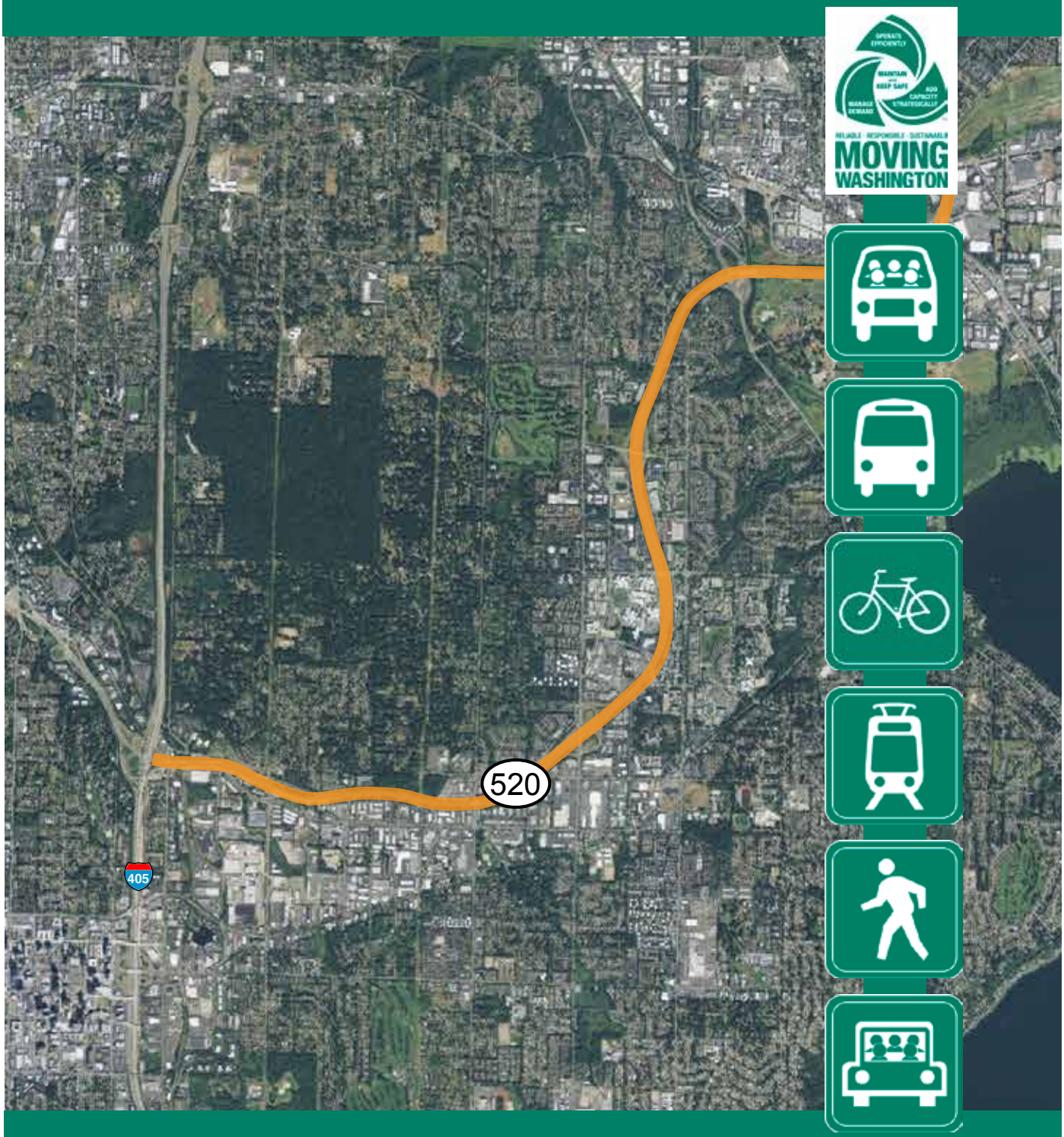
SR 520 Multi-modal Corridor Planning Study



MOVING WASHINGTON

Washington State Department of Transportation

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12-08-1440

Washington State Department of Transportation

Northwest Region

SR 520 Multi-modal Corridor Planning Study

Approved by:

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WSDOT Northwest Region Administrator

4/24/2013
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The Washington State Department of Transportation would like to acknowledge and thank the following parties for their involvement in the SR 520 Multi-modal Corridor Study and for their assistance and input into development of the draft and final reports.

SR 520 Mulit-modal Corridor Study Stakeholders

- City of Bellevue
- City of Kirkland
- City of Redmond
- City of Sammamish
- Group Health Cooperative
- Kemper Development
- King County Metro Transit
- King County Roads
- Microsoft
- Puget Sound Regional Council
- Sound Transit
- Wright Runstad & Company
- WSDOT

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SR 520 Multi-modal Corridor Planning Study

Milepost 7.0 to Milepost 13.0

April 2013

Lorena Eng

WSDOT Northwest Regional Administrator

Prepared by

Washington State Department of Transportation

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Table of Contents

List of Exhibits

Acronyms

AADT Annual Average Daily Traffic

AASHTO American Association of State Highway and Transportation Officials

AAWDT Annual Average Weekday Traffic

ADT Average Daily Traffic

ARM Accumulated Route Mileage

ATM Active Traffic Management

ATR Annual Traffic Report

ATR Automatic Traffic Recorder

AVMT Annual Vehicle Miles Traveled

AWDT Average Weekday Traffic

AWSC All-Way Stop Controlled Intersection

B/C Benefit Cost

B/C A Benefit/Cost Analysis

CARA Critical Aquifer Recharge Area

CMAQ Congestion Mitigation/Air Quality

CPS Corridor Planning Study

CTR Commute Trip Reduction

CWG Corridor Working Group

DAHP Department of Archaeology and Historic Preservation

DEIS Draft Environmental Impact Statement

EB Eastbound

EIS Environmental Impact Statement

EPA Environmental Protection Agency

EPL Express toll lanes: pay lanes, not all carpools are free.

ESA Endangered Species Act

FEIS Final Environmental Impact Statement

FEMA Federal Emergency Management Agency

FGTS Freight and Goods Transportation System (Washington State)

FHWA Federal Highway Administration

FTA Federal Transit Administration

GHGs Greenhouse Gases

GIS Geographic Information Systems

GMA Growth Management Area

HCM Highway Capacity Manual

HCS Highway Capacity Software

HNS Highway of National Significance

HOT HOV converted to toll; all carpools free.

HOV High Occupancy Vehicle

HSP Highway System Plan (Washington State)

HSS Highway of Statewide Significance

I Interstate (route)

I/C Interchange

I/S Intersection

ITS Intelligent Transportation Systems

LOS Level-of-Service

LRT Light Rail Transit

LU Land Use

MP Master Plan

MP Milepost

MPH Miles per Hour

MPO Metropolitan Planning Organization

MSA Metropolitan Statistical Area

N/A Not Applicable

NB Northbound

Acronyms - continued

NEPA	National Environmental Policy Act
NHS	National Highway System
NRHP	National Register of Historic Places
NWI	National Wetland Inventory
O & D	Origin & Destination (survey or zone)
OC	Overcrossing
OFM	Office of Financial Management (Washington State)
OWSC	One-Way Stop Controlled Intersection
P & R	Park and Ride
PSRC	Puget Sound Regional Council
PTBA	Public Transportation Benefit Area
RAB	Roundabout
RCW	Revised Code of Washington
RDP	Route Development Plan
ROD	Record of Decision
RTPO	Regional Transportation Planning Organization
ROW	Right-of-Way
SEIS	Supplemental Environmental Impact Statement
SEPA	State Environmental Policy Act
SOV	Single Occupancy Vehicle
SR	State Route
SRMP	State Route Milepost
STIP	Statewide Transportation Improvement Program
STP	Surface Transportation Program
S/V	Seconds per Vehicle
TAZ	Transportation Analysis Zone
TDM	Transportation Demand Management
TIB	Transportation Improvement Board
TIP	Transportation Improvement Program
TWSC	Two-Way Stop Controlled Intersection
UC	Undercrossing
US	United States (route)
V/C	Volume to Capacity Ratio
VMT	Vehicle Miles Traveled
VPH	Vehicles per Hour
WAC	Washington Administrative Code
WB	Westbound
WDFW	Washington (State) Department of Fish and Wildlife
WSDOT	Washington State Department of Transportation
WTP	Washington (State) Transportation Plan

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Executive Summary

What is the SR 520 Multi-modal Corridor Study – I-405 to Avondale Road?

