, and the Puget Sound Regional Council (PSRC).
- By 2021, SR 520 BRT lines would connect with the East Link LRT line in downtown Bellevue or at the Overlake Transit Center.
- Recommended measures to improve access to BRT include expanding service on local routes connecting to BRT stations. No funding is identified for these local transit improvements.
- The Final HCT Plan developed four alternative concepts for the Montlake Multimodal Center, including:
 - A baseline concept that assumes expansion of existing bus zones on NE Pacific Street and construction of a grade-separated bridge from the UW Link LRT station over Montlake Boulevard and NE Pacific Place to the UW Campus.
 - A baseline concept, as described previously, that incorporates the Rainier Vista Concept Plan developed by UW, which would add a lid over NE Pacific Place and

pedestrian bridges from the Montlake Triangle over NE Pacific Street and over Montlake Boulevard to the UW Link LRT station.⁵

- A grade-separated NE Pacific Street/Montlake Boulevard NE intersection, with a lid allowing direct pedestrian access between the UW Link LRT station, the UW Medical Center, the Montlake Triangle, and expanded bus zones on NE Pacific Street.
- A grade-separated NE Pacific Street/Montlake Boulevard NE intersection that incorporates the Rainier Vista Concept Plan developed by UW.
- All three of the Westside interchange options under evaluation in 2008—Options A, K, and L—included removal of the Montlake Flyer stop. To replace the function of the Montlake Flyer stop, the plan calls for additional direct service from SR 520 to the University District. No funding is identified for such additional service, nor for additional direct service to Capitol Hill and other central and east Seattle neighborhoods that currently access SR 520 corridor transit destinations by way of transfers at the Montlake Flyer stop.
- Projections based on growth trends from 1998-2008 show weekday transit ridership in the SR 520 corridor reaching 25,000 daily riders by 2020 (from approximately 15,000 per day in 2008).⁶
- Transit ridership across Lake Washington has grown at a higher rate than the average 3.1% per year growth rate for the entire region (PSRC, Transportation 2040).
- The SR 520 BRT concept plan cannot be implemented with available funding. Among other funding options, state law identifies transit operations and capital as potentially eligible expenditures for toll revenues.⁷

Evaluation of Potential SR 520 HCT Alignments in Seattle

As part of the SR 520 Bridge Replacement and HOV Project, Sound Transit and WSDOT evaluated potential HCT alignments in Seattle and on the Eastside to ensure that the final configuration of SR 520—and connecting ramps and roadway supports—does not preclude the future development of HCT in the corridor. Potential SR 520 HCT alignments in Seattle included:

- **LRT to Ballard, via N 45th Street:** Tunnel under Union Bay and the Montlake Cut from the west approach in the vicinity of Foster Island to the vicinity of the UW Link LRT station, continuing north in a tunnel under Montlake Boulevard to the vicinity of N 45th Street, continuing west in a tunnel under N 45th Street to Ballard, via the University District and Wallingford. An alternative alignment would reach the vicinity of the UW Link LRT station from the west approach by way of a tunnel in an alignment under SR 520 and Montlake Boulevard.

⁵. This plan has since been updated and no longer includes the high level pedestrian bridges over Pacific Street or Montlake Boulevard. These have been replaced with at-grade crossings. Only the lid over Pacific Place remains in the current plan.

⁶. Projections did not include the I-90 East Link LRT project. The SR 520 I-5 to Medina SDEIS TDR Cumulative Effects section shows a decrease in transit ridership on SR 520 when East Link is implemented, with ridership growth regaining the losses within ten years.

⁷. It is not clear if additional legislative approval is required to dedicate toll revenue collected in the SR 520 corridor, or connecting or parallel corridors, to transit operations. ESHB 1773 (2009), codified as RCW 47.56.820, provides that toll revenues may be expended on public “conveyances” and “operations” in the tolled corridor. However, such expenditures are subject to appropriation by the State Legislature. In the SR 520 corridor, toll revenues collected according to the terms of the Urban Partnership Agreement with the Federal Highway Administration (FHWA) may be expended on transit capital (e.g., purchase of 45 transit buses dedicated to the SR 520 corridor BRT routes is authorized), but may not be expended on transit operations. It is not clear if legislative appropriation could be secured to dedicate toll revenues to support transit operations.

- **LRT to Ballard, via N 40th Street:** Tunnel from the west approach to Montlake Boulevard in the SR 520 alignment, continuing north in a tunnel under the Montlake Cut in the vicinity of the Montlake Bridge, northwest in a tunnel under Pacific Street to a station in the vicinity of Brooklyn Avenue NE, continuing west in a tunnel under Pacific Street and N 40th Street to Ballard, via Wallingford and Fremont.
- **BRT to the University District:** Tunnel in the same alignment as the potential LRT line from the west approach to Pacific Street and Brooklyn (along the SR 520 alignment, continuing north in a tunnel under the Montlake Cut in the vicinity of the Montlake Bridge, and northwest in a tunnel under Pacific Street), continuing north in a tunnel under Brooklyn Street to an underground terminal BRT station in the vicinity of Brooklyn Avenue NE and NE Campus Parkway.
- **BRT to downtown Seattle, via Eastlake:** BRT in the SR 520 HOV/transit lanes from the west approach, through the Montlake interchange to the eastern approach to the SR 520/I-5 interchange (with an in-line BRT station just east of Montlake Boulevard), continuing in a dedicated bus tunnel to a BRT station on the west side of I-5 in the Eastlake neighborhood, then on to the South Lake Union neighborhood and downtown Seattle via surface lanes in the alignment of I-5 and the southbound exit to Mercer Street and Fairview Avenue North.

Sound Transit Long-Range Plan

As the Regional Transit Authority (under Revised Code of Washington {RCW} Chapters 81.104 and 81.112), Sound Transit is responsible for regional HCT planning. The Sound Transit Regional Transit Long-Range Plan (LRP) is a long-term vision for the development of regional high capacity transit service in the Central Puget Sound Region. The Regional Transit Long-Range Vision, the first LRP adopted by the Sound Transit Board of Directors (then known as the Central Puget Sound Regional Transit Authority) in May 1996, was used as a basis for much of the multimodal transportation planning conducted for the SR 520 corridor to date. That plan identified the following regional transit service on corridors across Lake Washington:

- Express bus service on a "Regional HOV Expressway" in the SR 520 corridor, and
- Potential rail extensions from Seattle to Redmond, Kirkland, and Issaquah, via Bellevue and the I-90 corridor.⁸

In July 2005, following extensive analysis and public outreach, the Sound Transit Board adopted an updated Long-Range Plan, which included the following changes to the cross-lake corridors:

- University District to Redmond and Northgate to Bothell were each designated as HCT corridors.
- Downtown Seattle to Redmond, via I-90 to downtown Bellevue was identified as an LRT or Rail Convertible BRT corridor.

With voter approval of Sound Transit 2 (ST2) in November 2008, Sound Transit secured the local funding necessary to implement the ST2 Plan, including high capacity transit improvements throughout the region:

⁸. "Potential rail extensions" are defined in the Sound Move plan as "possible extensions of light rail, commuter rail, or other technology."

- East Link light rail, which is an extension of Link LRT service from downtown Seattle to Redmond, via Mercer Island, downtown Bellevue, and Overlake. The Seattle to Bellevue segment of East Link will use the I-90 corridor to cross Lake Washington. The alignment of East Link from downtown Bellevue to Overlake and downtown Redmond is not finalized, but will generally follow the SR 520 corridor and will allow passengers to transfer between East Link trains and SR 520 corridor BRT and/or other HCT service and local service.
- ST2 provides funding for a 17% increase in regional ST Express bus service, beginning in 2009. This includes funding for a new route in the SR 520 corridor connecting the University District with Overlake and Redmond, increased service frequency and expanded hours of operation in the SR 522 corridor (Seattle to Bothell and Woodinville), additional service in the I-90 corridor, and a route connecting Overlake, Bellevue, and Auburn. (Other increases in service will occur in the South King, Snohomish, and Pierce County areas.)

The Regional Transit System Plan for the Central Puget Sound: Sound Transit 2: A Mass Transit Guide (July 2008), projected that the ST2 projects identified above would result in the following weekday peak hour transit travel time savings in 2030 (relative to the No Build Alternative):

- Bellevue to Seattle (14 minutes saved)
- University of Washington to Bellevue (6 minutes saved)
- Capitol Hill to Overlake/Redmond (25 minutes saved)
- Redmond/Overlake to SeaTac Airport (30 minutes saved)

To facilitate system expansion beyond the projects funded in the plan, ST2 also includes funding for planning studies, including HCT from Redmond to the University District via Kirkland in the SR 520 corridor, continuing on to Ballard and downtown Seattle.

Sound Transit HCT Planning: Assessment of Compatibility with the SR 520 Pacific Street Interchange Option

In 2005, Sound Transit commissioned Parsons Brinckerhoff (PB) to conduct a review of the proposed SR 520 Pacific Street Interchange Option and to assess its compatibility with potential future HCT across the SR 520 bridge. The intent of the study was to identify any elements of the proposed configuration for the Pacific Street Interchange Option that might preclude future introduction of an HCT connection from the SR 520 corridor to the LRT station that is currently under construction on University of Washington property adjacent to Husky Stadium (the U-Link LRT station). No design work was conducted as part of the study, but in order to identify potential conflicts, PB evaluated conceptual plans for both an elevated and an underground SR 520 HCT station on the parking lot south of Husky Stadium. Based on an evaluation of WSDOT and Sound Transit plans and these conceptual station options, the study made the following findings relevant to the design options currently under review by the City of Seattle:

- The Pacific Street Interchange Option can accommodate HCT with certain modifications and allows for either an elevated or an underground terminal station for a future SR 520 HCT line on the south parking lot of Husky Stadium.

- An underground station at the site would need to connect to the SR 520 alignment in the vicinity of Foster Island via a tunnel under Union Bay.
- An elevated terminal station could be connected to SR 520 by way of a bridge over Union Bay with either 70' or 110' clearance over the high water mark.⁹ The lower 70' clearance requirement would make it easier to configure a new station on the south parking lot of Husky Stadium as a terminal station.
- Pedestrian access to an elevated station would be at the west end of the station, closer to the main entrance of the U-Link LRT station.
- An underground station could have a platform located at the elevation of the lower mezzanine of the U-Link LRT station, allowing for easy transfers to North Link trains and/or to a pedestrian tunnel under Montlake Boulevard.

This study did not evaluate the feasibility, impacts, or potential conflicts of constructing (1) an SR 520 LRT station adjacent to the U-Link LRT station without the Pacific Street Interchange (e.g., with a transit-only bridge or tunnel crossing of Union Bay and a station location in the path of the proposed Pacific Street extension through the south stadium parking lot), or (2) a non-terminal station at the same location, with an extension of SR 520 HCT service to the west and/or north of the site. The study notes that "if an extension to the west were to be required...it is anticipated that the station location would be quite different from the location examined in this study."¹⁰

PSRC Vision 2040

The Vision 2040 Growth Management, Environmental, Economic, and Transportation Strategy for the Central Puget Sound Region, which establishes multi-county planning policies under the Washington State Growth Management Act (RCW.36.70A), defines a series of urban growth centers in Redmond, Overlake, Bellevue, the University District, and Ballard to be linked by HCT in the SR 520/N 45th Street corridor.

SR 520 Bridge Replacement and HOV Project Supplemental DEIS

A Supplemental Draft Environmental Impact Statement (SDEIS) was initiated for the SR 520 Bridge Replacement and HOV Project in 2007 to define and evaluate the performance and impacts of multiple Westside design options for the six-lane alternative for the corridor. All options—Design Options A, K, or L, including all sub-options evaluated in the SDEIS—would (a) add HOV lanes in both directions across the SR 520 bridge, (b) add an HOV direct connection to the I-5 express lanes that would be open for westbound to southbound trips in the morning and northbound to eastbound trips in the afternoon, (c) add HOV bypass lanes on all interchange on-ramps, and (d) remove the Montlake Freeway Transit Station. Option A (and Option A with sub-options, commonly referred to as Option A+) would include a westbound transit-only off-ramp to northbound Montlake Boulevard; Option A with sub-options would also include an eastbound direct access on-ramp.¹¹ Relevant SDEIS elements and findings include the following:

⁹. The clearance requirement for such a bridge will be set by the US Coast Guard.

¹⁰. One notable constraint limiting the location and profile (elevated v. underground) of a station in the vicinity of Husky Stadium and any potential extension to the west is the requirement to protect the Rainier View Corridor from Red Square on the UW campus.

¹¹. SDEIS (2009), p. 5-19

- With the No-Build Alternative, transit ridership in the corridor would increase by 8,150 person trips per day (+51% over current conditions {15,980 trips/day} to a total of 24,130 person trips per day). All of the six-lane options evaluated in the SDEIS are projected to increase transit ridership by an additional 3,450 person trips per day (+72% over current conditions to a total of 27,580 person trips per day).¹² This increase reflects the effect of HOV lane completion and tolling on mode choice.¹³
- Westbound transit travel times in 2030 from SR 202 to I-5 in the SR 520 corridor are projected to be five minutes faster during both the AM and PM peak periods under all of the six-lane design options evaluated in the SDEIS compared to the No Build Alternative.
- Eastbound transit travel times in 2030 from I-5 to SR 202 in the SR 520 corridor are projected to be up to 40 minutes faster during the PM peak period under all of the six-lane design options evaluated in the SDEIS compared to the No Build Alternative.
- King County Metro's *Transit Now* initiative will fund increased service, primarily on weekends and during the midday period, on two significant transit routes in the SR 520 corridor (271, 255). Additionally, King County has taken action to dedicate a one cent per thousand property tax to support King County's contribution to the Urban Partnership Agreement. This action does not fully finance the level of service proposed in the SR 520 HCT study, but it does support a very significant improvement in transit service.

Urban Partnership Agreement SR 520 Variable Tolling Project -- Transportation Discipline Report

In March 2009, WSDOT and the Federal Highway Administration (FHWA) released a Transportation Discipline Report, for the SR 520 Replacement Project, which evaluated the transportation effects of tolling the existing SR 520 bridge from 2010 to 2016. Three alternatives were evaluated, including a "Low Toll" alternative (one way tolls of \$2.95 during AM and PM peak periods), a "High Toll" scenario (one way tolls of \$3.80 during AM and PM peak periods), and a "No Build" alternative that assumed continuation of current toll-free operations on SR 520 through 2016 (effectively a "No Action" alternative). The impacts of tolling SR 520 and potentially I-90 after completion of the SR 520 Bridge Replacement and HOV Project were evaluated separately for each of several six-lane alternatives in the report

The methodological issues and findings of the SR 520 Variable Tolling Project Transportation Discipline Report that are relevant to the City of Seattle's current work include the following:

- The analysis of existing conditions indicates that vehicle traffic and person movements in the corridor peak in opposite directions. This means that total vehicle occupancy is higher westbound in the mornings and eastbound in the afternoons, reflecting the greater availability of transit serving the Seattle-bound commute and the greater transit accessibility of Westside commute destinations.¹⁴

¹². SDEIS (2009), p. 5-20

¹³. SDEIS (2009), Page ES-29. Note that although the impact of tolling on transit demand was modeled for the three design options evaluated in the SDEIS, no comparably price-sensitive evaluation was documented for the alternatives evaluated in the 2006 DEIS.

¹⁴. Lower parking prices and/or the availability of free or subsidized parking at Eastside commute destinations may also encourage SOV travel from eastbound morning commutes, resulting in lower overall vehicle occupancy in that direction.

- Peak period transit ridership is projected to increase between 26% for the Low Toll scenario and 32% for the High Toll scenario relative to the No Build alternative.¹⁵ This transit ridership advantage of the tolled scenarios is projected to remain constant through 2016.
- In 2010 and 2016, travel times for GP traffic and HOVs in the SR 520 corridor and on segments of I-405 would be significantly reduced as a result of implementation of either tolling scenario evaluated in the report.
- No significant change in travel time is projected for I-90 or SR-522 as a result of implementing either the High Toll or Low Toll scenarios for SR 520. Although some traffic would be diverted to these alternate routes, they are projected to have sufficient capacity to accommodate new trips without a significant reduction in travel speeds or increase in corridor travel times during the AM or PM peak periods in either 2010 or 2016.¹⁶
- As a result of implementing tolling, the total volume of vehicles crossing Lake Washington during peak periods—and associated vehicle miles traveled (VMT) and greenhouse gas emissions—is projected to decline by 3% to 5% during the morning peak period and by 4% to 5% during the afternoon peak period in 2010, as compared to the No Build alternative. This difference in traffic volumes between the tolled scenarios and the No Build alternative is projected to diminish slightly through 2016. In all tolled scenarios, total cross-lake VMT during peak periods will be lower than with the No Build alternative.¹⁷

Although these findings are useful in assessing the potential impacts of pursuing an SR 520 configuration with four tolled GP lanes plus two transit lanes, the benefits to mobility—including increased travel speeds for GP traffic and HOVs, reduced travel times, increased transit ridership, and reduced VMT—may be understated due to the limitations of the travel demand model used, the assumed travel network, and the availability of data inputs.

¹⁵. UPA SR 520 Variable Tolling EA, Transportation Discipline Report, Exhibit 4-20.

¹⁶. UPA SR 520 Variable Tolling EA, Transportation Discipline Report, Exhibits 4-15 to 4-18

¹⁷. UPA SR 520 Variable Tolling EA, Transportation Discipline Report, p. 4-13.

Chapter 3. Light Rail Opportunities

This section identifies and discusses potential light rail transit (LRT) segment alignment options on the Westside and Eastside of the SR 520 bridge. Segment alignment options are then evaluated for LRT potential and combined to develop a qualitative assessment of market and operation feasibility of LRT alignments connecting Seattle and Eastside destinations.

Assumptions

Several major assumptions have been made to conduct the analysis:

- LRT across the SR 520 corridor is feasible—the floating bridge, as designed, will accommodate the width and weight of LRT in the future.
- Details regarding alignment and guideway technology (e.g., at-grade, aerial, underground) in Seattle and on the Eastside are not yet designed and defined, and thus could change when conducting further engineering feasibility analyses.
- LRT levels of service (LOS) would at least match bus rapid transit (BRT) service planning assumptions (i.e., 7-minute frequency during peak hours, and 10-minute frequency during midday/off-peak hours).
- Crossing the Montlake Cut requires either an aerial structure with clearance of 110 feet above the water, a deep bore tunnel under the Lake Washington ship canal, or a second bascule bridge.
- U-Link and North Link tunnels cannot accommodate another line due to designed operation capacity and engineering design issues.

Introduction to LRT Segment Concepts

Preliminary LRT segment alignment concepts were identified on the west and east sides of SR 520. Segments were chosen following major travel and transit corridors in Seattle and the region that connect local activity centers (e.g., Seattle's Urban Villages) and regional activity centers (or regional growth centers as defined by PSRC), and that could support some form of high capacity transit (HCT) operation in the future (mostly LRT or BRT) based on expert knowledge and a qualitative assessment of existing and future market demand in the region.

Two basic “*bridge*” segments were defined for operation across Lake Washington on the SR 520 floating bridge:

- Evergreen Point to Husky Stadium
- Evergreen Point to Montlake Boulevard Interchange

A total of 15 segments were identified and evaluated in Seattle that could either connect with the bridge segment at Husky Stadium or at the Montlake Boulevard Interchange (see Figure 1, on page 19).

A total of 10 Eastside segments were identified and evaluated that would connect with the bridge segment at Evergreen Point (see Figure 1, on page 19).

Individual segment alignment maps and evaluation summaries are included in Appendices A and B, respectively, at the end of this report.

LRT Segment Evaluation Criteria

Eight major evaluation criteria were used to screen the LRT segment concepts. Criteria included origin-destination travel demand, potential corridor demand, network connectivity and duplication, land use and urban growth potential, a preliminary assessment of constructability and feasibility, a level of magnitude for potential costs, and potential impacts to neighborhoods and the environment. The methodology for screening each segment concept is described below.

1. Major Destinations Served

This criterion identifies Seattle neighborhoods, Eastside communities, regional centers, and urban villages served by potential LRT segment alignments.

Scoring Methodology:

- *Low = serves mostly residential community areas*
- *Medium = serves a mix of residential communities and activity centers*
- *High = serves multiple regional centers and urban villages*

2. Potential Market Reach

Potential market is defined as the total size of the market, or the number of persons and jobs that are within one-half mile of the potential LRT corridor segment.

