

Appendix I Transportation 2040 Alternatives Analysis Congestion Management Process Report

Appendix I:
Transportation 2040
Alternative Analysis

Congestion Management
Process (CMP) Report



Transportation 2040 Alternative Analysis
Congestion Management Process Report

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Report Overview

Congestion is an everyday occurrence in the central Puget Sound region, a problem likely to become more challenging as regional population and employment is forecast to grow by 1.5 million and 1.2 million respectively between 2006 and 2040. Not only does congestion cause delay and personal frustration, but it also affects the movement of people and goods, results in excess greenhouse gas emissions, and increases stress on critical infrastructure. The Puget Sound Regional Council (PSRC) is well aware of these critical congestion and mobility issues. As part of the region's long-range transportation plan update, decision-makers will decide how to address congestion and mobility issues within the constraints of available revenue, while balancing the need to sustain our environment. This report provides corridor-level analysis to support the Transportation 2040 Alternatives Analysis process.

This report is also a component of the region's Congestion Management Process (CMP). Federally mandated as part of the Safe, Accountable, Flexible, Efficient, and Transportation Equity Act: a Legacy for Users (SAFETEA-LU), the CMP must address congestion management through a process that provides for effective management and operation, based on a metropolitan-wide strategy of new and existing transportation facilities and programs. This CMP Report presents a systematic process for managing congestion that provides information on transportation system performance and identifies strategies to alleviate congestion and enhance the mobility of persons and goods to levels that meet state and local needs.¹

Report Content

This report is an excerpt from a full 2009 Congestion Management Plan Report that was issued in the fall of 2009. The purpose of this document is to provide corridor-level data and context for the Congestion and Mobility elements of the Transportation 2040 Alternatives Analysis. Data provided in what PSRC has dubbed the "CMP corridors" include travel demand forecasts for the Transportation 2040 alternatives regarding vehicle and transit travel time impacts. This information is summarized for six of the twelve CMP corridors. These six corridors represent a sample set of the regional conditions, including at least one corridor in each of the four counties in the central Puget Sound region.

CMP Screening Process

Corridor-level analysis provides an opportunity to evaluate congestion and mobility issues in a more focused geography, supplementing information obtained at the regional and subarea levels. To identify congested locations, a screening process is used. This process starts with the region's Metropolitan Transportation System and then considers other multimodal and freight congestion information for the region. For this analysis, congestion issues are identified using the following data sources:

- Metropolitan Transportation System (MTS) definition
- Travel time data collected from state-owned loop detectors
- Highway Performance Monitoring System (HPMS) data
- Regional Traffic Operators input
- Regional Transit Agencies input
- Freight T1 and T2 route definitions

A description of each of these data sources follows.

¹ For more information about federal mandates on the Congestion Management Process, see the U.S. Department of Transportation website: <http://plan4operations.dot.gov/congestion.htm>.

Metropolitan Transportation System

The MTS consists of regionally significant multimodal transportation facilities and services that are crucial to the mobility needs of the region. The MTS serves as a planning tool used to identify regional transportation problems and analyze and develop regional solutions. It serves as a focus for required state and regional transportation system performance monitoring, particularly for the federally required CMP. *Figure 1* is a composite map of the existing MTS.

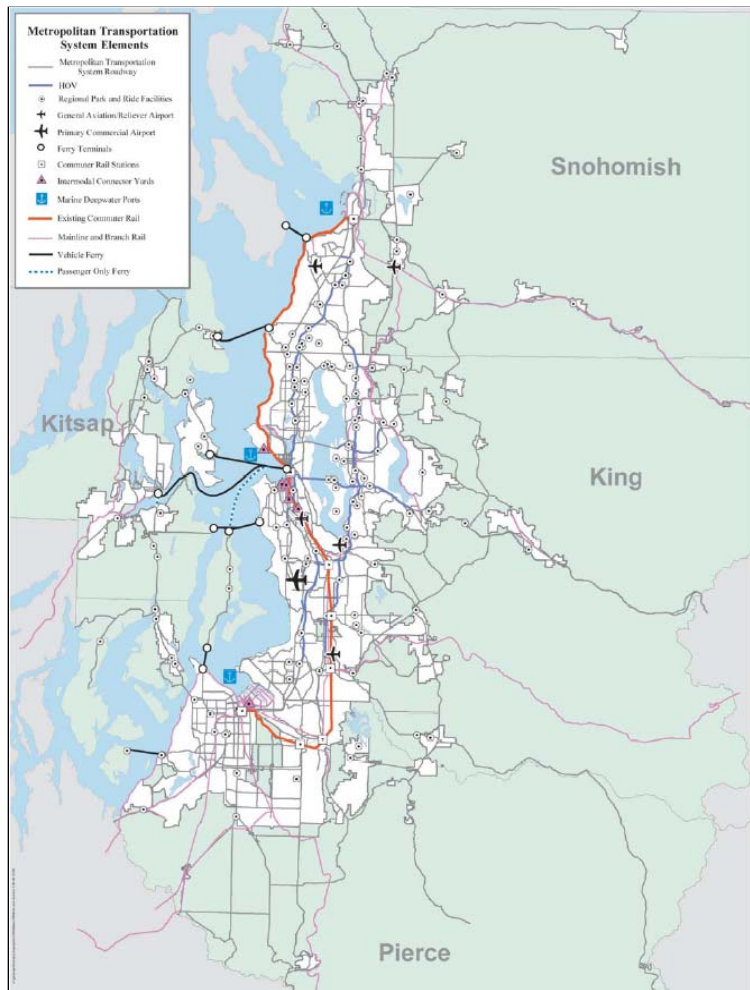
MTS facilities and services are defined functionally and geographically. A facility or service is part of the MTS if it provides access to any activities crucial to the social or economic health of the central Puget Sound region. Facilities that weave parts of the region together by crossing county or city boundaries are critical to the MTS. A more detailed description of the current MTS is available online at <http://www.psrc.org/projects/mtp/index2007.htm> (refer to the technical appendices).

Facilities in the MTS include those from the following seven transportation systems supported by Transportation System Management services²:

- Roadway System
- Ferry System
- Transit System
- Nonmotorized System
- Freight and Goods System
- Intercity Passenger Rail
- Regional Aviation

The CMP is required to identify a network from which to identify congested locations. The MTS is that network.

Figure 1: Existing Metropolitan Transportation System, 2006



² Services included in the MTS, unlike facilities, do not necessarily have a physical structure to them, but nevertheless are considered regionally significant. Services help provide access and improve overall system performance. These services are generally known as Transportation System Management, which includes intelligent transportation systems (ITS) and transportation demand management (TDM). ITS services help to optimize and integrate the operation of the multimodal transportation system, while TDM programs encourage people to make fewer single-occupancy vehicle trips.

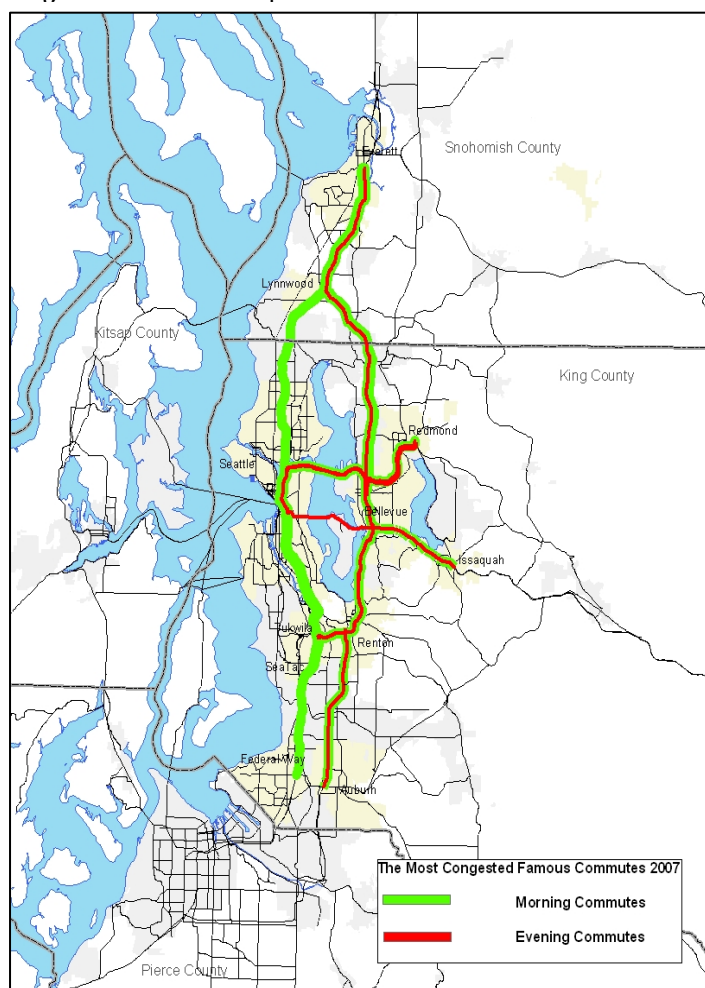
Travel Time Data

Most members of the traveling public are familiar with certain “famous commutes,” thanks to personal experience as well as the daily news. The first source of data for identifying congestion on the region’s transportation network relates to current travel time information. PSRC has identified the 10 worst morning and evening commutes (refer to *Figure 2* and *Table 1*) of the 52 commutes reported using the Washington State Department of Transportation’s (WSDOT) Maximum Throughput Travel Time Index (MT³I). Using this measure allows commutes of varying lengths to be compared to each other and ranked to determine the worst commutes in the region, according to travel time.

WSDOT monitors 52 commutes in King and Snohomish counties, of which 38 have been identified as commonly congested commute routes. These 38 routes are reported in WSDOT’s *The Gray Notebook*, a quarterly performance report that includes an annual congestion report each fall based on data from the previous calendar year³.

The basis of the WSDOT analysis measures is MT³I, which enables comparisons of travel times between routes of varying distances. For instance, the Bellevue to Seattle I-90 evening commute and the Issaquah to Seattle evening commute both have average travel times of 28 minutes. However, the first route is 11 miles long and the second is 15 miles long; using average travel times alone would not be a very meaningful comparison. By contrast, the MT³I value incorporates the expected travel time under maximum throughput conditions, which takes into account the length of the route. An MT³I of 1.0 would indicate a highway operating at maximum efficiency, and anything above that is working at lower efficiency due to congestion. As the MT³I value increases, travel time performance deteriorates. In this example, the Bellevue to Seattle I-90 evening commute has an MT³I of 2.23, which means that the commute route takes 123 percent longer than the time it would normally take at maximum throughput speeds. The Issaquah to Seattle evening commute has an MT³I of 1.54, which means that the commute will take 54 percent longer than the commute route would take at maximum throughput speeds. Therefore, the Bellevue to Seattle I-90 evening commute is considered the “worse” commute of the two.

Figure 2: WSDOT Top 10 Worst AM & PM Commutes



³ *The Gray Notebook*, November 2008 (online at <http://www.wsdot.wa.gov/NR/rdonlyres/BE788045-A653-4716-ACB2-5D78B4AA6F59/0/GrayNotebookSep08.pdf>).

Table 1: WSDOT Top 10 Worst AM & PM Commutes

Route Description	2006 MT ³ I Rank	Facilities	MT3I
Morning Commutes			
Tukwila to Bellevue	1	I-405	2.65
Lynwood to Bellevue	2	I-405	2.18
Seattle to Bellevue	3	I-5/SR 520/I-405	1.94
Everett to Bellevue	4	I-5/I-405	1.85
Federal Way to Seattle	5	I-5	1.8
Everett to Seattle	6	I-5	1.8
SeaTac to Seattle	7	I-5	1.77
Issaquah to Bellevue	8	I-90/I-405	1.62
Seattle to Redmond	9	I-5/SR 520	1.56
Auburn to Renton	10	SR 167	1.48
Evening Commutes			
Bellevue to Seattle	1	I-405/I-90/I-5	2.23
Redmond to Seattle	2	SR 520/I-5	2.13
Bellevue to Seattle	3	I-405/SR 520/I-5	2.11
Bellevue to Tukwila	4	I-405	2.08
Bellevue to Redmond	5	I-405/SR 520	1.88
Seattle to Bellevue	6	I-5/SR 520/I-405	1.77
Bellevue to Issaquah	7	I-405/I-90	1.74
Renton to Auburn	8	SR 167	1.74
Seattle to Redmond	9	I-5/SR 520	1.73
Bellevue to Lynwood	10	I-405	1.7

Highway Performance Monitoring System

In addition to travel time information, the HPMS provided by WSDOT is the first screening tool used to identify congestion locations on the MTS. Congested locations were selected that were operating at level of service (LOS) “E” or worse (refer to *Figures 3 and 4*). LOS “E” or worse roughly represents a facility with a volume-to-capacity (V/C) ratio of 0.9 or higher. This translates to stop-and-go conditions for the driver.