Due to limited state funding, the recommendations in this study will need to compete for funding with other proposed improvements around the state based on performance outcome.

The SR 520 Multi-modal Corridor Study is a planning level analysis that assessed:

- current and future travel conditions along the study corridor – how efficiently is the transportation network moving people and freight
- current and future travel needs along the study corridor – what modes of transportation do people use to travel now and what will travel needs be in the future
- existing and planned future growth along the study corridor and surrounding area - how has and will the area grow in population and employment and what impacts will this growth have on the study corridor.

To develop multi-modal recommendations that address current and future travel conditions and needs, the study process included:

- developing a corridor vision defining how the corridor should develop and operate until 2030
- gathering input from local officials, businesses, and the public regarding travel conditions along the corridor and what impacts these travel conditions do and could have on communities, businesses, and the environment
- reviewing existing regional and local comprehensive plans for planned population and employment growth and funded transportation improvements
- collecting and analyzing data such as traffic volumes, pedestrian and bicycle counts on non-motorized facilities; safety conditions along the corridor; and population and employment growth forecasts
- projecting future travel demand, and
- developing multi-modal recommendations.

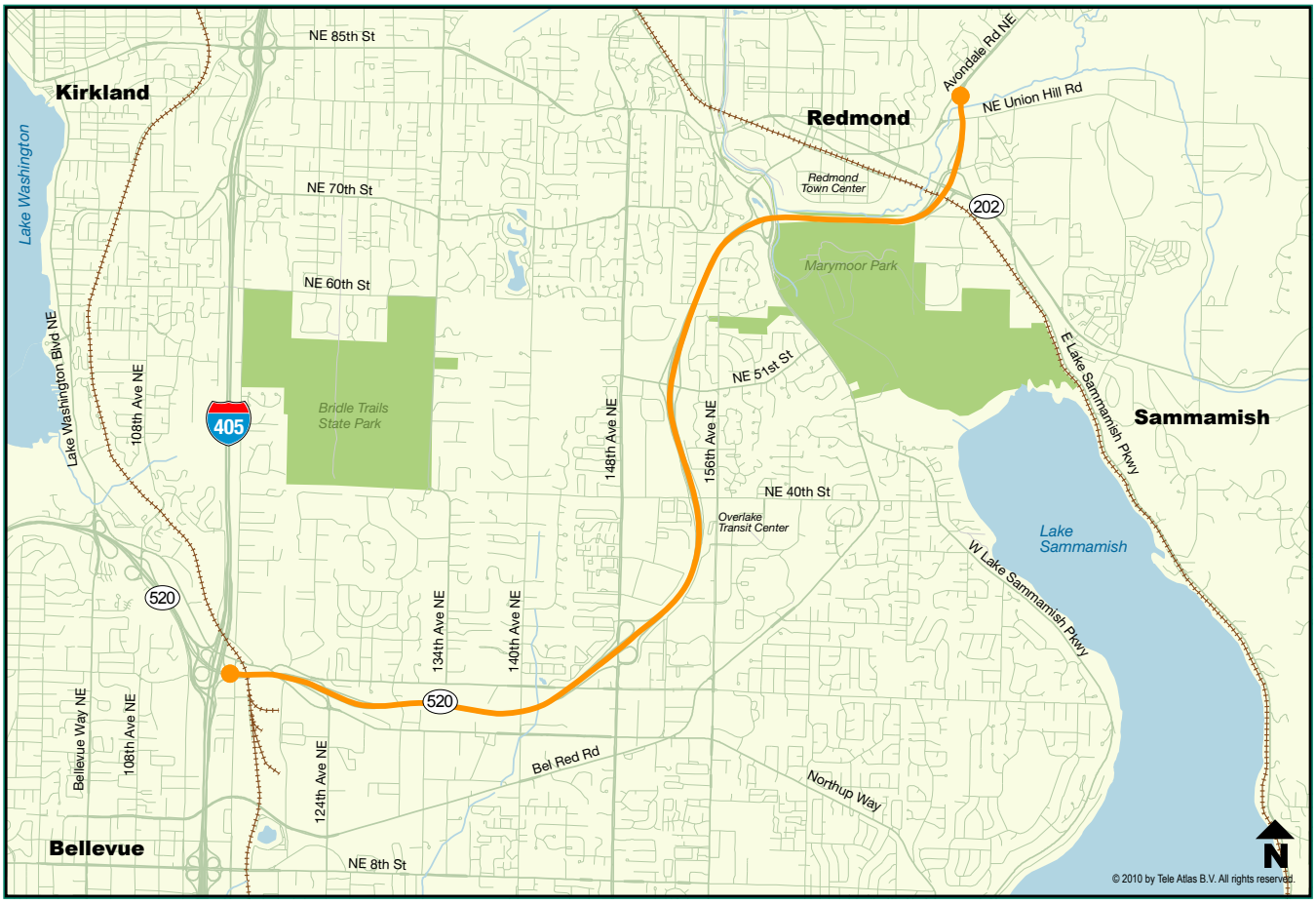
It should be noted that an analysis of traffic operations at the I-405/SR 520 interchange was not conducted for this study. Improvements to this interchange are already identified in the I-405 Master Plan, but are currently unfunded. Construction phases will be determined through the I-405 program and coordinated with the recommendations of the SR 520/124th Avenue NE interchange justification report.

For more information on the study, please visit the following website: www.wsdot.wa.gov/planning/Studies/SR520EastCorridor/

Where is State Route 520 located?

State Route (SR) 520 is located in King County, Washington. It begins in Seattle at I-5 and ends approximately 13 miles east at the SR 202/Avondale Road/Union Hill Road junction in the city of Redmond. The limits for the SR 520 Multi-modal Corridor Study begin at milepost 7.0 (just east of the I-405/SR 520 interchange) in the city of Bellevue and end at milepost 13.0 in Redmond.

Exhibit ES.1: SR 520 Study Corridor



Why did the Washington State Department of Transportation study State Route 520 from I-405 to Avondale Road?

The study area has experienced continuous and significant growth in housing and employment. In the interest of developing a proactive, multi-modal, integrated transportation corridor plan to address transportation demands along the corridor, the 2011 Washington State Legislature passed Engrossed Substitute House Bill 1175 that states: "$500,000 of the multimodal transportation account—state appropriation is provided solely for a multimodal corridor plan on state route number 520 between Interstate 405 and Avondale Road in Redmond."

See Chapter 3: *Population, Employment, and Land Use* for further discussion of population and employment growth and transit investments along the study corridor.

Who was involved in the corridor study?

A stakeholders group comprised of local and regional agencies and businesses assisted WSDOT with this corridor planning study, and gave broad support to the study's recommendations. The Stakeholders included:

- City of Bellevue
- City of Kirkland
- City of Redmond
- City of Sammamish
- Group Health Cooperative
- Kemper Development
- King County Metro Transit
- King County Roads
- Microsoft
- Puget Sound Regional Council
- Sound Transit
- Wright Runstad & Company
- WSDOT

See Chapter 1: *Introduction and Background* for more discussion on the stakeholders group.