Scoring Methodology:

- *Low = limited access from surrounding land uses, poor street connectivity, limited number of communities and destinations served*
- *Medium = combination of limited access and connections from many different communities and destinations*
- *High = corridor easily accessible from multiple communities and high number of connecting arterial streets*

3. Ridership Potential

Potential ridership is estimated at a qualitative level and based on current and expected transit ridership patterns, at the corridor level, for Metro and Sound Transit services.

Scoring Methodology:

- *Low = low ridership expectations based on existing and parallel corridors' ridership*
- *Medium = mixed ridership expectations based on existing ridership along comparable corridors*
- *High = high ridership levels in existing corridors and potential for increased transit demand*

4. System Connectivity

Potential transfer movements and the transit market shed for each LRT corridor option are described by identifying connections with major travel corridors in Seattle.

Scoring Methodology:

- *Low = low number of connections with major transit corridors in the system*

- *Medium = moderate number of connections or combination of segments with low and high connectivity with major transit corridors*
- *High = high levels of connectivity with major transit corridors and other transit services that could boost ridership in the corridor and system*

5. System Duplication

The corridor options are evaluated for duplication of existing HCT corridors as well as whether the LRT segment concept creates an alternative option that does not compete with existing or planned HCT infrastructure.

Scoring Methodology:

- *Low = directly competes with existing or planned HCT infrastructure, mostly the Link system*
- *Medium = moderate duplication or competition in limited segments of planned HCT system network*
- *High = does not duplicate or compete with existing or planned HCT infrastructure*

6. Land Use and Growth Potential

This criterion identifies residential and employment densities along major segments of the LRT corridor options and identifies the potential for densification and/or infill development along same corridors.

Scoring Methodology:

- *Low = primarily traverses areas that are highly consolidated in form and function and have few redevelopment and densification opportunities*
- *Medium = limited number of areas or segments with potential for redevelopment and densification*
- *High = traverses several segments of low density development or underdeveloped property with potential for redevelopment and densification*

7. Constructability and Feasibility

Potential guideway technology options are evaluated, such as at grade, aerial structures, and underground tunnels by segment given observable rights-of-way and topography; whether tunnel segments follow existing or planned alignments for Central, East, and North Link; and approximate significance of environmental impacts to communities and neighborhoods along the potential LRT corridor.

Scoring Methodology:

- *Low = high number of engineering challenges for LRT development, such as major grade changes, water bodies, tunneling, and complex aerial structure solutions with potentially high neighborhood impacts*
- *Medium = limited number of engineering challenges, complex solutions required at few locations only with limited impact*
- *High = minimum number of impacts and/or engineering challenges for LRT development*

8. Potential Cost

Based on approximate length in miles for each guideway technology, potential costs are estimated to allow comparison between segment alignment options.

Scoring Methodology:

- *Low = many underground segments that require new tunnels, long aerial structure segments, and/or complex engineering solutions at particular points*
- *Medium = combination of at-grade alignments with limited amount of tunneling work*
- *High = mostly at-grade alignment and limited number of grade changes, use of existing road or rail infrastructure*

LRT Segment Evaluation

Figure 1 on the next page presents a complete list of LRT segments considered for analysis and screening and the segments' scoring results for each evaluation criteria as described in the methodology above. The evaluation of LRT segment concepts is highly qualitative and is intended as a "first level" screening of potential LRT alignment segments, in both Seattle and on the Eastside, to select those segments that qualitatively present the best balance between a high number of opportunities for Seattle and its transportation system and a low number of difficulties for LRT implementation.

A few segments considered for evaluation closely duplicate funded Link system alignments. This was done purposefully to benchmark potential LRT segments west of the SR 520 bridge with approved Link alignment segments.

Many potential options exist to connect light rail along the SR 520 corridor with Seattle destinations and communities. Options are categorized from the outset by whether they cross the Montlake Cut or not. Segment concepts that do not cross the Montlake Cut stay on SR 520 and deviate at Montlake toward Capitol Hill and downtown or cross I-5 and deviate towards South Lake Union and downtown. All other segment concepts are proposed to serve North Seattle and Northeast Seattle neighborhoods and destinations, and places beyond.

As mentioned before, individual segment alignment maps and detailed evaluation summaries are included in the Appendices at the end of this report.

The scoring key utilized in the LRT segment evaluation matrix is as follows:

Scoring Key

-  1 Low
-  3 Medium
-  5 High

Figure 1: LRT Segment Evaluation

LRT Corridor Segment Options	EVALUATION CRITERIA							Potential Cost	Evaluation/Scoring Comments
	Destinations Served	Potential Market	Ridership Potential	System Connectivity	System Duplication	Land Use and Growth Potential	Constructability & Feasibility		
SR 520 Bridge – Husky Stadium/Montlake to Evergreen Point. No intermediate stops. Two options:									
1. Stop on north side of Montlake Cut by Husky Stadium	5	5	5	5	5	5	5	3	Segments #1 and #8 make central segment
2. Stop on south side of Montlake Cut on SR 520 ROW	5	5	5	5	5	5	5	5	Works with segments #3 and #4; not selected for further analysis
West of SR 520 Bridge – City of Seattle Options:									
3. Downtown Seattle via Roanoke, Eastlake and South Lake Union to Westlake Center Station	5	5	5	5	5	5	5	3	Not selected for further analysis
4. Downtown Seattle via 23rd Avenue and Madison to University Street Station	3	5	3	3	5	5	5	1	Not selected for further analysis
5. Downtown Seattle via Wallingford/Fremont, Queen Anne, Belltown to Westlake Center Station	5	5	5	5	5	5	5	1	Not selected for further analysis; mostly tunnel alignment, expected high cost
6. Downtown Seattle via Campus Pkwy, Eastlake, South Lake Union to Westlake Center Station	5	5	5	5	5	5	5	1	Not selected for further analysis; system duplication and high cost
7. Downtown Seattle via University Link Tunnel to Westlake Center Station	3	1	5	5	1	1	1	3	Not selected for further analysis; fatal flaw, University Link tunnel at capacity
8. University District via Pacific and Brooklyn to Brooklyn Link Station	1	3	3	3	3	3	5	5	Segments #1 and #8 make central segment
9. Northgate via Roosevelt/11th Avenue through University District and Green Lake	3	3	3	3	1	3	3	3	Not selected for further analysis; North Link duplication
10. Lake City via Roosevelt/11th Avenue and Lake City Way	3	5	3	3	3	5	3	3	Selected for analysis
11. Canyon Park via Lake City Way/SR 522 and UW Bothell Campus	5	5	5	5	3	5	3	1	Not selected for further analysis; potential extension of segment #10 at a later phase
12. Magnusson Park via Sand Point Way, Children's Hospital	3	1	1	1	5	3	5	5	Not selected for further analysis; low ridership expectations
13. Ballard via 45th Street and Market Street Corridors	5	5	5	5	5	5	1	1	Selected for analysis. Conceptual segment only; final alignment through Wallingford and Fremont T BD
14. Ballard via Campus Pkwy, 40th/39th Street and Leary Corridors	5	3	3	3	5	3	1	1	Not selected for further analysis; alternative to 45th Street alignment
15. Aurora Village via SR 99/Aurora Avenue and 45th Street to UW Station	5	5	5	5	1	5	3	1	Selected for analysis. Joint-operation with Rapid Ride is a major issue; can be shortened to Blitter Lake
16. Greenwood via Phinney Ridge and 45th Street Corridor	5	5	5	5	3	3	1	1	Selected for analysis
17. Whittier Heights via 85th Street, Green Lake, Ravenna and Roosevelt/11th Avenue Corridor	5	5	3	5	3	3	1	1	Selected for analysis
East of SR 520 Bridge – East King County Options:									
18. Woodinville Town Center via BNSF Corridor through Kirkland and Totem Lake Regional Center	3	1	1	5	5	3	5	3	Not selected for further analysis; low ridership expectations, right of way issues
19. Canyon Park via BNSF Corridor, Totem Lake, I-405 and UW Bothell Campus	5	3	3	5	5	3	3	1	Selected for analysis. Initial segment to Totem Lake with an extension to Canyon Park at a later phase
20. Downtown Redmond via Kirkland, BNSF Corridor, and 85th Avenue/Redmond Way Corridor	3	3	3	3	5	5	1	3	Not selected for further analysis; shorter variant of segment #21
21. Overlake Center via Kirkland (BNSF Corridor), 85th Street, and downtown Redmond	5	5	5	5	5	5	1	1	Not selected for analysis. Initial segment to downtown Redmond; extension to Overlake interlined with East
22. Downtown Redmond via SR 520, 148th Avenue and Willows/90th Street	3	5	3	1	1	3	5	3	Not selected for further analysis; low accessibility
23. Downtown Redmond via downtown Bellevue, Bel-Red, and Overlake (East Link corridor)	5	5	5	5	1	5	3	3	Selected for analysis. Potential interlining with East Link
24. Downtown Bellevue to connect with East Link at Bellevue Transit Center	1	3	3	3	3	1	5	5	Selected for analysis. Connection with East Link
25. Downtown Bellevue via BNSF to connect with East Link at Overlake Hospital/NE 8th Street	1	1	1	3	3	1	3	3	Not selected for further analysis; alternative to segment #24
26. Bellevue Crossroads via downtown Bellevue and NE 8th Street Corridor	3	3	3	3	3	3	1	1	Not selected for further analysis; potential grade issues along NE 8th Street
27. Issaquah Transit Center via downtown Bellevue, Bellevue Community College and I-90	5	5	3	5	3	3	1	1	Not selected for further analysis

Selected LRT Alignment Concepts

From the evaluation conducted and presented in Figure 1 above, a limited number of segments were selected in Seattle and on the Eastside for further consideration, based on their combined attributes and potential for success. These selected LRT segments were then paired together to combine their scoring and explore end-to-end alignment concepts that show the greatest potential for LRT implementation. Figure 2 below presents the pairings and scoring of LRT segments selected for further consideration.

Figure 2: Selected LRT Segment Pairings

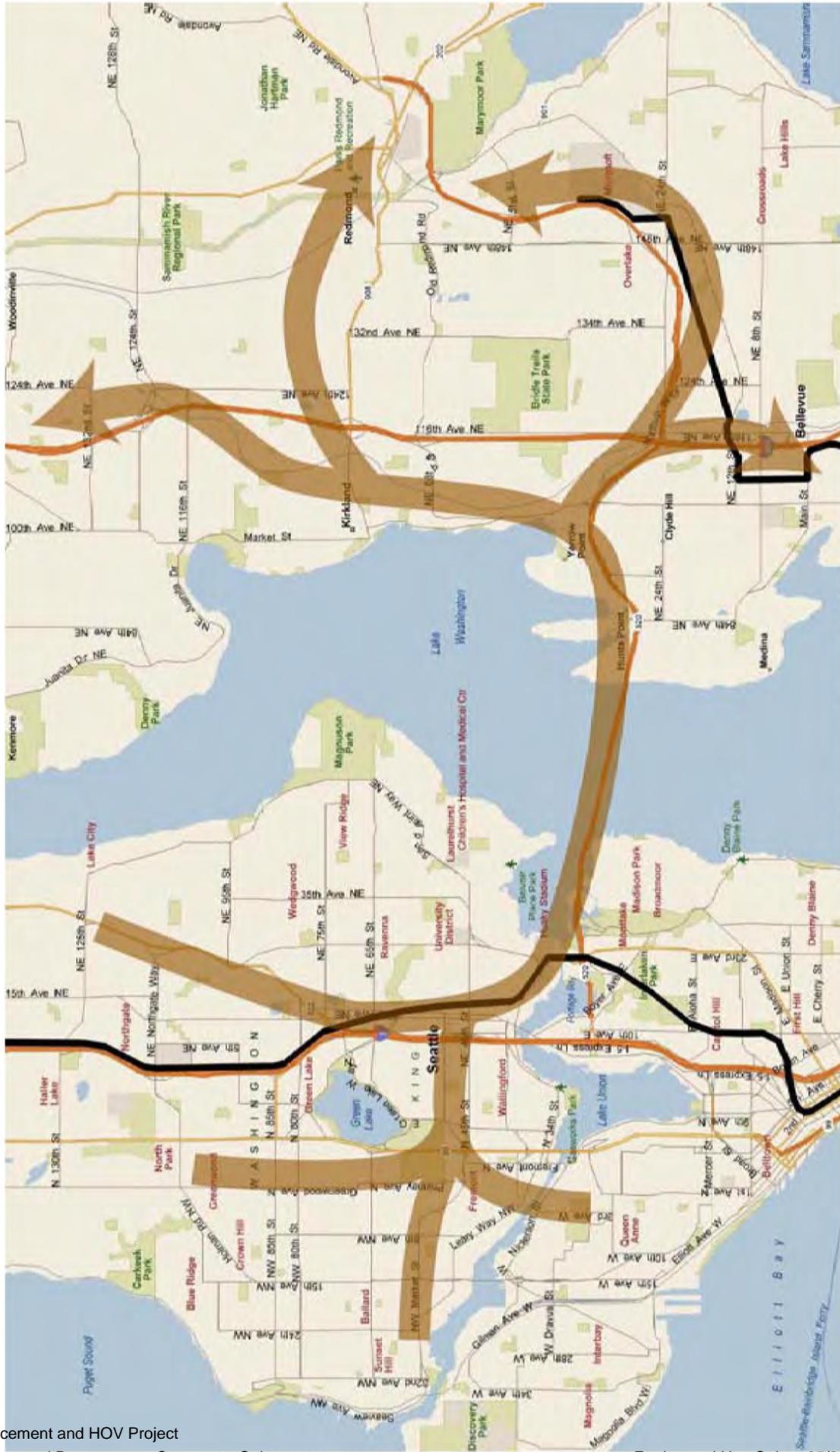
SR 520 Selected Segment Pairings	21. Overlake Center via Kirkland (BNSF Corridor), 85th Street, and downtown Redmond	23. Downtown Redmond via downtown Bellevue, Bell, and Overlake (East Link corridor)	19. Canyon Park via BNSF Corridor, Totem Lake, I-405 and UW Bothell Campus	24. Downtown Bellevue to connect with East Link at Bellevue Transit Center
13. Ballard via 45th Street and Market Street Corridors	H	H	M	L
15. Aurora Village via SR 99/Aurora Avenue and 45th Street to UW Station	H	H	M	L
16. Greenwood via Phinney Ridge and 45th Street Corridor	M	M	L	L
10. Lake City via Roosevelt/11th Avenue and Lake City Way	M	M	L	L
17. Whittier Heights via 85th Street, Green Lake, Ravenna and Roosevelt/11th Avenue Corridor	M	M	L	L

Based on the results of this analysis, five preliminary LRT alignments were selected for further study and analysis:

1. Ballard to Redmond, via Kirkland
2. Ballard to Redmond, via Overlake
3. Haller Lake to Redmond, via Kirkland
4. Haller Lake to Redmond, via Overlake
5. Ballard to Totem Lake, via the BNSF Corridor

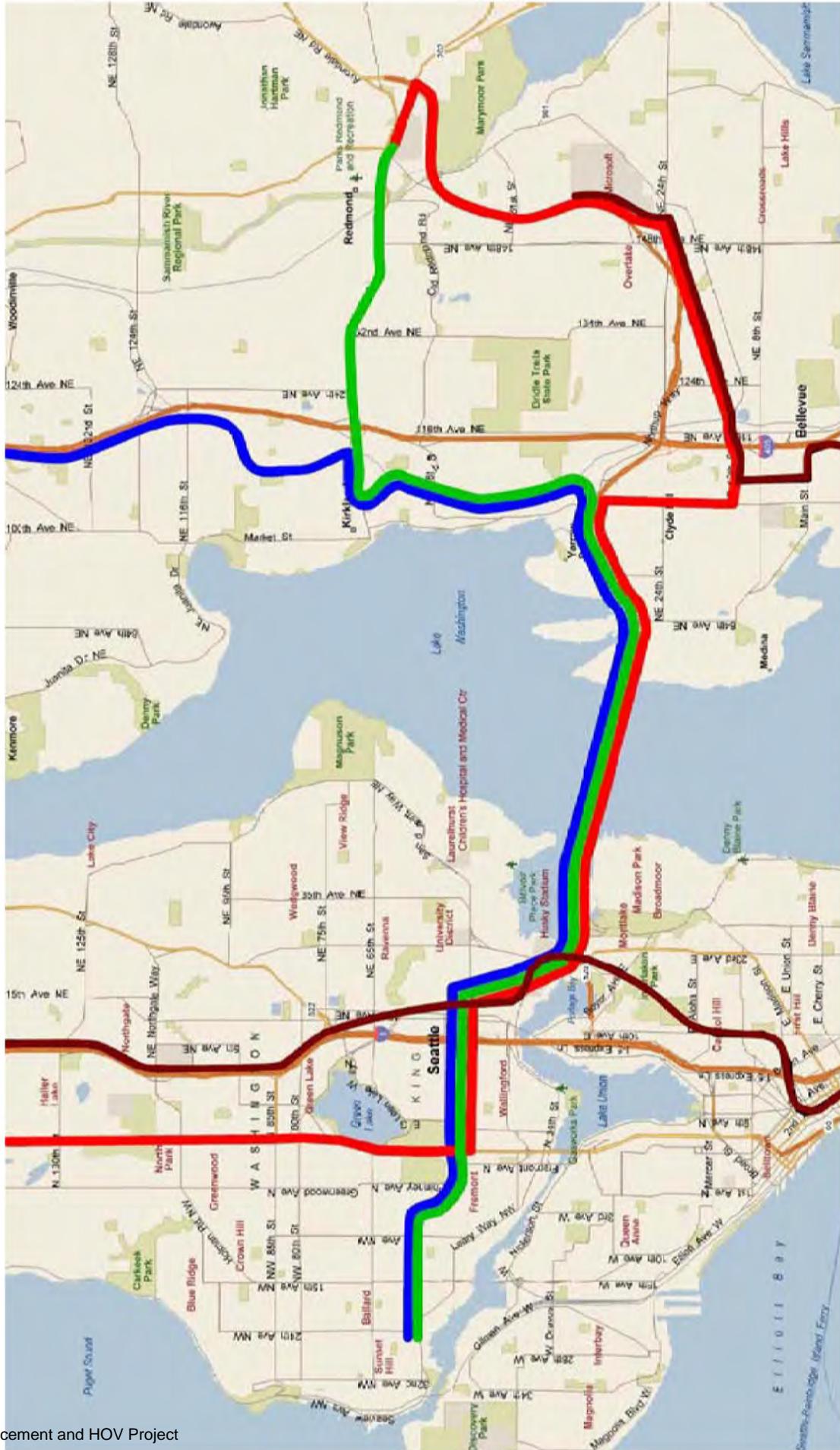
A summary of conceptual LRT alignment concepts and strategies is presented in Figures 3 and 4 on the next pages.

Figure 3: LRT Conceptual Strategies



Source: Microsoft Corporation and NAVTEQ Data

Figure 4: LRT Conceptual Alignments



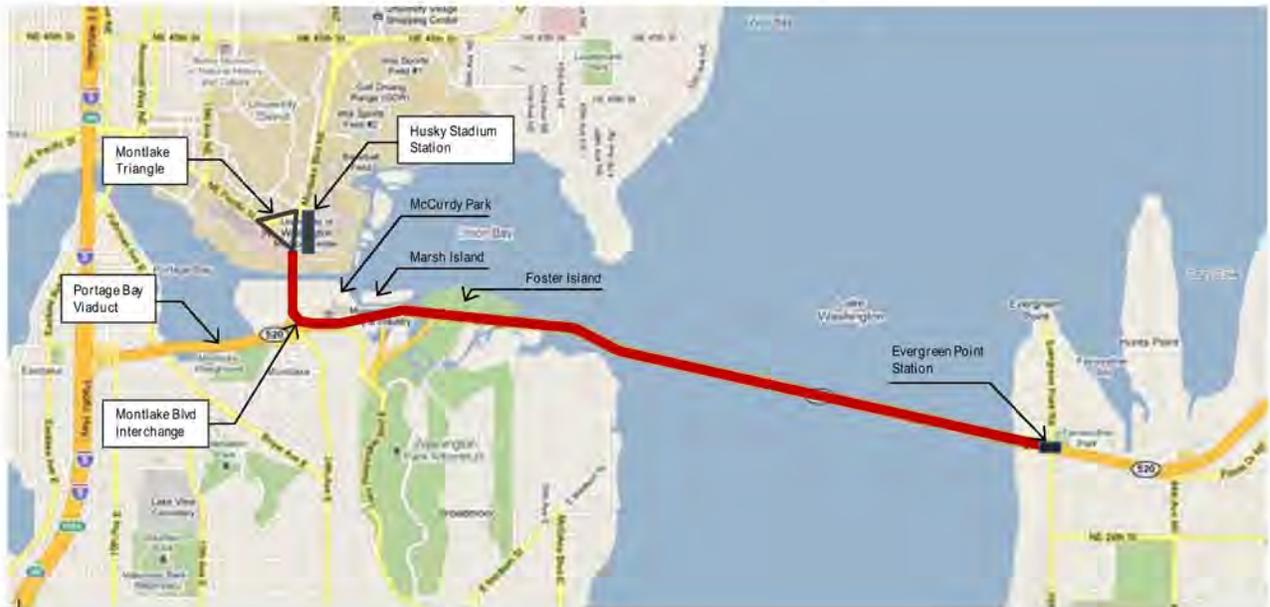
Source: Microsoft Corporation and NAVTEQ Data

Chapter 4. Phasing to Light Rail

The mayor's vision for the SR 520 corridor features a comprehensive high capacity transit (HCT) network, with a light rail alignment crossing the SR 520 bridge complemented by a robust bus rapid transit (BRT)/bus network. Accompanying that vision is a prediction of a future with different demands on the transportation system than those of today: a future where energy prices continue to increase, efforts to slow global climate change are more aggressive, and land use patterns demand higher capacity transportation connections. Such a future could significantly increase the transit and high occupancy vehicle (HOV) mode split crossing Lake Washington along the SR 520 corridor, well beyond the 17% estimated in the supporting transportation study of the Supplemental Draft Environmental Impact Statement (SDEIS).¹⁸ Throughout the remaining chapter there are references made to various locations and their relationship to each other on the SR 520 corridor, Figure 5 is a vicinity map containing labels for geographic names reference in this and subsequent sections.