The HPMS LOS “E” threshold was used to identify congested segments in addition to the ones identified by the travel time criterion used in *The Gray Notebook*. It is important to note that all of the segments identified through the travel time screening were also captured by the HPMS LOS “E” threshold.

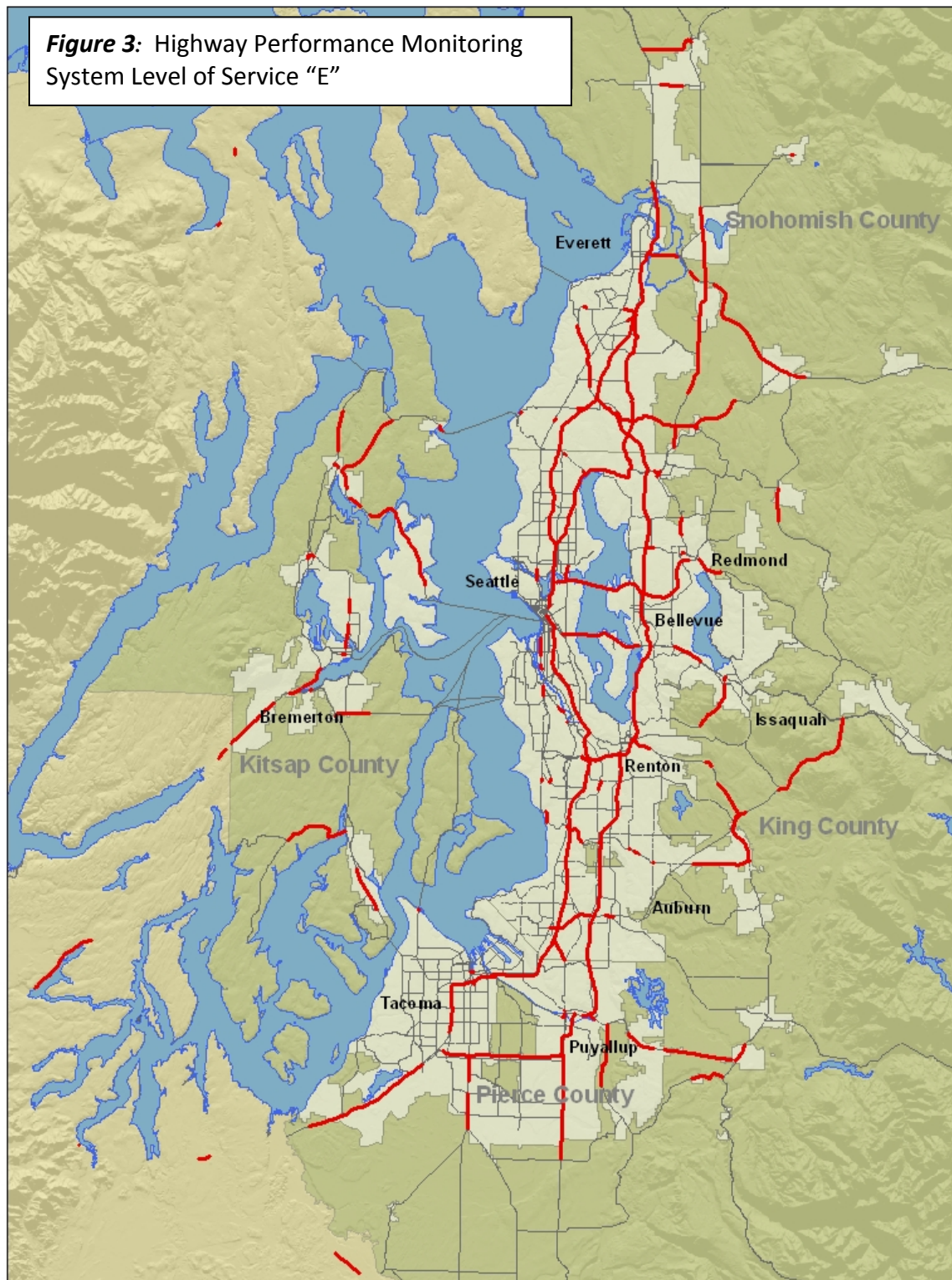


Figure 4: Other Commutes



Table 2: Other Commutes

Route	Start	End	Time
SR 522 to Marysville (SR 9)	SR 9 @ SR 522	SR 9 @ SR 528	PM
Sumner to Buckley (SR 410)	SR 410 @ SR 167	SR 410 @ SR 165	PM
Tacoma to Fort Lewis (SR 7)	SR 7 @ I-5	SR 7 @ SR 507	PM
Sumner to Buckley (SR 162)	SR 162 @ SR 410	SR 165 @ SR 410	PM
Seattle to Tacoma (I-5)	I-5 @ Terrace St	I-5 @ I-705	PM
Everett to Monroe (SR 2)	SR 2 @ I-5	SR 2 @ E Main St	PM
I-90 to Maple Valley (SR 18)	SR 18 @ I-90	SR 18 @ SE 240th St	PM
Auburn to Puyallup (SR 167)	SR 167 @ SR 18	SR 167 @ SR 161	PM
Tacoma to Fort Lewis (I-5)	I-5 @ I-705	I-5 @ 41st Division Dr	PM
Tacoma to SR 3 (SR 16)	SR 16 @ I-5	SR 16 @ SR 3	PM
Bainbridge Ferry to SR 3 (SR 305)	SR 305 @ Bainbridge Ferry	SR 305 @ SR 3	PM
Kingston Ferry to SR 305 (SR 307)	SR 104 @ Kingston Ferry	SR 307 @ SR 305	PM
Everett to Stanwood (I-5)	I-5 @ E Marine View Dr	SR 532 @ Old Pacific Highway	PM
I-5 to Puyallup (SR 512)	SR 512 @ I-5	SR 512 @ SR 167	PM
I-405 to Maple Valley (SR 169)	SR 169 @ I-405	SR 169 @ Witte Rd	PM
I-5 to Bothell (SR 522)	SR 522 @ I-5	SR 522 @ SR 527	PM
Monroe to Everett (SR 2)	SR 2 @ E Main St	SR 2 @ I-5	AM
Maple Valley to I-90 (SR 18)	SR 18 @ SE 240th St	SR 18 @ I-90	AM
Puyallup to Auburn (SR 167)	SR 167 @ SR 161	SR 167 @ SR 18	AM
Fort Lewis to Tacoma (I-5)	I-5 @ 41st Division Dr	I-5 @ I-705	AM
SR 3 to Tacoma (SR 16)	SR 16 @ SR 3	SR 16 @ I-5	AM
SR 3 to Bainbridge Ferry (SR 305)	SR 305 @ SR 3	SR 305 @ Bainbridge Ferry	AM
SR 305 to Kingston Ferry SR 307	SR 307 @ SR 305	SR 104 @ Kingston Ferry	AM
Stanwood to Everett (I-5)	SR 532 @ Old Pacific Highway	I-5 @ E Marine View Dr	AM
Puyallup to I-5 (SR 512)	SR 512 @ SR 167	SR 512 @ I-5	AM
Maple Valley to I-405 (SR 169)	SR 169 @ Witte Rd	SR 169 @ I-405	AM
Bothell to I-5 (SR 522)	SR 522 @ SR 527	SR 522 @ I-5	AM
Marysville to SR 522 (SR 9)	SR 9 @ SR 528	SR 9 @ SR 522	AM
Buckley to Sumner (SR 410)	SR 410 @ SR 165	SR 410 @ SR 167	AM
Fort Lewis to Tacoma (SR 7)	SR 7 @ SR 507	SR 7 @ I-5	AM
Buckley to Sumner (SR 162)	SR 165 @ SR 410	SR 162 @ SR 410	AM
Tacoma to Seattle (I-5)	I-5 @ I-705	I-5 @ Terrace St	AM

Congestion on Arterials – Traffic Operators Input

Because it is difficult to obtain consistent performance data on arterials, the CMP corridor analysis uses a list of key arterials developed through a recent project that evaluated arterial signal coordination, with considerations for transit/emergency management and freight movement. This project, the Regional Intelligent Transportation System Implementation Strategy (RITSIP), identified a list of key arterials.

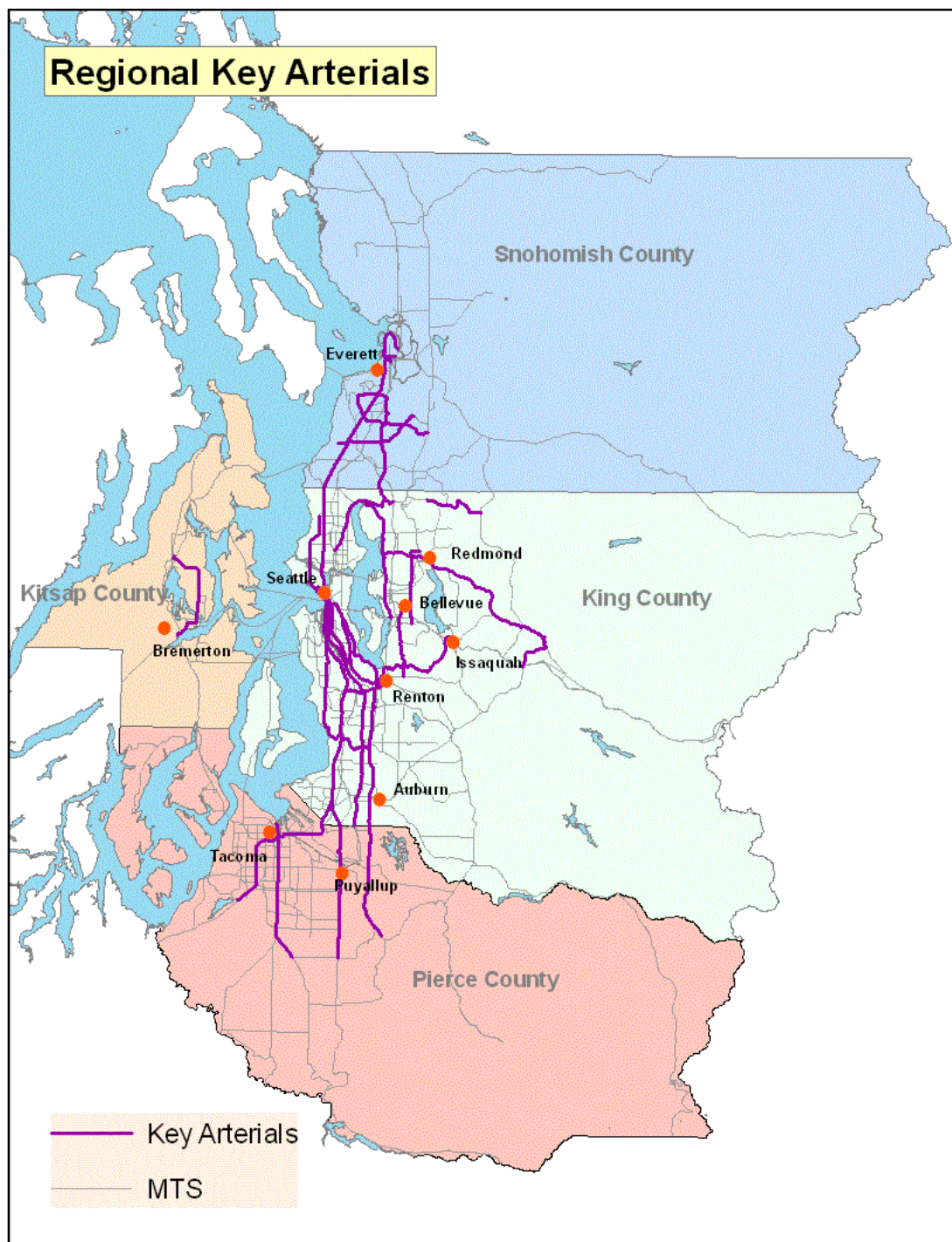
The criteria used to identify these key arterials included V/C ratio, redundancy, presence of transit routes and freight routes, as well as ability to serve as an alternate route to the interstate. These criteria go beyond existing congestion to identify key regional corridors that need to operate efficiently to serve day-to-day traffic, transit, freight, and emergency management. Because these key arterials have been prioritized on a regional scale, they provide another important resource for the CMP corridor analysis.