Minutes and materials of Stakeholders meetings can be found at the following website:
www.wsdot.wa.gov/planning/Studies/SR520EastCorridor/SR520MultiModalCorridorPlanningStudyStakeholdersGroup.htm

Moving Washington

Moving Washington is WSDOT's framework for making decisions about transportation investments that focus on keeping people and goods moving and supporting a healthy economy, environment, and communities.

Moving Washington is anchored by the department's highest priority: maintaining and preserving the safe and long-lasting performance of existing infrastructure, facilities and services. This is the heart of Moving Washington and the primary target of the department's investments.

Moving Washington combines three essential transportation strategies to achieve and align the objectives of WSDOT and its partners: manage demand, operate efficiently, and add capacity strategically.

It is through the application of these strategies that the Department is able to ensure that investments are integrated and solutions are cost-effective.

- Manage Demand – Whether shifting travel times, using public transportation or reducing the need to travel, managing demand on overburdened routes allows our entire system to function better. Strategies include improving the viability of alternate modes; providing traveler information to allow users to move efficiently through the system; and using variable-rate tolling in ways that reduce traffic during the most congested times and balance capacity between express and general purpose lanes.
- Operate Efficiently – This strategy gets the most out of existing highways by using traffic-management tools to optimize the flow of traffic and maximize available capacity. Strategies include using traffic technologies such as ramp meters and other control strategies to improve traffic flow and reduce collisions, deploying incident response teams to quickly clear collisions, optimizing traffic signal timing to reduce delay, and implementing low-cost/high-value enhancements to address immediate needs.
- Add Capacity Strategically – Targeting our worst traffic hotspots or filling critical system gaps to best serve an entire corridor, community or region means fixing bottlenecks that constrain the flow. Upgrading a failing on-ramp merge or hard-shoulder running during peak periods can free up the flow of traffic through a busy corridor. From improving rail crossings and ferry service to working with transit agencies to connect communities, from building direct access ramps for carpools and transit to including paths for pedestrians and bicycles, capacity improvements require strong partnerships with a shared vision for the corridor.

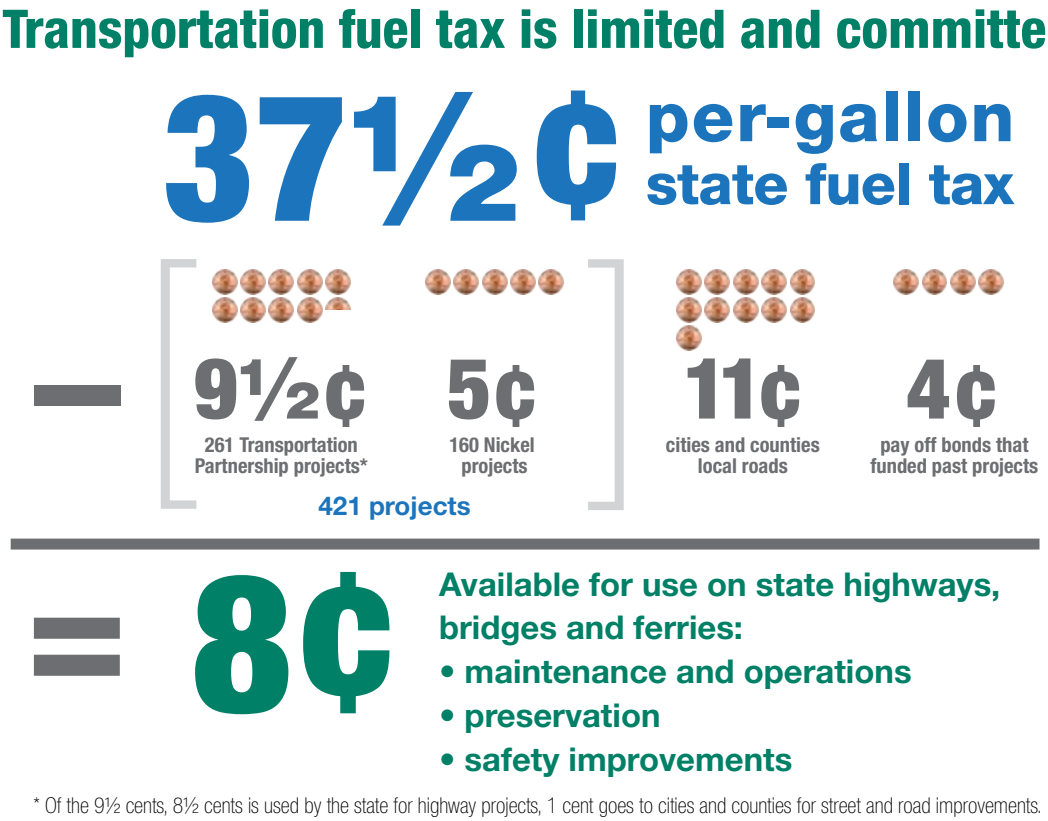
For more information on Moving Washington, visit:
www.wsdot.wa.gov/movingwashington/

Why Moving Washington?

At its most basic level Moving Washington is a budgeting and investment framework that is more important now than ever, given declining transportation revenue and growing demands on our state's highways, ferries and rails. The state is not in a position to build everything that is proposed so the state must have a way to prioritize its transportation needs and find the most efficient solutions that support and enhance Washington's economic vitality.

Exhibit ES.2 illustrates how transportation revenue is derived and spent in Washington State. As the exhibit demonstrates, 8 cents (21 percent) of the 37.5 cents gas tax collected on each gallon of fuel is available to operate, maintain, and improve the transportation system. Given this challenging financial situation it is necessary for the WSDOT to approach transportation investments in a strategic manner.

Exhibit ES.2: Transportation Revenue



* Of the 9½ cents, 8½ cents is used by the state for highway projects, 1 cent goes to cities and counties for street and road improvements.

Recommendations

The recommendations were developed recognizing the state's current financial situation and adhering to the principles and strategies of Moving Washington. The recommendations were developed through a series of workshops in collaboration with the study's stakeholders, using WSDOT performance measurement thresholds and other project evaluation criteria.

In addition to levels of service and speed performance of the system, the evaluation criteria also considered how a proposed improvement affected "Economy, Transportation, and Community" or "ETC." The purpose of ETC was to obtain a fuller picture of how a recommended improvement would benefit the community as a whole, not just the study corridor itself. For example, would a recommendation enhance freight movement or improve access to transit oriented development, promote energy conservation, or improve safety?

There were 18 separate evaluation criteria considered during the development of the recommendations. Further discussion of the evaluation criteria can be found in Chapter 6: *Recommendations and Planning Level Cost Estimates.*

To develop the recommendations the study process took the following steps:

1. Corridor needs were identified using WSDOT's performance measure thresholds of 70% of posted speed for highway segments and Level of Service "E" for intersections and ramp termini.
2. Workshops were conducted with various stakeholders and WSDOT personnel with backgrounds in engineering, planning, and environmental services. The workshops, divided between motorized and non-motorized modes of travel, examined various possibilities for improvements at the locations that were identified as having improvement needs now and through the 2030 planning horizon.
3. Recommendations were developed based upon the conceptual results emanating from the workshops and how those concepts fared when measured against WSDOT's performance measures and the other criteria and performance measures developed with the stakeholders.

The development of the recommendations was also guided by the vision adopted by the stakeholders for the corridor. This corridor vision states:

The SR 520 corridor vision is of a transportation corridor that:

- is safe to travel
- serves intra-regional travel
- enables business and residential growth in the local communities
- enhances multi-modal travel and system integration
- strengthens connections between major economic and job centers.

See Chapter 1: *Introduction and Background* for further discussion of the corridor vision and study goals.

