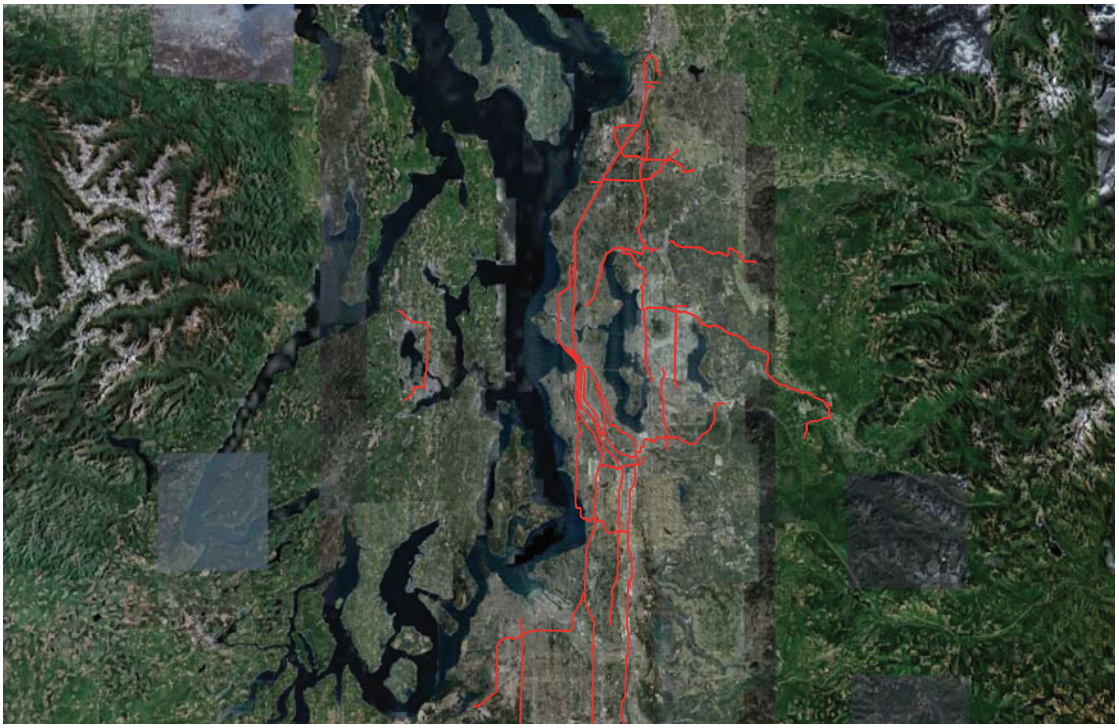
IBI GROUP

King County

HDR

Regional Intelligent Transportation Systems (ITS) Implementation Plan

Volume 2
ITS Projects



Submitted to the Puget Sound Regional Traffic Operators Committee

by IBI Group and HDR Engineering

December 22, 2009

TABLE OF CONTENTS

1. INTRODUCTION 1

2. BENEFITS OF DEPLOYING ITS 1

2.1 Traffic Signal Retiming and Coordination 2

2.2 Center-to-Center Interfaces 4

2.3 Transit Signal Priority 4

2.4 Dynamic Message Signs 4

2.5 Closed Circuit Television 4

2.6 Summary 4

3. COMPLIANCE WITH REGIONAL PLANS 5

3.1 Regional ITS Architecture 5

3.2 Transportation 2040 6

4. ITS CORRIDOR PROJECTS 6

4.1 Project Descriptions 6

4.2 Cost Estimates 8

4.2.1 Cost Summary 8

4.2.2 Capital Cost Breakdown 8

4.2.3 Equipment Cost Breakdown 8

K1: Woodinville Duval Road 12

K5: NE 90th/ 148th Ave NE/ 150th Ave SE 15

K10: Central Way/ NE 85th ST/ Redmond Way/ SR202 18

K12: 68th Ave NE/ NE 170th St/ Simonds Rd NE/ 100th Ave NE/ 98th Ave NE/ Market St/ Central Way/ Lake St S/ Lake Washington Blvd NE/ Bellevue Way NE/ SR908 21

K14: Richards Road SE/ Factoria Blvd SE/ Coal Creek Parkway SE/ Duval Avenue NE/ 138th Avenue SE 24

K16: MLK Way/ Airport Way S/ Logan Way/ Park Ave N/ NE Park Dr/ Sunset Blvd NE/ SR900/ 17th Ave NW/ NW Sammamish Rd/ SE 56th St 27

K17: SR99/ Aurora Ave N 30

K20: 4th Ave/ 4th Ave S/ East Marginal Way South/ Interurban Avenue South/ West Valley Highway/ SR181/ 68th Ave S/ West Valley Highway 35

K22: 1st Ave N/1st Ave/ 1st Ave S/Myers Way South/ 1st Aven S/SR509/ S 216th/ SR516/ South Kent Des Moines Road/ West Willis Street 39

K23: S 154th/ Southcenter BLVD/ Grady Way/ Main Ave S 44

K25: S Jackson Street/ Rainier Avenue South 47

K27: SR522 50

K29: Greenwood Ave N/ Holman Road NW/ 15th Avenue NW/ 15th Avenue W/ Elliot Ave W 53

K58: Lind/ SW 16th/ E Valley Highway/ E Valley Road/ 84th Avenue S/ Central Way/ Central Avenue/ Auburn Way 56

TABLE OF CONTENTS (CONT'D)

K70: Airport Way S 59
S4: Marine View Drive/ SR529/ Everett Avenue 62
S6: SR99 65
S9: SR527 68
S10: Airport Road/128th Street SW/SR96/ Cathcart Way 71
S11: 168th St SW/ 44th Ave W/ 164 St SW/ Seattle Hill Road 74
P1: 16th Ave S/ SR161/ Enchanted Parkway South/ Meridian Ave E 77
P3: Auburn Ave/ A Street NE/ E Valley Highway/ SR162 80
P6: Pacific Avenue/ SR7 83
P8: SR99/ South Tacoma Way/ Pacific Way SW/ Gravelly Lake Road SW 86
KT1: SR304/ SR303 89

1. INTRODUCTION

This report is the second volume of the Regional Intelligent Transportation Systems (ITS) Implementation Plan (RITSIP) prepared for the Puget Sound region. The purpose of this planning exercise was to identify key arterial corridors within King, Snohomish, Pierce and Kitsap counties that would provide the greatest transportation benefit from investments in traffic management, traveler information and transit technology improvements. The first volume of the plan presented the outcomes from the efforts leading up to the identification of the regional key arterial corridors. This second volume presents the ITS Plan project descriptions, cost estimates and maps.

The development of the RITSIP has been guided by the Puget Sound Regional Traffic Operators Committee (RTOC), consisting of traffic engineers representing city, county and state jurisdictions across the region. The RTOC was founded in response to a signal operations review by the Federal Highway Administration that found the region lacked cooperative leadership in the deployment of ITS and signal operations improvements across jurisdictional boundaries.

In addition to the RITSIP, which identifies capital improvements for the key corridors, a parallel project is underway. The Regional Concept for Transportation Operations (RCTO) identifies best practices and strategies for multi-jurisdictional signal coordination applicable to the RITSIP corridors.

The RITSIP incorporates and supports the RCTO strategies in the following ways:

- Project development of new multi-jurisdictional coordinated signal timing plans, including special plans to deal with incidents ranging from construction to emergency evacuations.
- Project deployment of supporting signal infrastructure, including new controllers and cabinets.
- Centralized signal system replacements and upgrades as needed for improved centralized operations. Currently, many but not all signals are centrally controlled from Traffic Management Centers (TMC). The ITS Plan implementation would provide this capability for all operating agencies.
- Broadband connectivity to all operating agencies' TMCs or Public Works offices to facilitate improved real-time monitoring and management of the corridors.
- Improved capability to perform "before and after" performance analysis of corridor improvements through advanced traffic data collection.
- Additional project funding for two years of operations included in cost estimates.

The RCTO includes the identification of Next Steps for moving the region forward in implementing the ITS Plan and RCTO strategies. The final volume of the ITS Plan is an executive summary that includes a high-level overview of the RITSIP and cost/benefit information for ITS and signal coordination projects. The executive summary is targeted towards elected officials and other decision makers seeking more information in consideration of providing funding for such projects.

2. BENEFITS OF DEPLOYING ITS

Intelligent Transportation Systems offer an array of benefits for urbanized areas, including reduced delays and vehicle emissions, improved traffic flow and travel times, and accident prevention. The resulting traffic flow improvements can result in improved economic productivity, and ITS improvements are often faster to implement compared to roadway construction while offering long-term safety and mobility benefits.

Implementing ITS technologies can be significantly less expensive than widening of arterial roadways or building new roads to achieve similar performance, especially in urban areas with limited space for new roadway capacity. New or expanded roads entail significant capital costs, including design, right-of-way acquisition, and lengthy, disruptive construction projects, while ITS improvements can be made on existing roadways without significantly impacting traffic patterns.

In addition to improved traffic operations and safety, ITS can be an effective tool in improving air and water quality and reducing greenhouse gas emissions. By reducing stops and delays, vehicles idle less and travel at more consistent speeds, improving fuel efficiency and reducing brake and tire wear. Fewer natural resources are thus required and fewer pollutants, such as carbon monoxide, particulate matter, and tire rubber residue, are released into the air and water. For example, a 2003 study found that coordinated signal timing in Syracuse, New York reduced total fuel consumption 9 to 13 percent and average vehicle emissions by 9 to 13 percent,[1] and a transit signal priority system in Helsinki, Finland resulted in a 1% reduction in particulate matter.[2]

The following are some of the benefits that have been measured from ITS projects deploying the types of technologies and improvements that are proposed for the RITSIP corridors.

2.1 Traffic Signal Retiming and Coordination

A well-implemented regional ITS program can improve travel times and reduce delays. Coordinated and optimized signal timing plans help improve traffic flow on major arterials and reduce delays at jurisdictional boundaries. According to the United States Department of Transportation, Traffic Signal Optimization and Retiming have a benefit/cost ratio[3] ranging from 17:1 to 62:1[4], while a 2001 study showed that optimizing signal timing plans, coordinating traffic signal control, and implementing adaptive signal control in California reduced travel time by 7.4 to 11.4 percent, decreased delay by 16.5 to 24.9 percent, and reduced stops by 17 to 27 percent.[5] In addition, alternative signal timing plans for peak and off-peak hours, planned and unplanned events, and emergencies help to optimize traffic flow across jurisdictions for various pre-selected traffic conditions on major corridors.

Locally, several arterial signal synchronization programs have been initiated throughout the Central Puget Sound Region. One of the most successful has been in King County where travel time improvements have ranged from 3% to 43% as shown in Figure 1.

[1] http://www.itsbenefits.its.dot.gov/its/benecost.nsf/ID/A9953A0DFDDA7B4885256E9B0052FB24?OpenDocument&Query=BMeasure
[2] http://www.itsbenefits.its.dot.gov/its/benecost.nsf/ID/00185704A74ACF4985256B6B0065ED32?OpenDocument&Query=BMeasure
[3] Benefit/cost ratio is measured in Excess User Cost reduction divided by Annualized Agency Costs. See http://knowledge.fhwa.dot.gov/tam/aashto.nsf/All+Documents/A0C59E817E96C42885256DDA0079011C/$FILE/TOOLS_BEN_CST.pdf for specifics.
[4] "Investment Opportunities for Managing Transportation Performance through Technology," US department of Transportation, Intelligent Transportation Systems Joint Program Office, 16 January, 2009.
[5] http://www.itsbenefits.its.dot.gov/its/benecost.nsf/ID/2149148A53A9E1378525733A006D4C8D?OpenDocument&Query=BApp

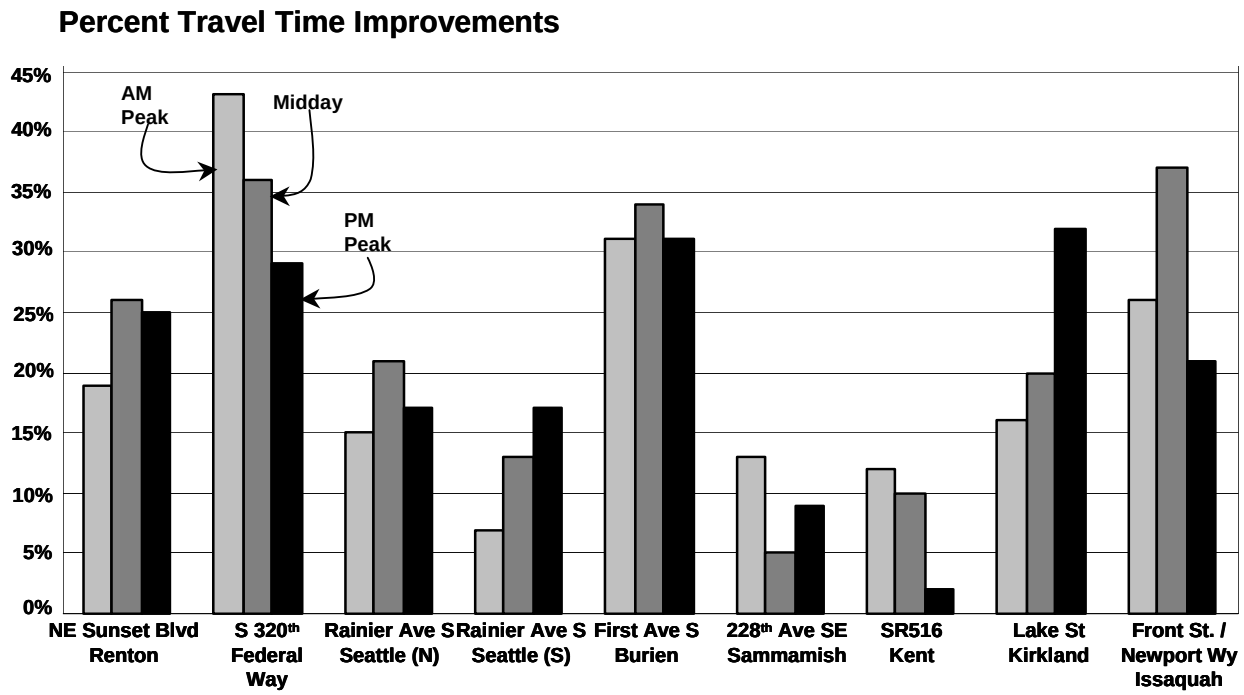


Figure 1: Travel Time Improvements from King County Signal Synchronization Projects[6]

In Seattle, retiming the signals on Greenwood Avenue N and Holman Road had the following results[7]:

- 30% reduction in corridor delay per vehicle
- 15% reduction in corridor travel time, and 195,000 annual hours reduced
- 6% reduction in fuel use, and $2.3 million saved in fuel costs
- 7% improvement in fuel efficiency (MPG)
- 5% reduction in hydrocarbons

The project did not require any new capital investments; therefore the only cost was $45,000 in staff hours. The comparison of the $2.3 million in fuel costs saved to the $45,000 of staff time cost results in a highly favourable cost effectiveness ratio of 50:1.