The RITSIP identified 135 key corridors within the four-county region. Of the 135 corridors identified, 15 in King County, 4 in Pierce County, 5 in Snohomish County, and 1 in Kitsap County were identified as the top 25 arterial corridors in the region (refer to *Table 3* and *Figure 5*). All 135 corridors are identified in Transportation 2040 as key ITS corridors.

Table 3: Regional ITS Implementation Plan Key Corridors (last updated November 5, 2008)

No.	County	Road Name	Start
K22	King	1st Avenue N / 1st Avenue / 1st Avenue S / Myers Way S / 1st Avenue S / SR509 / S 216th / SR516 / South Kent Des Moines Road / West Willis Street	Mercer Street
K17	King	SR99/Aurora Avenue N	Sno/King County Line
K25	King	S Jackson Street/Rainier Avenue South	4th Avenue South
K20	King	4th Avenue / 4th Avenue S / East Marginal Way South / Interurban Avenue South / West Valley Highway / SR181 / 68th Avenue South/West Valley Highway	Denny Way
P6	Pierce	Pacific Avenue / SR7	Stadium Way
K29	King	Greenwood Avenue N / Holman Road NW / 15th Avenue NW / 15th Avenue W / Elliot Avenue W	NE 145 th St/SR 523
S6	Snohomish	SR 99	Everett Station
K10	King	Central Way / NE 85th Street / Redmond Way / SR 202	Market Street
K12	King	68th Avenue NE / NE 170th Street / Simonds Road NE / 100th Avenue NE / 98th Avenue NE / Market Street / Central Way / Lake Street S / Lake Washington Boulevard NE / Bellevue Way NE / SR908	SR522/NE Bothell Way
K16	King	S 2nd, S 3rd St/Houser Way, Bronson Way/Sunset Boulevard NE/SR 900/17th Ave NW	SR167
K27	King	SR 522	I-405
P8	Pierce	SR99 / South Tacoma Way/Pacific Way SW/ Gravelly Lake Road SW	King County Line
K5	King	NE 90th / 148th Avenue NE/ 150th Ave SE	SR 202
S9	Snohomish	SR527	I-5
K23	King	S 154th/Southcenter Boulevard /Grady Way /Main Avenue S	SR99
P3	Pierce	Auburn Ave./ A Street NE/E Valley Highway/ SR162	Auburn Way
K58	King	Lind/ SW 16th/ E Valley Highway / E Valley Road / 84th Avenue S / Central Way / Central Avenue / Auburn Way	Grady Way
S4	Snohomish	Marine View Drive / SR529 / Everett Avenue	I-5
P1	Pierce, King	16th Ave S/SR161 / Enchanted Parkway South / Meridian Avenue E	SR99
K1	King	Woodinville Duval Road	SR522
S11	Snohomish	168th St SW/44th Ave W/164St SW/Seattle Hill Road	Olympic View Dr.
KT1	Kitsap	SR304/ SR303	SR3
S10	Snohomish	Airport Road / 128th Street SW / SR96/Cathcart Way	SR526
K70	King	Airport Way S	4th Ave South
K14	King	Richards Road SE / Factoria Boulevard SE / Coal Creek Parkway SE / Duval Avenue NE / 138th Avenue SE	Lake Hill Connector

Figure 5: Top 25 Key Arterials (RITSIP)



Congestion – Transit Operators Input

Locations of transit congestion will be evaluated through the CMP. A method was designed to mirror the process used to identify congested corridors on the State Highway network: monitoring information. Since most transit routes are on arterials without the centralized traffic monitoring data available to WSDOT (e.g., I-5, SR 520), a modified approach was developed to identify locations of transit congestion, initially focusing on transit routes operating on freeway locations that WSDOT identified as most congested. Similar data is not available for arterials where most transit routes operate.

Through the Transit Concepts Group, a working group of six transit agencies plus the City of Seattle, PSRC solicited identification of corridors where the transit agencies experience congestion. It became clear that prior to identifying corridor congestion, the group needed to identify the types of transit congestion they were experiencing. With the perspective that transit congestion is anything that results in longer travel times in the peak hour versus the non-peak midday hour, the Transit Concepts Group came up with the following definitions:

- General roadway congestion – Transit vehicles trapped in general roadway congestion.
- Re-entry congestion – Transit vehicles stopped at station pullouts and unable to re-enter general purpose travel lanes due to roadway congestion.
- High-volume loading congestion – Loading congestion with high volume of customers (peak hour – standing room only, bus bypass, etc.) causing longer vehicle dwell times at stops and stations.
- Mobility device loading congestion – Loading congestion due to customers with mobility devices requiring special loading or securing (wheelchairs, lift use, bicycles, etc.).

As a result, a travel corridor could be classified as transit-congested at peak hour based on operator experience.

Through their long-range planning processes, transit agencies have identified locations of transit congestion and planned improvements for routes. PSRC collected the routes listed in the long-range plans of PSRC's Transportation Operators Committee members:

- King County Metro (*existing projects: Transit Now's Rapid Ride BRT, Partnership hours*)
- Sound Transit (*ST2*)
- Community Transit (*SWIFT BRT*)
- Pierce Transit (*SR 7/Pacific Avenue, SR 99, SR 161*)
- Everett Transit (*SWIFT BRT on SR 99 N*)
- Kitsap Transit (*SR 303/305 BRT Lite*)
- City of Seattle Monorail and Streetcar (*UVTN*)
- Washington State Ferries (*Bremerton and Bainbridge Island Routes*)
- Pierce County Ferries
- King County Ferries

A new analytical tool, the Transit Competitive Index (TCI), was used to evaluate the five Metropolitan Cities (as designated in VISION 2040). The TCI, which was developed by PSRC in spring 2008, evaluates the transit travel demand for a select Origin-Destination pair or group of pairs based on the level of congestion on the existing roadway network independent of the existing transit service network. For

an evaluation of the five Metropolitan Cities, the TCI was used to determine transit travel patterns and identify gaps in travel demand based on the types of transit service currently provided.

The TCI findings showed the following travel patterns:

- Seattle and Bellevue are the major regional work destinations.
- Everett, Bremerton, and Tacoma are work destinations only for adjacent cities.
- Strong single-employer group destinations:
 - Naval Shipyards, Seattle-to-Bremerton shipyards
 - Boeing/Paine Field
 - Microsoft in Redmond/Overlake (Microsoft Connector service)

The following gaps in existing transit service were identified:

- The reverse commute of NW Seattle to Bellevue and Redmond
- The reverse commute of West Seattle to Bellevue and Redmond
- The strong north-south work commute and other travel demand along the east side of Lake Washington

The Transit Congested Corridor List started with the identified congested roadway corridors with transit operations, and then added the congested transit corridors identified by the transit agencies, along with adding the corridors identified by the gaps in existing service. The list was then geographically balanced by adding a corridor from all four counties and at least one corridor from each transit agency. The resulting list is the Transportation 2040 and CMP list of congested transit corridors displayed in *Figure 6*.

Figure 6: Congested Transit Corridors



Regional Freight Movement

The Washington State Freight and Goods Transportation System (FGTS) classifies state highways, county roads, and city streets according to the average annual gross truck tonnage carried. WSDOT, with the assistance of the Association of Washington Cities (AWC) and the County Road Administration Board (CRAB), updates the FGTS classifications on a periodic basis as required by the Washington State Legislature.

The FGTS provides an estimate of the highways and roadways most heavily used by trucks. It is used to establish funding eligibility for Freight Mobility Strategic Investment Board (FMSIB) grants, support Highways of Statewide Significance designation, fulfill federal reporting requirements, and support planning for pavement needs and upgrades.

The FGTS classifies roadways using five freight tonnage classifications⁴, T-1 through T-5, as follows:

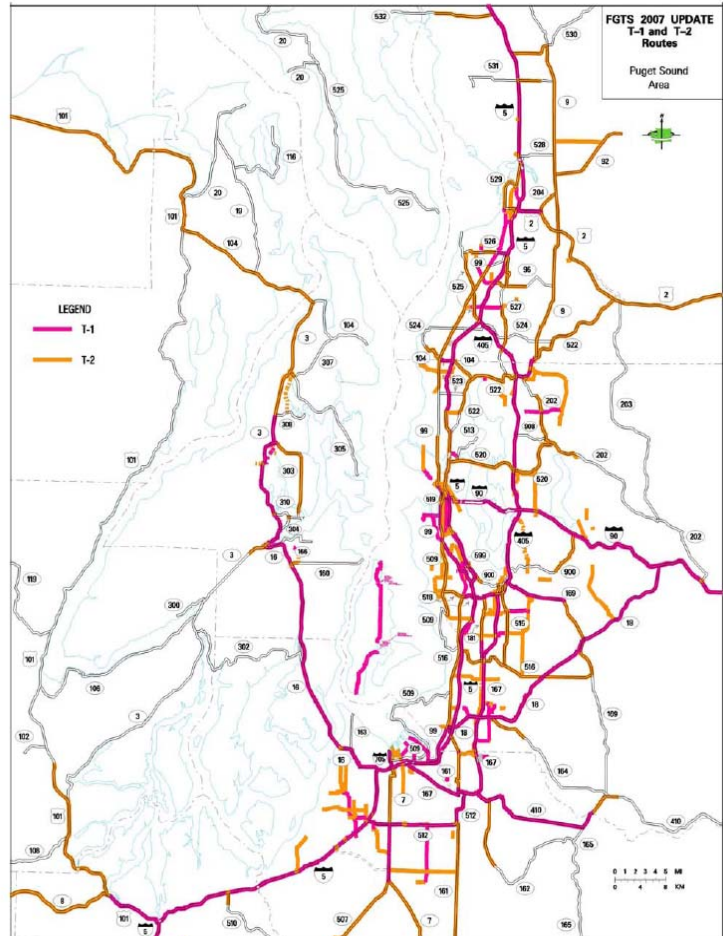
- T-1= more than 10 million tons per year
- T-2 = 4 million to 10 million tons per year
- T-3 = 300,000 to 4 million tons per year
- T-4 = 100,000 to 300,000 tons per year
- T-5 = at least 20,000 tons in 60 days

Washington's Strategic Freight Corridors are currently defined as those routes that carry four million or more gross tons of freight annually (T-1 and T-2). Tonnage values are derived from actual or estimated truck traffic count data that are converted into average weights by truck type.

Cars and trucks operate differently on Puget Sound's freeways. In general, trucks travel at lower speeds because they accelerate and decelerate more slowly than cars and occupy the outer lanes, mixing with merging traffic. In 2006, slightly over 135,000 truck trips were made daily, representing between 3 and 9 percent of vehicle volumes on different freeways. The average truck speeds were between 0.2 miles per hour (0.3 percent) and 12.8 miles per hour (20 percent) slower than cars. The difference in speeds varies widely by time of day, selected facility, and congested direction.

The T-1 and T-2 routes shown in *Figure 7* are identified as part of the regional MTS and included in CMP monitoring.

Figure 7: Central Puget Sound T1 and T2 Freight Routes



⁴ Washington State Freight and Goods Transportation System (FGTS) 2007 Update, Washington State Department of Transportation, 2008.

CMP Corridors

Six subareas were sorted into twelve corridors (refer to *Figures 8 and 9 and Table 4*), based on the evaluation process previously described. For the Congestion and Mobility Report issued as part of the Alternatives Analysis, vehicle and transit travel time analyses have been performed on six of the twelve corridors. Additionally, this report includes a list of the key mobility projects tested in each of the alternatives. Maps containing vehicle and transit travel times, as well as a list of projects by alternative, can be found in each corridor section. The twelve CMP corridors are as follows:

1. Kitsap – SR 3, SR 303
2. North Seattle – I-5, SR 99, Greenwood/15th, Roosevelt, Lake City Way
3. Eastside – I-405, SR 522, Coal Creek Parkway, SR 900, 148th, Lake WA Blvd
4. Southeast King – SR 169, SR 164, SR 18
5. Pierce West – SR 512, I-5S, SR 7, SR 167, Meridian, S. Tacoma Way
6. West Snohomish – I-5, SR 99
7. East Snohomish – SR 9, SR 2
8. Cross-Sound – Ferries, Tacoma Narrows Bridge
9. Cross Lake – SR 520, I-90
10. Outer Northeast King – SR 202, I-90
11. South King County – I-5, SR 99/Pacific Hwy, SR 509, SR 518, SR 167, West Valley, Auburn Way, Meridian
12. Pierce East – SR 162

Roadways may be included in more than one corridor for portions of I-5, which is represented in the Pierce West, South King, North Seattle, and West Snohomish corridors. As each corridor is discussed, the portion of roadway relevant to that corridor will be addressed.