There are twenty-two recommendations identified in the SR 520 Multi-modal Corridor Planning Study. These recommendations are categorized as either motorized or non-motorized and complement each other to address the safety and travel needs of all users of the SR 520 corridor.

The recommendations range in cost between $500,000 and $265,000,000 (2012 planning level cost estimates;) and design work ranging from the conceptual level (less than 1% design) to about a 10% design; depending upon the recommendation.

Prior to implementation, all recommendations will require more analysis and design to determine the most cost effective approaches in constructing the projects.

As the economy recovers or traffic conditions change, the data that was used to develop the recommendations for this corridor study should be updated or reevaluated if future conditions along the corridor evolve differently than anticipated in this study.

The following multi-modal recommendations are presented in accordance with the principles and strategies of Moving Washington.

Maintenance and Preservation

Maintenance

The costs for maintaining and operating the study segment of SR 520, based on 2005-2011 data from previous maintenance and operations activities, averaged approximately $330,000 per year. These activities are broken down into several categories with their approximate percentage of the yearly cost:

Traffic services, roadway maintenance and operations	48 percent
Third party damage repair	13 percent
Snow and ice control	12 percent
Roadside and landscape maintenance	12 percent

Preservation

There is currently a budgeted preservation project along the corridor to repave three mainline segments and nine ramps. See Exhibit ES.3: SR 520 Corridor Study Preservation Projects. See Exhibit ES.4: Preservation Project Locations for the locations of this work activity.

Maintenance and preservation work should continue as needed throughout the life of this facility to ensure the continued safe use of this resource by the travelling public. Additional information covering the preservation activities and costs can be found in Chapter 2: *Roadway Inventory, Safety, and Investments.*

Exhibit ES.3: SR 520 Corridor Study Preservation Projects

Moving Washington		Cost	Construction Phase
	Preservation Projects		
	Repavement of SR 520 mainline (3 locations) and nine ramps.	3.7 Million	2014

Exhibit ES.4: Preservation Project Locations

Safety

There have been no fatal collisions on the study corridor since the end of 2007[1], putting the fatal collision rate well below the statewide average for similar facilities.

There are two safety priority array lists which WSDOT maintains to help program safety projects: Collision Analysis Segments (CASs) and Intersection Analysis Locations (IALs). The study corridor does not currently contain any CASs. It does contain four IALs:

- Two at the eastbound ramps intersection with West Lake Sammamish Parkway NE
- Two at the eastbound offramp intersection with SR 202

Improvement recommendations to address these four IAL locations will depend on further analysis. There were no fatal or serious injury collisions at these four locations, but there were a number of less severe collisions that met other safety array criteria. Once a capital project is identified, it must still compete statewide with other safety projects for limited funding.

All of the fatal and serious injury collisions, and the vast majority of the less severe collisions, entailed driver behavior as a major contributing factor. Enhanced enforcement and education of the public on behavior-related topics (such as speeding, tailgating, failure to grant proper right-of-way, awareness of non-motorized modes of travel, and driver inattention and impairment) should therefore be undertaken to further improve safety on the study corridor.

Enhanced enforcement and public education has been shown to be most effective when undertaken through *Target Zero* community task forces. WSDOT analysis indicates that increased aggressive and persistent enforcement of driving infractions and *Target Zero* community task force activities can address the major factors contributing to fatal and serious injury collisions in the study corridor. If these actions are taken, capital improvements to reduce fatal and serious injury collisions will not be necessary.

There are no formally designated WSDOT safety projects currently identified for the study corridor. However, many of the planned projects have safety benefits. Both the state and the cities should continue to monitor collisions on the study corridor and, if warranted, determine if a specific physical fix would be effective.

[1] *Per data available as of February 4, 2013.*

Operate Efficiently

Maximizing flow characteristics and throughput by optimizing signal timing is a strategy that should be employed along the study corridor whenever and wherever possible. There are eleven existing ramp metering locations along the study corridor that will continue to maximize throughput throughout this corridor.

See "Project #1" in Exhibit ES.6: SR 520 Corridor Planning Study Recommendations for a full description of this strategy.

Manage Demand

Demand management strategies reduce vehicle trips or shift use of the roadway to off peak periods. These strategies are implemented in partnership with local governments, transit agencies, employers, and others, so the development of strategies will depend on the capacity and interests of local partners. Other considerations will include the objectives for the corridor, existing land uses and services, analysis of travel patterns and travel behavior, and financial resources. A five percent reduction in future traffic volumes is the target for these strategies. This target is assumed to be achieved within those twenty years as a result of the demand management measures. The following list of demand management strategies are recommended for this corridor.

- Expand commute trip reduction to small and medium businesses (e.g. Growth and Transportation Efficiency Centers).
- Expand vanpool programs.
- Minor transit enhancements (e.g. wayfinding signs, shelters, etc.).
- Parking management at worksites, neighborhoods and park and rides (e.g. priority parking for vanpools and carpools, discounted parking for carpools, etc.).
- Land use management (e.g. incentives and requirements for developers to provide less parking or subsidize transit passes, programs to incentivize people to live close to work, etc.).
- Outreach, incentives and promotions targeted to worksite and residential markets.
- Infrastructure and services to support first and last mile connections, e.g. vanshare targeted to worksite and residential markets, employer shuttles, bicycle lockers, park and ride expansion, etc.

The estimated cost is projected to reach up to $500,000 per year by the twentieth year. This estimate assumes improved transit service on the corridor, ongoing support for foundational TDM activities and bicycle/pedestrian improvements.

For further information see Chapter 6: *Recommendations and Planning Level Cost Estimates.*

Add Capacity Strategically

The following exhibits illustrate motorized and non-motorized capacity recommendations. Exhibit ES.5 is a map showing the locations of the recommendations and Exhibit ES.6 is a list with descriptions of the recommendations. These recommendations are shown together to portray a multi-modal corridor.

SR 520 Multi-modal Corridor Planning Study Recommendations

Exhibit ES.5: Map of Recommendations

1. Operational Enhancements
2. SR 520 Interim Regional Trail Improvements (108th Ave NE to 124th Ave NE)
3. New Dedicated SR 520 Regional Trail Alignment (108th Ave NE to 124th Ave NE)
4. SR 520/124th Ave NE Full Interchange (incl. Auxiliary lanes)
5. SR 520/148th Ave NE Interchange Overlake Access Ramp
6. SR 520/148th Avenue NE Trail Connection
7. SR 520 Regional Trail Grade Separation at 148th Ave NE
8. SR 520 Eastbound Auxiliary Lane - 148th Ave NE to NE 40th Street
9. SR 520 Regional Trail Grade Separation at NE 40th Street
10. Overlake Village Station Ped/Bike Bridge (SR 520/ 152nd Ave NE)
11. Overlake Transit Center Ped/Bike Bridge (SR 520/ NE 40th Street/ 156th Ave NE)
12. SR 520 Regional Trail Grade Separation at NE 51st Street
13. SR 520 Eastbound Shoulder Bus Lane - NE 51st Street to West Lake Sammamish Parkway
14. SR 520 Eastbound Auxiliary Lane - NE 51st Street to West Lake Sammamish Parkway
15. SR 520 Westbound Auxiliary Lane - West Lake Sammamish Parkway - NE 51st Street
16. NE 51st Street/ NE 40th Street Westbound Exit Ramp Modifications
17. SR 520/West Lake Sammamish Parkway Eastbound Off-Ramp Improvements
18. SR 520/West Lake Sammamish Parkway/ Leary Way Interchange Improvements
19. SR 520 Regional Trail Grade Separation at West Lake Sammamish Parkway
20. East Lake Sammamish Parkway Regional Trail Connection (SR 520/ SR 202)
21. SR 520/SR 202 Interchange Improvements at WB Ramp/SR 202 Intersection
22. SR 520/Avondale Rd/ Union Hill Rd Intersection Improvements

Due to limited state funding, the recommendations in this study will need to compete for funding with other proposed improvements around the state based on performance outcome. WSDOT is open to considering funding partnerships with jurisdictions if a non-motorized improvement meets mutual performance objectives.