A WSDOT re-timing project along US 2 in Monroe also calculated significant benefits[8]:

- Corridor travel time reduction of 2% to 29%
- 20% decrease in total collisions
- 35% decrease in injury collisions
- 19% decrease in rear end collisions

The collision reduction was achieved even though volumes increased from 31,000 vehicles per day to 34,000 vehicles per day.

[6] Source: King County Department of Transportation
[7] Source: Seattle Department of Transportation
[8] Source: WSDOT

2.2 Center-to-Center Interfaces

Center-to-Center (C2C) interfaces allow traffic management systems from different vendors to exchange data and status with one another and coordinate signal timing changes across jurisdictional boundaries. In addition, C2C can share various types of real-time data between TMCs in order to provide improved incident management capabilities and to assist in signal timing optimization. While quantitative data on the benefits of C2C is limited, qualitatively, C2C offers the benefit of a more seamless roadway network from the point of view of travelers, while allowing agencies to continue to use their traffic management system of choice. C2C could also offer opportunities for off-hours operational support, in that agencies could agree to allow others with extended operating hours to monitor and/or operate their corridors during times when their TMC is normally closed.

2.3 Transit Signal Priority

Modern signal systems allow for the implementation of Transit Signal Priority (TSP), which provides or extends green lights for buses or rail transit and make Bus Rapid Transit a viable option for carrying passengers more quickly than traditional bus lines and more efficiently than private automobiles. While TSP offers only moderate safety and environmental benefits, it has been shown to reduce transit delay by 30-40% and improve travel times by between 2 and 16%. In addition, a 2002 study showed that TSP on Rainier Avenue in Seattle reduced signal related stops for buses by 50%, improved ride comfort for passengers, and had only minor effects on cross-street traffic.[9]

2.4 Dynamic Message Signs

Portable and permanent Dynamic Message Signs (DMS) can alert drivers of various conditions, including accidents, slowdowns, and weather conditions such as ice and snow, giving motorists the opportunity to slow down or to choose alternative routes before reaching an incident, reducing the duration of incidents and the possibility of secondary crashes. For instance, a 2000 study showed that incident management strategies utilizing DMS in San Antonio, Texas resulted in a 5.7 percent decrease in delay, a 2.8 percent decrease in crashes, and a 1.2 percent decrease in fuel consumption per year.[10]

2.5 Closed Circuit Television

Closed Circuit Television (CCTV) systems and other system detection devices provide monitoring capabilities on major arterials and have multiple uses. For instance, CCTV can be used for traffic movement monitoring, traffic adaptive signal control, incident detection and management, and even real-time camera views available to travelers via the internet. Studies have shown that surveillance and detection reduced incident validation times by 5 to 12 minutes per incident in Monroe County, New York,[11] and the previously-mentioned US Department of Transportation study showed that such systems can achieve a 6:1 benefit to cost ratio.

2.6 Summary

The following table provides a summary of the cost/benefit ratios seen from ITS projects with improvements similar to those planned in the RITSIP.

[9] http://www.itsbenefits.its.dot.gov/its/benecost.nsf/ID/FBC8254A472F41E285256B9700531450?OpenDocument&Query=BApp
[10] http://www.itsbenefits.its.dot.gov/its/benecost.nsf/ID/70D42E82546A95BC8525733A006D4ECA?OpenDocument&Query=BApp
[11] http://www.itsbenefits.its.dot.gov/its/benecost.nsf/ID/3E2B0340CCBBAC3D852575A2004F9B09?OpenDocument&Query=BApp

Table 1: Benefits of various ITS implementations.

Table 1: Summary ITS Benefits

Category/Project	Benefit/Cost Ratio or Other Metric	Safety	Mobility	Energy/ Environment
Traffic Signal Optimization/Retiming	17:1 to 62:1	High	High	High
Closed-Circuit Television	6:1	High	Med	Med
Transit Signal Priority	Reduced transit delay 30-40%, improved travel time 2-16%, reduced signal-related stops 50%	Med	High	Med
Dynamic Message Signs	5.7% decrease in delay, 2.8% decrease in crashes, 1.2 percent decrease in fuel consumption per year	Low	High	Low

3. COMPLIANCE WITH REGIONAL PLANS

3.1 Regional ITS Architecture

The Federal Highway Administration (FHWA) has required that all regions deploying ITS implement a Regional ITS Architecture to ensure integration and interoperability between transportation systems. Compliance with this requirement is tied to eligibility for federal ITS funding. In 2005, the Puget Sound Regional Council (PSRC) approved the Puget Sound Regional ITS Architecture for this region. The Regional ITS Architecture defines a framework for ensuring institutional agreement and technical integration for the implementation of ITS projects. It is designed to provide guidance and serve as a resource in the development of local ITS.

In order to demonstrate compliance with the Federal requirements and the Regional ITS Architecture, local agencies are required to undertake a systems engineering analysis that includes a description of how their project “fits” into the architecture. The recommended approach to demonstrating that a project fits into the Regional ITS Architecture is described in the architecture documentation. Development of the RITSIP and RCTO has included most of the required steps, which include:

- Reviewing the market packages in the National and Regional ITS Architecture to determine which market packages are most applicable to the project. Most of the market packages most relevant to the RITSIP are included in the Regional ITS Architecture and no revisions are required. However, the National ITS Architecture continues to release new versions. PSRC regularly reviews and updates the Regional ITS Architecture to incorporate these updates.
- Determining which agencies, organizations and stakeholders could be involved in the project. Project stakeholders and coordination opportunities have been identified for each project.
- Develop an operational concept for the project using the results of the market package review and identification of stakeholders to be included in the project. Development of the Concept of Operations included this process.

- Develop a project ITS Architecture diagram that indicates subsystems (entities and stakeholders), equipment packages and information exchanges using the National ITS Architecture market package definitions and diagrams as a basis. The Regional ITS Architecture and other related documentation may be accessed via the PSRC web site at: http://www.psrc.org/datapubs/pubs/publist/publist_its.htm

Projects applying for federal CMAQ or STP funds through the regional or countywide TIP process must self-certify that the project complies with the Regional ITS Architecture. The above steps can help to assure this certification.

3.2 Transportation 2040

Transportation 2040 is the upcoming update to Destination 2030, PSRC's regional transportation plan, which is intended to guide transportation investments in the region over a 30-year period. Five alternative strategies for transportation are under consideration, in addition to a baseline alternative, which would complete any projects underway in the region. The alternatives vary in their emphasis on ITS improvements and will be considered for recommendation in the final plan, expected to be adopted in 2010. The ITS Plan corridor projects are included in PSRC's long-range transportation demand models.

4. ITS CORRIDOR PROJECTS

The ITS Plan presents projects for 25 multi-jurisdictional arterial corridors that are considered crucial to regional mobility. For each corridor, the existing ITS, signal and communications inventory was collected and mapped, and then a gap analysis performed to identify the ITS improvements needed to deploy a complete ITS corridor project.

It should be noted that the "order" in which projects may be deployed is unknown. Therefore, two nearby corridors may have improvements identified that, if deployed together, would be redundant in functionality. Engineering judgment in the design phase will determine the final quantities and device locations.

Additionally, projects may be deployed in phases as funding becomes available or as regional priorities change due to growth patterns or other variables. It may not be prudent or necessary to deploy the full ITS corridor in a single project, however for the sake of planning and consistency between projects, a "full" deployment is described in each project description and cost estimate.

4.1 Project Descriptions

The following improvements were identified as desirable for any "ITS Corridor" project. These improvements were identified and cost-estimated consistently for all corridors.

- Upgraded NTCIP-compliant signal controllers and cabinets as needed to support signal coordination, with rack space for additional ITS equipment.
- System detection devices along the corridor to collect arterial performance data, including volumes, congestion and travel times.
- Uninterruptible Power Supply (UPS) Backup: Given the critical nature of these corridors in providing connections to communities and alternate routes to freeways, UPS backup power will help to ensure that the corridors can continue to operate during power outages.

- Transit Signal Priority (TSP): Transit signal priority was included as an improvement along corridors with heavy transit usage and that had not already been identified for TSP implementations by transit agencies.
- Broadband (fiber optic) communications along the full length of each ITS corridor and back to the operating TMC(s) is the backbone for the implementation of the other improvements, including ITS devices, upgrades and operational strategies.
- Central System: Centralized signal control is critical to supporting enhanced corridor operations. The ITS Plan projects include upgraded or replaced central systems where needed to provide centralized signal control and operate ITS devices from a TMC.
- Traffic Management Center (TMC) Connections: Centralized ITS device control provided to each operator's TMC if not existing.
- CCTV: Each corridor should support CCTV camera surveillance by the operator. The exact intersection locations of the cameras will be determined during the corridor project design.
- Dynamic Message Signs: Located on approaches to decision points for major highways. These signs may be used to alert travelers to incidents and/or provide travel times or other information. The intent is to provide the information to the traveler at a point far enough in advance that they can be directed drivers towards a detour .
- Time of Day, Construction, Incident and Evacuation Timing Plans: In order to ensure smooth coordination of signals along the full length of the multi-jurisdictional corridors, the projects include development of new signal timing plans in line with regional operations strategies.
- Center to Center: The RTOC has identified the implementation of center-to-center interfaces between signal systems as the preferred method for sharing signal system data and coordinating diverse signal systems. However, the development cost of such interfaces will vary widely depending on the systems involved. A blank line item is included in the estimate to acknowledge the region's intent and desire to move towards C2C as the regional operating strategy for these corridors.

The following information is provided in a project description table for each corridor project:

- Project number, consisting of a county abbreviation indicating the primary location of the corridor (K for King, S for Snohomish, P for Pierce and KT for Kitsap) and numerical identification. These numbers were assigned during the initial corridor identification process that resulted in a list of over 130 key corridors (provided in Volume 1), which is why the project numbers are not consecutive in this document.
- Project start and end point: Cross streets or geographical reference points for the beginning and end points of the corridors.
- Operators and Other Stakeholders: List of corridor operators and other stakeholders: Identifies the agencies operating signals along the corridor. Other stakeholders are other heavy users of the corridor, such as transit or freight, as identified through outreach performed earlier in the planning process.
- Project Overview: Overview of the improvements identified for the corridor.
- Project Significance: Summary of key corridor criteria that the project scored highly on, as described in Volume 1.
- Corridor Connectivity: Possible strategies for providing TMC connectivity between each TMC operator and the corridor. It should be noted that these are essentially point-to-point connections between the corridor and TMC based on existing or planned fiber. Interagency agreements will be needed if connectivity via fiber owned by others is desired, such as the WSDOT freeway fiber network.

- Relationship to Other Corridor Projects: Suggestions for combining corridor project deployments with other nearby corridors or with corridors with a similar operational focus (such as corridors with BRT service).
- Other Considerations: Corridor's inclusion in other existing ITS plans; potential to build on to other capital improvement or ITS projects; and any dependencies.

4.2 Cost Estimates

Each corridor project description is accompanied by a corresponding planning-level cost estimate. The cost estimate is shown by jurisdiction and includes capital (equipment, design and construction) and operations costs. Per item costs were assessed based upon FHWA's ITS Cost Database[12] and professional judgment related to the proposed applications.

Each cost estimate has been divided into three tables as follows.

4.2.1 COST SUMMARY

The cost summary provides a high-level summary of the cost estimate broken out by jurisdiction. The cost summary includes the start and end points for the corridor segments and the number of signals owned by that jurisdiction. The number of signals was identified because it provides a basis for estimating the level of effort and related costs for preparing signal plans, as well as an idea of the number of major intersections that may require new equipment and/or upgrades.

The cost summary gives the estimate for the total project cost, which is the sum of the capital costs plus an estimate for two years of operations. Operations costs were estimated at $3,000 per year per intersection.

4.2.2 CAPITAL COST BREAKDOWN

The capital cost breakdown table includes the following cost items and assumptions:

- Equipment Costs: Sum of ITS device and timing plan costs per jurisdiction
- Design Costs: Includes the engineering activities for developing plans and specifications necessary to guide the installation. Estimated at 20% of equipment costs, not including the timing plans.
- Construction Costs: Includes contract administration and inspection activities required to support the installation activities. Estimated at 15% of equipment costs, not including timing plans.
- Contingency: Estimated at 10% of the total equipment, design and construction costs.

4.2.3 EQUIPMENT COST BREAKDOWN

The equipment cost breakdown provides estimated costs for each of the ITS, communications and signal equipment items described above. The following assumptions applied:

[12] http://www.itscosts.its.dot.gov/

Item	Description	Item Cost	Quantity	Assumptions
Controller and Cabinet	Estimated on the high side of the FHWA ITS Cost Database range due to complex nature and importance of operations for these projects. These costs may be reduced if the existing cabinet is capable of supporting the new controller with minor modifications.	$19,000	1 per signalized intersection	• Upgrade assumed if existing model unknown or not believed to be NTCIP compliant.
System Detection	Vehicle detection on all suitable intersection approaches that coincide with freeway decision points.	$25,000	1 per intersection based on DMS location(s)	• Assumed machine vision technology mounted on signal pole mast arms. Actual technology may vary.
UPS Battery Backup	Uninterruptible Power Supply and battery backup	$8,000	1 per signalized intersection	• Assumed traffic signal heads use LED technology and sufficient room exists for UPS equipment in traffic signal controller cabinet.
TSP	Field equipment included for corridors with significant transit service and no existing or planned TSP	$10,000	1 per every 3 signalized intersections	• Assumes only certain key intersections will be equipped.
Fiber	Provide required connectivity for entire corridor	$250,000	Cost per mile	• Fiber assumed to be "default" means of broadband communications. Other options may be found to be more appropriate in design.
Central System	Upgrade or replacement of central system as needed for signal and ITS device monitoring and control, OR configuration of existing system to add signals.	Varies	Cost per agency	• Estimate depends on configuration, upgrade or replacement. See notes.
TMC Connectivity	Provide corridor connectivity back to operating TMCs.	$15,000	Cost per signalized intersection requiring connectivity to TMC	• Traffic Busters will provide connectivity between TMCs. • Considered existing if agency indicated signals on central system and interconnected. • If more than a couple intersections exist along the corridor are without TMC connectivity, a lump sum estimate was calculated.