For each CMP corridor there is a description of the corridor, a description of proposed projects reflected in the Transportation 2040 Alternatives Analysis, and forecast travel time for transit and vehicles identified through the Transportation 2040 Alternatives Analysis.

Figure 8: CMP Subareas and Corridors

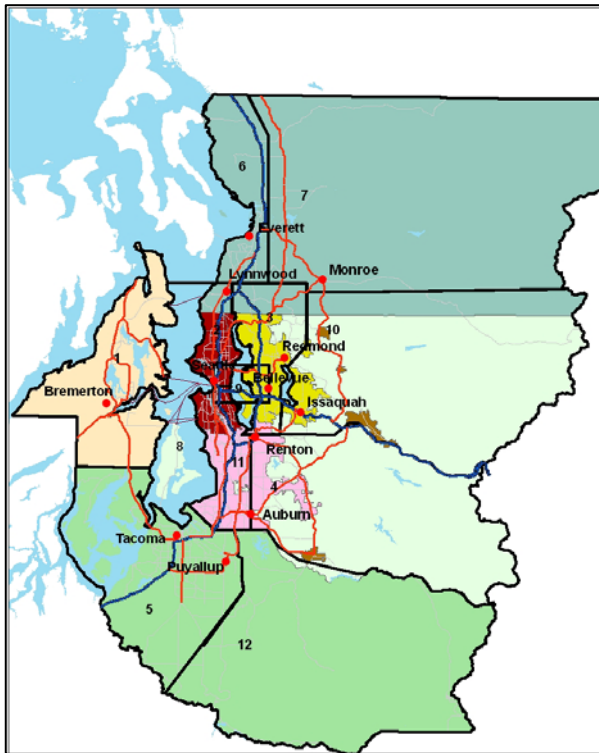


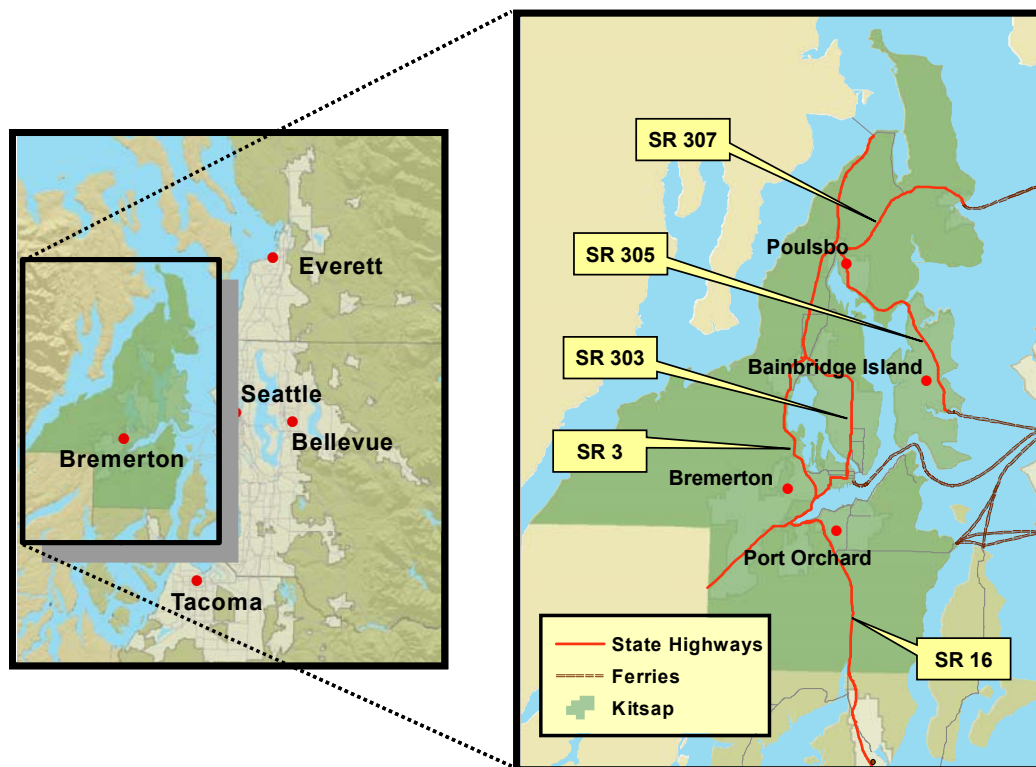
Figure 9: CMP Corridors



Table 4: CMP Corridors by Subarea

Snohomish County Subarea	South King County Subarea
Corridors within the Subarea:	Corridors within the Subarea:
o West Snohomish	o SE King
o East Snohomish	o South Seattle
o Portions of North Seattle, Eastside and Outer Eastside	o Cross Sound
o Cross Sound	
	Seattle/SeaShore Subarea
Pierce County Subarea	Corridors within the Subarea:
Corridors within the Subarea:	o North Seattle
o West Pierce	o South Seattle
o East Pierce	o Cross Lake
o Cross Sound	o Cross Sound
East King County Subarea	Kitsap County Subarea
Corridors within the Subarea:	Corridors within the Subarea:
o SE King	o Kitsap
o Outer Eastside	o Cross Sound
o Eastside	
o Cross lake	

Kitsap County CMP Corridor



Corridor Description

The Kitsap Corridor encompasses all of Kitsap County. Kitsap County is located west of Puget Sound on the Kitsap Peninsula. The corridor is bordered to the west by Hood Canal, to the east by Puget Sound, and to the south by Pierce and Mason counties.

Kitsap County has a combination of urban, suburban, and rural areas. Bremerton is the major population center in Kitsap County and is also a designated regional growth center. There is a variety of suburban

and rural communities as well, including Bainbridge Island, Kingston, Port Orchard, Poulsbo, and Silverdale.

The corridor includes industrial activity centers and other major trip generators that affect travel patterns. Industrial activity centers in the corridor include the Puget Sound Naval Shipyard, which is located in Bremerton, and the Bangor Naval Base, which is located in the northern part of the county, west of Poulsbo. Ferry terminals at Bainbridge Island, Bremerton, Kingston, and Southworth are major multimodal transfer points and link Kitsap County with King and Snohomish counties.

Major Employers:

- U.S. Navy
- Harrison Medical Center
- Public School Districts
- Olympic College
- Kitsap County

Regional Growth Centers:

- Bremerton
- Silverdale

Manufacturing/Industrial Centers:

- South Kitsap Industrial Area

Roadways: Based on 2006 HPMS data, the following roadways are functioning at LOS “E”:

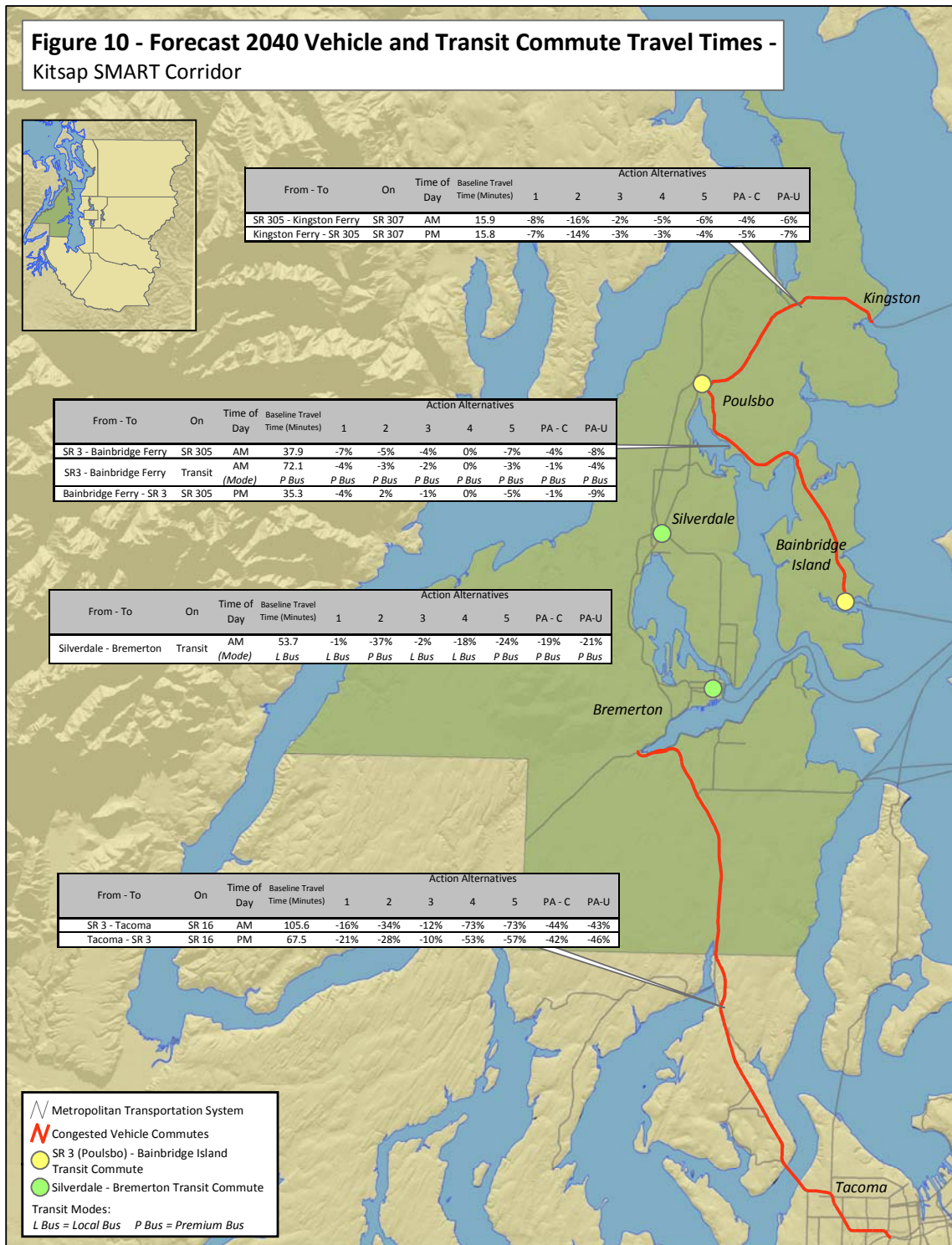
- SR 3 from the county line through Gorst and SR 16 to SR 310
- Segments of SR 303 from SR 304 to NE Waaga Way
- The intersection of SR 3 and SR 303
- SR 305 from the Bainbridge Ferry through Agate Pass to SR 307
- Segments of SR 307 from the Kingston Ferry to the SR 305
- Segments of SR 3 between SR 305 and the Hood Canal Bridge

The following arterial was identified by the Regional Traffic Operators Committee as a key arterial for freight, transit, high V/C ratio, and alternate route to the interstate:

- SR 304/303 from SR 3 to the Bremerton Ferry Terminal (KT 1)

Kitsap Corridor –Transportation 2040 Conditions

The following map details travel times by commute and mode.



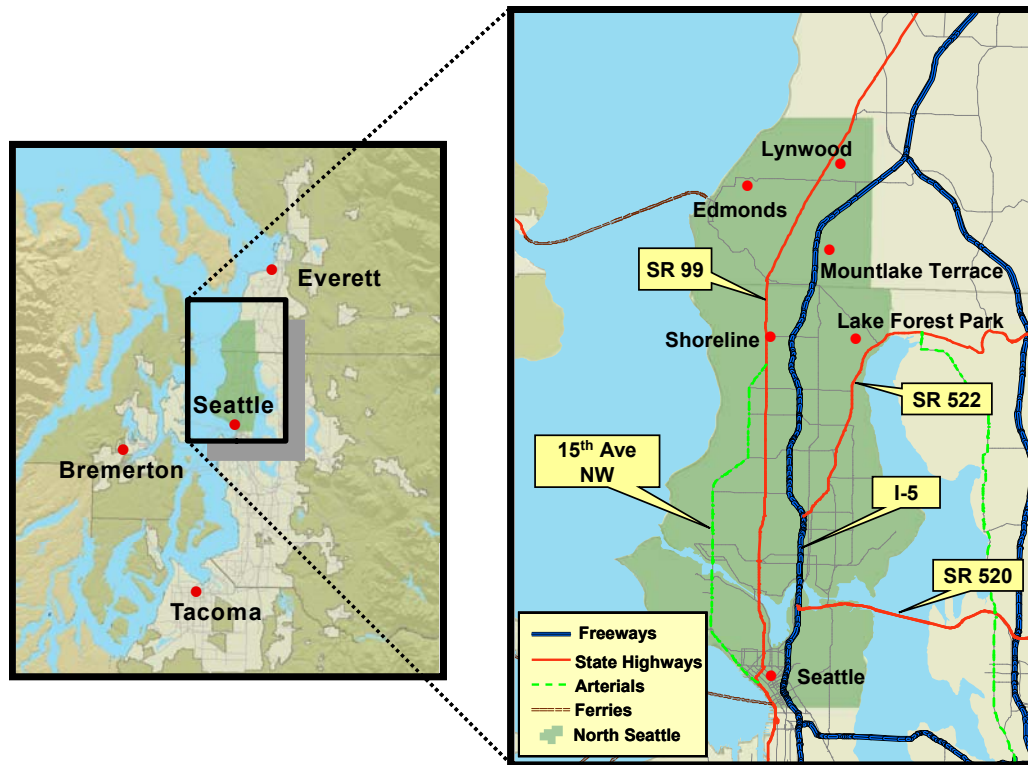
Kitsap Corridor—Transportation 2040 Forecast Conditions Discussion

Generally, all selected vehicle and transit commutes show reduced or comparable travel times in the action alternatives relative to the 2040 Baseline. Alternative 2 shows the best travel time improvement in the SR 307 vehicle commute and Silverdale to Bremerton transit commute, while Alternative 5 shows the best travel time improvements in both directions of the SR 16 Bremerton to Tacoma vehicle commute and the second best improvement in the Silverdale to Bremerton AM transit commute. With the exception of the morning SR 3 to Tacoma vehicle commute, the unprogrammed Preferred Alternative produces greater travel time savings than the financially constrained Preferred Alternative in the Kitsap SMART corridor. The return commute from Tacoma to SR 3 in the PM period shows the largest vehicle travel time savings, with a 46 percent travel time reduction.