Exhibit ES.6: SR 520 Multi-modal Corridor Planning Study Recommendations

Moving Washington Strategy	Project Number	Proposed Improvement	Cost Estimate (2012 $) In Millions $	Year of Need
	1	**Operational Enhancements; Intelligent Transportation Systems (ITS) including Active Traffic Management (ATM) and Traffic Signal System Upgrades and Optimization** Phased implementation of ATM systems including variable message signs, dynamic message signs and lane control signs. General system requirements include full monotube sign structures installed every 1/2 mile with electronic signs at each location. Traffic Signal System Upgrades include employing adaptive signal technologies at key intersections and corridors as well as providing for interoperability of closely spaced traffic signal between neighboring jurisdictions.	$39	2018
	2	**SR 520 Interim Regional Trail Improvements (108th Avenue NE to 124th Ave NE)** This project will build bike lanes and sidewalks on both sides of Northup Way between NE 33rd Street and NE 24th Street. It also includes bike lanes along NE 24th Street that will connect to the existing SR 520 trail to Northup Way. Other project features include a pedestrian and bicycle bridge over the Burlington Northern Santa Fe railway, planter strips, street lighting, driveway access improvements, and pedestrian crossings at key locations.	$12 (Actual needed amount is $4 million; $8 million has already been committed)	2011
	3	**New Dedicated SR 520 Regional Trail Alignment (108th Ave NE to 124th Ave NE)** Construct a separated 14’ wide non-motorized trail on a dedicated alignment between 108th Ave NE and the proposed full directional interchange at 124th Ave NE.	TBD	2019

Exhibit ES.6: *SR 520 Multi-modal Corridor Planning Study Recommendations (continued)*

Moving Washington Strategy	Project Number	Proposed Improvement	Cost Estimate (2012 $) In Millions $	Year of Need
	4	**SR 520/124th Avenue NE Full Interchange (including auxiliary lanes)** Reconstruct the existing half diamond interchange to provide a fully directional interchange accommodating all movements to and from the west and the east on SR 520. A final interchange configuration will be determined during the interchange justification report and environmental phase.	$265	2012
	5	**SR 520/148th Avenue NE Interchange/ Overlake Access Ramp** Improve eastbound off-ramp operations by constructing a grade separated ramp for through movements accessing the Overlake area east of 148th Avenue NE.	$53.1 ($43 million is required for the near- and mid-term needs)	2010
	6	**SR 520/148th Avenue NE Trail Connection** Trail connection between the SR 520 Regional Trail and the Overlake area.	$7.9	2010
	7	**SR 520 Regional Trail Grade Separation at 148th Ave NE** Construct non-motorized tunnel under 148th Ave NE and supporting structures as needed on the north side of the interchange.	$9-$21.5 total ($0.5 preliminary design)	2017 (preliminary design - 2015)
	8	**SR 520 Eastbound Auxiliary Lane – 148th Avenue NE to NE 40th Street** Design and construct a new 12’ wide auxiliary lane eastbound between the 148th Ave NE interchange and the NE 40th St interchange.	$9.5-$12.7	2022

Exhibit ES.6: *SR 520 Multi-modal Corridor Planning Study Recommendations (continued)*

Moving Washington Strategy	Project Number	Proposed Improvement	Cost Estimate (2012 $) In Millions $	Year of Need
	9	**SR 520 Regional Trail Grade Separation at NE 40th Street** Construct non-motorized tunnel under NE 40th St on the west side of the interchange.	$6.6	2014
	10	**Overlake Village Station Pedestrian & Bicycle Bridge - SR 520/152nd Ave NE** Construct a new bicycle and pedestrian bridge over SR 520 locating the southern landing at the East Link Light Rail Overlake Village Station and Overlake Regional Growth Center with the north landing at the 520 Regional Trail and employment area.	$11	2012
	11	**Overlake Transit Center Pedestrian-Bicycle Bridge (SR 520/NE 40th Street/156th Ave NE)** Design a new bicycle and pedestrian bridge over SR 520 south of NE 40th Street, locating eastern landing at the East Link Light Rail Overlake Transit Center Station and Overlake Regional Growth Center, with the west landing at the 520 Regional Trail and employment area.	TBD *Funding will be subject to a 3-party agreement between Sound Transit, Microsoft, and the City of Redmond.*	2012
	12	**SR 520 Regional Trail Grade Separation at NE 51st Street** Construct non-motorized tunnel under NE 51st St on the west side of the interchange.	$4.2	2015

Exhibit ES.6: *SR 520 Multi-modal Corridor Planning Study Recommendations (continued)*

Moving Washington Strategy	Project Number	Proposed Improvement	Cost Estimate (2012 $) In Millions $	Year of Need
	13	**SR 520 Eastbound Shoulder Bus Lane – NE 51st Street to West Lake Sammamish Parkway** Construct an eastbound shoulder lane for bus use between NE 51st Street and West Lake Sammamish Parkway.	$0.5	2014
	14	**SR 520 Eastbound Auxiliary Lane - NE 51st Street eastbound on-ramp to West Lake Sammamish Parkway** Add an eastbound lane from NE 51st Street on-ramp to Westlake Sammamish Parkway off-ramp.	$20-$26	2014
	15	**SR 520 Westbound Auxiliary Lane - West Lake Sammamish Parkway to NE 51st Street** Add a westbound lane from Westlake Sammamish Parkway on-ramp to NE 51st Street off-ramp.	$19-$25	2026
	16	**NE 51st Street/NE 40th Street Westbound Exit Ramp Modifications** Reconfigure the one lane exit into two separate exits by constructing a new exit for 40th Street about 1/2 mile further west of the existing exit.	$0.9	2015
	17	**SR 520/West Lake Sammamish Parkway - Eastbound Off Ramp Improvements** Construct either a multilane roundabout or exclusive right turn lane at the ramp terminal.	$2.6-$5	2021
	18	**SR 520/West Lake Sammamish Parkway/Leary Way Interchange Improvements** Construct either a multilane roundabout or double left turn lanes (WLSP southbound to Leary Way east-bound) and add a lane on Leary Way from West Lake Sammamish Parkway to the bridge over the Sammamish River.	$3-$6.6	2019

Exhibit ES.6: *SR 520 Multi-modal Corridor Planning Study Recommendations (continued)*