Item	Description	Item Cost	Quantity	Assumptions
CCTV Cameras	Full color PTZ cameras, encoder/decoder, power supply and pole	$25,000	1 per every 3 signalized intersections	• Cameras will be deployed at key intersections as needed to support corridor operations. • Some additional cameras needed along rural or limited access routes currently with few signals
Dynamic Message Signs	Smaller size permanent electronic sign boards appropriate for arterials.	$100,000	Cost per sign	• DMS will be provided roughly at decision points approaching freeway interchanges. • Final locations determined in design.
TOD and Construction Timing Plans	Includes analysis of existing conditions; development of timing plans and TOD schedules; and implementation; plus evaluation and refinement. Estimate includes neighboring signals within 2000 feet of the corridor. .	$2,500	Cost per signalized intersection	• Cross-jurisdictional coordination of boundary signals greater than 1 mile apart assumed not warranted.
Incident and Evacuation Timing Plans	Cooperative multi-jurisdictional development of timing plans for unplanned incident and evacuation scenarios.	$1,000	Cost per signalized intersection	• None such plans existing. • Reduced cost per intersection due to data collection and modeling completed during TOD plan development.

A detailed GIS-based map book was developed for each corridor. The map books show the corridors with existing and proposed future ITS elements. Each corridor map book also shows other corridors that are connected and at close proximity. Existing and planned devices ("planned" indicating programmed and funded but not yet built) are shown on the map at locations provided by the jurisdictions in their ITS inventory.

The following elements are shown on the maps:

- ITS corridor route
- Existing and future copper
- Existing and future fiber
- Traffic signals along and within 1-2 blocks of corridor
- System detection
- Approximate transit signal priority route
- CCTV camera coverage

Upon completion of the ITS Plan project, the GIS database used to generate the maps will be provided to the RTOC so that the information can be updated and maintained as projects move forward.

The following tables present the project descriptions.

K1: Woodinville Duval Road	
Project Start: SR522	**Project End:** SR203
Operators: King County	**Other Stakeholders:** City of Duvall, and Freight
Project Overview	***Project Significance***
This project will deploy the following ITS devices: • Upgrade, interconnect and synchronize signals • Enable centralized signal control • Development of new timing plans for incident and emergency management • System detection for traveler information data • Full CCTV camera coverage • DMS at key decision points • Fiber optic communications along entire corridor • Transit signal priority	• V/C ratio is 0.9 or greater • Principal arterial • Metropolitan Transportation System (MTS) identified route • No alternative routes • T1/T2 Freight Route • Route identified in King County ITS Plan
Corridor Connectivity	
• In order to provide connectivity back to the King County Traffic Control Center, the corridor could be linked via planned and existing fiber along Avondale Road.	
Relationship with Other Corridor Projects	
• Project connects with King County Avondale Road ITS project but does not connect with any other Regional ITS Plan corridors.	
Other Considerations	
• Principal east-west arterial corridor serving community of Duvall and providing connection to other East King County cities. • Solely operated by King County. • May be dependent upon Avondale Road connectivity back to King County TCC.	

K1 - Cost Summary

Corridor No.	Corridor	Agency Jurisdictions	Segment Start	Segment End	No. of Signals	Total Capital Costs	Operation Costs (2 Years)	**Total Project Costs**
K1	Woodinville Duval Road	King County	SR522	W Snoqualmie River	11	$4,505,738	$66,000	**$4,571,738**
		Duvall	W Snoqualmie River	Main St NW	0	$0	$0	**$0**
		Total Corridor	COUNTY LINE	Main St NW	11	$4,505,738	$66,000	**$4,571,738**

K1 - Capital Cost Breakdown

	Total Equip. Costs	Total Design Costs	Construction Support Costs	Contingency Costs	**Total Capital Costs**
King County	$3,047,000	$599,500	$449,625	$409,613	**$4,505,738**
Duvall	$0	$0	$0	$0	**$0**
Total Corridor	$3,047,000	$599,500	$449,625	$409,613	**$4,505,738**

K1 - Equipment and Signal Timing Cost Breakdown

										Timing Plans			
	Controller & Cabinet Upgrades	System Detection	UPS	Transit Priority (1/3 inter.)	Fiber (mile)	Central System Upgrade	TMC Connect	CCTV (1/3 inter.)	DMS	*TOD/ Constr. Plans*	*Incidents/ Evac. Plans*	C2C	**Total Equip. & Timing Costs**
Unit Cost	$19,000	$25,000	$8,000	$10,000	$250,000	Varies	Varies	$10,000	$100,000	*$3,500*	*$1,000*	TBD	
King County	11	2	11	9.3	9.3	$2,500	$10,000	2	2	11	11		**$3,047,000**
Duvall	0	0	0	0	0	$0	$0	0	0	0	0		**$0**
Total Corridor	$209,000	$50,000	$88,000	$93,000	$2,325,000	$2,500	$10,000	$20,000	$200,000	*$38,500*	*$11,000*		**$3,047,000**

Notes

- King County has Traconex controllers in TS1 cabinets which may not be configurable on any of their central systems.
- King County has planned fiber on Avondale Road up to K1 corridor which can provide TMC connectivity.

K5: NE 90th/ 148th Ave NE/ 150th Ave SE

Project Start: Highway 202/Redmond Woodinville Rd NE	**Project End:** I-90
Operators: King County, City of Bellevue, City of Redmond, and WSDOT NW Region	**Other Stakeholders:** Transit

Project Overview

This project will deploy the following ITS devices:

- Upgrade, interconnect and synchronize signals
- Enable centralized signal control
- Development of new timing plans for incident and emergency management
- System detection for traveler information data
- Fiber optic communications along entire corridor
- TMC Connections
- Full CCTV camera coverage
- DMS at key decision points
- Transit signal priority

Project Significance

- V/C ratio is greater than 0.9
- Principal arterial
- May be used as an alternative route for I-405.
- Connects to areas where average income is less than 80% of the regional median income
- Bus Rapid Transit route
- Route identified in City of Redmond ITS plan
- Connects an urban center to a manufacturing/industrial center

Corridor Connectivity

- The City of Redmond has fiber along NE 90th St connecting to City Hall.
- The City of Bellevue has fiber along NE 8th St connecting to the Bellevue TMC.
- Corridor intersects with I-90 and connectivity to WSDOT could be provided over the freeway fiber network.
- No clear path to connect King County TCC with its operations at the south end of the corridor. Connectivity may be provided via Traffic Busters or fiber-sharing agreements with WSDOT and other project partners.

Relationship with Other Corridor Projects

- Corridor intersects with the K10 corridor which provides connectivity between Redmond, Kirkland and Bellevue.

Other Considerations

- City of Bellevue plans to procure a new traffic responsive control system.
- Existing Transit Signal Priority on 148th Ave NE.

K5 - Cost Summary

Corridor No.	Corridor	Agency Jurisdictions	Segment Start	Segment End	No. of Signals	Total Capital Costs	Operation Costs (2 Years)	**Total Project Costs**
K5	NE 90th/ 148th Avenue NE/ 150th Ave SE	King County	SE Newport Way	SE 38th St.	2	$138,353	$12,000	**$150,353**
		Bellevue	SE 38th St	NE 20th St	10	$1,806,750	$60,000	**$1,866,750**
		Redmond	NE 20th St	Woodinville Redmond Road NE	18	$1,490,940	$108,000	**$1,598,940**
		WSDOT NW	I-90 Ramps; SR520 Ramps		4	$89,595	$24,000	**$113,595**
		Total Corridor	Denny Way	County Line Rd E	34	$3,525,638	$204,000	**$3,729,638**

K5 - Capital Cost Breakdown

	Total Equip. Costs	Total Design Costs	Construction Support Costs	Contingency Costs	**Total Capital Costs**
King County	$95,500	$17,300	$12,975	$12,578	**$138,353**
Bellevue	$1,233,000	$234,000	$175,500	$164,250	**$1,806,750**
Redmond	$1,042,500	$178,800	$134,100	$135,540	**$1,490,940**
WSDOT NW	$65,000	$9,400	$7,050	$8,145	**$89,595**
Total Corridor	$2,436,000	$439,500	$329,625	$320,513	**$3,525,638**

K5 - Equipment and Signal Timing Cost Breakdown

	Controller & Cabinet Upgrades	System Detection	UPS	Transit Priority (1/3 inter.)	Fiber (mile)	Central System Upgrade	TMC Connect	CCTV (1/3 inter.)	DMS	*Timing Plans* *TOD/ Constr. Plans*	*Timing Plans* *Incidents/ Evac. Plans*	C2C	Total Equip. & Timing Costs
Unit Cost	$19,000	$25,000	$8,000	$10,000	$250,000	Varies	Varies	$10,000	$100,000	*$3,500*	*$1,000*	TBD	
King County	2	0	2	1	0	$2,500	$10,000	1	0	*2*	*2*		**$95,500**
Bellevue	0	2	10	3	3.2	$0	$0	1	2	*14*	*14*		**$1,233,000**
Redmond	0	1	18	5	0.9	$200,000	$0	5	2	*33*	*33*		**$1,042,500**
WSDOT NW	0	0	4	0	0	$5,000	$0	1	0	*4*	*4*		**$65,000**
Total Corridor	$38,000	$75,000	$272,000	$90,000	$1,025,000	$207,500	$10,000	$80,000	$400,000	*$185,500*	*$53,000*		**$2,436,000**

Notes

- The City of Bellevue has four signalized intersections in very close proximity to the corridor that have been added to total of *Timing Plans.*
- The City of Bellevue plans to purchase a new central sytem. Unclear whether this is already funded.
- The City of Redmond has 15 signalized intersections in very close proximity to the corridor that have been added to total of *Timing Plans* .
- There are a total of 14 signalized intersections that are located on the Redmond/Bellevue border.
  These intersections have been added to the total counts for the City of Redmond.
- Assume all WSDOT operated signals to be configured onto existing i2TMS model signal system.
- System Detection and DMS identified for the following locations:
  148th Ave NE at NE 51st St: one DMS
  148th Ave NE at NE 24th St: one DMS
  148th Ave NE at I-90: two DMS

K10: Central Way/ NE 85th ST/ Redmond Way/ SR202

Project Start: Market Street	**Project End:** I-90 in North Bend
Operators: City of Kirkland, City of Redmond, and WSDOT NW Region	**Other Stakeholders:** Freight, and City of North Bend

Project Overview	***Project Significance***
This project will deploy the following ITS devices: • Development of new timing plans for incident and emergency management • System detection for traveler information data • Fiber optic communications along entire corridor • TMC connections • Full CCTV camera coverage • DMS at key decision points	• V/C ratio is 0.9 or greater • Principal arterial • Metropolitan Transportation System MTS) identified route • May be used as alternative route for I-90. • No alternative routes • T1/T2 Freight Route • Route identified in City of Redmond and City of Kirkland ITS plans

Corridor Connectivity

- Corridor intersects with I-405 and I-90 and connectivity to WSDOT could be provided over the freeway fiber network
- The City of Kirkland has existing conduit on Central Way, connecting to City Hall, which is the planned location for a new TMC.
- The City of Redmond has an existing ITS project along Redmond Way, including cameras and fiber communications to the TMC.

Relationship with Other Corridor Projects

- Corridor intersects with the K5 and K12 corridors, which together provide north-south, east-west connectivity between Eastside communities and alternate routes to freeways.

Other Considerations

- Kirkland's Central Way/Downtown Corridor project identified as high priority in City's ITS Plan and currently seeking funding.
- Kirkland is planning upgrades to existing controllers and a new central system upgrade, which are not included in this project's cost estimate.
- Upgrade to Redmond's central system identified as part of K5 Corridor project. If K10 deployed first, may need to do upgrade as part of K10 project.
- Approximately 50% of the estimated cost is for the rural portion of the corridor extending to North Bend. A lower cost first phase of the project could simply "fill the gaps" between Redmond and Kirkland.

K10 - Cost Summary

Corridor No.	Corridor	Agency Jurisdictions	Segment Start	Segment End	No. of Signals	Total Capital Costs	Operation Costs (2 Years)	**Total Project Costs**
K10	Central Way NE 85th Street/ Redmond Way/ SR 202	Kirkland	Market St	132nd Ave NE	9	$1,101,870	$54,000	**$1,155,870**
		Redmond	132nd Ave NE	188th Ave NE	20	$1,262,250	$120,000	**$1,382,250**
		WSDOT NW	188th Ave NE	I-90	12	$8,458,560	$72,000	**$8,530,560**
		Total Corridor	Market St	I-90	41	$10,822,680	$246,000	**$11,068,680**

K10 - Capital Cost Breakdown

	Total Equip. Costs	Total Design Costs	Construction Support Costs	Contingency Costs	**Total Capital Costs**
Kirkland	$756,000	$140,400	$105,300	$100,170	**$1,101,870**
Redmond	$881,500	$152,000	$114,000	$114,750	**$1,262,250**
WSDOT NW	$5,710,000	$1,131,200	$848,400	$768,960	**$8,458,560**
Total Corridor	$7,347,500	$1,423,600	$1,067,700	$983,880	**$10,822,680**

K10 - Equipment and Signal Timing Cost Breakdown

	Controller & Cabinet Upgrades	System Detection	UPS	Transit Priority (1/3 inter.)	Fiber (mile)	Central System Upgrade	TMC Connect	CCTV (1/3 inter.)	DMS	*Timing Plans* *TOD/ Constr. Plans*	*Timing Plans* *Incidents/ Evac. Plans*	C2C	Total Equip. & Timing Costs
Unit Cost	$19,000	$25,000	$8,000	$10,000	$250,000	Varies	Varies	$10,000	$100,000	*$3,500*	*$1,000*	TBD	
Kirkland	0	1	9	0	1.5	$0	$0	3	2	*12*	*12*		**$756,000**
Redmond	0	1	20	0	1.5	$0	$0	0	2	*27*	*27*		**$881,500**
WSDOT NW	0	1	12	0	21.5	$0	$0	6	1	*12*	*12*		**$5,710,000**
Total Corridor	$0	$75,000	$328,000	$0	$6,125,000	$0	$0	$90,000	$500,000	*$178,500*	*$51,000*		**$7,347,500**

Notes

- The first signalized intersection in the corridor is an integral part of Corridor K12 and, as such, has been included in the total number of signals for that specific corridor.
- The City of Kirkland has three signalized intersections in very close proximity to the corridor that have been added to total of *Timing Plans* .
- The City of Kirkland is planning upgrades to existing controllers and a new central system upgrade.
- The City of Redmond has seven signalized intersections in very close proximity to the corridor that have been added to total of *Timing Plans* .
- The City of Redmond has a new central system identified in the K5 Corridor.
- System Detection and DMS identified for the following locations:
  NE 85th St at I-405: two DMS
  NE Redmond Way at SR520: two DMS in proximity
  Snoqualmie Pkwy at I-90: one DMS

K12: 68th Ave NE/ NE 170th St/ Simonds Rd NE/ 100th Ave NE/ 98th Ave NE/ Market St/ Central Way/ Lake St S/ Lake Washington Blvd NE/ Bellevue Way NE/ SR908

Project Start: SR 522/NE Bothell Way	**Project End:** I-90
Operators: King County, City of Kirkland, and City of Bellevue	**Other Stakeholders:** WSDOT NW Region (operates signals in proximity to corridor start and end points), Transit

Project Overview

This project will deploy the following ITS devices:

- Development of new timing plans for incident and emergency management
- System detection for traveler information data
- Fiber optic communications along entire corridor
- Full CCTV camera coverage
- DMS at key decision points
- Transit signal priority

Project Significance

- V/C ratio is 0.9 or greater
- Principal arterial
- May be used as alternative route for I-405
- No alternative routes
- Route identified in City of Kirkland ITS Plan
- Connects multiple urban centers
- Connects an urban center to a manufacturing/industrial center

Corridor Connectivity

- The City of Kirkland has existing conduit on 100th Ave NE and part of Market Street, connecting to City Hall, which is the planned location for a new TMC.
- City of Bellevue has existing connectivity along the north portion of Bellevue Way to its TMC.
- Connectivity to King County's TCC could be provided through the existing NE 124th Street ITS project, which intersects this corridor.