The Preferred Alternative produces transit travel times that are relatively consistent with those shown for the preliminary action alternatives, with the Silverdale to Bremerton morning commute producing the largest transit travel time reduction.

Overall, these selected travel times suggest that all alternatives would decrease roadway congestion in the Kitsap corridor relative to the Baseline; however, the Preferred Alternative generally outperforms the five preliminary action alternatives. The travel times also suggest that, relative to the Baseline, roadway travel time improvements help to decrease transit congestion in all action alternatives in this corridor.

North Seattle CMP Corridor



Corridor Description

The cities of Seattle (north of downtown), Shoreline, Lake Forest Park, Montlake Terrace, Edmonds, and Lynnwood make up this corridor. Most of the land use is urban or suburban in nature. Major commercial/retail centers exist in downtown Seattle and many of its neighborhood community centers, such as Northgate, University District, West Seattle, Queen Anne/Seattle Center, and Beacon Hill. Other major trip generators in the corridor include the University of Washington, Seattle University, Seattle Pacific University, North Seattle Community College, Central Seattle Community College, many hospitals, and special events that occur at Seattle Center.

Major Employers:

- Children's Hospital
- UW
- Swedish
- City of Seattle
- King County
- Port of Seattle
- Group Health
- Providence Health
- Harborview Hospital

Regional Growth Centers:

- Seattle – Downtown/First Hill – Capitol Hill/University Community/Uptown Queen Anne/South Lake Union/Northgate
- Lynnwood

Manufacturing/Industrial Centers:

- Ballard-Interbay

Roadways: Based on 2006 HPMS data, roadways functioning at LOS “E” and/or key arterials include the following:

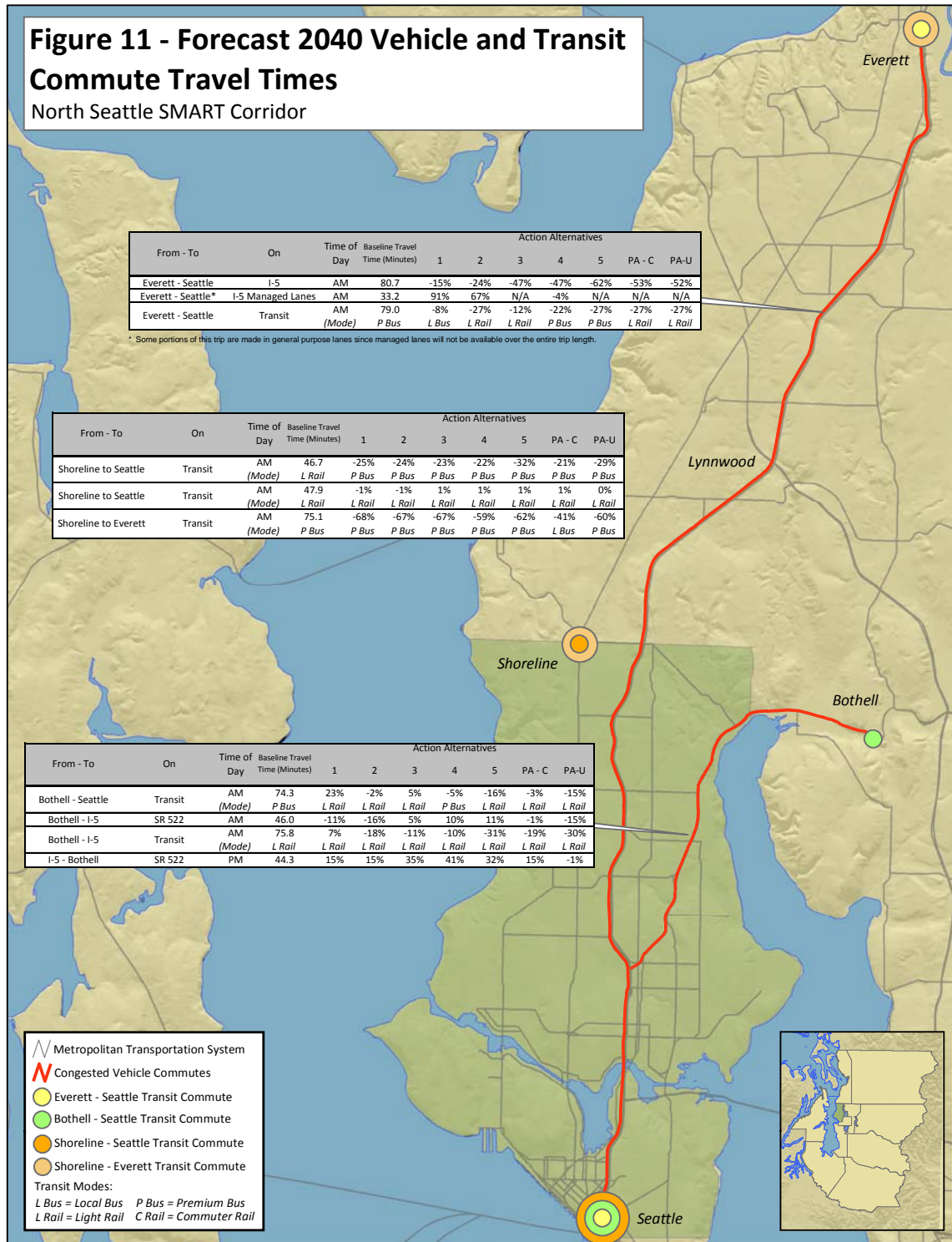
- I-5 from Seattle to Lynnwood
- SR 99 as an alternative route to I-5; congested segments near the Snohomish County line and the Aurora Bridge
- Greenwood and 15th Avenue NW north/south corridor from Seattle to NE 145th Street in Shoreline west of I-5
- Lake City Way (SR 522) from I-5 in Seattle to Bothell

The following arterials were identified by the Regional Traffic Operators Committee as key arterials for freight, transit, high V/C ratio, and alternate routes to the interstate:

- SR 99 (K17): between the Snohomish/King County line and the Pierce/King County line
- 1st Avenue N/1st Avenue/1st Avenue S/Myers Way S/1st Avenue S/SR 509/S 216th/SR 516/S Kent Des Moines Road/W Willis Street (K22): between Mercer Street (in Seattle) and Central Avenue S (in Kent). This corridor is primarily in the South King Corridor but a portion is in the North Seattle Corridor.
- SR 522 (K27): between I-405 and I-5
- Greenwood Avenue N/Holman Road NW/15th Avenue W/Elliott Avenue W (K29): between NE 145th Street/SR 523 and SR 99
- SR 99 (S6): between Everett Station and Snohomish King County line

North Seattle Corridor –Transportation 2040 Conditions

The following map details travel times by commute and mode.



North Seattle Corridor—Transportation 2040 Forecast Conditions Discussion

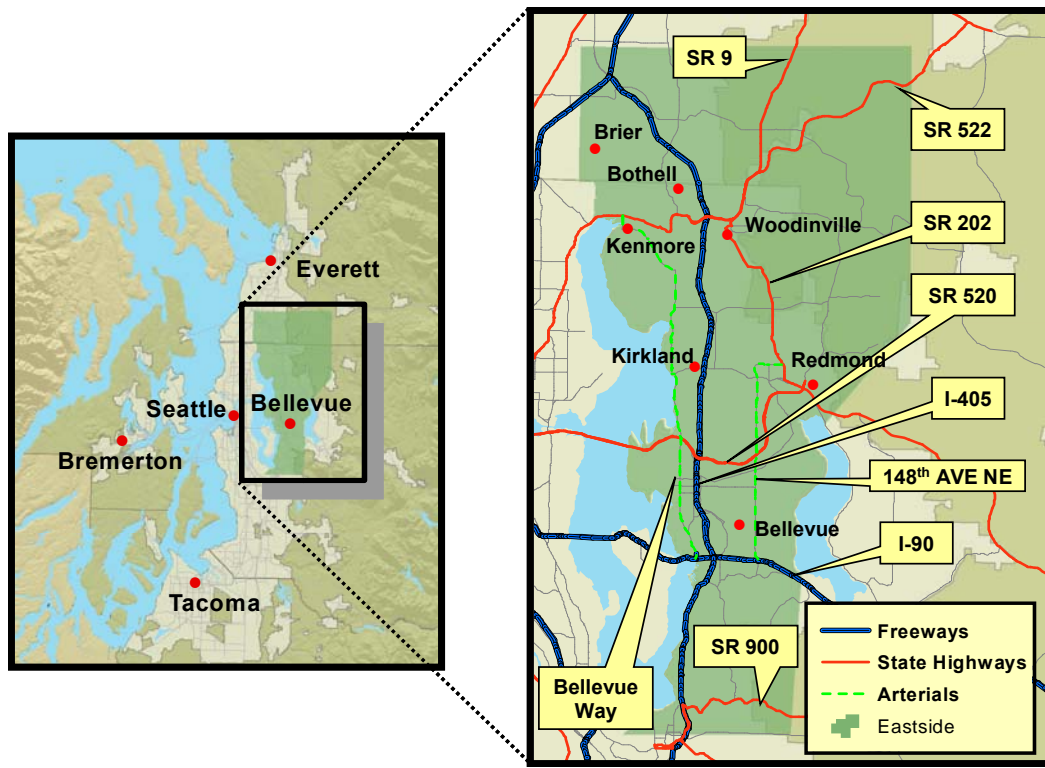
The travel time results are more varied in this corridor than in the Kitsap corridor. For trips in general purpose (GP) lanes, the Everett to Seattle AM commute shows the most significant travel time improvement relative to the Baseline of all vehicle travel times in the North Seattle SMART Corridor, with Alternative 5 showing the most improvement. The travel times on SR 522 from Bothell to I-5 in the AM also decrease relative to the Baseline, with the transit commutes showing the same or larger improvement compared to the vehicle trip in all action alternatives with the exception of Alternative 1. In the reverse direction (in the PM), the vehicle travel time increases in all action alternatives except the unprogrammed element of the Preferred Alternative.

The I-5 southbound AM managed lane travel times decrease in Alternative 4 relative to the Baseline but increase substantially in Alternatives 1 and 2. The increases are expected given the high-occupancy vehicle (HOV) lane restriction to vehicles with three or more passengers in the Baseline and the conversion of HOV to high-occupancy toll (HOT) operations that allow single-occupant vehicles (SOVs) to buy into managed lanes in Alternatives 1 and 2. The resulting managed lane travel times in those alternatives are closer to the GP travel times along the same facilities. Recalling that Alternatives 3, 5, and the Preferred Alternative have no managed lanes, HOVs and buses would share the GP lane travel time reduction shown by these alternatives.

Transit travel times improve or remain relatively consistent for commutes in all alternatives relative to the Baseline except for commutes with a Bothell terminus, which show travel time increases in Alternative 1 and in the Bothell to Seattle commute in Alternative 3. The Preferred Alternative, in most cases, performs comparably to or better than the five preliminary action alternatives. The forecasts show significant bus travel time reductions in the Shoreline-Seattle transit option in all alternatives, while the same commute using light rail shows little variation (as expected). The Everett-Seattle transit travel times show a decrease compared to the Baseline for all action alternatives, with the Preferred Alternative providing benefits comparable to those seen in Alternatives 2 and 5. In the SR 522 corridor out to Bothell, light rail improvements produce moderate to significant transit travel time reductions; however, vehicle commutes show mixed results, with the unprogrammed Preferred Alternative producing the only travel time reductions across all action alternatives.