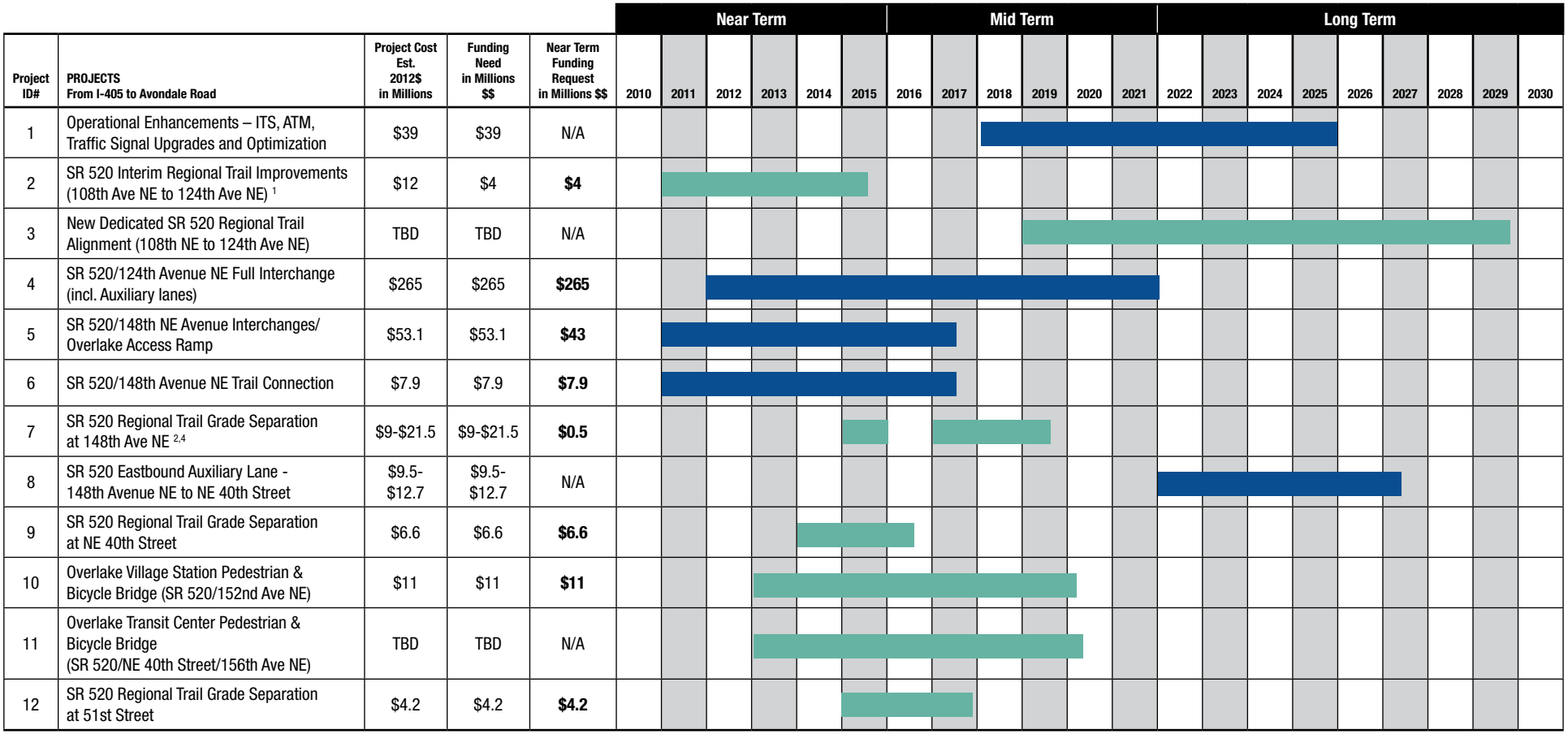
Moving Washington Strategy	Project Number	Proposed Improvement	Cost Estimate (2012 $) In Millions $	Year of Need
	19	**SR 520 Regional Trail Grade Separation at West Lake Sammamish Parkway** Construct a non-motorized overpass at West Lake Sammamish Parkway that connects the end of the SR 520 Regional Trail to the Sammamish River Regional Trail.	$4.6-$8.7	2019
	20	**East Lake Sammamish Parkway Regional Trail Connection (SR 520/SR 202)** Construct missing segment of trail system through interchange.	TBD	2022
	21	**SR 520/SR 202 Interchange Improvements at WB Ramp/SR 202 Intersection** Modify the bridge over Bear Creek to add a vehicular lane, providing a double left turn lane on Redmond Way to improve traffic flow and reduce conflict between motorized and pedestrian and bicycle traffic at the SR 520 and 202 Interchange. In addition, this project will construct a pedestrian and bicycle bridge on the south side of the bridge over Bear Creek to provide safe passage for non-motorized users.	$10	2015
	22	**SR 520/Avondale Road/Union Hill Road Intersection Improvements** Design and construct either a grade separation of SR 520 over Union Hill Road; or Design and construct a flyover ramp from westbound Union Hill Road to westbound SR 520.	$31-$87 total ($3 for preliminary design)	2022 (2015 preliminary design)

The motorized and non-motorized recommendations are also presented in a timeline format. This format shows the year of need for each recommendation and how long it is anticipated to construct each recommendation. The project numbers in the timeline coincide with the project numbers in the above chart.

See Exhibit ES.7: SR 520 Multi-modal Corridor Planning Study: Recommended Multi-modal Transportation Investments- By Year of Need.

Exhibit ES.7: SR 520 Multi-modal Corridor Planning Study: Recommended Multi-modal Transportation Investments - By Year of Need

Project ID#	PROJECTS From I-405 to Avondale Road	Project Cost Est. 2012$ in Millions	Funding Need in Millions $$	Near Term Funding Request in Millions $$
1	Operational Enhancements – ITS, ATM, Traffic Signal Upgrades and Optimization	$39	$39	N/A
2	SR 520 Interim Regional Trail Improvements (108th Ave NE to 124th Ave NE) [1]	$12	$4	**$4**
3	New Dedicated SR 520 Regional Trail Alignment (108th NE to 124th Ave NE)	TBD	TBD	N/A
4	SR 520/124th Avenue NE Full Interchange (incl. Auxiliary lanes)	$265	$265	**$265**
5	SR 520/148th NE Avenue Interchanges/ Overlake Access Ramp	$53.1	$53.1	**$43**
6	SR 520/148th Avenue NE Trail Connection	$7.9	$7.9	**$7.9**
7	SR 520 Regional Trail Grade Separation at 148th Ave NE [2,4]	$9-$21.5	$9-$21.5	**$0.5**
8	SR 520 Eastbound Auxiliary Lane - 148th Avenue NE to NE 40th Street	$9.5-$12.7	$9.5-$12.7	N/A
9	SR 520 Regional Trail Grade Separation at NE 40th Street	$6.6	$6.6	**$6.6**
10	Overlake Village Station Pedestrian & Bicycle Bridge (SR 520/152nd Ave NE)	$11	$11	**$11**
11	Overlake Transit Center Pedestrian & Bicycle Bridge (SR 520/NE 40th Street/156th Ave NE)	TBD	TBD	N/A
12	SR 520 Regional Trail Grade Separation at 51st Street	$4.2	$4.2	**$4.2**



[1] $4 million represents amount needed to complete interim project; $8 million in funding has already been allocated
[2] Grade separation would require tunnel under or bridge over ramp termini
[3] Study is needed to determine feasibility of project
[4] Earlier time line indicates preliminary design work
[5] Turn lanes or roundabout
[6] Grade separation would require tunnel under or bridge over Leary Way
[7] WSDOT is open to considering funding partnerships with jurisdictions if a non-motorized improvement meets mutual performance objectives.

* Tentative timeline includes PE, ROW, and construction subject to funding availabilities and statewide prioritization process

Exhibit ES.7: *SR 520 Multi-modal Corridor Planning Study: Recommended Multi-modal Transportation Investments - By Year of Need (continued)*

Project ID#	PROJECTS From I-405 to Avondale Road	Project Cost Est. 2012$ in Millions	Funding Need in Millions $$	Near Term Funding Request in Millions $$	Near Term 2010	2011	2012	2013	2014	2015	Mid Term 2016	2017	2018	2019	2020	2021	Long Term 2022	2023	2024	2025	2026	2027	2028	2029	2030
13	SR 520 Eastbound Shoulder Bus Lane - NE 51st Street to West Lake Sammamish Parkway [3]	$0.5	$0.5	**$0.5**																					
14	SR 520 Eastbound Auxiliary Lane - NE 51st Street to West Lake Sammamish Parkway [4]	$20-$26	$20-$26	**$15**																					
15	SR 520 Westbound Auxiliary Lane - West Lake Sammamish Parkway to NE 51st Street	$19-$25	$19-$25	N/A																					
16	NE 51st Street/NE 40th Street Westbound Exit Ramp Modifications	$0.9	$0.9	**$0.9**																					
17	SR 520/West Lake Sammamish Parkway Eastbound Off-Ramp Improvements [5]	$2.6-$5	$2.6-$5	N/A																					
18	SR 520/West Lake Sammamish Parkway/ Leary Way Interchange Improvements [5]	$3-$6.6	$3-$6.6	N/A																					
19	SR 520 Regional Trail Grade Separation at West Lake Sammamish Parkway [6]	$4.6-$8.7	$4.6-$8.7	N/A																					
20	East Lake Sammamish Parkway Regional Trail Connection (SR 520/SR 202)	TBD	TBD	N/A																					
21	SR 520/SR 202 Interchange Improvements at WB Ramp/SR 202 intersection	$10	$10	**$10**																					
22	SR 520/Avondale Rd/Union Hill Rd Intersection Improvements [4]	$31-$87	$31-$87	**$3.0**																					
	Total (rounded)	**$509-$603**	**$501-$595**	**$372**																					