Relationship with Other Corridor Projects

- Corridor intersects with the K27 and K10 corridors, which together provide north-south, east-west connectivity between Eastside communities and alternate routes to freeways.

Other Considerations

- City of Kirkland ITS Plan identifies 1 DMS, upgraded signal controllers and new central system for this corridor.
- City of Bellevue plans to procure a new traffic responsive control system.

K12 - Cost Summary

Corridor No.	Corridor	Agency Jurisdictions	Segment Start	Segment End	No. of Signals	Total Capital Costs	Operation Costs (2 Years)	**Total Project Costs**
K12	68th Ave NE/ NE 170th St/ Simonds Rd NE/ 100th Ave NE/ 98th Ave NE/ Market St/ Central Way/ Lake St S/ Lake Washington Blvd NE/ Bellevue Way NE/ SR908	King County	SR 522	NE 132nd St	8	$1,726,065	$48,000	**$1,774,065**
		Kirkland	NE 132nd St	SR520	9	$1,255,320	$54,000	**$1,309,320**
		Bellevue	SR 520	I-90	18	$1,748,340	$108,000	**$1,856,340**
		Total Corridor	SR522	I-90	35	$4,729,725	$210,000	**$4,939,725**

K12 - Capital Cost Breakdown

	Total Equip. Costs	Total Design Costs	Construction Support Costs	Contingency Costs	**Total Capital Costs**
King County	$1,174,000	$225,800	$169,350	$156,915	**$1,726,065**
Kirkland	$857,000	$162,400	$121,800	$114,120	**$1,255,320**
Bellevue	$1,213,500	$214,800	$161,100	$158,940	**$1,748,340**
Total Corridor	$3,244,500	$603,000	$452,250	$429,975	**$4,729,725**

K12 - Equipment and Signal Timing Cost Breakdown

										Timing Plans			
	Controller & Cabinet Upgrades	System Detection	UPS	Transit Priority (1/3 inter.)	Fiber (mile)	Central System Upgrade	TMC Connect	CCTV (1/3 inter.)	DMS	*TOD/ Constr. Plans*	*Incidents/ Evac. Plans*	C2C	**Total Equip. & Timing Costs**
Unit Cost	$19,000	$25,000	$8,000	$10,000	$250,000	Varies	Varies	$10,000	$100,000	*$3,500*	*$1,000*		
King County	0	2	8	3	3.9	$0	$0	1	0	*10*	*10*	TBD	**$1,174,000**
Kirkland	0	2	9	3	2.2	$0	$0	1	1	*10*	*10*		**$857,000**
Bellevue	0	2	18	5	2.4	$0	$0	3	2	*31*	*31*		**$1,213,500**
Total Corridor	$0	$150,000	$280,000	$110,000	$2,125,000	$0	$0	$50,000	$300,000	*$178,500*	*$51,000*		**$3,244,500**

Notes

- The City of Kirkland has one signalized intersection in very close proximity to the corridor that has been added to total of *Timing Plans*.
- The City of Kirkland has plans for one DMS, upgraded signal controllers and a new central system.
- The City of Bellevue has 13 signalized intersections in very close proximity to the corridor that have been added to total of *Timing Plans*.
- The City of Bellevue plans to purchase a new central sytem. Unclear whether this is already funded.
- The signalized intersection where K10 meets K12 is considered integral to this route and, as such, has been included in *TSP* and *Timing* counts.
- Transit Signal Priority proposed for entire corridor from I-90 to SR 522 (assume 1/3 of signals get TSP equipment).
- System Detection and DMS identified for the following locations:

  Bellevue Way SE at I-90: one DMS
  Bellevue Way SE at SR520: two DMS in proximity
  Bellevue Way SE at SR908: no DMS, but this intersection is a node/beginning point for Corridor K10
  100th Ave NE at Simmonds Rd NE: no DMS or signalized intersection, but the route breaks off of 100th Ave NE at this node

K14: Richards Road SE/ Factoria Blvd SE/ Coal Creek Parkway SE/ Duval Avenue NE/ 138th Avenue SE

Project Start: Lake Hills Connector	**Project End:** NE 4th St
Operators: City of Bellevue, City of Renton, and King County	**Other Stakeholders:** City of Newcastle, WSDOT NW Region, and Transit

Project Overview

This project will deploy the following ITS devices:

- Upgrade, interconnect and synchronize signals
- Development of new timing plans for incident and emergency management
- System detection for traveler information data
- Fiber optic communications along entire corridor
- TMC Connections
- Full CCTV camera coverage
- DMS at key decision points
- Transit signal priority

Project Significance

- V/C ratio is 0.9 or greater
- Principal arterial
- Multi-jurisdictional
- Possible alternative route to I-405
- Route identified in City of Renton ITS Plan

Corridor Connectivity

- Corridor intersects with I-90 and connectivity to WSDOT could be provided over the freeway fiber network
- Connectivity to Renton TMC could be provided via new fiber along K16
- No clear path to Bellevue TMC located on west side of I-405. May be potential for connectivity via existing fiber beginning at Coal Creek Parkway.
- No clear path to connect King County to operations in Newcastle. Connectivity may be provided via Traffic Busters or fiber-sharing agreements with WSDOT and other project partners.

Relationship with Other Corridor Projects

- Project may be combined with Renton portion of K16 to provide a more comprehensive alternative route to I-405.

Other Considerations

- Bellevue requested UASI grant for fiber along this corridor to connect with Renton, therefore listed as “planned” in cost estimate.
- Signals in Factoria segment on traffic responsive system.
- Signals in Newcastle are operated by King County. Upgrading controllers for centralized control via existing Actra system used by both King County and Renton would allow for shared visibility and potentially control by either agency.

K14 - Cost Summary

Corridor No.	Corridor	Agency Jurisdictions	Segment Start	Segment End	No. of Signals	Total Capital Costs	Operation Costs (2 Years)	Total Project Costs
K14	Richards Rd SE/ Factoria Blvd SE/ Coal Creek Pkwy/ 138th Ave SE	Bellevue	Lake Hills Connector	SE 72nd PL	14	$614,295	$84,000	**$698,295**
		Newcastle (operated by King County)	SE 72nd PL	SE 95th Way	5	$433,125	$30,000	**$463,125**
		Renton	SE 95th Way	NE 4th St	2	$494,010	$12,000	**$506,010**
		WSDOT NW (operated by Bellevue)	I-90 Ramps		2	$33,660	$12,000	**$45,660**
		Total Corridor	Lake Hills Connector	NE 4th St	23	$1,575,090	$138,000	**$1,713,090**

K14 - Capital Cost Breakdown

	Total Equip. Costs	Total Design Costs	Construction Support Costs	Contingency Costs	Total Capital Costs
Bellevue	$430,000	$73,400	$55,050	$55,845	**$614,295**
Newcastle (operated by King County)	$297,500	$55,000	$41,250	$39,375	**$433,125**
Renton	$335,000	$65,200	$48,900	$44,910	**$494,010**
WSDOT NW (operated by Bellevue)	$25,000	$3,200	$2,400	$3,060	**$33,660**
Total Corridor	$1,087,500	$196,800	$147,600	$143,190	**$1,575,090**

K14 - Equipment and Signal Timing Cost Breakdown

	Controller & Cabinet Upgrades	System Detection	UPS	Transit Priority (1/3 inter.)	Fiber (mile)	Central System Upgrade	TMC Connect	CCTV (1/3 inter.)	DMS	*Timing Plans* *TOD/ Constr. Plans*	*Timing Plans* *Incidents/ Evac. Plans*	C2C	Total Equip. & Timing Costs
Unit Cost	$19,000	$25,000	$8,000	$10,000	$250,000	Varies	Varies	$10,000	$100,000	*$3,500*	*$1,000*		
Bellevue	0	1	14	0	planned	$0	$0	3	2	*14*	*14*		**$430,000**
Newcastle (operated by King County)	5	0	5	2	0	$0	$100,000	2	0	*5*	*5*	TBD	**$297,500**
Renton	0	0	2	1	1.2	$0	$0	planned	0	*2*	*2*		**$335,000**
WSDOT NW (operated by Bellevue)	0	0	2	0	0	$0	$0	0	0	*2*	*2*		**$25,000**
Total Corridor	$95,000	$25,000	$184,000	$30,000	$300,000	$0	$100,000	$50,000	$200,000	*$80,500*	*$23,000*		**$1,087,500**

Notes

- The City of Bellevue plans to purchase a new central sytem. Unclear whether this is already funded.
- A King County system upgrade may involve adding signals to existing Actra or Icons system.
- Assume upgrade of controllers compatible with King County system is more cost efficient than purchasing a new system.
- Transit Priority recommended for Coal Creek Parkway SE from Newcastle Way to NE Sunset Blvd.
- System Detection and DMS identified for the following locations:
  Factoria Blvd SE at I-90: two DMS

K16: MLK Way/ Airport Way S/ Logan Way/ Park Ave N/ NE Park Dr/ Sunset Blvd NE/ SR900/ 17th Ave NW/ NW Sammamish Rd/ SE 56th St

Project Start: Rainier Ave S	**Project End:** E. Lake Sammamish Pkwy
Operators: City of Seattle, City Renton, WSDOT NW Region, and City of Issaquah	**Other Stakeholders:** Freight

Project Overview

This project will deploy the following ITS devices:

- Enable centralized signal control
- Development of new timing plans for incident and emergency management
- System detection for traveler information data
- Fiber optic communications along entire corridor
- TMC Connections
- Full CCTV camera coverage
- DMS at key decision points

Project Significance

- VMT is between 75,000 to 99,999
- V/C ratio is 0.9 or greater
- Principal arterial
- Metropolitan Transportation System (MTS) designated route
- Multi-jurisdictional
- May be used as an alternative route for I-5
- T1/T2 freight route
- Route identified in City of Issaquah and City of Renton ITS plans
- Connects an urban center to a manufacturing/industrial center

Corridor Connectivity

- Corridor is intersected by existing City of Seattle fiber south of Boeing Access Road that connects with Airport Way (K70) and continues to downtown Seattle.
- Connectivity to Renton and WSDOT could be provided via a link to the I-405 freeway fiber network. Alternatively, connectivity to Renton could be provided by a short build-out to connect with the K23 fiber which will run past the TMC on Grady Way in City Hall.
- Existing fiber on SR 900 and NW Sammamish Road portions of project provide connectivity to Issaquah TMC located at 1775 12th Avenue NW.

Relationship with Other Corridor Projects

- Project may be combined with Renton portion of K14 to provide a more comprehensive alternative route to I-405

Other Considerations

- Due to length of corridor, project could be split into phases, such as Phase 1: Seattle to Renton and Phase 2: Renton to Issaquah. Issaquah has already completed ITS projects along portions of the corridor within Issaquah.