The selected commutes in this corridor generally suggest that the all action alternatives, including the Preferred Alternative, improve roadway and north-south transit congestion in the I-5 corridor relative to the Baseline, with Alternative 5 and the Preferred Alternative showing the highest or close to the highest improvements of all commutes.

Eastside CMP Corridor



Corridor Description

The Eastside corridor encompasses many suburban cities, including Bellevue, Bothell, Issaquah, Kenmore, Kirkland, Redmond, Sammamish, Mercer Island, Newcastle, and Woodinville. The corridor also includes smaller suburban and rural communities, as well as some portions of unincorporated suburban and rural King County. The corridor includes major commercial/retail centers and other major trip generators, which affect travel patterns. Major commercial/retail centers are located in downtown Bellevue adjacent to I-405 and in the Overlake/Crossroads area of Bellevue and Redmond. Trip generators include Microsoft Corporation, Eddie Bauer, T-Mobile, Puget Sound Energy, and Overlake Hospital. The Overlake/Crossroads area is located east of downtown Bellevue and is near the east end of SR 520. Other major trip generators in the corridor include Bellevue Community College, hospitals, and many other medium-sized commercial/retail centers.

Regional Growth Centers:

- Downtown Bellevue
- Totem Lake - Kirkland
- Lynnwood
- Bothell - Canyon Park
- Redmond
- Overlake

- Renton

Major Employers:

- Microsoft
- Evergreen Hospital
- City of Bellevue
- Costco
- Overlake Hospital
- Puget Sound Energy
- Bellevue Community College

Roadways: Based on 2006 HPMS data, the roadways functioning at LOS “E” and/or those identified as key arterials include the following:

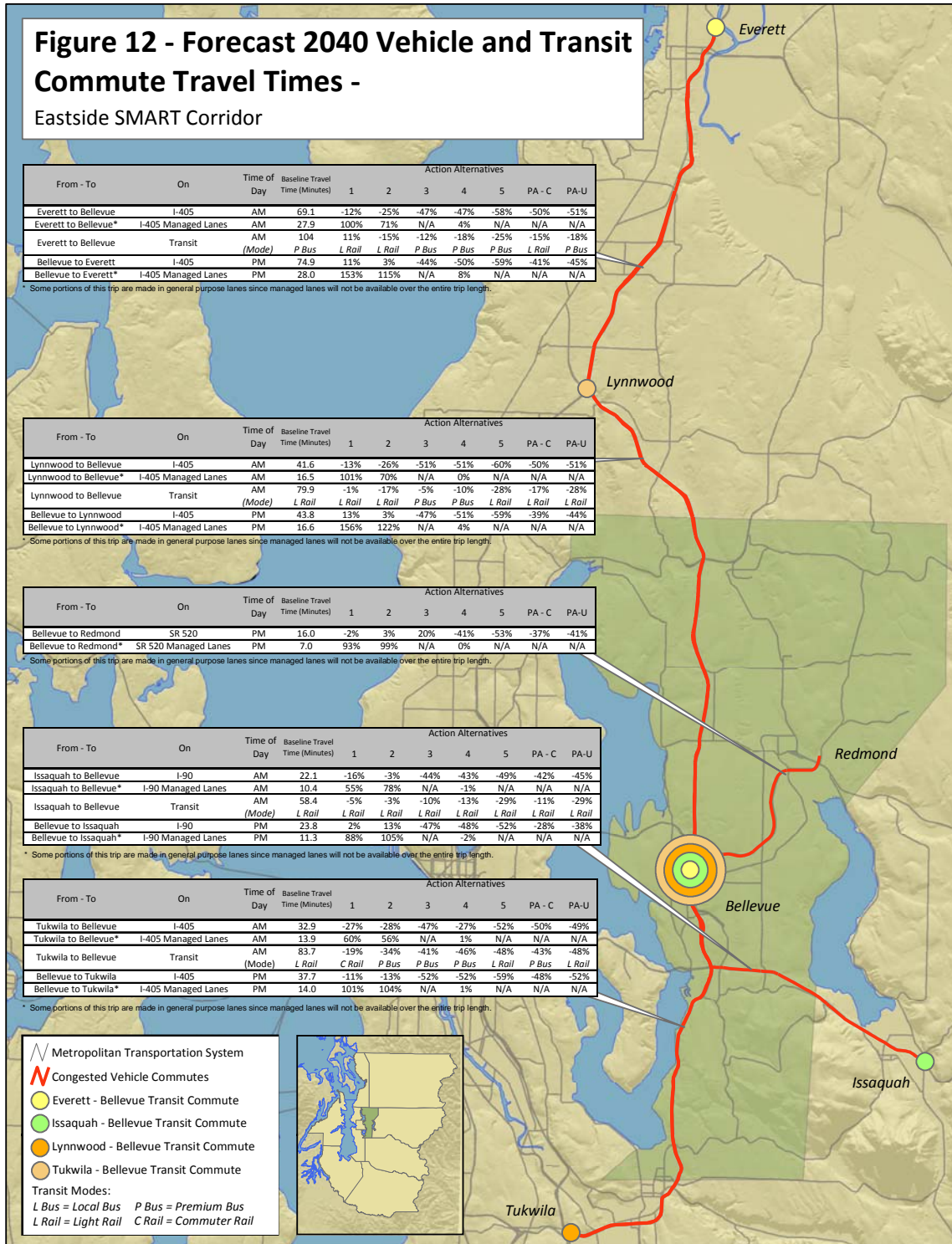
- I-405 from Renton to Lynnwood
- 148th Avenue NE between I-90 and SR 908 (Redmond-Fall City Road) – provides access to Microsoft Campus
- SR 522 from Lake City to I-405 – an alternate to SR 520 and I-90 cross-lake commute
- SR 520 from Bellevue to Redmond
- Lake Washington Boulevard – an alternate arterial route to I-405
- Coal Creek Parkway – an alternate arterial route to I-405 south of I-90 to SR 900
- SR 900 between Renton and Issaquah – an alternate route to I-405/I-90

The following arterials were identified by the Regional Traffic Operators Committee as key arterials for freight, transit, high V/C ratio, and alternate routes to the interstate:

- SR 522 (K27): Between I-405 and I-5
- 68th Avenue NE/NE 170th Street/Simonds Road NE/100th Avenue NE/NE 120th Place/
98th Avenue NE/Market Street/Central Way/Lake Street S/Lake Washington Boulevard NE/
Bellevue Way NE (K12): Between SR 522/NE Bothell Way and I-90
- NE 90th/148th Avenue NE (K5): Between SR 202 and Newport Way
- Central Way/NE 85th Street/Redmond Way/SR 202 (K10): Between Market Street and I-90
- Richards Road SE/Factoria Boulevard SE/Coal Creek Parkway SE/Duvall Avenue NE/
138th Avenue SE (K14): Between Lake Hill Connector and NE 4th Street
- S. 2nd Street, S 3rd Street/Houser Way, Bronson Way/Sunset Boulevard NE/Rainier Avenue S/
Airport Way S/Logan Avenue S/SR 900/17th Avenue NW/NW Sammamish Road/SE 56th Street
(K16): Between SR 167 and East Lake Sammamish Parkway
- NE Woodinville Duvall Road (K1): Between SR 522 and SR 203
- S Jackson Street/Rainier Avenue S (K25): Between 4th Avenue S and Grady Way
- SR 527 (S9): Between I-5 and SR 522 in Bothell

Eastside –Transportation 2040 Conditions

The following map details the travel times by commute and mode.



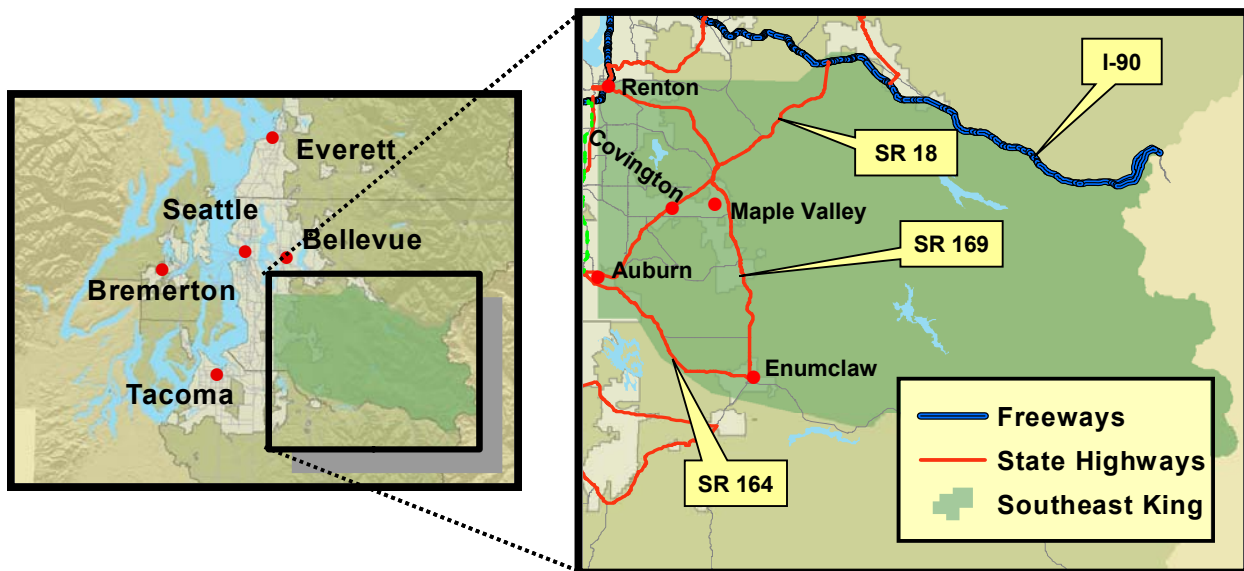
Eastside Corridor—Transportation 2040 Forecast Conditions Discussion

In the Eastside SMART Corridor, Alternatives 4 and 5 consistently show large GP travel time reductions relative to the Baseline across all commutes, with the Preferred Alternative performing not as well but comparably. Alternatives 1 and 2 consistently show the least improvement relative to the Baseline or actually forecast travel time increases.

Similar to the North Seattle Corridor, managed lane travel times consistently increase substantially relative to the Baseline for Alternatives 1 and 2 but decrease slightly in Alternative 4. Once again, this is an expected outcome of allowing SOVs to buy in to the HOT lanes in Alternatives 1 and 2, which in this analysis results in aligning the managed lane travel times more closely to the parallel GP travel times. In Alternatives 3 and 5, HOVs would see the same travel time reductions relative to the Baseline as the GP lanes. These reductions are substantial, except for the Bellevue to Redmond PM commute on SR 520, where Alternative 3 shows a travel time increase.

Transit travel times improve relative to the Baseline across all commutes and alternatives, except for Alternative 1, which shows an increase in travel time in the Everett to Bellevue AM commute and an insignificant decrease in the Lynnwood to Bellevue AM commute along I-405. For the most part, the Preferred Alternative mirrors Alternative 5 in consistently showing the most improvement in travel times, while Alternative 1 consistently shows the least improvement.

Southeast King County CMP Corridor



Corridor Description

This corridor includes rural suburban cities, such as Enumclaw, Maple Valley, and Covington, and urban and rural portions of unincorporated King County. Large traffic generators include the White River Amphitheater.