Two possible scenarios to phase to light rail transit (LRT) on the SR 520 corridor are identified in the following section; however, these are just two of many possible options. The subsequent pages provide additional description of the considerations for both scenarios. At the time of this writing, a final schedule for completion of the SR 520 I-5 to Medina Bridge Replacement and HOV Project is unknown, as the project budget currently has a \$2.6 billion shortfall. The goal is to complete the floating bridge and landings in 2014; this portion of the project is fully funded as currently designed.

Figure 5: SR 520 Bridge Vicinity Map



¹⁸. Transportation Discipline Report Exhibit 11-9, Cumulative Effects Daily Cross-Lake Person Trips, HOV 45,400, Transit 51,420, for total non-SOV 96,820, total person trips 561,560; $96,820/561,560 = 17.2\%$

Design and Construction Considerations

This section provides information on the details of phasing to a light rail system on SR 520—including the assumptions, considerations, and alternatives to accomplish that phasing—if the bridge deck is originally constructed without light rail in place, as suggested in the two phasing scenarios discussed previously.

Assumptions

- **LRT Extent** — Based on the alignment selection process, it is assumed that light rail will diverge from the SR 520 mainline on the Westside between Foster Island up to and including Montlake Boulevard. The Eastside divergence point is less certain but is currently assumed to occur in the area east of Evergreen Point station and west of the junction with I-405.
- **Lane Conversion** — In the six-lane phasing scenarios it is generally assumed that two lanes of SR 520 will be converted to exclusive light rail operation, with the bridge remaining the equivalent of six lanes wide. However, the possibility exists that joint operations of buses and LRT could be pursued. If all the challenges of joint operation could be met, buses and light rail could share the center lanes, and non-transit HOV would be moved into the GP lanes.

The Bridge Deck

Roadway Structure

The roadway structure currently under design accommodates future LRT by including structural elements and stray current protection for LRT. However, the need to limit the height of the bridge deck above the water establishes how the LRT rails would be added to the structure. Under the current design, the rails would not be embedded in the bridge deck but would be installed on top of the bridge deck due to the “thinness” of the concrete deck, rendering the potential for joint operations infeasible. Designers report it may be possible to add depth on top of the currently designed deck to provide a rubber tire running surface, but the additional weight on the bridge would require the addition of buoyancy with flanker pontoons as well as modifications to the deck supporting structure.

One critical question that must be answered in the final design of the bridge is the required cross-section of structure necessary to accommodate a two-track light rail system. This basic design assumption must be confirmed and established as a design criterion for the bridge deck. Initial evaluation and discussions with Sound Transit indicate that LRT requires a minimum of 15 feet of clear distance between traffic barriers in each direction, plus a 4-foot center median to support the overhead power lines for LRT, and a 2-foot traffic barrier on the outside to separate general purpose (GP) traffic. The total width would be 38 feet minimum from outside of traffic barrier to outside of traffic barrier, which may be challenging to accommodate within the current design of the bridge. Additionally, the floating bridge is similar to a tunnel in that it would require inclusion of an emergency evacuation path for light rail passengers. There must be adequate space between the rail lines to support this provision. Taken together these design parameters indicate the bridge deck may need to be up to ten feet wider than the current option A+ design to support conversion to light rail.

Pontoons

As presently designed, the pontoons are capable of supporting a six-lane roadway section as outlined in the SDEIS. Engineers report the current design is being analyzed to determine the amount of additional buoyancy and stability that would be necessary to accommodate the added load of LRT on the bridge. The potential of joint operations complicates this analysis, as that feature would add weight to the structure to allow the addition of running-ways for buses, essentially recessing the tracks.

One assumption that has been made in the design of the structure and the pontoons is that light rail would be installed on the inside lanes of the bridge. Neither the pontoons nor the current roadway structure are designed to accommodate LRT on the outside of the roadway. This option should be considered infeasible and prohibitively expensive.

Approaches

The bridge approaches also must be considered in the SR 520 design process. Presently, the bridge approaches are not designed to accommodate light rail conversion. Under current plans the conversion could only occur following reconstruction of the approaches, particularly on the west side. There must be sufficient space (i.e., a "gap") between the eastbound and westbound lanes of the SR 520 mainline between Foster Island and Montlake Boulevard to allow an LRT alignment and/or transit/high occupancy vehicle (HOV) lanes to diverge from the SR 520 alignment. This is a technically challenging area as the current roadway plans utilize two separate structures for the eastbound and westbound lanes. Preliminary engineering would be required to assure that light rail could be successfully added to the currently designed structures.

Scenario 1: Four-Lane Bridge

Medina to I-5 SR 520 Expanded to LRT Operation

Central Features:

- Initial four-lane replacement for floating bridge
- Portage Bay Viaduct rebuilt to improved version of current structure
- SR 520 Medina to Montlake phased to light rail following regional planning effort
- Transit operations in general purpose (GP) lanes improved through dynamic tolling

In Scenario 1, the four-lane floating bridge, which is one of the most crucial safety concerns of the SR 520 project, is replaced first. The underlying assumption is that the current SR 520 bridge must be replaced due to catastrophic failure and a four lane bridge is all that can be constructed to expeditiously reconnect the SR 520 corridor. Given that construction of the six lane bridge is fully funded, it is unlikely a four lane bridge would be the starting point under any other set of circumstances. Its inclusion here is to outline how a bridge replacement caused by a catastrophic event could also be phased to LRT operation. The new bridge would be constructed and temporarily connected to the current western approach. This scenario represents a departure from the phased implementation outlined in the SDEIS. The SDEIS phasing scenario assumes that the new floating bridge would be built in its four GP + two HOV (4+2) lane configuration and

striped for six lanes with a transition to the existing four-lane cross-section in the west approach area.

Figure 6: Four-Lane Bridge Replacement Section

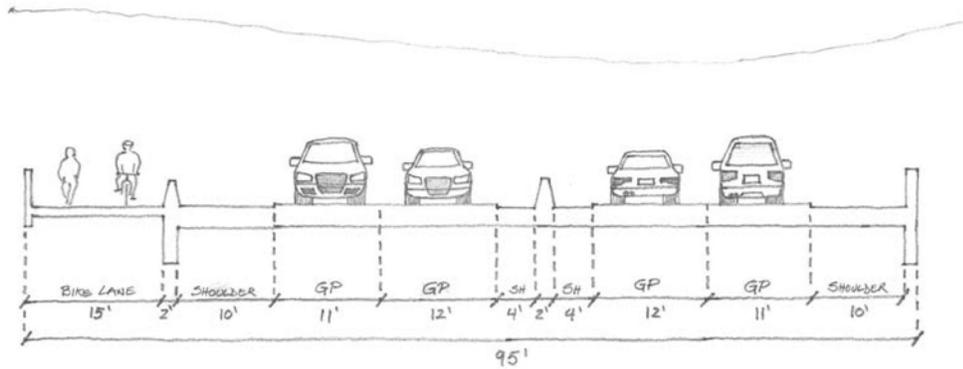
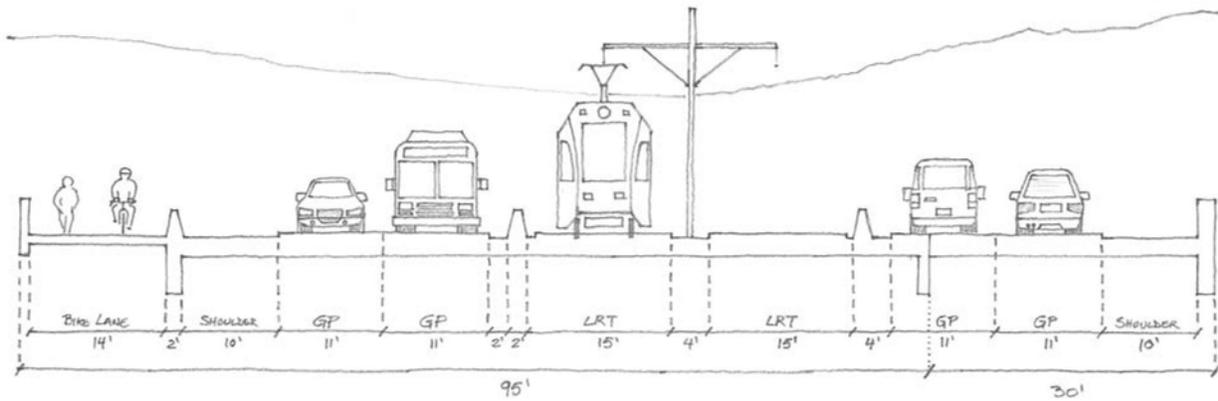


Figure 7: Expansion to LRT Operation



Scenario 2: Six-Lane Bridge

Four (4) GP + Two (2) HOV Lane SR 520 Converted to LRT Operation

Central Features:

- Initial six-lane replacement for bridge (4 GP lanes + 2 HOV lanes)
- Portage Bay Viaduct rebuilt to improved version of current structure
- Six-lane western approach constructed to Montlake that is LRT convertible
- SR 520 Medina to Montlake phased to light rail following regional planning effort

Scenario 2 begins with a six-lane replacement bridge and western approach that is constructed with the assumption that the two inside lanes will be converted to light rail operation. All necessary structural and floatation capacity to support LRT would be added to the bridge at the time of initial construction. The east and west approaches, including the Union Bay section, would be built to fully accommodate a light rail alignment. This requires inclusion of space between the eastbound and westbound roadways (i.e., a “gap” in the bridge) to allow a rail alignment to diverge from the center of the SR 520 mainline between Foster Island and McCurdy Park in the design of the western approach.

Depending on available funding and progress of the planning effort, HOV-exclusive access to Montlake Boulevard could be included in the initial construction phase. West of Montlake Boulevard, it may be possible to constrain the mainline section to four lanes, pending the outcomes of the planning effort; however, this would require supplemental environmental analysis that would also delay replacement of the floating bridge. The Portage Bay Viaduct would be reconstructed to address the seismic vulnerabilities of the structure, fix some of the traffic operations issues, improve stormwater collection, and incorporate a transit-only connection to the reversible HOV lanes on I-5, an important transit enhancement. The new structure would improve the current conditions with extended merge and diverge areas, managed shoulders, and more effective stormwater collection, while remaining four lanes wide through most of the alignment.

At the same time construction on the bridge and the approaches is underway, preparations for phasing to light rail could begin. Necessary planning, engineering, environmental analysis, and a regional decision-making process would be conducted to fully describe a light rail alignment and transit operating scenario for the SR 520 corridor. At completion of this effort—and in accordance with a new SR 520 Integrated HCT plan—the SR 520 corridor could be converted to include light rail in place of the HOV lanes.

How is Scenario 2 different than the Option A+ project described in the SDEIS?

- The floating bridge is slightly wider (up to 10 feet) and built to accommodate light rail (except rails, overhead power system, and separation barriers) at first construction. This includes additional roadway width and flotation and stability in the pontoon system.
- The western approach to the floating bridge would be specifically designed to accommodate light rail conversion in the future, including the divergence point between Foster Island and Montlake Boulevard.

- The eastern approach would also be designed to ensure light rail touches down in the Evergreen Point Station area. It is recognized this means that buses could no longer directly serve the platforms. To integrate the operations would require planning and construction of a new station.
- The Portage Bay Viaduct remains four lanes on initial build and, possibly, permanently.
- After corridor conversion to light rail, BRT/bus transit performance is achieved through traffic management alone, rather than with dedicated lanes and traffic management. (For example, the inside GP traffic lanes could become HOT lanes.)
- A new SDEIS process would be required to evaluate the design and operational differences between SDEIS Option A+ and the proposed scenario. The amount of delay would depend upon the time it took to make changes to the design and the extent of those changes. The floating bridge could not be replaced until the supplemental EIS was complete and all comments (on the DEIS and both SDEISs) were addressed.

Figure 8: Four GP Lanes + Two HOV Lanes Section

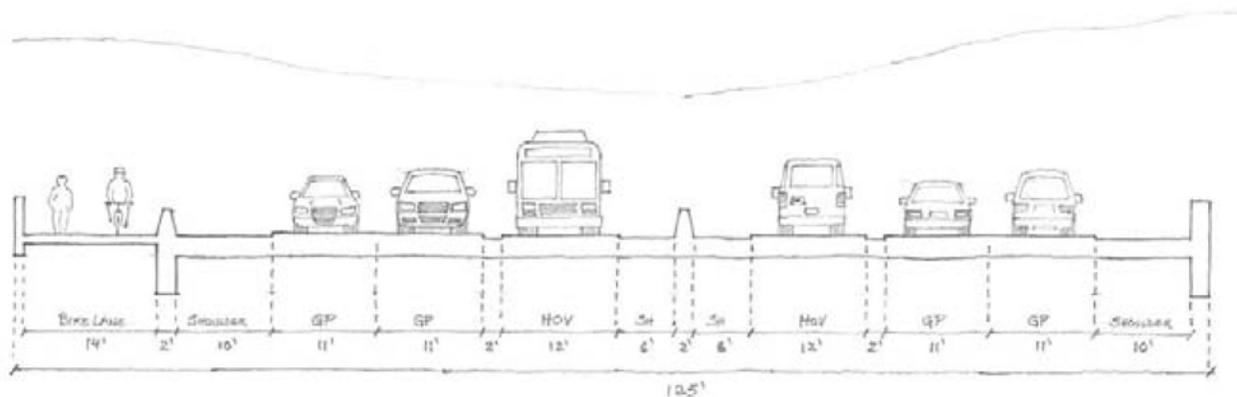
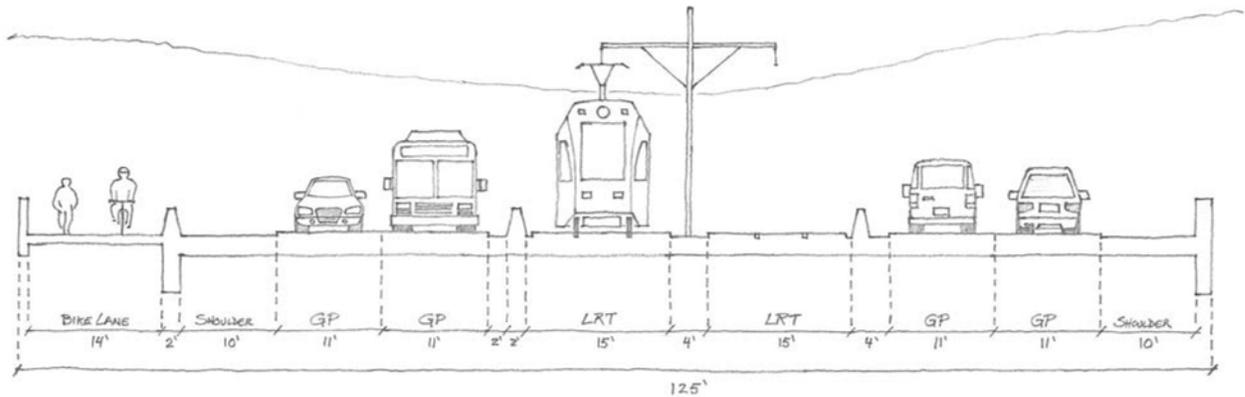


Figure 9: Four GP Lanes + LRT Operation Section



Shore-Side Connections

At the east and west ends of the bridge, or at some point along the alignment, it will be necessary for light rail to leave the center alignment of SR 520. Where and how this happens is of importance in the design of the bridge approaches and the corridor in order to maintain options for light rail development and to avoid significant construction or environmental costs when light rail is added to the corridor. Presently, the bridge approaches discussed in the SDEIS are not designed to accommodate light rail conversion. The addition of light rail assumes new construction on these approaches and the potential divergence points have not been established and designed.

Eastside

Current design for the Evergreen Point Transit station assumes LRT occupies a center position in the station, taking the place of bus operations. A new station would need to be designed to ensure good connectivity between buses and light rail; if joint operations were pursued, buses could enter the shared corridor at this location. East of the transit station, LRT would continue along the corridor and is expected to diverge from the SR 520 alignment prior to arriving at I-405. The roadway's width and outside retaining walls are being constructed so that LRT could be added to the freeway right of way while maintaining the six-lane (4+2) configuration. A consideration in the final alignment for light rail would be potential modifications to stations nearing construction in the Medina to SR 202 project. The specific alignment, where it diverges from the corridor, and the station locations would have potential impact on these stations.

Westside

Crossing the Lake Washington Ship Canal — All light rail alignments considered in this report assume a connection with the University Link at Husky Stadium. The connection is not necessarily on the same track or at the same depth as the U-Link station now under construction,

but an SR 520 light rail alignment would be built to allow connectivity between the SR 520 light rail line and what will then be the existing U-Link line (scheduled for opening in 2016). Crossing from the SR 520 corridor to Husky Stadium requires consideration of a number of constraints. No one of these constraints renders the crossing infeasible, but, taken together, the combination significantly limits feasible options. There are four different options under consideration for crossing the Montlake Cut:

1. High level fixed bridge
2. Low level bascule bridge
3. Tunnel
4. At grade on Montlake with the Option A+ Montlake bascule bridge

High Level Bridge

High level fixed bridge and Lake Washington Ship Canal (Montlake Cut) navigation channel — The current navigation channel, by Coast Guard regulation, must provide a minimum vertical clearance of 110 feet over the Ship Canal. (Some preliminary work has been conducted during the DEIS analysis on lowering the minimum vertical clearance to 70 feet, which is also the maximum vessel height for South Lake Washington; however, WSDOT was not successful in obtaining permission to use the lower clearance.) The SDEIS proposes that the 70 foot vertical navigation clearance would be governed by the SR 520 bridge, as the draw span is proposed to be removed and the vertical clearance of the east high rise is proposed to be 70 feet. The Coast Guard has a process they must follow to change the minimum navigational clearance for a body of water. This minimum vertical clearance establishes part of the potential design envelope for a high level bridge.

The navigational clearance is critical due to the adjacency of the centerline of the Lake Washington Ship Canal to what is the assumed station point for SR 520 light rail, next to the University Link station at Husky Stadium. These two points and the 6% maximum allowable grade for LRT establish the feasibility of a high level crossing over the Montlake Cut.

A high level bridge would also have some of the same environmental issues that created concerns about the DEIS Pacific Interchange design option. These include more columns in water and more shading over water, aesthetic concerns, filling of additional wetlands on Marsh Island, and conflicts with existing uses in the University of Washington South Campus area.

Bridges or elevated rail structures and Rainer Vista view corridor — The University of Washington Rainier Vista corridor is a protected view corridor. New view-blocking structures erected within the corridor would have to provide significant benefit and show that no feasible or prudent alternatives exist to offset impingement of the view corridor and to achieve approval from the University of Washington.

Figure 10: High Level Bridge over Lake Washington Ship Canal

This graphic is for illustrative purposes only. No geometric analysis or preliminary engineering has been conducted.