K16 - Cost Summary

Corridor No.	Corridor	Agency Jurisdictions	Segment Start	Segment End	No. of Signals	Total Capital Costs	Operation Costs (2 Years)	Total Project Costs
K16	MLK Way/ Airport Way S/ Logan Way/ Park Ave N/ NE Park Dr/ Sunset Blvd NE/ SR900/ 17th Ave NW/ NW Sammamish Rd/ SE 56th St	Seattle	Rainier Ave S	S 126th St	30	$3,504,600	$180,000	**$3,684,600**
		Renton	S 126th St	148th Ave SE	20	$804,375	$120,000	**$924,375**
		WSDOT NW	148th Ave SE	SE 95th St	3	$80,561	$18,000	**$98,561**
			I-5 Ramps, I-90 Ramps I-405 Ramps in Renton I-405 Ramps in Issaquah		6	$296,258	$36,000	**$332,258**
		Issaquah	SE 95th St	E Lk Sammamish Pkwy	9	$507,870	$54,000	**$561,870**
		Total Corridor	S 126th St	E Lk Sammamish Pkwy	68	$5,193,664	$408,000	**$5,601,664**

K16 - Capital Cost Breakdown

	Total Equip. Costs	Total Design Costs	Construction Support Costs	Contingency Costs	Total Capital Costs
Seattle	$2,398,500	$450,000	$337,500	$318,600	**$3,504,600**
Renton	$572,000	$91,000	$68,250	$73,125	**$804,375**
WSDOT NW	$57,750	$8,850	$6,638	$7,324	**$80,561**
WSDOT NW Ramps	$206,500	$35,900	$26,925	$26,933	**$296,258**
Issaquah	$356,000	$60,400	$45,300	$46,170	**$507,870**
Total Corridor	$3,590,750	$646,150	$484,613	$472,151	**$5,193,664**

K16 - Equipment and Signal Timing Cost Breakdown

	Controller & Cabinet Upgrades	System Detection	UPS	Transit Priority (1/3 inter.)	Fiber (mile)	Central System Upgrade	TMC Connect	CCTV (1/3 inter.)	DMS	*Timing Plans* *TOD/ Constr. Plans*	*Timing Plans* *Incidents/ Evac. Plans*	C2C	Total Equip. & Timing Costs
Unit Cost	$19,000	$25,000	$8,000	$10,000	$250,000	Varies	Varies	$10,000	$100,000	*$3,500*	*$1,000*		
Seattle	0	1	30	0	6.7	$10,000	$100,000	10	1	*33*	*33*		**$2,398,500**
Renton	0	1	20	0	0	$0	$0	7	2	*26*	*26*		**$572,000**
WSDOT NW	0	0	3	0	0	$250	$10,000	1	0	*3*	*3*	TBD	**$57,750**
WSDOT NW Ramps	0	2	6	0	0	$1,500	$60,000	2	0	*6*	*6*		**$206,500**
Issaquah	0	0	9	0	0	$0	$0	3	2	*12*	*12*		**$356,000**
Total Corridor	$0	$100,000	$544,000	$0	$1,675,000	$11,750	$170,000	$230,000	$500,000	*$280,000*	*$80,000*		**$3,590,750**

Notes

- Exact number of signals for City of Seattle difficult to accurately determine due to density. Uncertain which models are located in corridor.
- The City of Seattle has an existing signal system, but unknown if all signals are centrally controlled. Some intersections may need signal controller upgrades.
- The City of Renton has six signalized intersections in very close proximity to the corridor that have been added to total of *Timing Plans* .
- The City of Renton has two signals just west of I-405 interchange that are proposed, due to close proximity, to be grouped together with two WSDOT signals at interchange ramps for signal coordination purposes.
- WSDOT system upgrade costs assumed, need to add intesections to software configuration in i2TMS.
- WSDOT has existing or planned fiber along I-405 and I-90, but may require linkages to ramp intersection signals.
- The City of Issaquah has three signalized intersections in very close proximity to the corridor that have been added to total of *Timing Plans* .

K17: SR99/ Aurora Ave N

Project Start: Downtown Seattle	**Project End:** Pierce/King County Line
Operators: Seattle, King County, WSDOT NW Region, City of Kent, and City of Federal Way	**Other Stakeholders:** City of Shoreline, City of Tukwila, City of SeaTac, City of Des Moines, Freight, and Transit

Project Overview

Significant ITS investment has already been made in many locations along the SR 99/Aurora corridor, including Shoreline, downtown Seattle, and the Duwamish area of south Seattle. This project will "fill in the gaps", particularly in South King County, by deploying the following devices where applicable:

- Upgrade, interconnect and synchronize signals
- Enable centralized signal control
- Development of new timing plans for incident and emergency management
- System detection for traveler information data
- Fiber optic communications along entire corridor (where appropriate and not currently existing)
- TMC Connections
- Full CCTV camera coverage
- DMS at key decision points

Project Significance

- VMT is 100,000 or greater
- V/C ratio is 0.9 or greater
- Principal arterial
- MTS Designated
- Metropolitan Transportation System (MTS) designated route
- May be used as an alternative route for I-5 and other local routes
- Connects to areas where average income is less than 50% of the regional median income
- T1/T2 freight route
- Bus Rapid Transit route
- Connects multiple urban centers
- Connects an urban center to a manufacturing/industrial center

Corridor Connectivity

- Fiber along the corridor would provide connectivity to City of Seattle and King County traffic management centers. Short build-outs may be required to reach WSDOT, Kent and Federal Way TMCs. Other stakeholders could access video and traffic data via Traffic Busters or a workstation.

Relationship with Other Corridor Projects

- Combining K17, P9 and S6 corridors would create a regional SR 99 ITS corridor extending from Everett to Tacoma.
- K17 and K22 (1st Avenue South) jointly carry detour and overflow traffic from I-5 and SR 509. Combining these two projects would provide improved reliability for freight moving between the Port of Seattle, Duwamish industrial area and SeaTac Airport, as well as commuters moving between the Regional Growth Centers of Burien, SeaTac and Seattle.
- K17, K20, K22, K25 and K70 comprise a significant portion of the SoDo ICM corridor.

Other Considerations

- SR 99 (SR518 - S 320th St) is a Bus Rapid Transit route.
- BRT route on Aurora Ave N from N 204th St to N 145th St
- SR 99 through downtown Seattle will be undergoing significant changes due to the planned construction of a new bored tunnel route and subsequent teardown of the Alaskan Way Viaduct.

K17 - Cost Summary

Corridor No.	Corridor	Agency Jurisdictions	Segment Start	Segment End	No. of Signals	Total Capital Costs	Operation Costs (2 Years)	**Total Project Costs**
K17	SR99/ Aurora Ave	Shoreline/ King County	Sno/King County Line	N 145th St	11	$623,205	$66,000	**$689,205**
		Seattle	N 145th St	S. 101st	43	$2,706,165	$258,000	**$2,964,165**
		Tukwila	S. 101st	S. 152nd	0	$1,707,750	$0	**$1,707,750**
		SeaTac/ King County	S. 152nd	S 216th	12	$318,285	$72,000	**$390,285**
		Des Moines/ WSDOT NW	S 216th	S 240th	6	$279,180	$36,000	**$315,180**
		Kent	S 240th	S 272nd	5	$264,825	$30,000	**$294,825**
		Federal Way	S 272nd	Pierce/King County Line	14	$2,091,375	$84,000	**$2,175,375**
		WSDOT NW	SR99 Ramps @ W Marginal Way/ SR99 Ramps @ SR518		4	$530,145	$24,000	**$554,145**
		Total Corridor	Sno/ King County Line	Pierce/ King County Line	95	$8,520,930	$570,000	**$9,090,930**

K17 - Capital Cost Breakdown

	Total Equip. Costs	Total Design Costs	Construction Support Costs	Contingency Costs	**Total Capital Costs**
Shoreline/ King County	$436,000	$74,600	$55,950	$56,655	**$623,205**
Seattle	$1,904,000	$317,800	$238,350	$246,015	**$2,706,165**
Tukwila	$1,150,000	$230,000	$172,500	$155,250	**$1,707,750**
SeaTac/ King County	$233,000	$32,200	$24,150	$28,935	**$318,285**
Des Moines/ WSDOT NW	$195,000	$33,600	$25,200	$25,380	**$279,180**
Kent	$186,500	$31,000	$23,250	$24,075	**$264,825**
Federal Way	$1,437,500	$265,000	$198,750	$190,125	**$2,091,375**
WSDOT NW	$360,500	$69,400	$52,050	$48,195	**$530,145**
Total Corridor	$5,902,500	$1,053,600	$790,200	$774,630	**$8,520,930**

K17 - Equipment and Signal Timing Cost Breakdown

										Timing Plans			
	Controller & Cabinet Upgrades	System Detection	UPS	Transit Priority (1/3 inter.)	Fiber (mile)	Central System Upgrade	TMC Connect	CCTV (1/3 inter.)	DMS	*TOD/ Constr. Plans*	*Incidents/ Evac. Plans*	C2C	**Total Equip. &Timing Costs**
Unit Cost	$19,000	$25,000	$8,000	$10,000	$250,000	Varies	Varies	$10,000	$100,000	*$3,500*	*$1,000*	TBD	
Shoreline/ King County	0	1	11	0	1	$0	$0	1	0	*14*	*14*		**$436,000**
Seattle	0	2	43	0	3.5	$10,000	$100,000	1	2	*70*	*70*		**$1,904,000**
Tukwila	0	0	0	0	4.6	$0	$0	0	0	*0*	*0*		**$1,150,000**
SeaTac/ King County	0	0	12	0	0.1	$0	$0	4	0	*16*	*16*		**$233,000**
Des Moines/ WSDOT NW	0	0	6	0	0	$0	$100,000	2	0	*6*	*6*		**$195,000**
Kent	5	0	5	0	planned	$0	$0	2	0	*7*	*7*		**$186,500**
Federal Way	0	2	0	0	2.5	$200,000	$0	5	4	*25*	*25*		**$1,437,500**
WSDOT NW	0	1	4	0	0	$40,000	$20,000	3	2	*3*	*3*		**$360,500**
Total Corridor	$95,000	$150,000	$648,000	$0	$2,925,000	$250,000	$220,000	$180,000	$800,000	*$493,500*	*$141,000*		**$5,902,500**

Notes

- The City of Shoreline has thee signalized intersections in very close proximity to the corridor that have been added to total of *Timing Plans* .
- Future TSP along Aurora from 145th and north is funded.
- Fiber added for the City of Shoreline from N 185th St to N 205th St (County Line).
- Exact number of signals for City of Seattle difficult to accurately determine due to density. Uncertain which models are located in corridor.
- The City of Seattle has an existing signal system, but unknown if all signals are centrally controlled. Some intersections may need signal controller upgrades.
- The City of Seattle's two most northern signals in this corridor are proposed to be grouped with the City of Shoreline signals for coordination purposes due to close proximity.
- Fiber proposed for City of Tukwila to connect to corridor network.
- The City of SeaTac has four signalized intersections in very close proximity to the corridor that have been added to total of *Timing Plans* .
- Signals near the Cities of Federal Way, Kent, and Des Moines border, which runs along S 272nd St, are proposed to be grouped together for coordination purposes due to close proximity.
- The City of Des Moines TMC connectivity may be provided via BRT rather than through this project.
- The City of Kent system upgrade is proposed under the K58 Corridor.
- The City of Kent has two signalized intersections in very close proximity to the corridor that have been added to total of *Timing Plans* .
- The City of Federal Way has 11 signalized intersections in very close proximity to the corridor that have been added to total of *Timing Plans* .
- The City of Federal Way has existing video detection at each intersection, only requiring two additional cameras for each intersection at $15,000 apiece, and has existing UPS at each intersection.
- Assume all WSDOT operated signals to be configured onto existing i2TMS model signal system.
- WSDOT has existing or planned fiber along SR518 but may still require linkages to intersection signals.
- System Detection and DMS identified for the following locations:

  SR99 at Ferry Terminal at the edge of Downtown Seattle: two DMS
  SR99 at SR518 (City of Tukwila / City of SeaTac node): two DMS in proximity, one facing each direction. SDE assumed under WSDOT jurisdiction
  SR99 at SR18, City of Federal Way: two DMS, one SD

K20: 4th Ave/ 4th Ave S/ East Marginal Way South/ Interurban Avenue South/ West Valley Highway/ SR181/ 68th Ave S/ West Valley Highway

Project Start: John St	**Project End:** SR18
Operators: City of Seattle, City of Tukwila, City of Kent, King County, and City of Auburn	**Other Stakeholders:** Freight, and Transit

Project Overview	***Project Significance***
This project will deploy the following ITS devices: • Upgrade, interconnect and synchronize signals • Development of new timing plans for incident and emergency management • System detection for traveler information data • Fiber optic communications along entire corridor • TMC Connections • Full CCTV camera coverage • DMS at key decision points • Transit signal priority	• VMT is 100,000 or greater • V/C ratio is 0.9 or greater • Principal arterial • Highway of Statewide Significance • Multi-jurisdictional • Connects to areas where average income is less than 50% of the regional median income • T1/T2 freight route • 4th Avenue South/East Marginal Way/Interurban Avenue included in SoDo Integrated Corridor Management (ICM) corridor • Connects multiple urban centers

Corridor Connectivity

- Fiber along the corridor would provide connectivity to City of Seattle and King County traffic management centers.
- Connection to King County could also be provided via existing King County TransValley project on S 277th.
- Connectivity to Tukwila could be provided via existing fiber on Southcenter Boulevard.
- To reach Kent City Hall on 4th Ave S, connectivity could be provided via the K22 project or an additional build-out.
- To reach Auburn City Hall on Main St., additional fiber would be required or potentially via a fiber sharing agreement with WSDOT along SR 18.

Relationship with Other Corridor Projects

- K17, K20, K22, K25 and K70 comprise a significant portion of the SoDo ICM corridor.

Other Considerations

- Transit signal priority proposed for 4th Avenue and 4th Avenue South from Denny Way to E Marginal Way
- Kent system upgrade proposed in K58 corridor cost estimate.
- Kent has existing conduit along K20 from north to south city boundaries.