Motorized
Non-Motorized [7]

[1] $4 million represents amount needed to complete interim project; $8 million in funding has already been allocated
[2] Grade separation would require tunnel under or bridge over ramp termini
[3] Study is needed to determine feasibility of project
[4] Earlier time line indicates preliminary design work
[5] Turn lanes or roundabout
[6] Grade separation would require tunnel under or bridge over Leary Way
[7] WSDOT is open to considering funding partnerships with jurisdictions if a non-motorized improvement meets mutual performance objectives.

* Tentative timeline includes PE, ROW, and construction subject to funding availabilities and statewide prioritization process

Next Steps

While this study does not guarantee funding for the proposed recommendations, it does allow future consideration for funding requests to be focused on near term improvement recommendations subject to competition with other projects around the state based on performance outcome.

The recommendations will be considered for incorporation into the State Highway System Plan (HSP), the PSRC's metropolitan transportation plan (Transportation 2040), and respective county and city comprehensive plans.

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Chapter 1:
Introduction and Background

What is the Purpose of a Corridor Planning Study?

Corridor studies are part of the Washington State Department of Transportation (WSDOT) long-range planning program and are intended to identify potential investments in WSDOT-owned roads and ensure alignment with the Highway System Plan and Moving Washington. The corridor plan can also be used by transportation stakeholders such as local agencies and regional transportation planning organizations in their planning processes.

A corridor study analyzes operating conditions, environmental constraints, population and employment growth, land use development, right of way needs, and other elements that affect the highway's traffic operations.

To ensure that the study recommendations are consistent with the corridor vision, the corridor plan includes a public participation process. This process seeks public involvement on multiple levels, from the creation of a stakeholders group, briefings to elected officials, and creation of a study website. This website is utilized to keep the public informed of the study's progress and post material pertinent to the study.

The study's website is:
www.wsdot.wa.gov/planning/Studies/SR520EastCorridor/

The SR 520 Multi-modal Corridor Planning Study (I-405 to Avondale Road)

The State Route (SR) 520 Multi-modal Corridor Planning Study covers an approximately six mile long stretch of SR 520 from the Interstate 405 interchange in Bellevue (MP 7.0) to Avondale Road in Redmond (MP 13.0). The land use within the study area is a mixture of suburban and urban communities and includes designated regional urban growth centers, international companies, and large scale development sites.

Exhibit 1.1: SR 520 Multi-modal Corridor Planning Study Area

Analysis for the study included current and future travel conditions and needs, and existing and planned future growth along the study corridor. This analysis was used to identify recommendations that could be implemented between now and 2030. At the time of release of the final report, funding has not been allocated for the recommendations.

The recommendations in this study are consistent with state and regional policies for investments in transportation. Those policies are:

State Policies

The study recommendations are consistent with the six investment guidelines set forth in RCW 47.04.280 which states that public investments in transportation should support achievement of these six policy goals:

1. **Economic Vitality:** To promote and develop transportation systems that stimulate, support, and enhance the movement of people and goods to ensure a prosperous economy
2. **Preservation:** To maintain, preserve, and extend the life and utility of prior investments in transportation systems and services
3. **Safety:** To provide for and improve the safety and security of transportation customers and the transportation system
4. **Mobility:** To improve the predictable movement of goods and people throughout Washington State
5. **Environment:** To ensure Washington's quality of life through transportation investments that promote energy conservation, enhance healthy communities, and protect the environment
6. **Stewardship:** To continuously improve the quality, effectiveness, and efficiency of the transportation system

The recommendations are also consistent with RCW 47.06.050, which requires that WSDOT first assess strategies to enhance operational efficiency of the existing system before expanding the system. Strategies to improve operational efficiencies include, but are not limited to: transportation systems management, transportation demand management, high occupancy vehicle facilities, and express toll lanes.

Moving Washington

Moving Washington is WSDOT's framework for making decisions for transportation investments that focus on keeping people and goods moving and supporting a healthy economy, environment, and communities. This framework is anchored by the Department's highest priority: maintaining and preserving the safe and long-lasting performance of existing infrastructure, facilities and services. This is the heart of Moving Washington and the primary target of the Department's investments.

Moving Washington combines three strategies to achieve and align the objectives of WSDOT and its partners: manage demand, operate efficiently, and add capacity strategically. It is through the application of these strategies that the Department is able to ensure that investments are integrated and solutions are cost-effective.

Following is a brief description of the Moving Washington strategies.

- **Managing demand** by offering more commute choices
- **Operating efficiently** to get the most use out of the roads and infrastructure we have
- **Adding capacity strategically** to best use limited resources by targeting the most congested areas.

Visit the following website for more information on Moving Washington: www.wsdot.wa.gov/movingwashington

Regional Policies

VISION 2040 is the Puget Sound Regional Council's framework for long-range transportation planning in King, Pierce, Kitsap and Snohomish counties by integrating freight, ferries, highways, local roads, transit, bicycling, and walking. The regional perspective for transportation recognizes the critical link between transportation, land use planning, economic development, and the environment. The recommendations in this study support the three transportation goals of VISION 2040 listed below.

1. As a high priority, the region will maintain, preserve, and operate its existing transportation system in a safe and usable state.
2. The future transportation system will support the regional growth strategy by focusing on connecting centers with a multimodal transportation network.
3. The region will invest in transportation systems that offer greater options, mobility, and access in support of the regional growth strategy.

Transportation 2040 is the region's 30-year transportation plan that will assist Puget Sound in moving forward by making transportation decisions and investments that move the region in the direction of sustainability, mobility, and environmental responsibility. Transportation 2040 includes:

- Transit, bike, pedestrian, and roadway investments needed to support the region's expected growth (1.5 million more people and 1.2 million more jobs by 2040).
- Enhance the integration and connectivity of the transportation system, across and between modes, for people and freight.
- Strategies for reducing greenhouse gas emissions and protecting the health of the Puget Sound. These strategies are intended to complement steps being taken at the national level and are consistent with state programs and direction.
- Transportation investments that fully support the region's growth strategy, VISION 2040, focusing job and housing growth in vibrant centers and supporting livability throughout the region.
- An innovative and equitable financing plan that shifts how transportation improvements are funded, replacing traditional sources that are declining or no longer available.

Visit the following websites for more information on Vision 2040 and Transportation 2040:
http://psrc.org/growth/vision2040
http://psrc.org/transportation/t2040

What was the planning process for the SR 520 Multi-modal Corridor Study?

The study process engaged local jurisdictions, agencies, and businesses to help identify transportation-related needs and develop, evaluate, and select recommendations. To identify transportation needs the following criteria were considered:

- population and employment growth
- where future development is planned to occur
- environmental issues and constraints
- future travel demand and projected deficiencies
- public and local agency input

The typical planning process is shown in Exhibit 1.2 and includes the following steps:

Exhibit 1.2: Typical Corridor Planning Study Process

Establish a Stakeholders or Corridor Working Group composed of staff from local and regional agencies. The stakeholders provide input on the transportation safety and mobility needs and potential projects for the SR 520 Multi-modal Corridor Planning Study area.