Low Level Bridge

Drawbridge — This alternative for crossing the Montlake Cut utilizes a low level bascule bridge. LRT would begin leaving the SR 520 alignment between Foster and Marsh Islands and turn north in the vicinity of McCurdy Park, cross the Ship Canal, and end at a surface, or slightly subsurface, station at Husky Stadium. This alternative has the disadvantage compared to the high level bridge or tunnel of being less reliable as a result of bridge openings for vessel traffic. A possible solution might be to increase the “closed bridge” vertical clearance to meet a high percentage (e.g., 90 to 95%) of the vessel passages, leaving only a few vessels that would actually cause a bridge opening. The disadvantage of this strategy is that the piers for a bascule bridge are very substantial: the higher the fixed portion of the bridge, the greater the visual disruption. This design also conflicts with existing uses in the University of Washington South Campus area.

Figure 11: Low Level Bridge across Montlake Cut

This graphic is for illustrative purposes only. No geometric analysis or preliminary engineering has been conducted.

Tunnels

Tunnels and Foster Island traditional cultural property and endangered aquatic species —

The portion of Foster Island that has historically been above the waterline of Lake Washington is presumed to be a traditional cultural property, making excavation in this area highly problematic in terms of negatively impacting the site. This designation adds a risk element to a tunneling option. It does not preclude a tunnel option for crossing the Montlake Cut (particularly if the alignment did not cross Foster Island), but is a significant constraint. Additionally, the southern edge of the Lake Washington Ship Canal is a known migration path of several Endangered Species Act listed salmon species. Construction in water or near shorelines is severely restricted to protect these species. Tribal treaty fishing also occurs in the vicinity of SR 520, and the tribe has expressed serious concerns about tunneling options in the past. Also, cut or fill in open water or wetlands is regulated by the Corps of Engineers, who will only issue a permit for the least environmentally damaging alternative under consideration. Again, this does not rule out the possibility of a tunnel but does add significant restrictions and costs.

Tunnel slopes, paths and emergence points — In evaluating the feasibility of a tunnel crossing in the SDEIS, WSDOT noted that the slopes required to cross under the Montlake Cut and make a slightly subsurface approach to the Montlake and Pacific intersection are in the range of 7-9% grades, more than the 6% allowed for light rail operation. However, these grades assumed a shallow tunnel and not a bored tunnel. This suggests that an LRT tunnel crossing the Montlake Cut would likely be longer than those analyzed for Option K in the SDEIS and would likely require

the new light rail tunnel to pass under the U-Link tunnel with a very deep station in order to maintain the necessary gradients for operation. This deep tunnel would establish the feasible surface point for the light rail, meaning that the line would likely be in a tunnel for some distance past Husky Stadium before a surface alignment becomes feasible given the required depth of the station and maximum grade allowed for LRT design.

Figure 12: Tunneling under Montlake Cut



This graphic is for illustrative purposes only. No geometric analysis or preliminary engineering has been conducted.

Surface Approach

Surface Approach on Montlake Boulevard — This alignment alternative maintains LRT in the SR 520 alignment until it reaches either 24th Avenue or Montlake Boulevard. The alignment would rise to the level of Montlake, make a sharp right turn, and proceed on Montlake Boulevard, over the Option A+ new bascule bridge to cross the Montlake Cut. The current Montlake Bridge, a historic structure, is not capable of supporting the weight of the rails within the lift mechanism. There are also substantial questions about the structural ability of this older bridge to handle the dynamic loading of a light rail vehicle. The radius of the turn from SR 520 to Montlake Boulevard would be near the minimum 100 foot radius allowable and would require very slow speeds (i.e., 5 to 10 mph) to negotiate the curve. It should be noted that minimum radius curves are a frequent source of rail noise, a sort of high pitched squeal. The same issues regarding reliability discussed in the low level crossing would apply here, but the potential to mitigate those by raising the closed clearance of the new bridge is not possible without impacting the historic bridge.

Figure 13: Second Bascule Bridge across Montlake Cut

This graphic is for illustrative purposes only. No geometric analysis or preliminary engineering has been conducted.

Joint Operations

The current bridge is configured as a six-lane structure with the inside lanes (i.e., lanes 3 and 4) dedicated to transit/HOV operations. Under a scenario where LRT is added to the transit/HOV lanes, the question arises about the possibility of joint operation of buses and LRT in these lanes. There are several considerations that impact the cost and feasibility of joint operations.

1. There are no known high speed (more than 25 mph) joint operations of buses and LRT. While high speed joint operations is theoretically possible from a control and signaling perspective, a system has not been developed, tested, and approved for this type of operation. The possibility exists that such a system could be invented for the SR 520 corridor, but the probability that such a system will be developed in the near future is slim. Comparing the results of 25 mph operation versus 50 mph operation, the time difference from Evergreen Point to Montlake is about 3 minutes, over a distance of about 2.7 miles.
 - a) Low speed (25 mph or less) joint operations of LRT and buses have been successful at several locations in North America, one in Seattle's Downtown Transit Tunnel. While low speed joint operations may be possible on SR 520 from a control standpoint, there are important perception considerations as well; for passengers on the LRT and buses, the extended distance of low speed operation and the visibility of traffic flowing at higher speeds would act as a substantial deterrent to building ridership. Bridge operation with tolls in place will likely render higher speeds in the

general purpose traffic lanes, again making transit seem like a second choice rather than the primary choice.

- b) In evaluating options for the I-90 East Link crossing, Sound Transit studied the feasibility of joint operations extensively. Their studies showed that the regulatory and safety considerations far outweighed the potential benefits on the I-90 corridor, and the possibility was eliminated from further consideration (although in the case of I-90, buses will be operating in an HOV lane rather than in a GP lane as would be the case on SR 520).
 - c) It is unlikely that King County Metro would elect to use the shared BRT/LRT/transit lanes given the possibility that the speed performance in the general purpose lanes may higher than joint operations would allow. This would also avoid the issues of buses getting stuck behind disabled transit vehicles in a lane with no ability to bypass the disabled vehicle.
2. The structure, as reviewed above, would have to be revised to provide a running surface for buses/BRT vehicles over the tracks. The structure of the bridge could be strengthened to accommodate the additional load, but the weight of the running surface and structure could require that floatation capacity be added to the pontoons. While the pontoons are being designed to accommodate the possibility of adding floatation through the use of "flanker" pontoons, there is a substantial cost to add new floatation capacity.
 3. To cross SR 520 with light rail, it would be necessary to include an emergency evacuation pathway for customers (likely between the light rail tracks) should it be necessary to leave the light rail vehicle and exit the bridge structure in an emergency situation. Specific accommodation for this space would need to be resolved before the final cross-section and structural design for a joint operation bridge is pursued.
 4. The Federal Railroad Administration, National Highway Safety Administration, Federal Transit Administration, and Federal Highway Administration would all have a measure of approval authority that impacts joint operations. The weight and braking capabilities, as well as the federal crash resistance construction standards, are substantially different between the two vehicle types. Federal safety authorities would have to approve joint operations, even in the presence of a feasible control system. The outcome of the regulatory authorities could substantially restrict even low speed operations to the point that the transit carrying capacity of the bridge is reduced below the capability of either LRT or BRT/bus operating independently due to spacing requirements to meet safety standards (i.e., that only one bus or light rail vehicle in each direction is allowed on the bridge deck at any given time).
 5. Similar to joint bus and light rail operations at the terminals of the Downtown Seattle Transit Tunnel, merge points would be essential for safe operations. This requires space for buses or light rail vehicles to wait until they can be safely merge into the joint operation. For example, it is not unusual to observe two or more buses waiting for their "turn" to enter the Seattle Transit Tunnel complex. In Portland this merge and diverge area has been, and remains, one of the major design issues in the Willamette Multi-Modal Bridge (which will have light rail, streetcars, and BRT sharing right of way). On SR 520 the west merge area would look like a small interchange and would present challenging design issues to allow all the different movements while ensuring a safe operation. It is important to remember that a significant number of buses would continue to be destined to downtown Seattle from the Eastside and would need to continue west from the point on

SR 520 where the light rail leaves the mainline. The Eastside connection would be similarly complex but would be contained in a landside location where there is a planned joint bus/transit station, allowing the queuing space to be designed into the station, which would require re-design of the plans currently included in the SR 520 Eastside Project.

HOV Lanes on SR 520 West of Montlake Blvd

If light rail occupies the transit/HOV lanes from Evergreen Point to Montlake, a question to be answered is whether building HOV lanes on SR 520 between Montlake Blvd and I-5 is necessary to ensure reliable transit operations to downtown Seattle. It is likely, except under a possible joint operation scheme, that buses and HOVs will operate in the four GP lanes from somewhere in Medina to Montlake Boulevard. The distance from Montlake to I-5 is about 0.6 mile.

The current SDEIS Option A+ assumes that the HOV lanes connect to and from the south in the I-5 express lanes. Buses would operate in the same direction as the express lanes on I-5—that is, westbound SR 520 to southbound I-5 in the morning and northbound I-5 to eastbound SR 520 in the afternoon. When the opposite direction is not available, transit vehicles will operate in the general purpose traffic lanes as they currently operate.

Traffic operations on the Portage Bay Viaduct are characterized by considerable weaving and merging as drivers merge from north and southbound I-5 to get off at Montlake or continue on SR 520 eastbound. Westbound drivers are selecting a lane to go north or south on I-5 while the traffic from Montlake is being added and drivers are moving to a lane based on their desired direction. The trade-off for not building the HOV lanes in this segment of SR 520 is a significantly reduced footprint for the Portage Bay Viaduct. However, the operational effects of eliminating the HOV lanes would require supplemental environmental analysis, resulting in delay.

Transit Direct Access Ramps at Montlake

The other issue raised by the transition is how to treat transit or HOVs in the Montlake vicinity. As stated above, under Scenario 2 it is expected there will be some period of time between opening of SR 520 HOV lanes and moving traffic out of the center lanes for construction and operation of light rail. There are essentially two possibilities between opening of SR 520 and opening of light rail. One is that transit, and possibly HOVs, are offered exclusive on and off ramps to and from the east from Montlake or 24th Avenue much as designed in Option A+ of the SDEIS. When light rail construction begins, these ramps might continue to be usable depending on how light rail crosses the Montlake Cut.

A second option, not proposed in the phasing scenarios, is to pre-build the light rail crossing of the Montlake Cut and use that as the transit and HOV priority access until light rail construction begins. After that time, non-LRT transit and HOVs would have the same priority as general purpose traffic, with no facilities to support preferential access. Even with light rail in place across the floating bridge from the Eastside, buses will continue to play a significant role in providing cross-lake mobility between Eastside areas not served by light rail and the Westside. This approach would likely require supplemental EIS analysis for the new structure, since its design is unknown and it was not evaluated in the SDEIS.

Transit/HOV Lane Usage

The second scenario proposed above includes transit and HOV lanes constructed as part of the project; matching the codified direction of the legislature. This raises the potential for an extended policy discussion about later conversion of this facility to a light rail only facility, thus removing transit and HOV use of the HOV lanes. Taking a page from Sound Transit's history, this was one of the more challenging issues in the public discourse regarding installation of East Link light rail on I-90.

Traffic Operations, Tolling, and Level of Service

Light Rail Transit

Under a scenario where LRT is operating on SR 520, assuming the alignment connects reasonably large activity centers, toll levels on the bridge would have an impact on transit ridership; the higher the toll, the greater the transit ridership. Levels of LRT service would need to be increased accordingly. One of several outcomes of higher tolls on SR 520 would be diversion of auto traffic to non-tolled facilities crossing Lake Washington. The entire tolling plan would have to be reviewed and likely modified (e.g., tolls implemented on I-90) to account for this diversion. The process for accomplishing this modification includes legislative action and new a new toll structure set by the Washington State Transportation Commission...

Transit (BRT/Buses)

The level of service for BRT/bus transit is directly dependent on where it operates in the corridor: in exclusive lanes, in HOV lanes, or in GP lanes. Similar to LRT, higher tolls for single occupant vehicles will tend to increase transit ridership, route diversion, time of day diversion, and trips not taken. Again it must be noted that even in the presence of an LRT line crossing the SR 520 corridor, there will continue to be a need for high quality bus/BRT service due to the dispersed origins and destinations on the Eastside of Lake Washington. East Link will serve a significant proportion of new transit trips to Eastside activity centers. While there is good potential to establish a second light rail corridor that could attract significant ridership across the lake, the singular alignment characteristics, even in conjunction with East Link, will not be capable of meeting all cross-lake access needs. Thus a robust bus network remains an important element in the SR 520 crossing.

In a scenario where buses and BRT are mixed with HOVs, only commitment to an active traffic management plan will assure transit performance. A continuously measured performance objective (e.g., 45 miles per hour, 90% of the time), adjustment to minimum occupancy requirements, and/or varying toll levels based on occupancy would be required to assure BRT/bus transit performance and level of service.

If BRT/bus transit are mixed with GP traffic—as in the first scenario or the second after light rail is added to the corridor—the conditions listed above for management of HOV lanes would need to be significantly expanded and applied to all GP traffic to assure operating speeds for transit could be maintained. Theoretically there is a price at which enough vehicle demand can be dampened to maintain speeds over SR 520 at peak times; whether the toll levels necessary to accomplish this are politically tenable is a different question.

HOVs

The phasing plans noted above could move HOVs out of the HOV lanes and into the GP lanes. Without a complex tolling strategy, HOVs essentially perform with the same travel time characteristics as single occupant vehicles. This type of operation would require a re-evaluation of the SR 520 tolling strategy and almost could lead to tolls on other cross-lake facilities.

General Purpose Traffic

Similar to HOVs, general purpose traffic receives maximum benefit when the two center lanes of the bridge are reserved for all high occupancy vehicles. The higher the volume of HOVs that utilize the center lanes, the more capacity becomes available to low occupancy vehicles in the remaining lanes. If HOVs and/or BRT/bus transit are added to the GP lanes, low occupancy vehicles must compete with transit and HOVs for road space, thus reducing the level of service available and increasing corridor congestion. The level of service for autos may be addressed through a comprehensive, performance-based tolling system. This means that general purpose traffic capacity would be constrained by applying market-based transportation demand management techniques as a way to assure a given level of service for the roadway. This type of tolling operation would require a new SR 520 tolling strategy and could lead to tolls on other cross-lake facilities.

Chapter 5. Conditions for Success

This chapter identifies the potential challenges associated with implementing a high capacity transit network including bus rapid transit (BRT) and/or light rail (LRT) on SR 520. There is a combination of singular challenges and processes to be observed in bringing this potential transit improvement to construction and operation. Each section below represents a separate, although often related, set of processes to be followed or issues to be resolved. This description is not intended to appear to be an insurmountable set of process steps that must be given attention to potentially built light rail in the SR 520 corridor. Rather it is intended to outline what it takes to build light rail, or a significant HCT corridor, in any location with some special attention given to the unique issues presented by the SR 520 project.

Statutory Changes

In 2007 the Washington State Legislature established a process to find an acceptable alternative for safety replacement and improvement of SR 520. The legislature created the mediation process in Revised Code of Washington (RCW) Chapter 47.01.405 (1), then went on in 47.01.405 (5) to define the intended scope of the corridor:

"(5) The process established in subsection (1) of this section shall result in a project design that provides six total lanes, with four general purpose lanes and two lanes that are for high occupancy vehicle travel that could also accommodate high capacity transportation. The bridge shall also be designed to accommodate light rail in the future and to support a bus rapid transit system."

The language in this statute is sufficiently ambiguous to allow a number of potential interpretations.

In 2009 the state legislature took the unusual step of establishing in law the basic design criteria and cross-section of SR 520. Chapter 47.01.408 RCW reads in part:

"...shall be designed to provide six total lanes, with two lanes that are for transit and high-occupancy vehicle travel, and four general purpose lanes."

This appears to rule out the possibility that the two lanes designated for high occupancy vehicles (HOV) could be dedicated solely to transit operations or that the six lanes would only cover part of the corridor from SR 202 to I-5. In order to move forward with LRT on SR 520. Further legal analysis would be required but it appears this law would need to be amended to establish transit-only operations in what are presently designated as transit and HOV lanes.

Planning and Environmental Processes

In many respects, this is the area where the most work is needed to ensure the success of HCT, BST or LRT, on the SR 520 corridor. Key steps include:

- Conduct alternatives analysis/analyses (AA) on potential corridors on the Westside and Eastside to arrive at and describe a "locally preferred alternative" (not to be confused with a "preferred alternative" in an environmental process, although the two are often merged). Given the dispersal of urban centers on the Eastside and the existence of East Link, connecting the highest market potential of these urban centers is an important step for establishing an alignment that attracts sufficient ridership to warrant the investment in an HCT system that could include a second light rail line for the over Lake Washington.
- Conduct an environmental review process that would result in a "preferred alternative."

- Update the Sound Transit Long-Range Plan to recognize the findings of the AA and environmental analysis.
- Update Transportation 2040, if necessary; high capacity transit (HCT) is identified in the SR 520 corridor, however, rail alignments not directly related to the bridge are not included in the current plan.
- Using the preferred alternative, conduct an initial corridor design study (i.e., 30% design) to fully resolve any specific issues related to engineering challenges.
- When the currently funded Sound Transit Link light rail network reaches full build out in about 2020, the current projection is that it will be necessary to operate near capacity on the segment between downtown Seattle and Northgate to serve the high ridership forecast for that segment. Future planning studies must carefully evaluate transfer activity between a potential SR 520 HCT system and the U-Link line to ensure an overcrowding or over-capacity situation is not created at the Husky Stadium station due to increased demand resulting from the connection.
- Determine local support for the preferred alternative. This could be a rewrite and vote on the Sound Transit finance plan or an independent effort to establish a separate funding source, likely also to be a public vote.

These steps must be undertaken in partnership with the Washington State Department of Transportation (WSDOT), regional transit providers (i.e., Sound Transit, King County Metro), the University of Washington, Eastside constituents, and Seattle residents. A full planning process for light rail on the corridor is an expensive undertaking that requires significant time and resources.

Funding

There are no light rail or HCT planning or design funds programmed until 2016, as a Sound Transit ST II project, to begin consideration of LRT/HCT on the SR 520 corridor. A planning study to be undertaken in 2016 is currently funded by the voter-approved Sound Transit 2 Transit Development Program (ST2); however, funds for environmental review, preliminary engineering design, final design, and construction dollars are not available through ST2.

Federal funding of rail starts and new starts is changing rapidly. It is currently forecast that Congress will change the program even further. This could be a key funding source and may, in the next two years, offer greater opportunity for SR 520 light rail development to be recognized for the ability to reach measures of performance related to energy consumption, livability, job creation and access, and greenhouse gas emissions, all of which appear to be priorities of Congress and the current administration.

Although no project budget or funding plan has been established for building light rail in the SR 520 corridor, it will be important to look at the bonding capacity of the region at the time bonding might be necessary to finance construction.

While not a necessity to establish a light rail project on the SR 520 corridor, it is notable that use of the revenues generated from tolls on SR 520 are limited based on Chapter 47.56.820 RCW. Transit construction and operation directly related to the facility may be eligible for toll revenue under this chapter. However, the funds must first be appropriated by the legislature. To date no funds for transit operations on any state toll facility have been appropriated by the legislature. As some parts of the RCW chapters dealing with tolling have been changed in the 2010 session of

the legislature, an important next step is to conduct further research with the Code Reviser's Office to understand any recent modifications.

Engineering

Joint Operations — No evidence has been found to indicate that joint operations with buses and light rail vehicles is possible at speeds higher than 25 mph. Joint operations have been successful in low speed environments like the Downtown Seattle Transit Tunnel or transit malls (e.g., Downtown Portland). In addition to lack of evidence to support joint operations in high speed situations, approval would be needed from the Federal Highway Administration (FHWA) and the Federal Transit Authority (FTA).

Design Assumptions — LRT requires a minimum of 15 feet of clear distance between traffic barriers in each direction, plus a 4-foot center median to support the overhead power lines for LRT, and a 2-foot traffic barrier on the outside to separate general purpose (GP) traffic. The total width would be 38 feet minimum from outside of traffic barrier to outside of traffic barrier, which may be challenging to accommodate within the current design of the bridge.

If a bus were to operate in the same lane as the light rail vehicle, then the bus lane would be only 15 feet wide. This would allow for an 11-foot travel lane and a distance of 2 feet to the traffic barrier on the right side. However, the lane may need to be wider to accommodate bus operating requirements. This means that if a bus or light rail vehicle breaks down in the transit lane, all LRT service is halted and bus service in the lane is trapped until the disabled vehicle is towed out of the way, as there would not be a way to drive around the stalled vehicle due to the traffic barrier on the outside of the LRT corridor. LRT service requires barriers between GP traffic and LRT service; bus traffic would require a center median barrier for opposing travel. Additionally, the floating bridge is similar to a tunnel in that it would require inclusion of an emergency evacuation path for light rail passengers. There must be adequate space in the center to support this activity.