K20 - Cost Summary

Corridor No.	Corridor	Agency Jurisdictions	Segment Start	Segment End	No. of Signals	Total Capital Costs	Operation Costs (2 Years)	Total Project Costs
K20	4th Ave/ 4th Ave S/ East Marginal Way South/ Interurban Avenue South/ West Valley Highway/ SR181/ 68th Avenue South/ West Valley Highway	Seattle	Denny Way	16th Ave S	55	$4,103,550	$330,000	$4,433,550
		Tukwila	16th Ave S	SW 43rd St	4	$3,202,155	$24,000	$3,226,155
		Kent	SW 43rd St	S 277th St	11	$2,724,480	$66,000	$2,790,480
		King County	S 277th St	S 285th St	1	$230,670	$6,000	$236,670
		Auburn	S 285th St	Boundary Blvd	7	$1,927,035	$42,000	$1,969,035
		King County	Boundary Blvd	County Line Rd E	1	$1,069,695	$6,000	$1,075,695
		Total Corridor	Denny Way	County Line Rd E	79	$13,257,585	$474,000	$13,731,585

K20 - Capital Cost Breakdown

	Total Equip. Costs	Total Design Costs	Construction Support Costs	Contingency Costs	Total Capital Costs
Seattle	$2,841,500	$508,000	$381,000	$373,050	$4,103,550
Tukwila	$2,161,000	$428,600	$321,450	$291,105	$3,202,155
Kent	$1,854,500	$355,600	$266,700	$247,680	$2,724,480
King County	$156,500	$30,400	$22,800	$20,970	$230,670
Auburn	$1,310,500	$252,200	$189,150	$175,185	$1,927,035
King County	$721,500	$143,400	$107,550	$97,245	$1,069,695
Total Corridor	$9,045,500	$1,718,200	$1,288,650	$1,205,235	$13,257,585

K20 - Equipment and Signal Timing Cost Breakdown

										Timing Plans			
	Controller & Cabinet Upgrades	System Detection	UPS	Transit Priority (1/3 inter.)	Fiber (mile)	Central System Upgrade	TMC Connect	CCTV (1/3 inter.)	DMS	*TOD/ Constr. Plans*	*Incidents/ Evac. Plans*	C2C	**Total Equip. & Timing Costs**
Unit Cost	$19,000	$25,000	$8,000	$10,000	$250,000	Varies	Varies	$10,000	$100,000	*$3,500*	*$1,000*	TBD	
Seattle	0	1	55	19	6.5	$0	$0	16	1	*67*	*67*		**$2,841,500**
Tukwila	4	2	4	0	5.9	$0	$100,000	1	4	*4*	*4*		**$2,161,000**
Kent	0	1	11	0	5.7	$0	$0	4	2	*17*	*17*		**$1,854,500**
King County	1	0	1	0	0.5	$0	$0	0	0	*1*	*1*		**$156,500**
Auburn	0	1	7	0	3.8	$0	$0	3	2	*11*	*11*		**$1,310,500**
King County	1	1	1	0	2.5	$0	$10,000	3	0	*1*	*1*		**$721,500**
Total Corridor	$114,000	$150,000	$632,000	$190,000	$6,225,000	$0	$110,000	$270,000	$900,000	*$353,500*	*$101,000*		**$9,045,500**

Notes

- The City of Seattle has 12 signalized intersections in very close proximity to the corridor that have been added to total of *Timing Plans*.
- The City of Seattle has numerous signalized intersections in the downtown grid in very close proximity to the corridor that have not been added to total of Timing Plans.
- Transit Signal Priority proposed for 4th Ave and 4th Ave S from Denny Way to E Marginal Way (assume 1/3 of signals get TSP equipment).
- Assumes the City of Tukwila has Siemens Actra central system that can be configured with signals in this corridor.
- The City of Kent has six signalized intersections in very close proximity to the corridor which have been added to total of *Timing Plans*.
- The City of Kent system upgrade proposed under the K58 Corridor.
- The City of Auburn has four signalized intersections in very close proximity to the corridor that have been added to total of *Timing Plans*.
- System Detection and DMS identified for the following locations:
  - 4th Ave and S Jackson St: one DMS for SB traffic only (i.e., NB terminus)
  - E Marginal Way at S Boeing Rd: one DMS
  - W Valley Hwy at Southcenter Blvd: two DMS, one facing each direction; omited DMS location at I-5
  - W Valley Hwy at SR516: two DMS, one facing each direction
  - W Valley Hwy at SR18: two DMS, one facing each direction
  - W Valley Hwy at County Line Rd E: no DMS placement

K22: 1st Ave N/1st Ave/ 1st Ave S/Myers Way South/ 1st Aven S/SR509/ S 216th/ SR516/ South Kent Des Moines Road/ West Willis Street

Project Start: SR99/SR509	**Project End:** SR169
Operators: City of Seattle, King County, City of Kent, and WSDOT NW Region	**Other Stakeholders:** City of Burien, City of Normandy Park, City of Des Moines, Freight, and Transit

Project Overview

This project will deploy the following ITS devices:

- Upgrade, interconnect and synchronize signals
- Enable centralized signal control
- Development of new timing plans for incident and emergency management
- System detection for traveler information data
- Fiber optic communications along entire corridor
- TMC Connections
- Full CCTV camera coverage
- DMS at key decision points
- Transit signal priority

Project Significance

- VMT is greater than 100,000
- V/C ratio is greater than 0.9
- State Route
- Metropolitan Transportation System (MTS) designated route
- Multi-jurisdictional
- No alternate routes
- Connects to areas where average income is less than 50% of the regional median income
- T1/T2 freight route
- Major transit route
- 1st Avenue South included in SoDo Integrated Corridor Management (ICM) corridor
- Connects multiple urban centers
- Connects an urban center to a manufacturing/industrial center

Corridor Connectivity

- Fiber along the corridor would provide connectivity to City of Seattle and King County traffic management centers.
- Connection to WSDOT could be provided via freeway fiber network, as corridor has several freeway interchanges.
- Connection to Kent City Hall at 220 4th Ave S could be provided via a short build-out from SR 516 along 4th Ave S. This build-out could also provide City of Kent connectivity to K58 and K20.
- Other stakeholders could access video and traffic data via Traffic Busters or a workstation.

Relationship with Other Corridor Projects

- K17 (SR 99) and K22 jointly carry detour and overflow traffic from I-5 and SR 509. Combining these two projects would provide improved reliability for freight moving between the Port of Seattle, Duwamish industrial area and SeaTac Airport, as well as commuters moving between the Regional Growth Centers of Burien, SeaTac and Seattle.
- K17, K20, K22, K25 and K70 comprise a significant portion of the SoDo ICM corridor.

Other Considerations

- Existing Transit Signal Priority on 1st Ave S.

K22 - Cost Summary

Corridor No.	Corridor	Agency Jurisdictions	Segment Start	Segment End	No. of Signals	Total Capital Costs	Operation Costs (2 Years)	**Total Project Costs**
K22	1st Ave N/ 1st Ave/ 1st Ave S/ Myers Way S/ 1st Ave S/ SR509/ S 216th/ SR516/ South Kent Des Moines Rd/ West Willis Street	Seattle	Mercer	99th St S	42	$4,109,985	$252,000	**$4,361,985**
		King County	99th St S	SW 164th Pl	2	$1,330,808	$12,000	**$1,342,808**
		Burien/ King County	Meeker St	62nd Ave S	8	$1,072,665	$48,000	**$1,120,665**
		Normandy Park/ WSDOT	SW 164th Pl	Des Moines Memorial Park	5	$1,593,281	$30,000	**$1,623,281**
		Des Moines/ WSDOT	Des Moines Memorial Park	I-5	7	$1,502,078	$42,000	**$1,544,078**
		Kent	I-5	Meeker St	3			
			62nd Ave S	Central Ave	5			
			Total		*8*	$2,075,535	$48,000	**$2,123,535**
		WSDOT NW	I-5 Ramps		2	$70,785	$12,000	**$82,785**
		Total Corridor	Mercer	Central Ave	72	$11,755,136	$444,000	**$12,199,136**

K22 - Capital Cost Breakdown

	Total Equip. Costs	Total Design Costs	Construction Support Costs	Contingency Costs	**Total Capital Costs**
Seattle	$2,885,500	$486,200	$364,650	$373,635	**$4,109,985**
King County	$898,500	$177,900	$133,425	$120,983	**$1,330,808**
Burien/ King County	$744,500	$131,800	$98,850	$97,515	**$1,072,665**
Normandy Park/ WSDOT	$1,078,750	$211,250	$158,438	$144,844	**$1,593,281**
Des Moines/ WSDOT	$1,018,500	$198,300	$148,725	$136,553	**$1,502,078**
Kent	$1,407,000	$274,200	$205,650	$188,685	**$2,075,535**
WSDOT NW	$50,000	$8,200	$6,150	$6,435	**$70,785**
Total Corridor	$8,082,750	$1,487,850	$1,115,888	$1,068,649	**$11,755,136**

K22 - Equipment and Signal Timing Cost Breakdown

										Timing Plans			
	Controller & Cabinet Upgrades	System Detection	UPS	Transit Priority (1/3 inter.)	Fiber (mile)	Central System Upgrade	TMC Connect	CCTV (1/3 inter.)	DMS	*TOD/ Constr. Plans*	*Incidents/ Evac. Plans*	C2C	**Total Equip. & Timing Costs**
Unit Cost	$19,000	$25,000	$8,000	$10,000	$250,000	Varies	Varies	$10,000	$100,000	*$3,500*	*$1,000*	TBD	
Seattle	0	2	42	8	7.3	$10,000	$100,000	3	0	*101*	*101*		**$2,885,500**
King County	2	0	2	0	2.9	$500	$100,000	1	0	*2*	*2*		**$898,500**
Burien/ King County	8	1	8	0	0.75	$500	$0	3	2	*19*	*19*		**$744,500**
Normandy Park/ WSDOT	5	0	5	0	3.6	$0	$1,250	2	0	*5*	*5*		**$1,078,750**
Des Moines/ WSDOT	6	0	7	0	2.8	$0	$1,500	2	1	*6*	*6*		**$1,018,500**
Kent (I-5)	3	0	3	0	1.8	$0	$0	1	1	*3*	*3*		**$654,500**
Kent (62nd Ave)	5	1	5	0	1	$0	$100,000	2	2	*5*	*5*		**$752,500**
Kent (Total)	8	1	8	0	2.8	$0	$100,000	3	3	*8*	*8*		**$1,407,000**
WSDOT NW	0	1	2	0	0	$0	$0	0	0	*2*	*2*		**$50,000**
Total Corridor	$551,000	$125,000	$592,000	$80,000	$5,037,500	$11,000	$302,750	$140,000	$600,000	*$500,500*	*$143,000*		**$8,082,750**

Notes

- Transit Signal Priority proposed for 1st Ave and 1st Ave N from W Mercer St. to Yesler Way (assume 1/3 of signals get TSP equipment).
- Assume the City of Burien uses the same system and TMC connectivity as King County.
- The City of Burien has 11 signalized intersections in very close proximity to the corridor that have been added to total of *Timing Plans* .
- Assume the Cities of Normandy Park and Des Moines and WSDOT signals will all be integrated with WSDOT i2TMS signal system.
- The City of Kent system upgrade proposed under the K58 Corridor.
- System Detection and DMS identified for the following locations:

  1st Ave S at S Spokane St: one DMS
  1st Ave S at S Lucile St: one DMS
  1st Ave S at SR518: two DMS
  S Kent Des Moines Rd at I-5: two DMS; assumed WSDOT jurisdiction
  S Kent Des Moines Rd at SR167: two DMS

K23: S 154th/ Southcenter BLVD/ Grady Way/ Main Ave S

Project Start: SR99	**Project End:** SR900
Operators: City of Tukwila and City of Renton	**Other Stakeholders:** Freight

Project Overview

This project will deploy the following ITS devices:

- Development of new timing plans for incident and emergency management
- System detection for traveler information data
- Fiber optic communications along entire corridor
- Full CCTV camera coverage
- DMS at key decision points
- Transit signal priority

Project Significance

- V/C ratio is greater than 0.9
- Principal arterial
- MTS Designated
- Multi-jurisdictional
- Connects to areas where average income is less than 50% of the regional median income
- T1/T2 freight route
- Connects multiple urban centers

Corridor Connectivity

- There is existing fiber on Southcenter Blvd which connects to Tukwila City Hall.
- The Renton TMC at City Hall is located on the corridor.

Relationship with Other Corridor Projects

- Corridor connects with three north-south ITS Plan corridors: K17, K20, and K58. These corridors combined connect Renton and Tukwila with destinations in Seattle, Federal Way and Auburn, and Sea-Tac Airport.
- Installing the portion of fiber along Grady Way from the TMC to Lind (K58) could provide a connectivity point to the other Renton-area RITSIP corridors as they are completed.

Other Considerations

- Arterial connects Renton to SR 167 and I-405
- Arterial connects to Southcenter Mall, a major retail hub

K23 - Cost Summary

Corridor No.	Corridor	Agency Jurisdictions	Segment Start	Segment End	No. of Signals	Total Capital Costs	Operation Costs (2 Years)	Total Project Costs
K23	S 154th/ Southcenter BLVD/ Grady Way/ Main Ave S	Tukwila	SR 99	Boeing Access Road	10	$618,750	$60,000	**$678,750**
		Renton	Boeing Access Road	SR 900	11	$1,449,855	$66,000	**$1,515,855**
		Total Corridor	SR 99	SR 900	21	$2,068,605	$126,000	**$2,194,605**

K23 - Capital Cost Breakdown

	Total Equip. Costs	Total Design Costs	Construction Support Costs	Contingency Costs	Total Capital Costs
Tukwila	$429,500	$76,000	$57,000	$56,250	**$618,750**
Renton	$1,002,000	$180,600	$135,450	$131,805	**$1,449,855**
Total Corridor	$1,431,500	$256,600	$192,450	$188,055	**$2,068,605**

K23 - Equipment and Signal Timing Cost Breakdown

	Controller & Cabinet Upgrades	System Detection	UPS	Transit Priority (1/3 inter.)	Fiber (mile)	Central System Upgrade	TMC Connect	CCTV (1/3 inter.)	DMS	*Timing Plans* *TOD/ Constr. Plans*	*Timing Plans* *Incidents/ Evac. Plans*	C2C	Total Equip. & Timing Costs
Unit Cost	$19,000	$25,000	$8,000	$10,000	$250,000	Varies	Varies	$10,000	$100,000	*$3,500*	*$1,000*		
Tukwila	0	1	10	3	0.5	$0	$0	2	1	*11*	*11*	TBD	**$429,500**
Renton	0	1	11	4	2.2	$0	$0	0	2	*22*	*22*		**$1,002,000**
Total Corridor	$0	$50,000	$168,000	$70,000	$675,000	$0	$0	$20,000	$300,000	*$115,500*	*$33,000*		**$1,431,500**

Notes

- The City of Tukwila has one signalized intersection in very close proximity to the corridor that has been added to total of *Timing Plans*.
- Transit Signal Priority proposed for the entire corridor length from International Blvd to S 2nd St (assume 1/3 of signals get TSP equipment).
- The City of Renton has 11 signalized intersections in very close proximity to the corridor that have been added to total of *Timing Plans*.
- System Detection and DMS identified for the following locations:

  Southcenter Blvd at I-5: one DMS
  SW Grady Way at SR167: two DMS

K25: S Jackson Street/ Rainier Avenue South

Project Start: 4th Ave South	**Project End:** Logan Ave S
Operators: City of Seattle, King County, and City of Renton	**Other Stakeholders:** WSDOT NW Region, Freight, and Transit

Project Overview

This project will deploy the following ITS devices:

- Upgrade, interconnect and synchronize signals
- Enable centralized signal control
- Development of new timing plans for incident and emergency management
- System detection for traveler information data
- Fiber optic communications along entire corridor
- TMC Connections
- Full CCTV camera coverage
- DMS at key decision points

Project Significance

- V/C ratio is greater than 0.9
- Principal arterial
- MTS Designated
- Multi-jurisdictional
- May be used as an alternative route for I-5.
- Connects to areas where average income is less than 50% of the regional median income
- T1/T2 freight route
- Major transit route
- Route identified in City of Renton ITS plan
- S Jackson Street identified in SoDo Integrated Corridor Management concept of operations
- Connects multiple urban centers
- Connects an urban center to a manufacturing/industrial center

Corridor Connectivity

- Connectivity to the Renton City Hall could be provided via the K23 project.
- The corridor can connect to the existing fiber on 5th Ave S which connects to the Seattle TMC.
- King County TCC is located within two blocks of the corridor start point.
- Corridor crosses I-5 and ends very close to the I-405/SR 167 interchange in Renton, potentially providing connectivity to WSDOT via the freeway fiber network.