Compile and analyze data regarding existing and projected traffic conditions, existing roadway design compared to current design standards, the surrounding natural and built environment, and future population and employment growth in the area.

Identify needs and potential projects to improve safety and address preservation and mobility needs within the limits of the SR 520 study area.

Evaluate potential projects using criteria based on RCWs, planning policies, and guidelines in the corridor planning study.

Formulate draft recommendations based upon results of evaluation of potential projects.

Stakeholders review the proposed recommendations for the SR 520 Multi-modal Corridor Planning Study.

Issue draft report documenting the study process, findings, and proposed recommendations.

WSDOT publishes the SR 520 Multi-modal Corridor Planning Study final report.

Who was involved in the SR 520 Multi-modal Corridor Study?

The study was led by WSDOT's Urban Planning Office with assistance from a stakeholders group to provide input and insight into the transportation concerns of their respective agencies. The stakeholders group also acted as a sounding board for the development of the recommendations. The Stakeholders group was composed of transportation planners, engineers, managers, and policy makers from the cities and various businesses along the study corridor; along with regional planning and transit agencies.

The Stakeholders included:

- City of Bellevue
- City of Kirkland
- City of Redmond
- City of Sammamish
- Group Health Cooperative
- Kemper Development
- King County Metro Transit
- King County Roads
- Microsoft
- Puget Sound Regional Council
- Sound Transit
- Wright Runstad & Company
- WSDOT

The Corridor Vision and Study Goals

At the beginning of the corridor study, the Stakeholders adopted a vision for the corridor that outlines how the corridor should develop and operate over the coming decades. This corridor vision is in alignment with the Governor's Connecting Washington Task Force's ten year strategy to promote principle based investments critical to Washington's economic future. The vision is also in agreement with WSDOT's Moving Washington principles and strategies.

The SR 520 corridor vision is of a transportation corridor that:

- is safe to travel
- serves intra-regional travel
- enables business and residential growth in the local communities
- enhances multi-modal travel and system integration
- strengthens connections between major economic and jobs centers

Additionally, the stakeholders adopted goals for the study itself. These goals support the vision and helped guide the study process and influenced the development of the recommendations.

Study Goals

Develop improvement recommendations that:

- comply with ESHB 1175
- implement Moving Washington by developing improvement recommendations that are sustainable and focus on maintenance, preservation, safety, efficient operations, demand management, and adding capacity strategically
- leverage funding from public and private resources
- promote economic development and job creation
- advance the Connecting Washington investment principles
- are in alignment with the legislature's six investment guidelines found in RCW 47.04.280. (Those guidelines are: economic vitality, preservation, safety, mobility, environment, and stewardship.)

What are the key topics reviewed by the corridor study?

- delays being experienced by motorists at major interchanges and ramp termini
- addressing movement conflicts between motor vehicles and pedestrians and bicyclists
- improving and completing pedestrian and bicycle facilities
- preservation of corridor right of way for potential future expansion of the highway
- light rail service to Bellevue and Redmond
- no access to eastbound SR 520 from 124th Avenue NE
- redevelopment of the Bel-Red corridor and future associated transportation needs
- development of the Spring District and future associated transportation needs
- gap in the SR 520 Regional Trail
- 148th Ave NE Interchange improvements
- completion of the Overlake Access Ramps
- redevelopment of the Group Health site and future associated transportation needs
- redevelopment of the Overlake area and future associated transportation needs
- future HOV lane placement and operational effects

History of the SR 520 Corridor

SR 520 is a state highway in the state of Washington. It extends approximately 13 miles from Seattle to Redmond. The roadway originates at Interstate 5 in Seattle at the north end of Capitol Hill just south of Roanoke Park and terminates at SR 202 in Redmond. International companies such as Microsoft and Nintendo of America have located their headquarters and campuses along the SR 520 corridor in the city of Redmond.

The highway bridges Portage Bay and crosses through the Montlake neighborhood in Seattle and continues east on a causeway through the marshlands of the Washington Park Arboretum and across Foster Island. From there it crosses Lake Washington on the Evergreen Point Floating Bridge to Medina. At 7,578 feet it is the longest floating bridge in the world.

From Medina, it straddles the border between the cities of Hunts Point and Yarrow Point to the north, and Clyde Hill to the south. Intersecting with I-405 in Bellevue, it continues east, crossing the Sammamish River and Bear Creek, before ending at a junction with SR 202. In 1996 a set of ramps connecting SR-520 to Avondale Road NE were completed.

SR 520 first appears on planning maps in the late 1950s. It is not in the 1956 Comprehensive Plan of Seattle, in which the preferred second bridge crossing of Lake Washington connects Sand Point and Juanita (now part of Kirkland).

With the completion of the Evergreen Point Floating Bridge in August 1963, SR 520 opened to traffic. Originally, it was legislatively defined as PSH-1 EP (Primary State Highway 1, Evergreen Point branch). When the new numbering system for Washington highways took effect in 1964, SR 520 ran from I-5 to the junction of Lake Washington Boulevard NE and Lincoln Avenue (now Bellevue Way). The segment from I-5 to I-405 is shown as existing or to be improved; the segment from I-405 to SR 202 is shown as proposed. The 1967 Puget Sound Regional Council of Governments recommended freeway system omits the segment from I-405 to SR 202, replacing it with a freeway from the Sand Point-Kirkland bridge (then proposed as a third Lake Washington crossing) along the route of SR 908, deviating southward near West Lake Sammamish Parkway to end at the current SR 520 terminus. In this plan, SR520 ends at I-405.

In the early 1970s the segment from I-405 to 148th Avenue NE opened. In the mid-1970s, the segment between West Lake Sammamish Parkway and SR 202 opened as SR 920 as a Super-2 freeway. By 1990 this segment was widened to a divided 4-lane freeway. SR 920 was a temporary designation of what is now part of SR 520 between West Lake Sammamish Parkway and State Route 202 in Redmond.

In 1973, the outside shoulder of westbound SR 520 from Bellevue Way to the bridge was converted for use as a transit only lane, so buses could bypass the tollbooths for the bridge. The existing general-purpose lanes were narrowed to accommodate the conversion. In the late 1980s, the lane was re-designated as a High Occupancy Vehicle (HOV) lane for transit and carpools of 3 or more passengers. All planning maps from 1974 onward show the SR 520 routing as it currently exists. The final segment of SR 520 between 148th Avenue NE and West Lake Sammamish Parkway opened in1979.

When the missing link between 148th Ave NE and SR 901 was completed in the early 1980s, SR 920 was replaced by SR 520. However upon completion, there was a short section crossing SR 901 where SR 520 narrowed to one lane, and then immediately back to two. This section of SR 520 was widened and a new interchange was built at the junction of SR 520, SR 202, and Avondale Road - the former eastern terminus of SR 920.

In the 1990s, both sides of SR 520 from the I-405 interchange to West Lake Sammamish Parkway were widened to add a HOV lane on both sides of the roadway, and collector distributor lanes were added from NE 40th Street to West Lake Sammamish Parkway. A new interchange was built at NE 40th Street to accommodate expansion of the Microsoft and Nintendo of America corporate campuses and an additional overcrossing was added at NE 36th Street to facilitate local circulation over SR 520. In December 2010 additional widening between West Lake Sammamish Parkway (WLSP), and SR 202 was completed. This widening added one new mile of HOV lane and a new outside lane.

During the development of SR 520 within the study area, multiple improvements have been made by the local jurisdictions to accommodate non-motorized travel along the corridor. These independent improvements have been put into place with the the goal of providing all the east side communities and Seattle with a regional, non-motorized connection along the corridor.