Connecting with U-Link — From an engineering perspective, the most challenging areas of light rail planning for the corridor are where a light rail system would depart from the SR 520 mainline on both sides of the water. This is a pivotal issue that could well establish the feasibility of light rail in the corridor. These features must be agreed upon before WSDOT completes final design for the Westside or Eastside approaches and the bridge. Crossing the Montlake Cut and joining the system to a useable connection point with U-Link is of primary importance. This does not imply that the SR 520 light rail occupies the same track as U-Link, but it must land with adjacency that facilitates system connectivity.

Chapter 6. Recommendations and Next Steps

Decisions on how to use the SR 520 corridor to maximum advantage for the future of the region are being made at a time of changing perspectives on transportation. Mayor McGinn seeks to create an alternative solution for the SR 520 project that supports a more socially just, environmentally sound corridor that reflects the needs of Seattle residents.

Mayor McGinn's goal is to ensure that the SR 520 I-5 to Medina Bridge Replacement and HOV Project is built in such a way as to be fully designed for and convertible to light rail transit (LRT) on the day the project opens to traffic. The mayor expects light rail to become one of the corridor's modes of transportation sooner rather than later, although light rail operations are likely to be phased into the corridor's operations at some time following the project's opening.

Sufficient transit markets exist to warrant a formal alternatives analysis of high-capacity transit (HCT) in the SR 520 corridor. This analysis should fully consider the potential benefits of HCT alignments that tie Eastside travel sheds to Westside travel sheds north of the Lake Washington Ship Canal. For SR 520 the final design and construction of the bridge and approach replacement project should be done with a full understanding of future transit alignments, capacity, and mode split in the SR 520 corridor. The corridor between Foster Island and I-5 is sufficiently sensitive, environmentally and politically, that there will be but one opportunity to "get it right" in terms of construction for the next 75 to 100 years.

Phasing: Next Steps

This report identifies two scenarios to phase safety-sensitive portions of the project while preserving the ability to convert the floating bridge and the east and west approaches to carry light rail in the future. The current budget for constructing the replacement project has a funding shortfall of about \$2.6 billion of the \$4.65 billion needed. Given this shortfall and the urgency of addressing the public safety issues associated with the floating bridge, phasing of project construction is nearly assured.

The SR 520 Medina to I-5 Bridge Replacement and HOV Project should be phased and constructed in such a way as to immediately address the safety issues in the corridor, minimize the cost of adding LRT to the corridor at a future time, and allow the planning work described above to proceed to a conclusion that will inform how best to phase an increase in transit capacity on the SR 520 corridor.

Careful consideration and basic design coordination for LRT on the SR 520 bridge should take place between WSDOT and Sound Transit to ensure adequate footprint, structure, and stability exist to support LRT on a six-lane bridge deck and/or that the modifications and the costs necessary to add light rail to a four-lane bridge should be well understood.

Construction that expands the current number of vehicle lanes, general purpose or HOV, between Foster Island and I-5 must be accomplished only with a full understanding of future transit alignments, capacity, and mode split in the SR 520 corridor. This portion of the corridor is sufficiently sensitive, environmentally and politically, that the probability is there will be but one opportunity to "get it right" in terms of construction for the next 75 to 100 years.

Light Rail Planning: Next Steps

Sound Transit's current project to construct light rail to the Eastside over I-90 should continue unabated. The focus of effort on SR 520 should be assessing the potential to add a second cross-Lake Washington LRT corridor, not to replace the current planning and design work underway.

An Alternatives Analysis for HCT alignments crossing the SR 520 bridge and traveling through the Eastside should begin as soon as travel demand data is available from the 2010 Census (about 2012), using a 2040 planning horizon, at a minimum.

In parallel with the Alternatives Analysis for SR 520, the City of Seattle should pursue an Alternatives Analysis for city-based HCT corridors that include Husky Stadium as a station or a line terminus.

At the completion of the two Alternative Analyses, the Sound Transit Long Range Plan, City of Seattle Transit Plan, and Transportation 2040 should be updated.

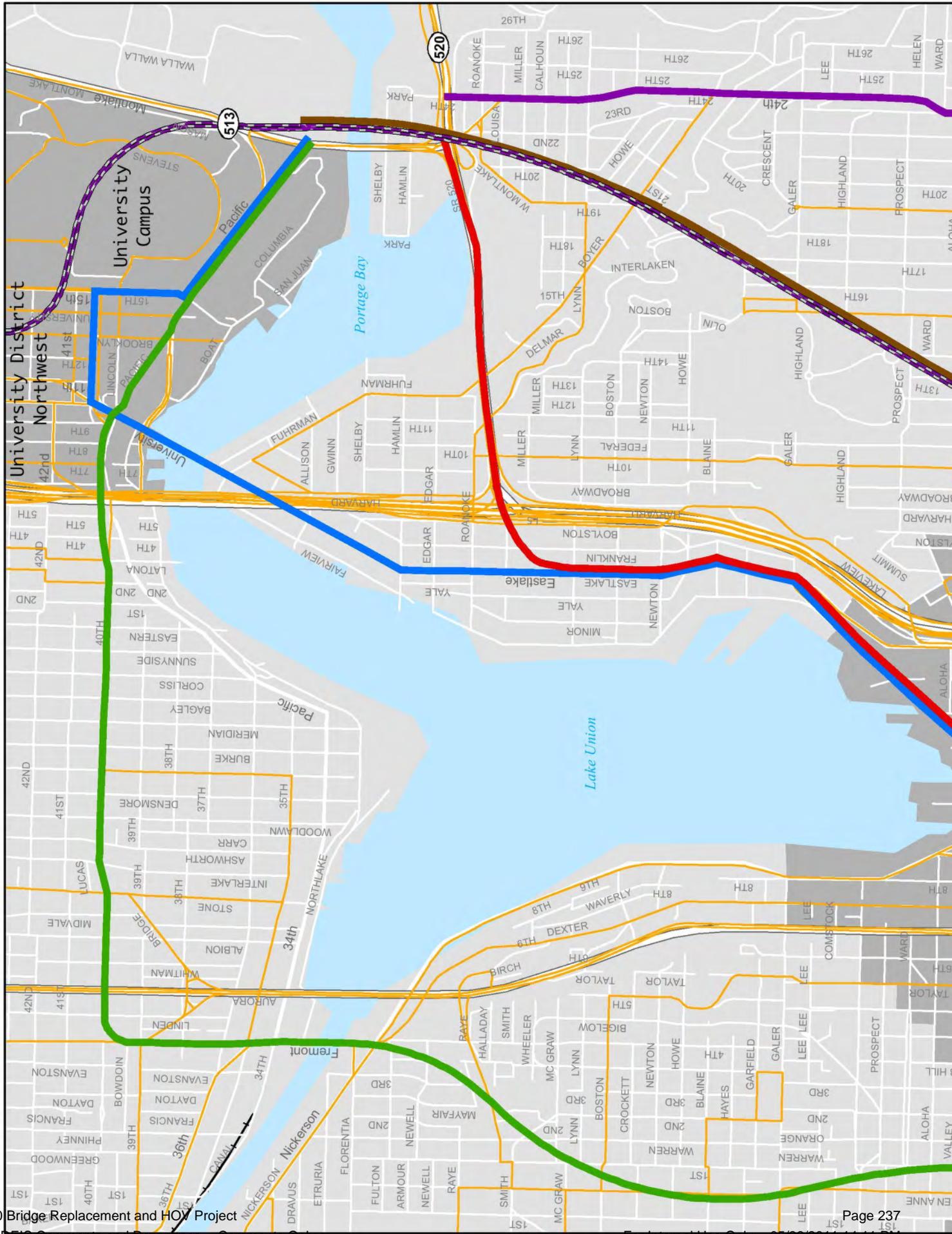
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Appendix A

LRT Segment Evaluation Maps

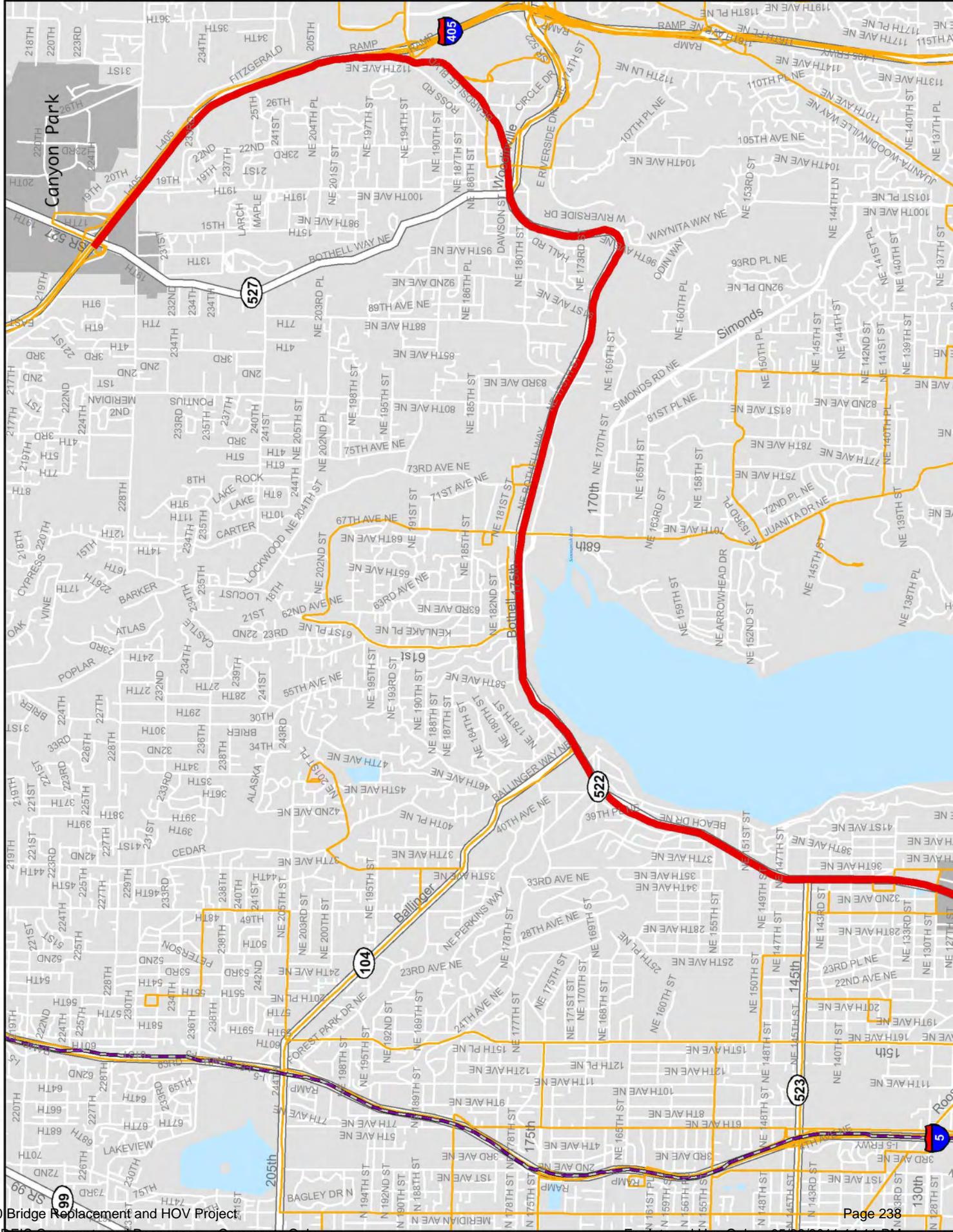


Potential Light Rail Alignments - Seattle (Draft)



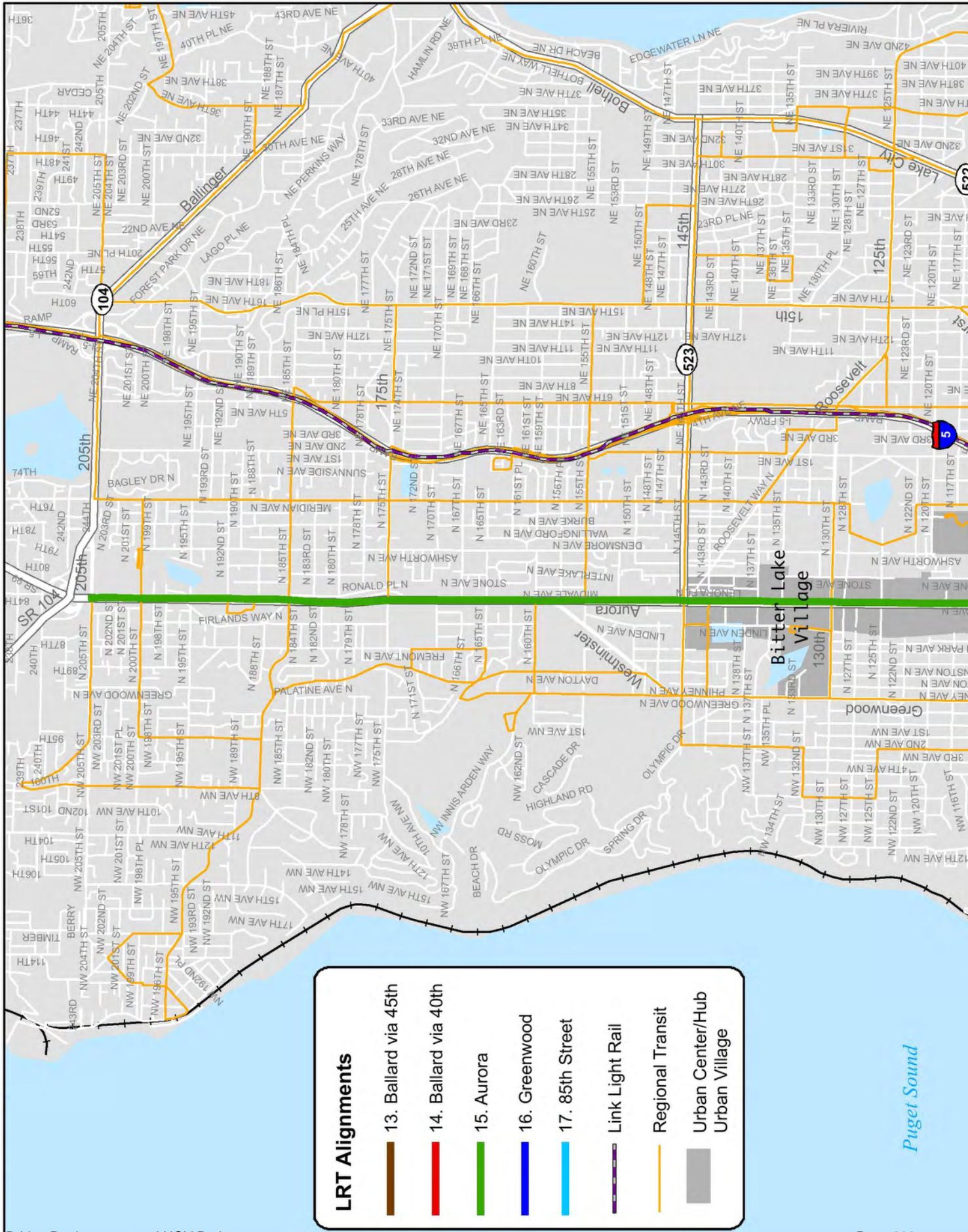
520 Bridge Replacement and HOV Project

Potential Light Rail Alignments - Seattle (Draft)



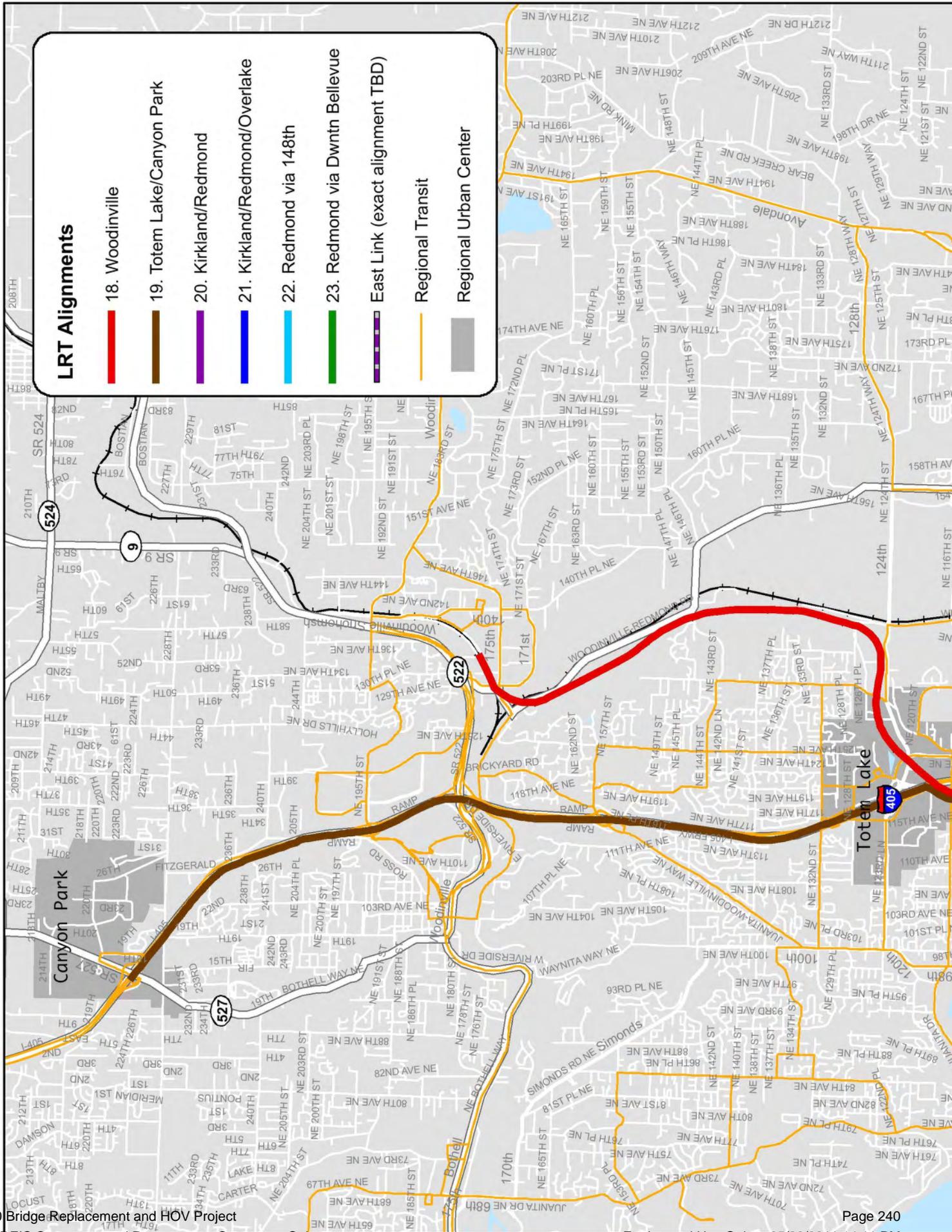
SR 520 Bridge Replacement and HOV Project

Potential Light Rail Alignments - Seattle (Draft)



Puget Sound

Potential Light Rail Alignments - Eastside (Draft)





- LRT Alignments**
- 24. Downtown Bellevue
 - 25. Downtown Bellevue via BNSF
 - 26. Crossroads
 - 27. Issaquah
 - East Link (exact alignment TBD)
 - Regional Transit
 - Regional Urban Center

Appendix B

LRT Preliminary Alignments Evaluation

1. Ballard to Redmond, via Kirkland

The following segments have been identified for the purpose of describing the alignment (they do not imply a construction phasing sequence):

- Segment 1: Ballard to Fremont
- Segment 2: Fremont to University District
- Segment 3: University District to SR 520/BNSF Corridor
- Segment 4: SR 520/BNSF Corridor to Downtown Kirkland
- Segment 5: Downtown Kirkland to Downtown Redmond

Regional Travel Origins and Destinations Served

The alignment would connect key areas in North Seattle with portions of Kirkland and Redmond. Origins and destinations along the alignment in Seattle include Ballard, Fremont, Wallingford, and the University District. On the Eastside, the major destinations served would be downtown Kirkland and downtown Redmond.

Regional System Connectivity

The line could connect with many significant transit services in Seattle, including Link light rail, Ballard-Uptown RapidRide, Aurora Avenue RapidRide, and local bus service along Greenwood/Phinney, Roosevelt/11th Avenue NE, and to the University District. On the Eastside, the line could connect with Bellevue-Redmond RapidRide along 148th Avenue, transit centers in Kirkland and Redmond, the South Kirkland Park and Ride, and transit service along Market Street and 124th and 132nd Avenues in East Kirkland.