Relationship with Other Corridor Projects

- K17, K20, K22, K25 and K70 comprise a significant portion of the SoDo ICM corridor.

Other Considerations

- 50% of the existing cabinet/controllers will need to be replaced in this corridor.

K25 - Cost Summary

Corridor No.	Corridor	Agency Jurisdictions	Segment Start	Segment End	No. of Signals	Total Capital Costs	Operation Costs (2 Years)	Total Project Costs
K25	S Jackson Street/ Rainier Ave. S	Seattle	4th Ave S.	Ryan St.	41	$5,025,735	$246,000	**$5,271,735**
		King County	Ryan St.	89th Ave	1	$461,216	$6,000	**$467,216**
		Renton	89th Ave	Grady Way	7	$1,531,654	$42,000	**$1,573,654**
		WSDOT NW (by Seattle)	I-90 Ramps		1	$32,051	$6,000	**$38,051**
		Total Corridor	4th Ave S.	Grady Way	50	$7,050,656	$300,000	**$7,350,656**

K25 - Capital Cost Breakdown

	Total Equip. Costs	Total Design Costs	Construction Support Costs	Contingency Costs	Total Capital Costs
Seattle	$3,445,000	$642,200	$481,650	$456,885	**$5,025,735**
King County	$311,750	$61,450	$46,088	$41,929	**$461,216**
Renton	$1,040,750	$200,950	$150,713	$139,241	**$1,531,654**
WSDOT NW	$22,750	$3,650	$2,738	$2,914	**$32,051**
Total Corridor	$4,820,250	$908,250	$681,188	$640,969	**$7,050,656**

K25 - Equipment and Signal Timing Cost Breakdown

										Timing Plans			
	Controller & Cabinet Upgrades	System Detection	UPS	Transit Priority (1/3 inter.)	Fiber (mile)	Central System Upgrade	TMC Connect	CCTV (1/3 inter.)	DMS	*TOD/ Constr. Plans*	*Incidents/ Evac. Plans*	C2C	**Total Equipment and Timing Costs**
Unit Cost	$19,000	$25,000	$8,000	$10,000	$250,000	Varies	Varies	$10,000	$100,000	*$3,500*	*$1,000*	TBD	
Seattle	27	2	41	12	7	$10,000	$100,000	14	2	*52*	*52*		**$3,445,000**
King County	1	0	1	1	1	$250	$10,000	1	0	*1*	*1*		**$311,750**
Renton	7	1	5	3	2.1	$1,750	$100,000	5	1	*8*	*8*		**$1,040,750**
WSDOT NW	0	0	1	0	0	$250	$0	1	0	*1*	*1*		**$22,750**
Total Corridor	$665,000	$75,000	$384,000	$160,000	$2,525,000	$12,250	$210,000	$210,000	$300,000	*$217,000*	*$62,000*		**$4,820,250**

Notes

- The City of Seattle has 11 signalized intersections in very close proximity to the corridor that have been added to total of *Timing Plans* .
- The City of Renton signal controller models not listed on the inventory list. It is assumed new controllers/cabinets are required.
  Assume new signal controllers to be integrated with existing Siemens system.
- System Detection and DMS identified for the following locations:
  Rainier Ave S at I-90: two DMS
  Rainier Ave S at S 7th St: one DMS

<table>
<tr><th colspan="2">K27: SR522</th></tr>
<tr><td>Project Start: I-405</td><td>Project End: I-5</td></tr>
<tr><td>Operators: City of Seattle, and WSDOT NW Region</td><td>Other Stakeholders: Freight, and Transit</td></tr>
<tr><td>Project Overview</td><td>Project Significance</td></tr>
<tr><td>This project will deploy the following ITS devices:
Development of new timing plans for incident and emergency management
Fiber optic communications along entire corridor
Full CCTV camera coverage
DMS at key decision points
Transit signal priority</td><td>V/C ratio is greater than 0.9
Principal arterial
Identified Highway of Statewide Significance
May be used as an alternative route for SR520.
No alternate routes
Connects to areas where average income is less than 80% of the regional median income
T1/T2 freight route
Route identified in City of Seattle ITS plan</td></tr>
<tr><td colspan="2">Corridor Connectivity</td></tr>
<tr><td colspan="2">Corridor intersects with I-5 and I-405 and connectivity to WSDOT could be provided over the freeway fiber network.
Connectivity to the Seattle TMC may be provided via tie-in with existing City of Seattle fiber at NE 15th St.</td></tr>
<tr><td colspan="2">Relationship with Other Corridor Projects</td></tr>
<tr><td colspan="2">Corridor connects with S9 and K12 corridors, which together provides east-west and north-south connectivity between Seattle and the eastside communities.</td></tr>
<tr><td colspan="2">Other Considerations</td></tr>
<tr><td colspan="2">WSDOT is installing license plate readers along corridor and a changeable message sign in Woodinville with travel time information.
Existing Transit Signal Priority on Lake City Way NE.</td></tr>
</table>

K27 - Cost Summary

Corridor No.	Corridor	Agency Jurisdictions	Segment Start	Segment End	No. of Signals	Total Capital Costs	Operation Costs (2 Years)	**Total Project Costs**
K27	SR 522	Seattle	I-5	SR 523	17	$778,635	$102,000	**$880,635**
		WSDOT NW	SR 523	I-405	13	$1,184,040	$78,000	**$1,262,040**
		Total Corridor	I-5	I-405	30	$1,962,675	$180,000	**$2,142,675**

K27 - Capital Cost Breakdown

	Total Equip. Costs	Total Design Costs	Construction Support Costs	Contingency Costs	**Total Capital Costs**
Seattle	$557,000	$86,200	$64,650	$70,785	**$778,635**
WSDOT NW	$812,500	$150,800	$113,100	$107,640	**$1,184,040**
Total Corridor	$1,369,500	$237,000	$177,750	$178,425	**$1,962,675**

K27 - Equipment and Signal Timing Cost Breakdown

	Controller & Cabinet Upgrades	System Detection	UPS	Transit Priority (1/3 inter.)	Fiber (mile)	Central System Upgrade	TMC Connect	CCTV (1/3 inter.)	DMS	*Timing Plans* *TOD/ Constr. Plans*	*Timing Plans* *Incidents/ Evac. Plans*	C2C	Total Equip. & Timing Costs
Unit Cost	$19,000	$25,000	$8,000	$10,000	$250,000	Varies	Varies	$10,000	$100,000	*$3,500*	*$1,000*		
Seattle	0	2	17	0	0.5	$0	$0	2	1	*28*	*28*	TBD	**$557,000**
WSDOT NW	0	0	13	4	2	$0	$0	1	1	*13*	*13*		**$812,500**
Total Corridor	$0	$50,000	$240,000	$40,000	$625,000	$0	$0	$30,000	$200,000	*$143,500*	*$41,000*		**$1,369,500**

Notes

- The City of Seattle has 11 signalized intersections in very close proximity to the corridor that have been added to total of *Timing Plans* .
- Transit Signal Priority proposed for the remainder of the corridor along NE Bothell Way (SR 522) from starting at NE 145th St (assume 1/3 of signals get TSP equipment). Total TSP equipment (3) for this remainder is based on a combined 10 signalized intersections.
- Existing WSDOT license plate readers will provide travel time information along the corridor that will be posted to a message sign in Woodinville. The City of Seattle DMS remain in project for alerting eastbound travelers.
- System Detection and DMS at the beginning and end of the corridor

K29: Greenwood Ave N/ Holman Road NW/ 15th Avenue NW/ 15th Avenue W/ Elliot Ave W

Project Start: NE 145th St/SR523	**Project End:** SR99
Operators: City of Seattle	**Other Stakeholders:** Freight, and Transit

Project Overview	***Project Significance***
This project will deploy the following ITS devices: • Development of new timing plans for incident and emergency management • System detection for traveler information data • Fiber optic communications along entire corridor • TMC Connections • Full CCTV camera coverage • DMS at key decision points	• V/C ratio is greater than 0.9 • Principal arterial • May be used as an alternative route for SR99. • Connects to areas where average income is less than 50% of the regional median income • T1/T2 freight route • Bus Rapid Transit route • Route identified in City of Seattle ITS Plan • Connects multiple urban centers • Connects an urban center to a manufacturing/industrial center

Corridor Connectivity

- Connectivity to the Seattle TMC could be provided via a tie-in with the K17 project, or via a build-out along Battery Street to tie in with existing Seattle fiber at 4th and Battery.

Relationship with Other Corridor Projects

- Project terminates at K17 (Aurora Avenue).

Other Considerations

- Corridor connects downtown Seattle to the growing area of Interbay, as well as provides a key connection to the neighborhoods of Magnolia, Ballard and Greenwood.
- Existing Transit Signal Priority on 15th Ave W.
- Future BRT route on 15th Ave NW from NW 8th St to SR99.

K29 - Cost Summary

Corridor No.	Corridor	Agency Jurisdictions	Segment Start	Segment End	No. of Signals	Total Capital Costs	Operation Costs (2 Years)	**Total Project Costs**
K29	Greenwood Ave N/ Holman Road NW/ 15th Avenue NW/ 15th Avenue W/ Elliot Avenue W	Seattle	NW 145th St	SR 99	42	$5,473,710	$252,000	**$5,725,710**
		Total Corridor	NW 145th St	SR 99	42	$5,473,710	$252,000	**$5,725,710**

K29 - Capital Cost Breakdown

	Total Equip. Costs	Total Design Costs	Construction Support Costs	Contingency Costs	**Total Capital Costs**
Seattle	$3,759,500	$695,200	$521,400	$497,610	**$5,473,710**
Total Corridor	$3,759,500	$695,200	$521,400	$497,610	**$5,473,710**

K29 - Equipment and Signal Timing Cost Breakdown

	Controller & Cabinet Upgrades	System Detection	UPS	Transit Priority (1/3 inter.)	Fiber (mile)	Central System Upgrade	TMC Connect	CCTV (1/3 inter.)	DMS	*Timing Plans* *TOD/ Constr. Plans*	*Timing Plans* *Incidents/ Evac. Plans*	C2C	Total Equip. & Timing Costs
Unit Cost	$19,000	$25,000	$8,000	$10,000	$250,000	Varies	Varies	$10,000	$100,000	*$3,500*	*$1,000*	TBD	
Seattle	0	5	42	0	9.5	$0	$100,000	14	4	*63*	*63*		**$3,759,500**
Total Corridor	$0	$125,000	$336,000	$0	$2,375,000	$0	$100,000	$140,000	$400,000	*$220,500*	*$63,000*		**$3,759,500**

Notes

- The City of Seattle has 21 signalized intersections in very close proximity to the corridor that have been added to total of *Timing Plans* .
- System Detection and DMS identified for the following locations:

  15th Ave NW at NW 87th St: one DMS
  15th Ave NW at NW 53rd St: one DMS
  15th Ave NW at W Dravus St: one DMS
  Elliot Ave W at Battery St: one DMS

K58: Lind/ SW 16th/ E Valley Highway/ E Valley Road/ 84th Avenue S/ Central Way/ Central Avenue/ Auburn Way

Project Start: I-405	**Project End:** SR164
Operators: City of Renton, City of Kent, King County, and City of Auburn	**Other Stakeholders:** Freight

Project Overview	***Project Significance***
This project will deploy the following ITS devices: • Upgrade, interconnect and synchronize signals • Enable centralized signal control • Development of new timing plans for incident and emergency management • System detection for traveler information data • Fiber optic communications along entire corridor • TMC Connections • Full CCTV camera coverage • DMS at key decision points	• V/C ratio is greater than 0.9 • Principal arterial • Multi-jurisdictional • May be used as an alternative route for SR167 • Connects to areas where average income is less than 80% of the regional median income • T1/T2 freight route • Route identified in Renton ITS Plan • Connects multiple urban centers • Connects an urban center to a manufacturing/industrial center

Corridor Connectivity

- Connectivity to the Renton City Hall could be provided via a tie-in with the K23 project.
- Connection to Kent City Hall on 4th Ave S could be provided via a short build-out from Central Ave N. along W Gowe St. This build-out could also provide City of Kent connectivity to K20 and K22.
- Connectivity to the Auburn City Hall could be provided via existing fiber network on 2nd St SW.
- Connectivity to King County TCC could be provided via existing Trans-Valley projet fiber on 272nd/277th.

Relationship with Other Corridor Projects

- Corridor connects with K22 and K23 corridors which provide east-west connectivity in South King County.

Other Considerations

- Project would provide a northern extension of existing Auburn Way ITS.