Major Employers:

- Public school districts

Regional Growth Centers:

- Renton
- Auburn
- Kent

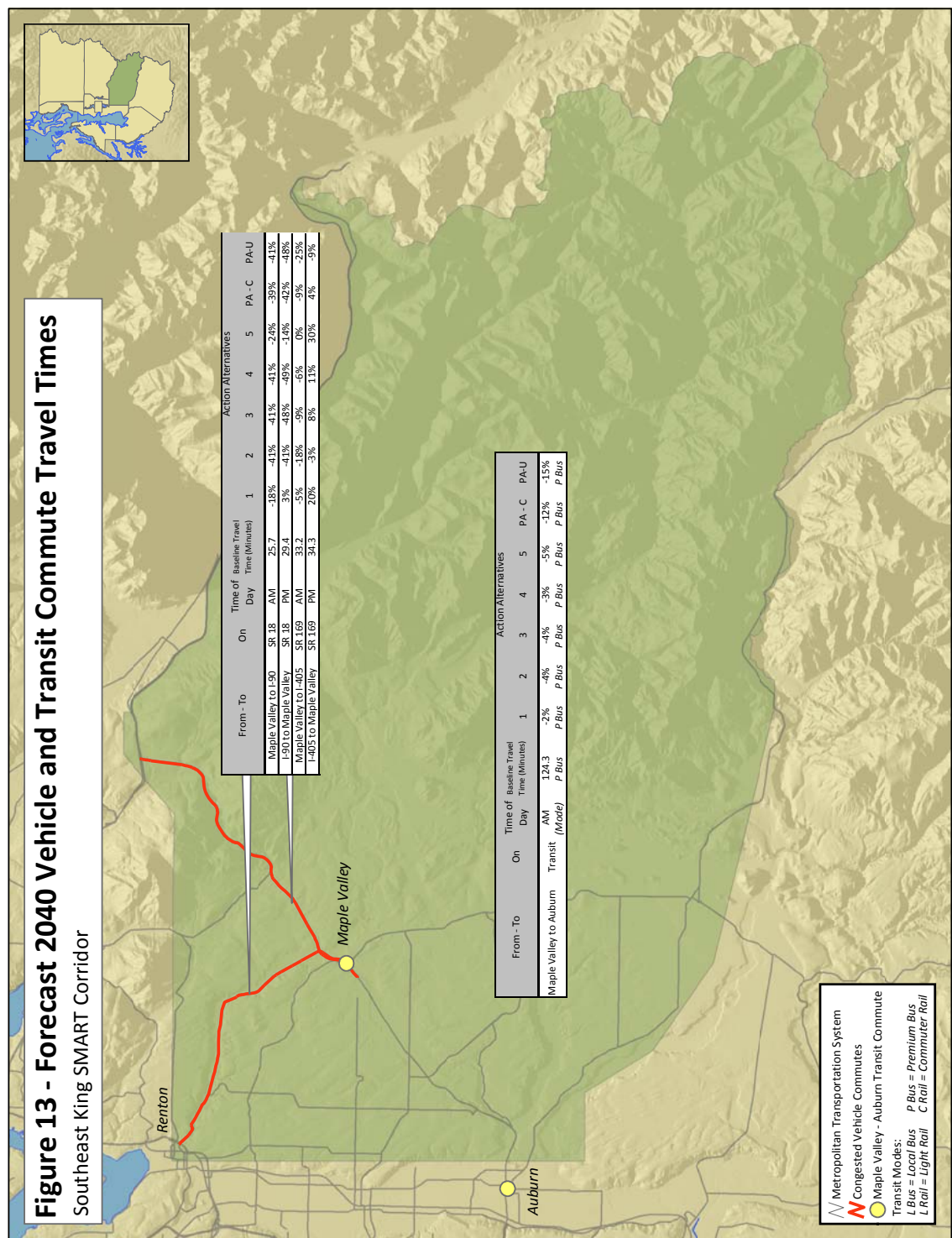
Roadways: Based on 2006 HPMS data, roadways functioning at LOS “E” and/or those identified as key arterials include the following:

- The interchange of SR 18 and SR 169
- SR 516 between SR 18 and SR 169
- SR 164 event traffic

The Regional Traffic Operators Committee did not identify any key arterials in this corridor.

Southeast King –Transportation 2040 Conditions

The following map details travel times by commute and mode.



Southeast King County Corridor—Transportation 2040 Forecast Conditions Discussion

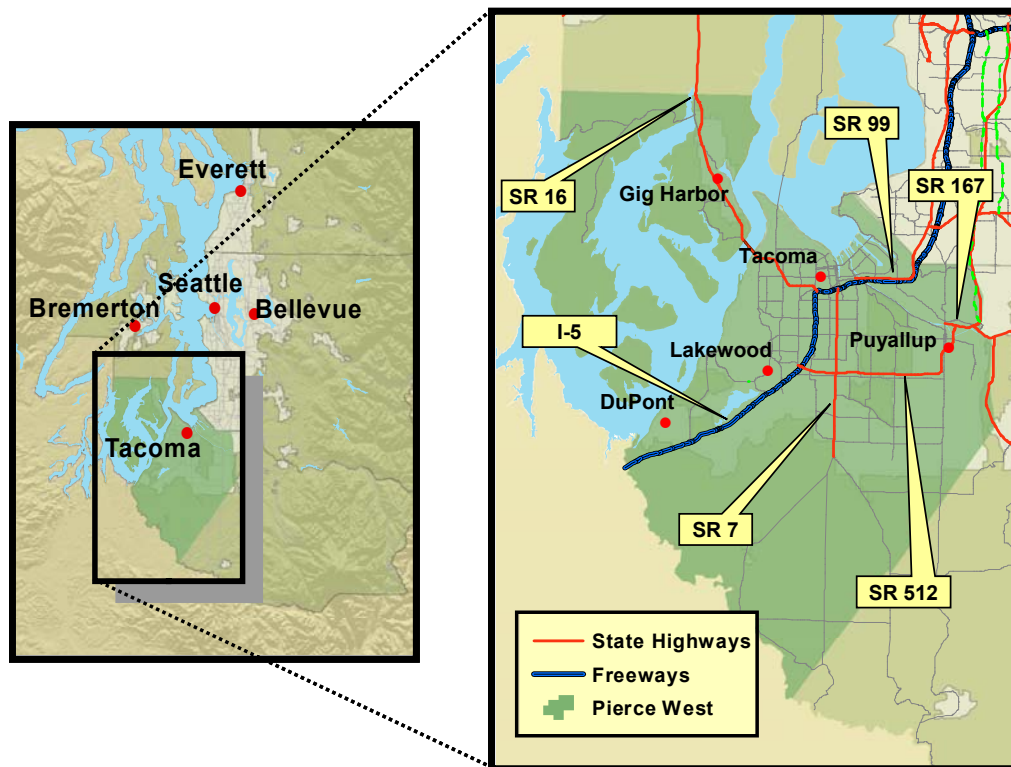
For GP roadway commutes, all action alternatives show marked travel time improvements relative to the Baseline along SR 18. Preferred Alternative travel times along SR 18 in the AM and PM periods are comparable to the performance forecast for Alternatives 2, 3, and 4. In the PM I-405 to Maple Valley direction, only Alternative 2 and the unprogrammed Preferred Alternative show an improvement, with Alternative 5 showing the most significant travel time increase.

While not as significant as travel time improvements along SR 18, vehicle commutes on SR 169 show improvement across all action alternatives in the AM period, with the Preferred Alternative outperforming all preliminary alternatives. In the PM peak, all action alternatives generally show travel time increases, except Alternative 2 and the unprogrammed element of the Preferred Alternative.

There are no managed lanes proposed in any alternative for the chosen commutes.

All action alternatives show modest travel time improvements relative to the Baseline on the Maple Valley to Auburn transit commute. The Preferred Alternative produces a greater reduction in transit travel time relative to the Baseline between Maple Valley and Auburn on the AM commute than the five preliminary action alternatives.

West Pierce County CMP Corridor



Corridor Descriptions

The Pierce West Corridor includes urban, suburban, and rural areas. Tacoma is located on the eastern shore of Puget Sound and is the major urban center in Pierce County. Other communities on the east side of Puget Sound include large suburbs, such as Lakewood and Puyallup, as well as smaller suburban communities and rural areas. Pierce County on the Kitsap Peninsula is a combination of suburban and rural development and includes the community of Gig Harbor.

This corridor includes major commercial/retail centers, industrial activity areas, and other major trip generators, which affect travel patterns. Major commercial/retail centers are located in downtown Tacoma north of I-5, in the Tacoma Mall area near the junction of I-5 and SR 16, and in the South Hill Mall area adjacent to SR 512 in south Puyallup and the Puyallup Fairgrounds. Major industrial activity areas are located in Tacoma at the Port of Tacoma facilities on Commencement Bay and south of Lakewood at the McChord Air Force Base and Fort Lewis Military Reservation. Other major trip generators in the corridor include Pacific Lutheran University, Tacoma Community College, hospitals, University of Puget Sound, and the Tacoma Dome.

Major Employers:

- Multicare Health System
- U.S. Army
- Public school districts
- U.S. Air Force

- State of Washington

Regional Growth Centers:

- Downtown Tacoma
- Tacoma Mall
- Downtown Puyallup
- South Hill
- Lakewood

Manufacturing/Industrial Centers:

- Port of Tacoma
- Frederickson

Roadways: Based on 2006 HPMS data, the roadways functioning at LOS “E” and/or those identified as key arterials include the following:

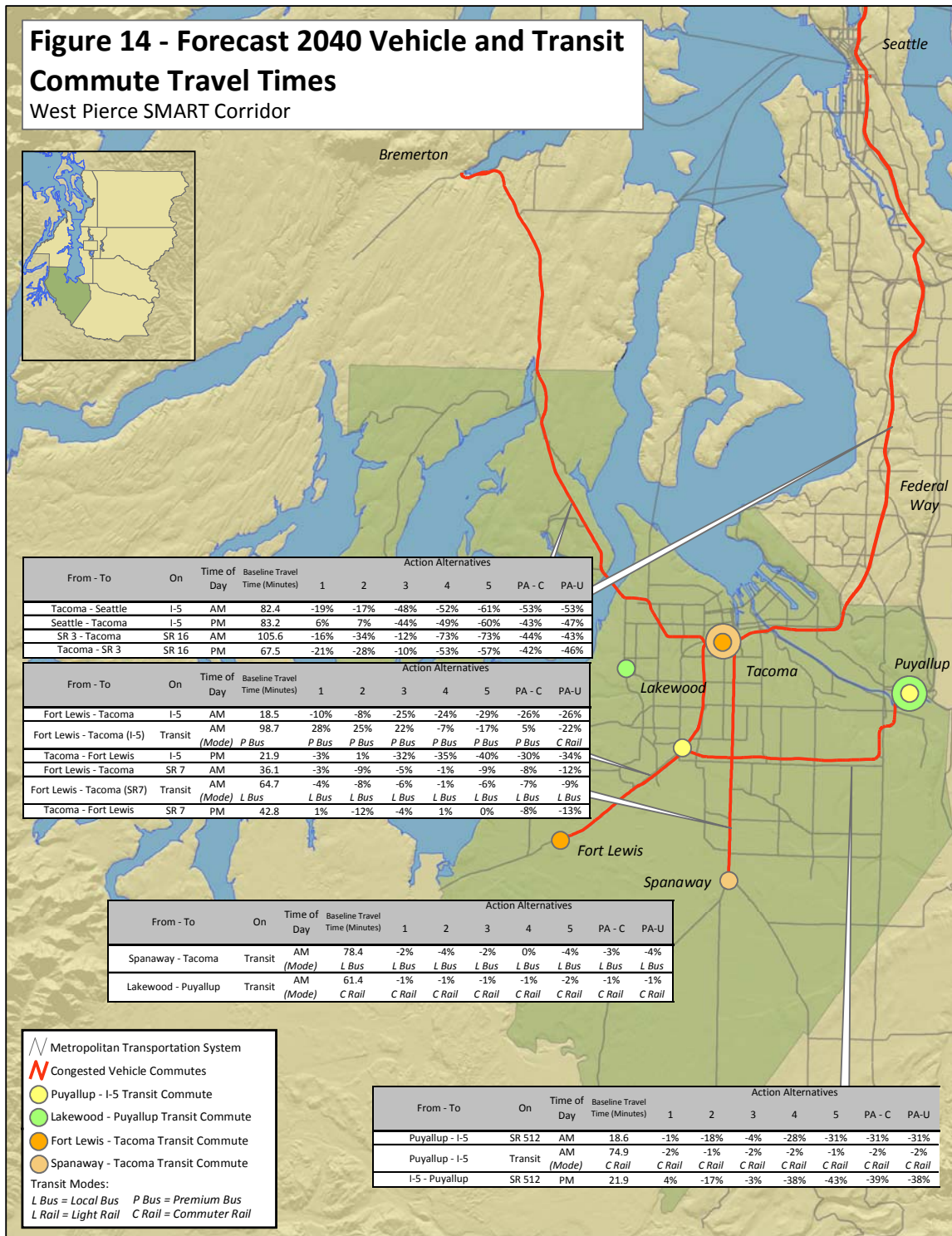
- I-5 from county line to county line, particularly through downtown Tacoma and at Fort Lewis gate exit
- SR 512 between I-5 and SR 162 (Meridian/SR 167)
- SR 7 from SR 512 to SR 507
- S Tacoma Way from I-5/SR 16 to I-5 at SR 512
- Portions of SR 16 from Tacoma through Gig Harbor

The following arterials were identified by the Regional Traffic Operators Committee as key arterials for freight, transit, high V/C ratio, and alternate routes to the interstate:

- 16th Avenue S/SR 161/Enchanted Parkway S/Meridian Avenue E (P1): between SR 99 and 224th Street E
- SR 99/E G Street/E 26th Street/S Tacoma Way/Pacific Highway SW/Gravelly Lake Drive SW (P8): between King County line and Nyanza Road SW/Gravelly Lake Drive SW
- Pacific Avenue/SR 167 (P6): between Stadium Way and 224th Street E

Pierce West –Transportation 2040 Conditions

The following map details travel times by commute and mode.