Bus Operations Impacts and Opportunities

In Seattle, the alignment would duplicate existing King County Metro (KCM) service between Ballard and the University District, such as routes 44 and 46. On the Eastside, the line would duplicate services currently provided by Sound Transit (ST) route 540, and would likely capture many riders from the planned ST 542 service (Redmond to the University District).

Land Use and Growth Potential

In Seattle, there is significant retail and commercial development along the corridor in Ballard, Wallingford, and the University District. There is high-density housing in Ballard and the University District, with low to mid-density housing in between. The most significant employment density is in the University District. Potential for growth in both population and employment density exists in Ballard and along the Market and 45th Street corridors in Wallingford. On the Eastside, the most significant retail and commercial development is in downtown Kirkland, downtown Redmond, and along the 85th Street corridor. High-density residential development exists in downtown Kirkland and downtown Redmond, and low to mid-density residential development exists along 85th Street and Redmond Way. Employment densities are low to mid-level along portions of the BNSF corridor, 85th Street, and in Redmond's Sammamish Valley area and downtown. There is potential for densification along the BNSF corridor and 85th Street.

Ridership Potential

The potential ridership in this alignment is estimated to be high as compared to other alignments selected for further analysis. In Seattle, the line would potentially capture riders traveling between Ballard, Wallingford, and the University District, as well as those traveling to the Eastside. The service would be crossed by three high capacity transit lines: one light rail and two bus rapid transit. High frequency service would allow convenient transfers between the different services. On the Eastside, ridership would likely be lower because it would serve lower density areas and smaller employment centers. The line would serve commuters traveling from Redmond and Kirkland to the University District and other parts of Seattle as well as mid-day travel between Redmond and Kirkland. Ridership could be increased by connecting and interlining this alignment with East Link at downtown Redmond or by extending the line to the Overlake Transit Center.

Phasing and Expansion Opportunities

The line could be constructed in phases. Initially, a line between the University District and downtown Kirkland could be constructed to connect Seattle to the Eastside. Extensions to Ballard and downtown Redmond could follow to increase coverage and ridership. An extension from downtown Redmond to Overlake would connect the line to East Link. The line at build out could create a fast and direct HCT connection between North Seattle and Redmond or Overlake.

Construction Feasibility and Impacts

Along Segment 1, the line could be at grade, elevated, or underground. Segment 2 through Fremont and Wallingford to the University District would likely need to be underground for two main reasons: 1) There is only one corridor (Market/45th Street) that travels continuously through Wallingford, Fremont, and Ballard, and it has a relatively narrow right-of-way, which would make the insertion of a light rail line difficult; and, 2) A surface or elevated alignment would be affected by steep grades, and a surface operation would likely have worse travel time performance than an exclusive ROW. Once in the University District, Segment 3 would need to cross the Montlake Cut and travel along the SR 520 corridor before heading north. Segment 4 would run along the Burlington Northern Santa Fe (BNSF) right-of-way. The line could run at grade, although there are numerous street crossings along the route that may require grade separation. The alignment would need to deviate from the BNSF corridor to provide closer accessibility to downtown Kirkland, and then it would travel east along Segment 5 via 85th Street and Redmond Way to downtown Redmond. The right-of-way along this segment could be at grade, elevated, or underground, but the feasibility of each has not been evaluated. Steep grade issues might exist between downtown Kirkland and I-405 and also in the stretch between Rose Hill and downtown Redmond.

Environmental Impacts

The environmental and neighborhood impacts of the line would be partially dependent on the utilized rights-of-way. Noise pollution is possible along any surface or elevated alignments. A tunnel along Segment 2 to the University District would keep vehicle noise underground, although construction activity at the portals would impact nearby residents. The segment traveling from the University District onto the SR 520 floating bridge would need to be engineered carefully to avoid impacting sensitive environmental areas and nearby residents. Along Segment 4, the line would impact neighboring residential areas, although utilizing the BNSF corridor might reduce takings of private property. Depending on the alignment, the line could impact traffic and businesses along 85th Street and Redmond Way.

Potential Cost

A Ballard-Kirkland-Redmond line would likely have a high-level of cost when compared to the other selected options. A tunnel between Wallingford and the University District would be expensive, as would be either an underground tunnel or an aerial structure across the Montlake Cut to connect with the SR 520 floating bridge. Construction in the Kirkland and Redmond segments may be less costly. The at-grade segment along the BNSF corridor, if feasible, would be less expensive than an elevated or underground alignment but would require many expensive grade-separated crossings.

Summary: Opportunities and Challenges

The Ballard-Kirkland-Redmond alignment is an excellent candidate for a light rail line. It has the potential for high ridership, as it would serve dense urban neighborhoods in Seattle (including the University District) and downtown Redmond, which have been designated by the Puget Sound Regional Council (PSRC) as regional growth centers. These areas could accommodate additional growth spurred by the light rail line. The line could replace heavily used bus routes and connect with significant current and future transit lines, including Link light rail and RapidRide bus rapid transit (BRT). There are a number of engineering challenges that would need to be overcome, including tunneling between Wallingford and the University District and a connection to the SR 520 Bridge across the Montlake Cut that could drive up construction costs. Final engineering design solutions are needed to determine level of costs on this alignment. In addition, further market demand, alignment, and guideway technology feasibility analyses are required.

2. Ballard to Redmond, via Overlake

The following segments have been identified for the purpose of describing the alignment (they do not imply a construction phasing sequence):

- Segment 1: Ballard to Fremont
- Segment 2: Fremont to University District
- Segment 3: University District to SR 520/Bellevue Way
- Segment 4: SR 520/Bellevue Way to Downtown Bellevue
- Segment 5: Downtown Bellevue to Overlake Transit Center [East Link]
- Segment 6: Overlake Transit Center to Downtown Redmond

Regional Travel Origins and Destinations Served

The alignment would connect dense portions of North Seattle with high density areas on the Eastside. Origins and destinations along the alignment in North Seattle include Ballard, Fremont, Wallingford, and the University District. On the Eastside, the corridor would follow the alignment of East Link from downtown Bellevue to downtown Redmond. The destinations served could include downtown Bellevue, Overlake, and downtown Redmond, which are PSRC regional growth centers.

Regional System Connectivity

The line could connect with many significant transit services in Seattle, including Link light rail, Ballard-Uptown RapidRide, Aurora Avenue RapidRide, and bus services along Greenwood/Phinney, Roosevelt/11th Avenue NE, and in the University District, such as Community Transit express buses. On the Eastside, the line would connect to East Link in downtown Bellevue and proceed along the East Link alignment, connecting to other transit routes at Overlake Transit Center and downtown Redmond.

Bus Operations Impacts and Opportunities

In Seattle, the alignment would duplicate existing King County Metro (KCM) service between Ballard and the University District, such as routes 44 and 46. On the Eastside, the line would duplicate East Link for travel to the University District, as well as the planned ST route 542; additionally, the alignment would likely capture some riders from ST route 545, from Redmond and Overlake to downtown Seattle.

Land Use and Growth Potential

In Seattle, there is significant retail and commercial development along the corridor in Ballard, Wallingford, and the University District. There is high-density housing in Ballard and the University District, with low to mid-density housing in between. The most significant employment density is in the University District. Potential for growth in both employment and residential density exists in Ballard and along the Market and 45th Street corridors. On the Eastside there is low density residential along the SR 520 corridor and Bellevue Way. Downtown Bellevue has very high residential and employment densities and can accommodate more growth, and there is future transit-oriented development (TOD) potential along the Bel-Red Corridor. Overlake has high employment density and increasing residential density, while downtown Redmond is

expected to grow in residential density and is surrounded by large employment centers in the Sammamish Valley and Southeast Redmond (Redmond-Fall City Road).

Ridership Potential

Ridership potential for this alignment is also estimated to be high when compared to other options selected for analysis. In Seattle, the line would capture riders traveling between Ballard, Wallingford, and the University District, as well as those traveling to the Eastside. The alignment would be crossed by three high capacity transit lines: one light rail and two bus rapid transit corridors. High frequency service would allow for convenient transfers between the different lines. For residents of the Eastside, the line would provide a fast connection to the University District. There are many people who travel between these areas who could potentially use the route. One factor that might lead to lower ridership is that the line duplicates or approximates some service that will be provided by the currently funded Link alignments. People traveling between downtown Bellevue and Seattle will already be served by Link, as will those traveling between downtown Bellevue and Overlake.

Phasing and Expansion Opportunities

The line could be constructed in phases. Initially, a line between the University District and downtown Bellevue could be constructed to connect to East Link and provide more choices to riders in the Eastside. This relatively short line can potentially create a more comprehensive Link system and provide a fast connection between the University District and the Eastside. An extension to Ballard could follow to increase system coverage and ridership.

Construction Feasibility and Impacts

Along Segment 1, the line could be at grade, elevated, or underground. Segment 2 through Fremont and Wallingford to the University District would likely need to be underground for two main reasons: 1) There is only one corridor (Market/45th Street) that travels continuously through Wallingford, Fremont, and Ballard, and it has a relatively narrow right-of-way, which would make the insertion of a light rail line difficult; and, 2) A surface or elevated alignment would be affected by steep grades, and a surface operation would have worse travel time performance than an exclusive ROW. From the University District, the line would travel either underground in a tunnel parallel to Link or on an aerial structure to cross the Montlake Cut and connect with the SR 520 bridge, to then proceed at grade along SR 520 to Bellevue Way. From there it could proceed at grade along Bellevue Way (or via the BNSF corridor parallel to I-405) and then connect with East Link in downtown Bellevue and follow the East Link alignment.

Environmental Impacts

The environmental and neighborhood impacts of the line would be partially dependent on the utilized rights-of-way. Noise pollution is possible along any surface or elevated alignments. A tunnel along Segment 2 to the University District would keep vehicle noise underground, although construction activity at the portals would impact nearby residents. The segment traveling from the University District onto the SR 520 bridge would have to be engineered carefully to avoid impacting sensitive environmental areas and nearby residents. The line could create noise along Bellevue Way if running at-grade. Utilizing the East Link alignment would create additional noise along that route due to the increased frequency of service.

Potential Cost

A Ballard-Bellevue-Redmond line would likely have a medium-level of construction cost when compared to other options. A tunnel between Wallingford and the University District would be expensive, as it would be either an underground tunnel or an aerial structure across the Montlake Cut to connect with the SR 520 Bridge. Construction on the SR 520 and Bellevue Way segments presumably would be less costly, as they could be done at grade. Utilizing the existing East Link right-of-way would extend the line while minimizing additional costs and maximizing opportunity for Eastside residents. However, having two lines operate in this corridor would require further market analysis and demand evaluation. The cost of operating two routes between downtown Redmond and downtown Bellevue at high frequency to serve Seattle would result in very high frequency levels along Segments 5 and 6 of the alignment. This cost may not be warranted by future demand in the corridor.

Summary: Opportunities and Challenges

The Ballard-Bellevue-Redmond alignment is a very good candidate for a light rail line. It has the potential for high ridership, as it would serve dense urban neighborhoods in Seattle and four PSRC regional growth centers: the University District, downtown Bellevue, Overlake, and downtown Redmond. These areas could accommodate additional growth spurred by the light rail line. The line could help to create a more integrated regional transit system by connecting to significant current and future transit lines, including Link light rail and RapidRide BRT. There are a number of engineering challenges that would need to be overcome, including tunneling from Fremont to the University District and connecting to the SR 520 corridor across the Montlake Cut that may drive up construction costs. Final engineering design solutions are needed to determine level of costs on this alignment. Also duplication of East Link on the Eastside is an issue that requires further demand and cost-benefit evaluation.

3. Haller Lake to Redmond, via Kirkland

The following segments have been identified for the purpose of describing the alignment (they do not imply a construction phasing sequence):

- Segment 1: Haller Lake to Aurora Avenue/45th Street
- Segment 2: Aurora Avenue/45th Street to University District
- Segment 3: University District to SR 520/BNSF Corridor
- Segment 4: SR 520/BNSF Corridor to Downtown Kirkland
- Segment 5: Downtown Kirkland to Downtown Redmond

Regional Travel Origins and Destinations Served

This alignment would connect key areas in North Seattle with important centers on the Eastside. In Seattle, the neighborhoods served include Haller Lake, North College Park, Greenwood, Phinney Ridge, Fremont, Wallingford, and the University District. On the Eastside, the destinations served would include downtown Kirkland and downtown Redmond, which is a PSRC regional growth center.

Regional System Connectivity

The alignment could connect to a number of existing and planned transit operations in Seattle including Link light rail, Aurora Avenue RapidRide (which would need to be redesigned with light rail on the corridor), bus services along 85th Street, 45th Street, Roosevelt/11th Avenue NE, and to the University District. On the Eastside, the line could connect with Bellevue-Redmond RapidRide along 148th Avenue, transit centers in Kirkland and Redmond, the South Kirkland Park and Ride, and transit service along Market Street and 124th and 132nd Avenues in East Kirkland.

Bus Operations Impacts and Opportunities

In Seattle, the alignment would duplicate portions of the planned Aurora Avenue RapidRide and KCM route 44, and it would likely capture riders on KCM route 48 traveling to the University District. The line would provide a “one-seat ride” (a trip with no transfers) to the University District for residents of the Haller Lake and Bitter Lake neighborhoods, which is not a service provided today. Local bus service on Aurora Avenue would continue to be important for people traveling to and from downtown Seattle. On the Eastside, the line would duplicate services currently provided by ST route 540 and would likely capture many riders from the planned ST route 542 service (downtown Redmond to University District). Duplication of Aurora Avenue RapidRide and joint LRT/BRT operations are major issues for this alignment; the feasibility of joint operations has not been evaluated in the Aurora Avenue corridor.

Land Use and Growth Potential

Segment 1 of the alignment along Aurora Avenue consists of low-density residential, retail, and commercial development, and potentially it could be redeveloped at higher densities. There is low to mid-density residential and commercial development along the 45th Street corridor and high residential and commercial density in the University District. On the Eastside, the most significant retail and commercial development is in downtown Kirkland, downtown Redmond, and along the NE 85th Street corridor. High-density residential exists in downtown Kirkland and downtown Redmond, and low to mid-density residential development exists along 85th Street and Redmond Way. There is low to mid-level employment density along portions of the BNSF Corridor, 85th

Street, and in Redmond's Sammamish Valley area and downtown. Large housing tracts exist along the BNSF corridor in Kirkland that could potentially be redeveloped at higher density. The NE 85th Street corridor also has room for potential TOD.

Ridership Potential

Potential ridership on this alignment is estimated at medium level when compared to other options selected for analysis. The line could serve people in North Seattle headed to the University District, as well as those traveling to/from Kirkland and Redmond. On the Eastside, ridership would likely be lower because the line would serve lower density areas and smaller employment centers. The line could serve commuters traveling from Redmond and Kirkland to the University District and other parts of Seattle as well as midday travel between Redmond and Kirkland. Ridership could be increased by connecting to and interlining with East Link at Overlake or Redmond.

Phasing and Expansion Opportunities

The line could be constructed in phases. Initially, a line between the University District and downtown Kirkland could be constructed to connect Seattle to the Eastside. Extensions to Aurora Avenue and downtown Redmond could follow to increase coverage and ridership. An extension from downtown Redmond to Overlake would connect the line to East Link, which may potentially create a fast and direct connection between North Seattle and Overlake. Connecting with East Link could also strengthen connections and ridership between major Eastside destinations and communities, including Kirkland, Redmond, Overlake, and Bellevue with a continuous HCT service link between them.

Construction Feasibility and Impacts

Segment 1, which would travel south from Haller Lake along Aurora Avenue, could be constructed at grade given Aurora Avenue's wide right-of-way. Segment 2, from Aurora Avenue/45th Street to the University District, would likely need to be underground given the lack of adequate right-of-way along 45th Street. Once in the University District, Segment 3 would need to cross the Montlake Cut on either an underground tunnel or an aerial structure to meet with the SR 520 floating bridge, and then travel at grade before heading north. Segment 4 would run along the Burlington Northern Santa Fe (BNSF) corridor. The line could run at grade, although there are numerous street crossings along the route that may require grade separation and further alignment evaluation. The alignment would need to deviate from the BNSF corridor to provide closer access to downtown Kirkland and then travel east along Segment 5, via 85th Street and Redmond Way to downtown Redmond. This segment could be constructed at grade, elevated, or underground, but the feasibility of each has not been evaluated. Steep grade issues might exist between downtown Kirkland and I-405 and in the stretch between Rose Hill and downtown Redmond.

Environmental Impacts

The environmental and neighborhood impacts of the line would be dependent on the rights-of-way used. Noise pollution is possible along any surface or elevated alignments. A tunnel to the University District would keep vehicle noise underground, although construction activity at the portals would impact nearby residents. The segment traveling from the University District onto the SR-520 bridge would need to be engineered carefully to avoid impacting sensitive environmental areas and nearby residents. Along Segment 4, the line would impact neighboring residential areas, although using the BNSF corridor might reduce takings of private property. Depending on

the right-of way utilized, the line could impact traffic and businesses along NE 85th Street and Redmond Way.

Potential Cost

A Haller Lake-Kirkland-Redmond line would likely have a medium-level of cost when compared to other options. A tunnel for Segments 2 would be expensive, and on Segment 3 either a deep tunnel under the Montlake Cut and/or an aerial structure to connect with the SR 520 Bridge would be expensive and challenging. Construction on the Aurora Avenue, Kirkland, and Redmond segments would theoretically be less costly. The at-grade segment utilizing the BNSF corridor would be less expensive than an elevated or underground alignment, but would still require many grade-separated crossings.

Summary: Opportunities and Challenges

The Haller Lake-Kirkland-Redmond alignment is a good candidate for a light rail line, as it could potentially provide a fast link between North Seattle and key centers on the Eastside. Existing public right-of-way could be used for much of the route, making it less expensive than other options. Although portions of Aurora Avenue are not very densely developed, the line could serve as a catalyst for growth and revitalization along the corridor. The most difficult and potentially expensive segments to construct would likely be Segments 2 and 3 from Aurora Avenue to SR 520. Also, the joint LRT/BRT operations along Aurora Avenue may prove unfeasible which could render this option less attractive than other selected alignments. Further market analysis and engineering design are needed in this alignment to determine operational feasibility and costs.

4. Haller Lake to Redmond, via Overlake

The following segments have been identified for the purpose of describing the alignment (they do not imply a construction phasing sequence):

- Segment 1: Haller Lake to Aurora Avenue/45th Street
- Segment 2: Aurora Avenue/45th Street to University District
- Segment 3: University District to SR 520/Bellevue Way
- Segment 4: SR 520/Bellevue Way to Downtown Bellevue
- Segment 5: Downtown Bellevue to Overlake Transit Center [East Link]
- Segment 6: Overlake Transit Center to Downtown Redmond

Regional Travel Origins and Destinations Served

The alignment would connect key areas in North Seattle with important centers on the Eastside. In Seattle, the neighborhoods served would include Haller Lake, North College Park, Phinney Ridge, Fremont, Wallingford, and the University District. On the Eastside, the major destinations served would include downtown Bellevue, Overlake, and downtown Redmond.

Regional System Connectivity

The alignment could connect to a number of existing and planned transit operations in Seattle including Link light rail, Aurora Avenue RapidRide (which would need to be redesigned with light rail on the corridor), bus services along 85th Street, 45th Street, Roosevelt/11th Avenue NE, and services to the University District (i.e., Community Transit). On the Eastside, the line could connect to East Link in downtown Bellevue and proceed along the East Link alignment, connecting to major transit routes at the Overlake Transit Center and in downtown Redmond.

Bus Operations Impacts and Opportunities

In Seattle, the alignment would duplicate portions of the planned Aurora Avenue RapidRide and KCM route 44 and would likely capture riders on KCM route 48 traveling to the University District. It could provide a one-seat ride to the University District for residents of the Haller Lake and Bitter Lake neighborhoods, which is not a service available today. Local bus service on Aurora Avenue would continue to be important for people traveling to and from downtown Seattle. On the Eastside, the line would duplicate the planned ST route 542 (downtown Redmond to U. District) and would likely capture some riders from ST route 545 (Redmond to downtown Seattle). Duplication of Aurora Avenue RapidRide and joint LRT/BRT operations is a major issue for this alignment; the feasibility of joint operations has not been evaluated on the Aurora Avenue corridor.

Land Use and Growth Potential

Segment 1 of the alignment along Aurora Avenue consists of low-density residential, retail, and commercial development, which potentially could be redeveloped at higher density. There is low to mid-density residential and commercial development along the 45th Street corridor and high residential and commercial density in the University District. On the Eastside there is low-density residential along SR 520 and Bellevue Way. Downtown Bellevue has very high residential and employment densities and can still accommodate more growth, and there is future transit-oriented development potential along the Bel-Red Corridor. Overlake has high employment density and

increasing residential density, while downtown Redmond is currently growing in residential density and is surrounded by large employment centers in the Sammamish Valley and Southeast Redmond (Redmond-Fall City Road).

Ridership Potential

Potential ridership on this alignment is estimated to be medium-level as compared to other alignments selected for analysis. The line could serve people in North Seattle headed to the University District, as well as those traveling to Bellevue and Redmond. For residents of the Eastside, the line could provide a fast connection to the University District. There are many people who travel between these areas who could potentially use the route. One factor that might lead to lower ridership is that the line would duplicate or approximate service that will be provided by the currently funded Link alignments. People traveling between North Seattle and the University District will already be served by Link, as will those traveling between downtown Bellevue and Overlake.

Phasing and Expansion Opportunities

An initial alignment could connect the University of Washington with downtown Bellevue and East Link. This starter line would connect a number of regional growth centers as well as two lines in the Link system. Later phases could extend the line to Aurora Avenue/85th Street, and later to Aurora Avenue/130th Street.

Construction Feasibility and Impacts

Segment 1, which would travel south from Haller Lake along Aurora Avenue, could be constructed at grade given Aurora Avenue's wide right-of-way. Segment 2, from Aurora Avenue/45th Street to the University District, would likely need to be underground given the lack of adequate right-of-way along 45th Street. From the University District, the line would travel either underground in a tunnel parallel to Link or on an aerial structure, across the Montlake Cut and onto the SR 520 bridge, and then proceed along SR 520 until Bellevue Way. From there it could travel at grade along Bellevue Way (or via the BNSF corridor parallel to I-405) and then connect with East Link in downtown Bellevue and follow the East Link alignment.

Environmental Impacts

The environmental and neighborhood impacts of the line would be dependent on the rights-of-way used. Noise pollution is possible along any surface or elevated alignments. A tunnel to the University District would keep vehicle noise underground, although construction activity at the portals would impact nearby residents. The segment traveling from the University District onto SR 520 would need to be engineered carefully to avoid impacting sensitive environmental areas and nearby residents. The line could create significant noise along Bellevue Way if running at-grade. Utilizing the East Link alignment could create additional noise along that route due to the increased frequency of service.

Potential Cost

A Haller Lake-Bellevue-Redmond line would likely have a lower level of cost when compared to other options. A tunnel for Segment 2 would be expensive, as it would be either a deep tunnel or aerial structure across the Montlake Cut to connect with the SR 520 Bridge, in Segment 3. Construction on the Aurora Avenue, SR 520, and Bellevue Way segments would be less costly, as they are assumed to be done at grade. Utilizing the existing East Link right-of-way would

extend the line while minimizing additional costs and maximizing opportunity for Eastside residents. However, having two lines operate in this corridor would require further market analysis and demand evaluation. The cost of operating two routes between downtown Redmond and downtown Bellevue at high frequency to serve Seattle would result in very high frequency levels along Segments 5 and 6 of the alignment. This cost may not be warranted by future demand in the corridor.

Summary: Opportunities and Challenges

The Haller Lake-Bellevue-Redmond alignment is a good candidate for a light rail line. It would serve heavily used transit corridors in Seattle and provide a fast link between North Seattle and key centers on the Eastside. Existing public rights-of-way could be used for much of the route, making it less expensive than other options. The line could also serve as a catalyst for growth and revitalization along Aurora Avenue. The most difficult segments to construct would likely be Segments 2 and 3 from Aurora Avenue to SR 520. Final engineering design solutions are needed to determine construction cost level on this alignment. One downside to the alignment is that it would serve many of the same areas on the Eastside as the currently funded Link alignments, including North Seattle, the University District, downtown Bellevue, the Bel-Red corridor, and Overlake. An alignment that served different areas would be more equitable. Duplication of East Link on the Eastside is an issue that requires further demand and cost-benefit evaluation.

5. Ballard to Totem Lake, via the BNSF Corridor

The following segments have been identified for the purpose of describing the alignment (they do not imply a construction phasing sequence):

- Segment 1: Ballard to Fremont
- Segment 2: Fremont to University District
- Segment 3: University District to SR 520/BNSF Corridor
- Segment 4: SR 520/BNSF Corridor to Downtown Kirkland
- Segment 5: Downtown Kirkland to Totem Lake

Regional Travel Origins and Destinations Served

The alignment would connect key areas in North Seattle with portions of Kirkland, Juanita, and Totem Lake. Origins and destinations along the alignment in North Seattle include Ballard, Fremont, Wallingford, and the University District. On the Eastside, the major destinations served would be downtown Kirkland and Totem Lake, which is a PSRC regional growth center.

Regional System Connectivity

The line could connect with many significant transit services in Seattle, including Link light rail, Ballard-Uptown RapidRide, Aurora Avenue RapidRide, and bus services along Greenwood/Phinney Avenue, Roosevelt/11th Avenue NE, and to the University District. On the Eastside, the line could connect with the South Kirkland Park and Ride, transit service along NE 85th Street and NE 116th and 124th Streets, and potentially the Kingsgate Park and Ride.

Bus Operations Impacts and Opportunities

In Seattle, the alignment would duplicate existing King County Metro service between Ballard and the University District, such as routes 44 and 46. On the Eastside, the line would duplicate services currently provided by KCM route 277, ST route 540, and would likely capture many riders from a number of express routes that operate between Kirkland and downtown Seattle.

Land Use and Growth Potential

In Seattle, there is significant retail and commercial development along the corridor in Ballard, Wallingford, and the University District. There is high-density housing in Ballard and the University District, with low to mid-density housing in between. The most significant employment density is in the University District. Potential for growth in both residential and employment density exists in Ballard and along the Market and 45th Street corridors. On the Eastside, the most significant retail and commercial development is in downtown Kirkland and Totem Lake. There is high-density residential in downtown Kirkland, while there is low to mid-level residential density in Totem Lake. There is low to mid-level employment density along portions of the BNSF corridor, and mid-level retail and employment density in Totem Lake. Considerable potential for growth and redevelopment exists in Totem Lake. The City of Kirkland has been working with the owner of Totem Lake Mall to redevelop the property, although the project has been put on hold. A light rail station would spur growth in the area.

Ridership Potential

Ridership potential for the alignment is estimated to be lower than other options. In Seattle, the line would capture riders traveling between Ballard, Wallingford, and the University District, as well as those traveling to the Eastside. The line would be crossed by three high capacity transit lines: one light rail and two bus rapid transit. High frequency service would allow convenient transfers between these lines. On the Eastside, ridership would likely be lower because the alignment would serve lower-density areas and smaller employment centers. Although many people work in Totem Lake and other areas of Kirkland, it is likely that only a small percentage would use light rail for commuting to work given the auto-oriented environment that currently is predominant in the area.

Phasing and Expansion Opportunities

The line could be constructed in phases. Initially, a line between the University District and downtown Kirkland could be constructed to connect Seattle to the Eastside. Extending the line to Totem Lake could potentially be done at a relatively low cost (if done at grade), and an extension to Ballard could follow to increase coverage and ridership. From Totem Lake the line could be extended to Canyon Park (a regional growth center in the county boundary between King and Snohomish) or alternatively to Woodinville or Redmond via the BNSF corridor. The adequacy of the BNSF corridor to support light rail has not yet been evaluated.

Construction Feasibility and Impacts

Along Segment 1, the line could be at grade, elevated, or underground. Segment 2 through Fremont and Wallingford to the University District would likely need to be underground for two main reasons: 1) There is only one corridor (Market/45th Street) that travels continuously through Wallingford, Fremont, and Ballard, and it has a relatively narrow right-of-way, which would make the insertion of a light rail line difficult; and, 2) A surface or elevated alignment would be affected by steep grades, and a surface operation would have worse travel time performance than an exclusive ROW. Once in the University District, Segment 3 would need to cross the Montlake Cut on either an underground tunnel or an aerial structure to connect with the SR 520 bridge before heading east. Segment 4 would run along the BNSF corridor before deviating to the west to serve downtown Kirkland through a tunnel or other right-of-way. Segment 5 would travel from downtown Kirkland and rejoin the BNSF corridor and proceed to Totem Lake. Many street crossings along the BNSF corridor may require grade separation; further evaluation and feasibility of this alignment as an at-grade option is needed.

Environmental Impacts

The environmental and neighborhood impacts of the line would be partially dependent on the rights-of-way used. Noise pollution is possible along any surface or elevated alignments. Tunnels in Seattle and Kirkland would keep vehicle noise underground, although construction activity at the portals would impact nearby residents. The segment traveling from the University District onto SR 520 would need to be engineered carefully to avoid impacting sensitive environmental areas and nearby residents. Along Segments 4 and 5, the line would impact neighboring residential areas, although utilizing the BNSF corridor might reduce takings of private property.

Potential Cost

A Ballard-Kirkland-Totem Lake line would likely have a medium to high-level of cost when compared to other selected options. A tunnel between Fremont and the University District would

be expensive, as would an underground tunnel or aerial structure across the Montlake Cut to connect with the SR 520 bridge. Construction in the SR 520 corridor to Kirkland and the Kirkland to Totem Lake segments would likely be less costly if at grade operation is feasible (no LRT feasibility determined yet). The assumed at-grade operation on segments utilizing the BNSF corridor would be less expensive than an elevated or underground alignment, but they would require many grade-separated crossings with local streets. An underground tunnel constructed to better serve downtown Kirkland would also be costly.

Summary: Opportunities and Challenges

The Ballard-Totem Lake alignment is a weaker candidate for a light rail line than other options analyzed herein. It would expand light rail to areas that do not have planned service and would improve regional transit connections for dense Seattle neighborhoods, downtown Kirkland, and Totem Lake. By connecting to a regional growth center, the alignment would fit in with PSRC's regional growth strategy. The drawback is that it would likely have lower ridership than other alignment options because it does not connect with the major employment centers on the Eastside: downtown Bellevue and Overlake. Compared to other options this alignment may be less expensive to build and could open access to areas with potential for residential and commercial redevelopment, making it an attractive option. Further engineering design and market demand evaluation is needed to determine feasibility and cost-benefit.



DATE: March 22, 2010; updated April 13, 2010
TO: Stephanie Brown, Seattle Department of Transportation
FROM: David Graves, AICP, Senior Planner
SUBJECT: SR 520 Supplemental Draft Environmental Impact Statement

L-008-001

Attached are comments of Seattle Parks and Recreation on the SR 520, I-5 to Medina Bridge Replacement and HOV Project Supplemental Draft Environmental Impact Statement (SDEIS). The purpose of this memo is to highlight selected policy issues of substantial significance that should be brought forth in the City's response to the SDEIS.

Background

If implemented, proposed upgrades to State Route 520 will have significant impacts to a number of Seattle parks over a span of years, and a base set of impacts for the life of the freeway corridor. There will be impacts to park resources protected under Section 4(f) of the Federal Highway Administration legislation associated with the SR 520 project. City of Seattle park resources under the jurisdiction of the Superintendent of Seattle Parks & Recreation that will be impacted by the SR 520 project include Roanoke Park, Bagley Viewpoint, West Montlake Park, Montlake Playfield and the associated submerged lands, Lake Washington Boulevard, East Montlake and McCurdy Parks and the Washington Park Arboretum. (see attached map) As such, appropriate mitigation of the project impacts is warranted and necessary.

Comments

L-008-002

Seattle Parks & Recreation respectfully submits the following comments in response to the Supplemental Draft Environmental Impact Statement (SDEIS) for the I-5 to Medina: Bridge Replacement and HOV Project issued on January 22, 2010:

- **Bagley Viewpoint** - Bagley Viewpoint is a well visited viewpoint along Delmar Drive East which provides views to the east of Lake Washington, Montlake Cut, the University of Washington and the Cascade mountain range. No other viewpoint in Seattle provides this unique view to the east. The viewpoint was redeveloped following the construction of the access freeway to the Evergreen Point floating bridge in 1963. The freeway cut the viewpoint off from its previous connection to Interlaken Park.

April 13, 2010

- L-008-002
 - Loss of this unique viewpoint must be mitigated. The SDEIS indicates that a lid is proposed in this area that will provide similar view functions and also serve to reconnect the neighborhood through the triangle between 10th Avenue East, East Roanoke Street and East Delmar Drive. WSDOT must ensure that this lid remains part of the project and does not get removed due to funding concerns. Absent the lid, WSDOT must provide a view opportunity similar to the one provided by Bagley Viewpoint and work to reconnect this viewpoint to Interlaken Park as it was originally constructed.
- L-008-003
 - **Montlake Playfield** - While physical impacts to the playfield associated with the SR 520 project will be minimal, the visual impacts and noise associated with the project, both during construction and after it is completed, will be significant. Every effort must be made to limit the potential for noise from the freeway to impact users of the playfields, members of the public who come to the area to take advantage of the newly reconstructed hand-carried boat launch, and the public and fauna that use the newly enhanced wetland areas.
- L-008-004
 - During construction, any temporary work bridges and/or barges must not restrict canoe/kayak access between the Montlake Playfield boat launch and Portage Bay.
- L-008-005
 - Parks is just completing a large wetland restoration project along the perimeter of Montlake Playfield. There are additional wetland enhancement opportunities available. Montlake Playfield should be considered for any required wetland mitigation/enhancement as part of the projects mitigation requirements.
- L-008-006
 - Parks owns submerged lands associated with the playfield. The submerged areas provide habitat opportunities on lands in public ownership protected from development. Impacts and/or intrusion onto these lands, either permanent or temporary during construction, must be appropriately mitigated.
- L-008-007
 - **West Montlake Park** - While there will likely be no physical impacts to this park associated with the SR 520 project, the visual impacts and noise associated with the project, both during construction and after it is completed could be significant. Every effort must be made to limit the potential for noise from the freeway to impact users of the park.
- L-008-008
 - **Lake Washington Boulevard** - Lake Washington Boulevard is referred to as a city street throughout the Supplemental Draft Environmental Impact Statement for the SR 520, I-5 to Medina: Bridge Replacement and HOV Project (SDEIS). The 4f evaluation fails to identify Lake Washington Boulevard as either a historic resource or a park and recreation resource. This officially designated park boulevard is a 204-acre, 9.2-mile-long linear park wholly owned by the City and under the jurisdiction of Seattle Parks and Recreation. It is a crucial element in the 1903 Olmsted Plan for the Seattle's boulevard system, sometimes referred to as the "Emerald Necklace." Decisions about the future design of the SR 520 improvements must be made with the understanding that Lake Washington Boulevard was never designed to function as an extension of direct-access ramps to and from SR 520. Where Lake Washington Boulevard serves as a corridor through the Arboretum, vehicles and bicycles must be able to travel on it in a manner consistent with the design and intent of the surrounding Arboretum.

L-008-008

- There should be no direct access from SR 520 to Lake Washington Boulevard. From the day it opened, SR 520 and the access ramps to and from Lake Washington Boulevard have encouraged and facilitated traffic through the Arboretum which would not otherwise be there. This increased traffic through the heart of the Arboretum limits access to the Japanese Garden from the rest of the Arboretum, reduces the air quality due to vehicle emissions, increases noise from traffic and makes crossing Lake Washington Boulevard unsafe.
- Lake Washington Boulevard has become an extension of the on/off ramps to SR 520. Had existing environmental laws been in place, mitigation of the impacts on the Arboretum of the original 520 project would have been significant or more likely, the project would have been redesigned. If direct access to and from SR 520 to Lake Washington Boulevard remains a part of the future project, exacerbating the current condition, the Arboretum should be duly compensated for the use of the boulevard in the future.
- As mitigation for the increased traffic on Lake Washington Boulevard directly attributable to SR 520, traffic calming measures should be implemented on the boulevard.
- If the SR 520 project includes direct access ramps to and from Lake Washington Boulevard to SR 520, additional tolls should be included on these ramps. Tolls should be included as a way of travel demand management to discourage people from using Lake Washington Boulevard to access SR 520. Also, the revenue from these tolls should be dedicated to the Arboretum to help mitigate the impacts of the increased noise, air emissions and vehicular distraction on the physical nature, educational value and visitor experience of the Washington Park Arboretum.

L-008-009

- **Washington Park Arboretum** - The Washington Park Arboretum, State Arboretum for the State of Washington, is a stunning gem in Seattle's park system. It provides respite, scenery, recreation and solace to thousands of visitors in every season of the year. It provides educational, recreational, conservation and volunteering opportunities to those who seek it out. The City of Seattle and the University of Washington have been cooperatively managing this park since the original 1934 agreement.
 - Since the SR 520 highway was opened, the Arboretum has been fractured by the highway structure itself and the noise, pollution and visual intrusion of the structure on the physical nature, educational value and visitor experience of the Washington Park Arboretum. A percentage of the tolls collected on the main line of SR 520 should be dedicated to improvements in the Arboretum as mitigation for past, current and future impacts of siting a transportation facility in the heart of a natural area and arboretum.
 - The physical nature, educational values and visitor experience within the Washington Park Arboretum should be enhanced by the construction and operation of the SR 520 I-5 to Medina: Bridge Replacement and HOV project if properly designed with sensitivity to the park.

L-008-009

- All efforts must be made to avoid any adverse impacts to the Arboretum, both during construction and through the long term operation of the SR 520 facility.
- To the extent that there will be adverse impacts to the Arboretum, every impact must be thoroughly mitigated.
- Unavoidable adverse impacts must be mitigated. Those of shorter duration must be addressed during the construction phase. Long term impacts of facilitating increased traffic through the Arboretum which has a direct impact on the physical nature, educational value and visitor experience in the Washington Park Arboretum need to be avoided through sound design or mitigated appropriately.
- Design of the new structure should address the potential for increased noise through the Arboretum as a result of the increased traffic. The project must be designed such that noise levels decrease from the levels experienced today.

L-008-010

- The project must be designed such that the visual impact of the structure complements and does not detract from the physical nature, educational value and visitor experience of the Washington Park Arboretum. Designing a “signature” bridge does not reduce the visual impact of a concrete and/or steel structure in the heart of a 230-acre arboretum.

L-008-011

- **Washington Park Arboretum Master Plan** - In May 2001, the Seattle City Council approved the long-range master plan for the Washington Park Arboretum, creating a road map for Arboretum improvements over the next 20 years. The master plan ensures the Washington Park Arboretum will effectively fulfill three primary purposes—conservation, recreation and education—for decades to come. Together, University of Washington Botanic Gardens and Seattle Parks and Recreation, with support from the Arboretum Foundation, are working to implement the master plan. Substantial public and private funds have recently been raised and spent to improve the visitors’ experience. The Pacific Connection Gardens have been newly created, the Japanese Garden Gatehouse has been redeveloped and a number of other park improvements have been made. All these contributions will likely be negatively impacted by the proposed SR 520 project.
 - The Master Plan adopted in 2001 made note of the fact that there would be limited new buildings built within the Washington Park Arboretum. Instead, UW, the Arboretum Foundation and Seattle Parks and Recreation would address their long term need for additional educational, maintenance and classroom space by expanding into the building which currently houses the Museum of History and Industry (MOHAI), once MOHAI vacated the building. The City of Seattle owns the building which MOHAI currently occupies. Since all of the options in the SDEIS involve expansion of the roadway such that the MOHAI will be demolished, WSDOT must provide replacement space as envisioned in the Master Plan.
 - There are four significant projects at the north end of the Arboretum which are identified in the Arboretum Master Plan: Complete the Waterfront Trail as a loop all the way around Duck Bay; Add access, sitting and viewing areas on the west side of Duck Bay; Daylight

L-008-011

Arboretum Creek; and, Create an entry at the west/north end of the Arboretum with the same grand character as the south entry. The redevelopment of SR 520 may negate the potential to undertake some or all of these projects to the detriment of the Arboretum and contrary to the goals set out in the Master Plan. To the extent mitigation measures are necessary as a result of unavoidable significant impacts associated with the SR 520 project; these identified Arboretum Master Plan project should be fully funded by WSDOT for implementation by Parks and/or UW.

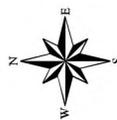
L-008-012

- In addition to the above identified Parks properties, there are other lands linked to these parks adjacent to the SR 520 corridor that will be impacted by the project. While these pieces of linked property are not all city-owned, the linked recreational areas are still important to the city, and each of its parts is important. The SR 520 project will do excessive damage to these properties.

Thank you for the opportunity to review and comment on the Supplemental Draft Environmental Impact Statement for the I-5 to Medina: Bridge Replacement and HOV Project.