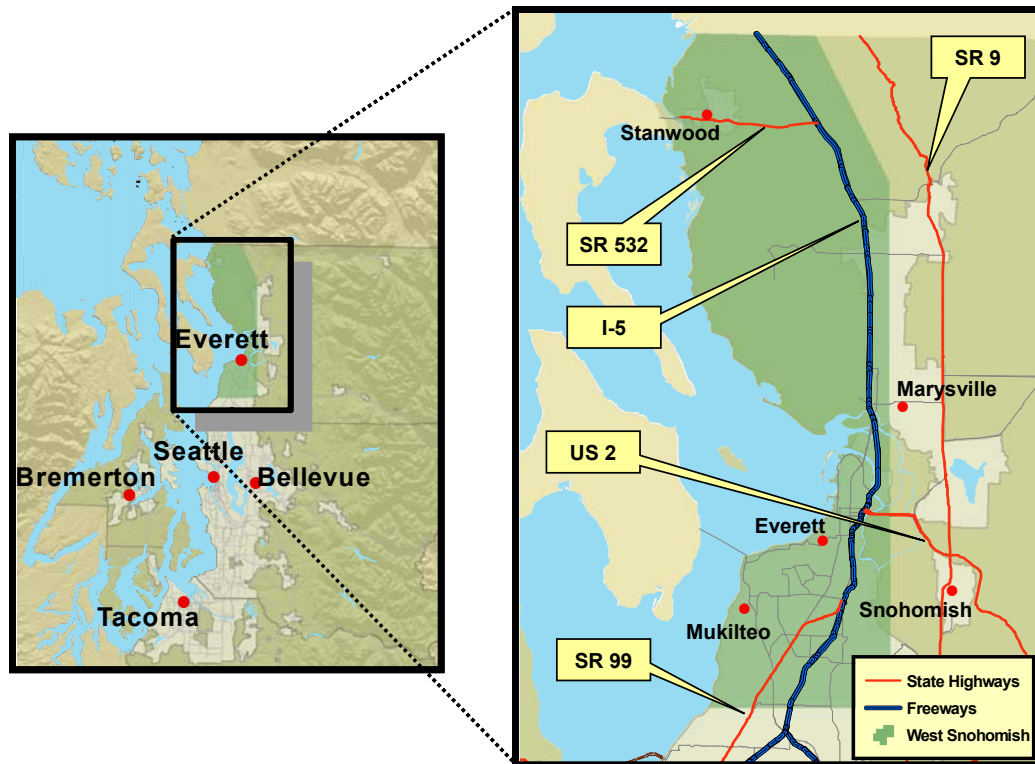


Pierce West Corridor—Transportation 2040 Forecast Conditions Discussion

In the AM period, all preliminary action alternatives improve relative to the Baseline on all commutes, with Alternative 5 showing the most improvement across all commutes. In the PM period, Alternatives 1 and 2 show travel time increases or the smallest travel time decrease relative to the Baseline on most of the selected vehicle commutes, except for Alternative 2 showing a travel time decrease on SR 7 from Tacoma to Fort Lewis. Alternative 5 again shows the most improvement on all commutes, except for the PM movement from Tacoma to Fort Lewis on SR 7, where it shows no change. Both AM and PM travel times across all selected commutes improve relative to the Baseline in both the constrained and unprogrammed elements of the Preferred Alternative. The most significant reductions in travel time occur in the SR 16 and I-5 corridors, followed by the AM commute on SR 512 from Puyallup to I-5. For the most part, vehicle commute travel time reductions do not vary much between the constrained and unprogrammed portions of the Preferred Alternative, and all see a larger travel time improvement than transit commutes.

The five preliminary action alternatives show little change or modest transit travel time improvement relative to the Baseline, except for Alternatives 1, 2, and 3 in the bus trip from Fort Lewis to Tacoma using the I-5 corridor, which show travel time increases. Within the Preferred Alternative there are few significant differences in the transit travel time performance relative to the Baseline. This could be attributed to the Baseline investment in transit service in the West Pierce SMART Corridor. Most transit commutes utilize the same mode of travel in the Preferred Alternative as in the Baseline, with the exception of the Fort Lewis to Tacoma transit commute along I-5 greatly benefiting from commuter rail investments in the unprogrammed portion. This 22 percent improvement is the largest transit travel time reduction in the corridor in the Preferred Alternative.

West Snohomish CMP Corridor



Corridor Descriptions

The West Snohomish CMP corridor contains urban, suburban, and rural areas with the most developed areas in the southwest portion of the county. Everett is the largest city and the major urban center in the corridor. Snohomish County has suburban communities of various sizes and rural areas. The corridor includes major commercial/retail centers and industrial activity areas affecting travel patterns in the corridor. Major commercial/retail centers are located in downtown Everett east of I-5, the Everett Mall area in south Everett near the intersection of I-5 and SR 526, and the Alderwood Mall area in Lynnwood near the intersection of I-5 and I-405. Commercial/retail activity also extends much of the length of the SR 99 corridor to Everett Mall. A major industrial activity area in west Snohomish is the Paine Field area, which is home to Boeing, its contractors, and other industrial operations. The Port of Everett is an industrial activity area for wood product manufacturing and also home to Naval Station Everett.

Major Employers:

- U.S. Navy
- Premera Blue Cross
- Providence Everett Medical Center
- Tulalip Tribes
- Verizon
- Rinker Materials

Regional Growth Centers:

- Downtown Everett
- Lynnwood

Manufacturing/Industrial Centers:

- Paine Field/Boeing

Roadways: Based on 2006 HPMS data, roadways functioning at LOS “E” and/or those identified as key arterials include the following:

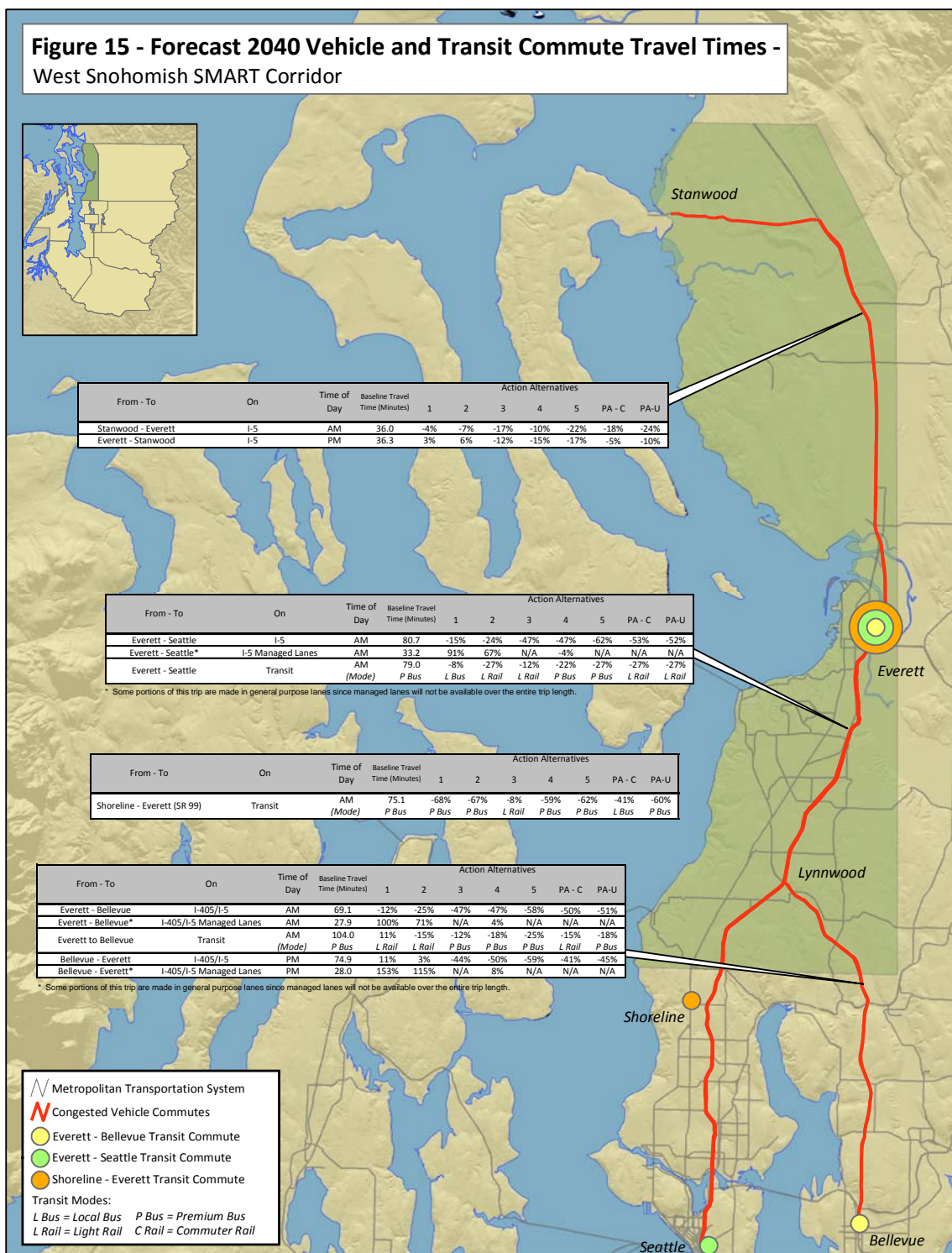
- I-5 from Lynnwood (I-405) to Marysville
- Small segments of SR 99 from Everett to SR 524
- SR 525 from I-5/I-405 to SR 526 near Boeing Paine Field area
- SR 527 from SR 522 to SR 526, a parallel route to I-5
- SR 532 from I-5 to Stanwood

The following arterials were identified by the Regional Traffic Operators Committee as key arterials for freight, transit, high V/C ratio, and alternate routes to the interstate:

- SR 99 (S6): between Everett Station and Snohomish-King County line
- 168th Street SW/44th Avenue W/164th Street SW/Seattle Hill Road (S11): between Olympic View Drive and SR 96
- SR 527 (S9): between I-5 and SR 522 in Bothell
- Airport Road/128th Street SW/SR 96/Cathcart Way (S10): between SR 526 and SR 9
- Marine View Drive/SR 529/Everett Avenue (S 4): between I-5 and I-5 loop

West Snohomish –Transportation 2040 Conditions

The following map details travel times by commute and mode.



Snohomish West Corridor—Transportation 2040 Forecast Conditions Discussion

GP vehicle commute travel times decrease relative to the Baseline in all action alternatives, with the exception of the PM periods for Alternatives 1 and 2, which show modest travel time increases. Alternative 5 consistently shows the most improvement in GP commute times. Alternative 1 consistently shows the least improvement, with a mix of the smallest improvements and some travel time degradations. Generally, the Preferred Alternative performs comparably to or better than Alternatives 3, 4, and 5.

The managed lane commute travel times match the pattern shown by other corridors with managed lanes: Alternatives 1 and 2 with their HOT systems show markedly increased travel times relative to the Baseline, where HOV travel times are low given the 3+ HOV restriction. Alternative 4 shows only modest travel increase in its managed lanes. In the long term, “managed lanes” as we refer to them today will not exist in the Preferred Alternative. All lanes of the highway will be managed in the form of facility tolling, and rideshare vehicles will enjoy the same travel time improvements reflected in the GP lanes.

In general, the Preferred Alternative shows travel time improvements comparable to or larger than the five preliminary action alternatives. Transit travel times improve across all commutes relative to the Baseline, with the Shoreline to Everett AM commute along SR 99 seeing the largest improvement across all alternatives. Transit commutes out of Everett to Seattle and Bellevue in the morning also see significant reductions. It is worth noting that while the transit commute between Everett and Bellevue utilizes light rail in the constrained element of the Preferred Alternative, the same commute in the unprogrammed plan shows premium bus as being the fastest mode available. This suggests that improvements in roadway congestion have made bus modes more attractive by lowering their travel times substantially.

In general, the results suggest that the Preferred Alternative performs comparably to or better than the five preliminary action alternatives on all modes for most commutes in this corridor.