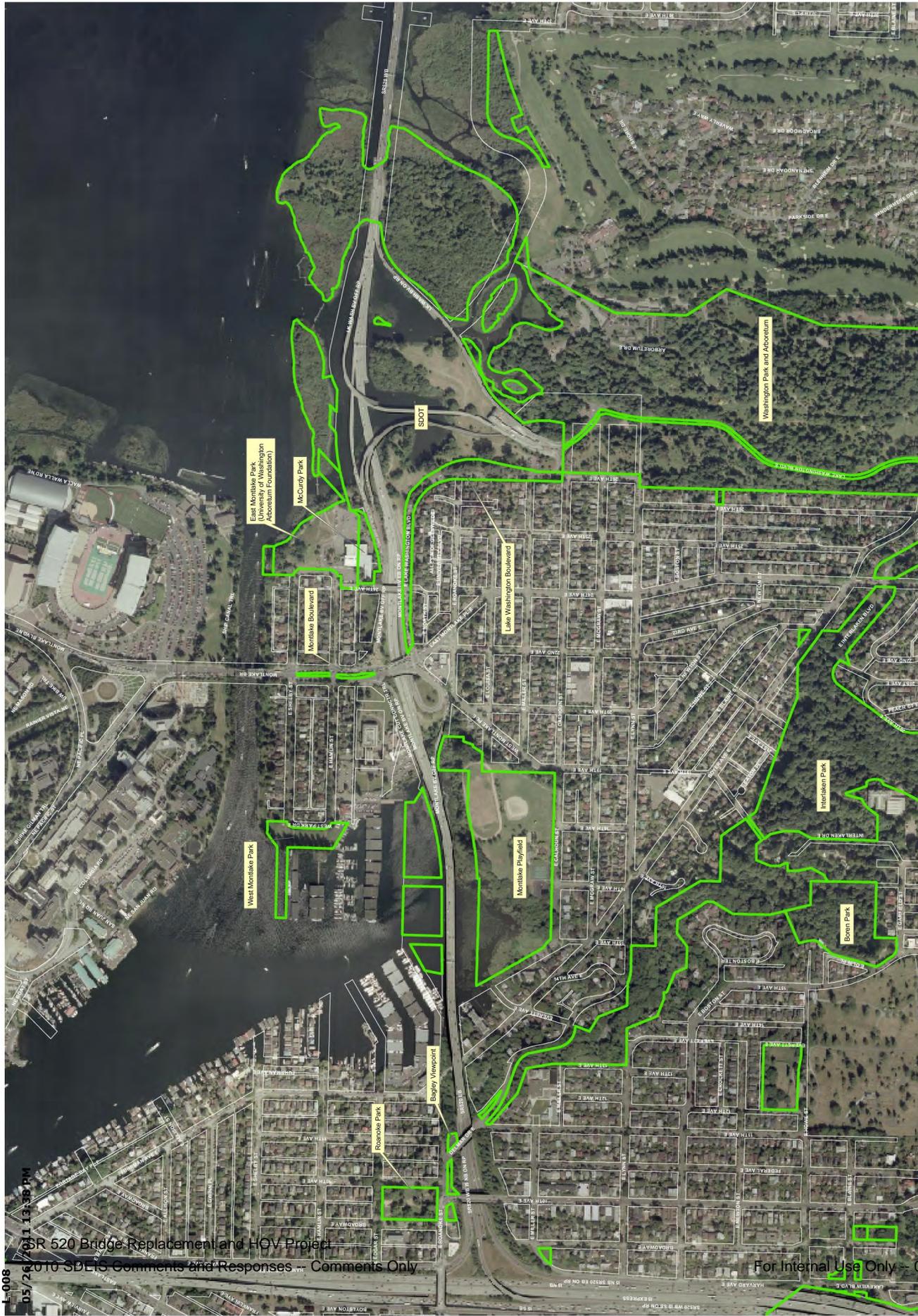
Additional Information

If you any questions regarding the SR520 project, please contact David Graves at 684-7048 or e-mail to david.graves@seattle.gov.



1 inch = 300 feet

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 Orthophoto source: USGS/Trimble, June 2002
 Map date: April 13, 2010



L-008 05/26/2011 13:36 PM



April 7, 2010

Stephanie Brown
Seattle Department of Transportation
Major Projects
POB 34996
Seattle, WA 98124-4996

RE: SR 520, I-5 to Medina: Bridge Replacement and HOV Project Supplemental Draft Environmental Impact Statement

Dear Stephanie,

This letter contains the comments from the Seattle Fire Department on the SR 520, I-5 to Medina Bridge Replacement and HOV Project Supplement Draft Environmental Impact Statement.

The purpose of this letter is to highlight the Department's primary life safety concerns associated with the project design.

1. **Lids and Tunnels:** These facilities will need to meet Fire Code requirements for life safety systems.
2. **Overwater Structures:** The height of the west transition span between Foster Island and the floating bridge must meet clearance requirements for Seattle Fire Department boats. The navigation channel must align with the bridge clearance and the anchoring system for the floating portion of the bridge must not interfere with the navigation channel under the west transition span.
3. **Fire Department Facilities:** Changes to the intersection of 10th Avenue and Roanoke Street will negatively impact fire Station 22 by taking property from the front of the station and removing space for planned expansion to the east of the station.

Thank you for requesting input from the Seattle Fire Department. If you have questions or need further information related to the Department's comments, please contact Gary English at 206-386-1450 or email to gary.english@seattle.gov.

Very truly yours,

A handwritten signature in black ink, appearing to read "John Nelsen".

Assistant Chief John H. Nelsen
Fire Marshal

JHN:GLE:pd

Fire Marshal's Office
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City of Seattle

Department of Planning and Development

Diane M. Sugimura, Director

MEMORANDUM

Date: April 15, 2010
To: Carl Marquardt, Mayor's Office
From: Diane M. Sugimura, Director
Subject: DPD Comments on SR 520 SDEIS

General Comments

These comments apply to the entire document, including Chapter 5 (summary of impacts) and the various discipline reports.

L-010-001 | Please state what permits will be sought from the City, including whether a Shoreline Substantial Development Permit will be sought.

L-010-002 | The City assumes that it will adopt the State's environmental documents, and on the basis of those adopted documents, exercise the City's substantive SEPA authority. SMC 25.05.630 identifies the need for independent review before the City can appropriately adopt the State's environmental documents. "An agency adopting an existing environmental document must independently review the content of the document and determine that it meets the adopting agency's environmental review standards and needs for the proposal."

L-010-003 | State of Washington statutes and WACs and the City's SEPA ordinance all require that the project's impacts and proposed mitigations be clearly identified. For example, RCW 43.21C.060 calls for identification of "specific adverse environmental impacts...identified in the environmental documents" (with respect to conditioning) and "significant adverse impacts identified...in an EIS" (with respect to denial.)

SMC 25.05.440 (E), Affected Environment, provides: "This section of the EIS shall describe the existing environment that will be affected by the proposal, analyze significant impacts of alternatives including the proposed action, and discuss reasonable mitigation measures that would significantly mitigate these impacts." Similarly, with respect to proposed mitigation, SMC 25.05.660 (A)(2) provides that "mitigation measures shall be related to specific, adverse environmental impacts clearly identified in an environmental document..."

WSDOT's Environmental Procedures Manual also calls for this clear identification. For example, "The environmental document must discuss impacts on both the natural...and built...environment. The EIS must also discuss unavoidable adverse impacts." (WSDOT EPM



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L-010-003

M31-11.06, Page 411-11). Similarly, with respect to discipline reports: “A discipline report provides evidence that all potentially significant impacts have been considered, presents information to support any findings regarding the significance of any impacts, and demonstrates clearly that the report complies with the requirements of environmental law.”

Based on DPD’s review of the document, there is ample room to improve the clarity: (1) are all impacts identified and described as such, (2) are these impacts characterized as adverse, and (3) are these impacts characterized as either above or below the level of significance. Finally, if mitigations are being proposed, they should be clearly identified as such.

L-010-004

The following examples are based on the Visual Quality section of Chapter 5, but also apply to other aspects of the environment described in the entire document.

When Visual Quality is discussed (page 5-168), it is stated that “all options would result in **changes** to the visual character and quality in the Montlake area....Option K and L would include additional structures....These structures would **dominate views much more** than the existing ramps and main line.”

It is not clear whether these changes are impacts, and if so, whether they are significant adverse impacts or not. When new structures “dominate views much more” –this suggests an impact, but again, no indication is given by the author as to whether it is significant or not.

Page 5-68 states that the effects of Option A “...**would result in high levels of change** to the visual character of the landscape from the viewpoint of commuters and adjacent residents.” Page 5-69 states that some aspects of Option K , e.g., the retaining walls for the tunnel entrance will “be visible to commuters and park users, **with the highest level of visual effects** on views from the Arboretum Trail at Marsh Island and the UW WAC. From these sensitive locations, the structures **would dominate views much more** than the existing ramps and main line do.”

On Page 5-70 the document provides that “Option K would also result in **very high levels of change** to visual character and quality in the southeast campus of the University of Washington.” Similarly, also on Page 5-70, with respect to Option L: “The walls and elevated interchange would also **dramatically change the character and quality of views** from the Arboretum Trail at Marsh Island and the WAC. From these sensitive locations, the **structures would dominate views much more** than the existing ramps and main line do.”

After these sentences, on Page 5-71, a reference is made to “visual impacts”. “Adding northbound capacity on Montlake Boulevard to Option L would result in **no measurable differences in the visual impacts described above.**”

From this reference, it appears that the above examples, and others, have been descriptions of “impacts.” Please confirm that each example is or is not an “impact, ” whether it is adverse or not, and whether it is significant or not.

Although the visual quality section is cited for this example, the same request is made for each other section of the document and the various sections summarized in Chapter 5. When an effect of the

L-010-004 | environment is described, please state whether or not the effect is or is not an “impact, ” whether it is adverse or not, and whether it is significant or not.

Visual Quality Comments

L-010-005 | As stated in general comments, impacts and their characterization as adverse and/or significant need to be clearly identified, as do proposed mitigations.

The Discipline Report does not appear to follow WSDOT’s Environmental Procedures Manual. (EPM) The EPM requires that “the Visual Impacts Discipline Report...must include a qualitative **and quantitative analysis** of all significant views from and toward the facility throughout the project length.” The report does not currently include a quantitative analysis. In response to a July 2009 City comment on the consistency between the numerical rating and the text, the response was:

“The matrix included with this version of the document has been deleted because of its inherent (internal) inconsistencies. A summary table has replaced the matrix because it offers more information as well as a composite evaluation of the whole landscape unit.”

As a methodological comment, it would be clearest to the reviewers if the quantitative analysis, when it is replaced, is indicated throughout the narrative text, as well as in an appendix. For example, if, in the narrative, the change in visual quality for a particular landscape unit or SEPA-protected viewpoint is discussed, the numerical tabulation should be included at that point so that the qualitative and quantitative descriptions of change can be compared and correlated.

The numerical analysis is particularly important in identifying whether an impact is adverse or not and significant or not. It would be helpful to identify what level of numerical change in visual quality equates to a impact, equates to an “adverse” impact and equates to a “significant” impact. Although the EPM identifies a change of 1.0 or greater as equating to a “significant” impact, the City’s SEPA substantive authority encompasses conditioning impacts that are less than significant. (See RCW 43.21C.060 cited in general comments.) Therefore, a numerical rating that corresponds to impacts, even if they are not significant, is necessary, and would be helpful in understanding how the scale of impacts was assessed in the Report.

L-010-006 | At 25.05.675 (P) and Attachment 1 to Chapter 25.05, the City’s SEPA ordinance lists specific views of the mountains, water, skyline, etc. and the viewpoints from which these views are protected. Impacts on these specific views should be clearly identified as described above. Although these views are indicated on page 28 of the Visual Quality Discipline Report and are included in the landscape units chosen, the Report should show a table of the affected SEPA-protected views with a clear statement of any impacts on those specific views. This is in addition to the overall assessment of impacts to the landscape units.

L-010-007 | Much of the project will take place in the City’s designated shoreline environments. The City identifies protected view corridors in most of its shoreline environments (SMC 23.60 et seq). Only the Conservancy Navigation and Conservancy Protection environments do not include view corridor protections. These views are also clearly protected in the City’s Comprehensive Plan

L-010-007 | (Shoreline area objectives). Please identify any impacts, including whether these are adverse and/or significant, to view corridors in the City's shoreline environments.

Land Use Comments

L-010-008 | (Chapter 5, page 5-38) When parking and moorage are replaced for the Seattle Yacht Club and the Queen City Yacht Club, respectively, this may require shoreline variances as the clubs are nonconforming uses and the parking and moorage could expand those nonconforming uses. Private clubs are considered institutions, and institutions are prohibited in the CM and CN shoreline environments. Expansion of a non-conforming use is a land use impact and should be specifically identified.

L-010-009 | On page 5-45 is Exhibit 5.3-1. In this exhibit is one aerial photo look east/northeast, and 3 diagrams. For the three diagrams, please clarify if all of them are oriented with north at the top. This appears to be the case, but it could be clarified with north arrows.

Shoreline Comments

L-010-010 | pp.4-14-15 and pp. 5-42, 3: Discussion should include the fact that City of Seattle's Environmental Critical Areas ordinance (SMC 25.09) also applies to this project area, in addition to shoreline regulations (SMC 23.60).

L-010-011 | p. 5-131: This discussion of impacts of overwater structures on fish should include specific discussion about the increased risk of predation on juvenile salmon associated with overwater structures, including providing habitat for known predators for salmon in Lake Washington. This document does vaguely mention this impact on p. 5-131 (third paragraph from the bottom) and speaks about how fish may avoid shaded areas and that their migration could be delayed, but this discussion should be more explicit about the increased risk of predation associated not only with in-water structures (as mentioned on p. 5-132) but also overwater structures and shaded areas.

p. 5-135: The discussion of the fish tracking study results should mention that this study was focused on migration impacts (e.g., delay, behavior) and not predation and predation risks and that other relevant research is available regarding salmon migration in this area, including predation impacts, with a prime example being the Synthesis of Salmon Research and Monitoring: Investigations Conducted in the Western Lake Washington Basin (SPU, ACOE 2008).

L-010-012 | pp-5-140-1: This section should also specifically address the potential ecological impacts and mitigation measures associated with the increase in impervious surfaces associated with each of the alternatives, particularly in areas within 200 feet of ordinary high water (subject to City's shoreline code and the general development standards in SMC 23.60.152) and within 100 feet of ordinary high water (per SMC 25.09.200). This discussion should include calculations for existing and proposed impervious surface in the project area within 100 feet of ordinary high water. Under the City's ECA code (SMC 25.09.200 B 4), any increase in impervious surface and/or vegetation removal within 100 feet of ordinary high water (the ECA shoreline habitat buffer) potentially triggers mitigation for impacts to shoreline ecological functions, which is separate from wetland impacts and stormwater management.

L-010-013

p. 5-143:

The discussion about what has been done to avoid or minimize impacts on this page should include more specific discussion about the proposed height of the bridge in the western approach over open water and over wetlands and what has been done in order to elevate the bridge alternatives as much as feasible to avoid or minimize shading impacts, per previous discussion in the document about the acknowledged ecological impacts associated with bridge height (e.g., p. 5-132) and shading.

L-010-014

pp. 7-35-36:

The conclusion stated that “On the basis of a recent fish tracking study..., these effects are expected to be minor” should include a number of caveats about the limitations of that study (cited previously in the document; and mentioned in comments above regarding p. 5-135) and the fact that there is considerable research about the negative effects of overwater and in-water structures and shading in the near shore environment on juvenile salmon, including increased risk of predation. This one tracking study is not sufficient to make this statement regarding the cumulative effects of this entire project, including construction, on fish resources. Again, there is a whole body of research that is relevant here, including the Synthesis of Salmon Research and Monitoring: Investigations Conducted in the Western Lake Washington Basin (SPU, ACOE 2008), as well as salmon recovery plans for WRIA 8 and associated research.

pp. 7-36: The argument presented here about the relatively small fraction of fish habitat area impacted by this project compared to the total habitat available for the potentially affected species is weak and does not cite any relevant research or scientific support for this analysis. Each life history stage is critical for salmonid survival and this project area does contain critical habitat for specific life stages such as juvenile rearing and out-migration functions as well as adult life stages. So destruction, removal or damage to this habitat and associated ecological functions could indeed have significant impacts on salmon using this area, particularly those stocks with relatively low numbers such as Cedar River Chinook, regardless of the relative size of this area compared to the area utilized over the entire salmonid life cycle.



City of Seattle
Department of Transportation

Thank you for the opportunity to comment on the SR 520 Bridge Replacement and HOV Project Supplemental Draft Environmental Impact Statement (SDEIS). SDOT's interests and concerns on this project fall into the areas of permitting, managing traffic, multi-modal access, and traffic modeling.

Permitting

SDOT's primary role on this project relates to the issuance of street use permits. All closures within City of Seattle street right-of-way will require a street use permit. Please consult with SDOT early to reduce conflicts between proposed closures related to this project and other projects in the area (e.g., 45th Street Viaduct replacement, U-Link station construction). When developing your permit applications, please consider the following:

- City of Seattle streets and state routes that act as city streets (like Montlake Boulevard) must be designed to the standards set forth in the City of Seattle Right-of-Way Improvements Manual.
- Designated haul routes for the project must be approved as part of the street use permitting process.

Managing Traffic

The use of active traffic management (ATM) and transportation demand management (TDM) can help manage congestion in the project area. Specific comments are listed below:

- Develop a comprehensive intelligent transportation system (ITS) program for Montlake Boulevard and 23rd Avenue. Key features of this program should be dynamic message signs, signal system upgrades, emergency vehicle preemptions, and live travel time information.
- Implement a traffic management plan (TMP) for Lake Washington Boulevard that includes traffic calming measures, improved pedestrian crossings, etc.
- Utilize TDM tools to reduce vehicle miles traveled (VMT) in an effort to meet the state mandated reduction targets.
- Dedicate a portion of the tolling revenue to transit to ensure high-quality transit service across the corridor.

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L-011-003

Multi-Modal Access

The project should improve the bicycle and pedestrian environments near the corridor and consider priority treatments for transit in the project area to ensure a socially equitable outcome. Specifically, the project should:

- Ensure connectivity between the new regional bicycle path on SR 520, the Burke Gilman Trail, and the nearby designated City of Seattle bicycle routes. All newly designed bicycle routes should be designed to City of Seattle standards.
- Improve pedestrian safety in the interchange area around SR 520 and Montlake Boulevard by reducing crossing distances and providing state-of-the-practice pedestrian treatments.
- Add transit priority treatments, such as queue jumps and bus-only lanes, to help both local and regional transit in the project area.

L-011-004

Traffic Modeling for City Streets

The current level of traffic modeling for City of Seattle streets, as presented in the SDEIS, should be updated prior to final design. SDOT requests a fully calibrated VISSIM-like model for Montlake Boulevard, Pacific Street, 23rd Avenue, and Lake Washington Boulevard. Given the complexity of the city street network and the tendency for queue back-ups through several intersections, the existing SYNCHRO analysis is insufficient.

City of Seattle
Office of Arts & Cultural Affairs

Michael Killoren, Director
Michael McGinn, Mayor



InterOffice Memo

To: Mayor Michael McGinn
From: Michael Killoren
Date: April 14, 2010
Subject: Comments for the SR 520 SDEIS

The Office of Arts & Cultural Affairs and the Seattle Arts Commission expresses its strong recommendation to prioritize the urban framework and urban space in the design and planning of the elements of the State Route 520 expansion. We urge all parties to consider the impacts these projects will have on the urban fabric, and encourage its project designers to provide thoughtful, appropriately scaled placemaking strategies and innovative design. We hope that the projects will include the thinking of artists in the state-funded components.

The SR 520 expansion that occurs within the city of Seattle should express the highest level of design excellence and green development befitting the city's status as an international city. We recommend that the same requirements expected of projects funded by the city of Seattle be applied to the SR 520 expansion. These include strict adherence to the recommendations of the Seattle Design Commission as well as accommodation of percent-for-art requirements. Artist involvement on the design teams for these projects is essential and should be mandated outside of the percent-for-art legislation at the state level.

We encourage your commitment to design that incorporates principles of human-scale placemaking, environmental stewardship, coherent approach to future expansion, clear expression of function, sophisticated design and incorporation of artistic thinking.

Please consider us, and the Seattle Design Commission, as your resource for guidance of these design processes. We have experience managing large scale, high profile transportation projects, and would welcome the opportunity incorporate art and the ideas of artists into the design and construction of the SR 520 expansion.

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