K58 - Cost Summary

Corridor No.	Corridor	Agency Jurisdictions	Segment Start	Segment End	No. of Signals	Total Capital Costs	Operation Costs (2 Years)	Total Project Costs
K58	Lind/ SW 16th/ E Valley Hwy/ E Valley Rd/ 84th Ave S/ Central Way/ Central Ave/ Auburn Way	Renton	Grady Way	SW 43rd St	7	$951,885	$42,000	**$993,885**
		Kent	SW 43rd St	Green River	16	$3,566,970	$96,000	**$3,662,970**
		King County	Green River	S 277th St	0	$185,625	$0	**$185,625**
		Auburn	S 277th St	SR164	17	$424,710	$102,000	**$526,710**
		Total Corridor	Grady Way	SR164	40	$5,129,190	$240,000	**$5,369,190**

K58 - Capital Cost Breakdown

	Total Equip. Costs	Total Design Costs	Construction Support Costs	Contingency Costs	Total Capital Costs
Renton	$651,500	$122,200	$91,650	$86,535	**$951,885**
Kent	$2,423,000	$468,400	$351,300	$324,270	**$3,566,970**
King County	$125,000	$25,000	$18,750	$16,875	**$185,625**
Auburn	$321,000	$37,200	$27,900	$38,610	**$424,710**
Total Corridor	$3,520,500	$652,800	$489,600	$466,290	**$5,129,190**

K58 - Equipment and Signal Timing Cost Breakdown

										Timing Plans			
	Controller & Cabinet Upgrades	System Detection	UPS	Transit Priority (1/3 inter.)	Fiber (mile)	Central System Upgrade	TMC Connect	CCTV (1/3 inter.)	DMS	*TOD/ Constr. Plans*	*Incidents/ Evac. Plans*	C2C	**Total Equip. & Timing Costs**
Unit Cost	$19,000	$25,000	$8,000	$10,000	$250,000	Varies	Varies	$10,000	$100,000	*$3,500*	*$1,000*	TBD	
Renton	0	1	7	0	2	$30,000	$0	0	0	*9*	*9*		**$651,500**
Kent	16	1	16	0	5.6	$125,000	$100,000	6	2	*18*	*18*		**$2,423,000**
King County	0	0	0	0	0.5	$0	$0	0	0	*0*	*0*		**$125,000**
Auburn	0	0	17	0	0	$30,000	$0	2	0	*30*	*30*		**$321,000**
Total Corridor	$304,000	$50,000	$320,000	$0	$2,025,000	$185,000	$100,000	$80,000	$200,000	*$199,500*	*$57,000*		**$3,520,500**

Notes

- Assumes the City of Renton signal system will require software module for DMS operations.
- The City of Renton has two signalized intersections in very close proximity to the corridor that have been added to total of *Timing Plans*.
- Assumes the City of Kent needs to replace the existing signal system with a new one and will require some type of upgrade to TMC connectivity.
- The City of Kent has two signalized intersections in very close proximity to the corridor that have been added to total of *Timing Plans*.
- Assumes the City of Auburn signal system adequate for project needs; although inventory of controllers types unknown and may require upgrade for DMS software module.
- The City of Auburn has 13 signalized intersections in very close proximity to the corridor that have been added to total of *Timing Plans*.
- System Detection and DMS identified for the following locations:
  E Valley Rd at SR167: two DMS (the two additional DMS posted at Auburn Way/SR18 are part of Route P3)

K70: Airport Way S

Project Start: 4th Ave South	**Project End:** Boeing Access Rd
Operators: City of Seattle	**Other Stakeholders:** Freight

Project Overview	***Project Significance***
This project will deploy the following ITS devices: • Development of new timing plans for incident and emergency management • System detection for traveler information data • Full CCTV camera coverage • DMS at key decision points	• Principal arterial • May be used as an alternative route for I-5. • Connects to areas where average income is less than 50% of the regional median income • T1/T2 freight route • Major transit route • Route identified in SoDo Integrated Corridor Management concept of operations • Connects an urban center to a manufacturing/industrial center

Corridor Connectivity

- Existing fiber along entire length of corridor, connecting to City of Seattle network.

Relationship with Other Corridor Projects

- K17, K20, K22, K25 and K70 comprise a significant portion of the SoDo ICM corridor.

Other Considerations

- Along with other SoDo ICMS corridors, corridor is a north-south parallel to I-5 connecting freight and commuter traffic moving between downtown and Port of Seattle destinations and the industrial area south of Seattle.
- Corridor is direct route to Boeing Field

K70 - Cost Summary

Corridor No.	Corridor	Agency Jurisdictions	Segment Start	Segment End	No. of Signals	Total Capital Costs	Operation Costs (2 Years)	**Total Project Costs**
K70	Airport Way S	Seattle	4th Ave S	Boeing Access Rd	12	$1,164,240	$72,000	**$1,236,240**
		Total Corridor	4th Ave S	Boeing Access Rd	12	$1,164,240	$72,000	**$1,236,240**

K70 - Capital Cost Breakdown

	Total Equip. Costs	Total Design Costs	Construction Support Costs	Contingency Costs	**Total Capital Costs**
Seattle	$798,000	$148,800	$111,600	$105,840	**$1,164,240**
Total Corridor	$798,000	$148,800	$111,600	$105,840	**$1,164,240**

K70 - Equipment and Signal Timing Cost Breakdown

										Timing Plans			
	Controller & Cabinet Upgrades	System Detection	UPS	Transit Priority (1/3 inter.)	Fiber (mile)	Central System Upgrade	TMC Connect	CCTV (1/3 inter.)	DMS	*TOD/ Constr. Plans*	*Incidents/ Evac. Plans*	C2C	**Total Equip. & Timing Costs**
Unit Cost	$19,000	$25,000	$8,000	$10,000	$250,000	Varies	Varies	$10,000	$100,000	*$3,500*	*$1,000*	TBD	
Seattle	0	4	13	0	0.4	$0	$0	4	4	*12*	*12*		**$798,000**
Total Corridor	$0	$100,000	$104,000	$0	$100,000	$0	$0	$40,000	$400,000	*$42,000*	*$12,000*		**$798,000**

Notes

- System Detection and DMS identified for the following locations:
  Airport Way at I-90: one DMS
  Airport Way at S. Spokane St: one DMS
  Airport Way at S. Michigan St: one DMS
  Airport Way at S. Boeing Access Rd: one DMS

S4: Marine View Drive/ SR529/ Everett Avenue

Project Start: I-5	**Project End:** I-5 (loop)
Operators: City of Everett	**Other Stakeholders:** Freight

Project Overview	***Project Significance***
This project will deploy the following ITS devices: • Development of new timing plans for incident and emergency management • System detection for traveler information data • Fiber optic communications along entire corridor • Full CCTV camera coverage • DMS at key decision points	• V/C ratio is greater than 0.9 • Principal arterial • Metropolitan Transportation System (MTS) designated route • "Loop" may be used as an alternative route for I-5. • Connects to areas where average income is less than 50% of the regional median income • T1/T2 freight route

Corridor Connectivity

- Everett City Hall is located approximately 2.5 blocks south of the corridor on Cedar St. Connectivity could be provided via a short 3-block build-out to the S6 corridor or along Cedar St.
- Connecting the corridor to the WSDOT fiber via the existing 41st St. fiber hub could create a fiber ring along the corridor and I-5 between Everett Avenue and Marine View Drive.

Relationship with Other Corridor Projects

- Corridor is in close proximity to S6 corridor.
- City of Everett signal system upgrade cost item included in S6 project estimate.

Other Considerations

- Corridor provides access to Everett City Center from I-5

S4 - Cost Summary

Corridor No.	Corridor	Agency Jurisdictions	Segment Start	Segment End	No. of Signals	Total Capital Costs	Operation Costs (2 Years)	**Total Project Costs**
S4	Marine View Drive/ SR529/ Everett Avenue	Everett	I-5 (Everett Ave)	I-5 (19th St)	20	$3,101,175	$120,000	**$3,221,175**
		Total Corridor	I-5 (Everett Ave)	I-5 (19th St)	20	$3,101,175	$120,000	**$3,221,175**

S4 - Capital Cost Breakdown

	Total Equip. Costs	Total Design Costs	Construction Support Costs	Contingency Costs	**Total Capital Costs**
Everett	$2,121,000	$399,000	$299,250	$281,925	**$3,101,175**
Total Corridor	$2,121,000	$399,000	$299,250	$281,925	**$3,101,175**

S4 - Equipment and Signal Timing Cost Breakdown

	Controller & Cabinet Upgrades	System Detection	UPS	Transit Priority (1/3 inter.)	Fiber (mile)	Central System Upgrade	TMC Connect	CCTV (1/3 inter.)	DMS	*Timing Plans* *TOD/ Constr. Plans*	*Timing Plans* *Incidents/ Evac. Plans*	C2C	Total Equip. & Timing Costs
Unit Cost	$19,000	$25,000	$8,000	$10,000	$250,000	Varies	Varies	$10,000	$100,000	*$3,500*	*$1,000*	TBD	
Everett	0	2	20	0	6.1	$0	$0	6	2	*28*	*28*		**$2,121,000**
Total Corridor	$0	$50,000	$160,000	$0	$1,525,000	$0	$0	$60,000	$200,000	*$98,000*	*$28,000*		**$2,121,000**

Notes

- The City of Everett has ten signalized intersections in very close proximity to the corridor that have been added to total of *Timing Plans* .
- The City of Everett has been identified for central system upgrade in the S6 Corridor.
- System Detection and DMS identified for the following locations:
  Everett Ave at I-5: one DMS
  Marine View Drive at I-5: one DMS

S6: SR99

Project Start: SR529	**Project End:** Downtown Seattle
Operators: City of Everett, WSDOT NW Region, and City of Lynnwood	**Other Stakeholders:** City of Edmonds, Transit and Freight

Project Overview

This project will deploy the following ITS devices:

- Upgrade, interconnect and synchronize signals
- Enable centralized signal control
- Development of new timing plans for incident and emergency management
- System detection for traveler information data
- Fiber optic communications along entire corridor
- Full CCTV camera coverage
- DMS at key decision points

Project Significance

- VMT is between 75,000 and 100,000
- V/C ratio is greater than 0.9
- Principal arterial
- Metropolitan Transportation System (MTS) designated route
- Multi-jurisdictional
- May be used as an alternative route for I-5.
- Connects to areas where average income is less than 50% of the regional median income
- T1/T2 freight route
- Bus Rapid Transit route
- Connects multiple urban centers
- Connects an urban center to a manufacturing/industrial center

Corridor Connectivity

- The City of Lynnwood has existing fiber along 196th St SE connecting to TMC.
- Connectivity to WSDOT Shoreline TMC could be provided via fiber along K16 or existing fiber along SR 525 (via a fiber sharing agreement with Lynnwood for fiber along 164th)
- Everett City Hall on Cedar St. could be reached via existing fiber on 41st St.

Relationship with Other Corridor Projects

- Combining K17, P9 and S6 corridors would create a regional SR 99 ITS corridor extending from Everett to Tacoma.

Other Considerations

- Community Transit has deployed their first SWIFT Bus Rapid Transit route along this corridor. Community Transit has expressed an interest in partnering with the City of Everett to deploy this project, and is interested in utilizing the new fiber to get better real-time transit data.

S6 - Cost Summary

Corridor No.	Corridor	Agency Jurisdictions	Segment Start	Segment End	No. of Signals	Total Capital Costs	Operation Costs (2 Years)	Total Project Costs
S6	SR99	Everett	Everett Station	Airport Rd	32	$1,127,610	$192,000	**$1,319,610**
		WSDOT NW	Airport Rd	164th St SW	4	$1,688,569	$24,000	**$1,712,569**
		Lynnwood	164th St SW	220th St SW	10	$1,356,300	$60,000	**$1,416,300**
		Edmonds (operated by Lynnwood)	220th St SW	Sno/King County Line	5	$705,375	$30,000	**$735,375**
		Total Corridor	Everett Station	Sno/King County Line	51	$4,877,854	$306,000	**$5,183,854**

S6 - Capital Cost Breakdown

	Total Equip. Costs	Total Design Costs	Construction Support Costs	Contingency Costs	Total Capital Costs
Everett	$806,000	$125,200	$93,900	$102,510	**$1,127,610**
WSDOT NW	$1,145,250	$222,750	$167,063	$153,506	**$1,688,569**
Lynnwood	$925,000	$176,000	$132,000	$123,300	**$1,356,300**
Edmonds (operated by Lynnwood)	$478,500	$93,000	$69,750	$64,125	**$705,375**
Total Corridor	$3,354,750	$616,950	$462,713	$443,441	**$4,877,854**

S6 - Equipment and Signal Timing Cost Breakdown

	Controller & Cabinet Upgrades	System Detection	UPS	Transit Priority (1/3 inter.)	Fiber (mile)	Central System Upgrade	TMC Connect	CCTV (1/3 inter.)	DMS	*Timing Plans* *TOD/ Constr. Plans*	*Timing Plans* *Incidents/ Evac. Plans*	C2C	Total Equip. & Timing Costs
Unit Cost	$19,000	$25,000	$8,000	$10,000	$250,000	Varies	Varies	$10,000	$100,000	*$3,500*	*$1,000*	TBD	
Everett	0	2	32	0	planned	$120,000	$0	planned	2	*40*	*40*		**$806,000**
WSDOT NW	0	2	4	0	3.2	$1,750	$0	3	2	*7*	*7*		**$1,145,250**
Lynnwood	0	0	10	0	0	$0	$0	0	8	*10*	*10*		**$925,000**
Edmonds (operated by Lynnwood)	0	0	5	0	1.5	$40,000	$0	1	0	*3*	*3*		**$478,500**
Total Corridor	$0	$100,000	$408,000	$0	$1,175,000	$161,750	$0	$40,000	$1,200,000	*$210,000*	*$60,000*		**$3,354,750**

Notes

- CCTV and fiber are planned for the City of Everett; uncertain if already funded.
- The City of Everett system upgrade cost includes a new IQCentral model, which will require new translators in existing cabinets/controllers, and modules for DMS and CCTV (assuming existing Multisonics controllers can be integrated).
- The City of Everett has seven signalized intersections in very close proximity to the corridor that have been added to total of *Timing Plans* .
- **The WSDOT system upgrade cost includes a new Siemens i2TMS model (assuming Nextphase controller software is compatible).**
- WSDOT also has existing/proposed fiber along SR526.
- The City of Lynnwood plans for six to eight DMS along the corridor.
- The City of Edmonds system upgrade cost based on assumed upgrade to the City of Lynnwood's Naztec ATMS which requires software modules for CCTV and DMS.
- System Detection and DMS identified for the following locations:
  Evergreen Way at SR526: two DMS
  Evergreen Way at SR525: two DMS

<table>
<tr><th colspan="2">S9: SR527</th></tr>
<tr><td>Project Start: I-5</td><td>Project End: SR522 (Bothell)</td></tr>
<tr><td>Operators: City of Everett, Snohomish County and WSDOT NW Region</td><td>Other Stakeholders: City of Bothell, Freight and Transit</td></tr>
<tr><td>Project Overview</td><td>Project Significance</td></tr>
<tr><td>This project will deploy the following ITS devices:
Development of new timing plans for incident and emergency management
System detection for traveler information data
Fiber optic communications along entire corridor
Full CCTV camera coverage
DMS at key decision points</td><td>VMT is between 75,000 and 100,000
V/C ratio is greater than 0.9
Principal arterial
Metropolitan Transportation System (MTS) designated route
Multi-jurisdictional
May be used as an alternative route to I-5.
T1/T2 freight route
Route identified in WSDOT ITS plan</td></tr>
<tr><td colspan="2">Corridor Connectivity</td></tr>
<tr><td colspan="2">Corridor intersects with I-405 and connectivity to WSDOT could be provided over the freeway fiber network.
Connectivity to Everett City Hall and Snohomish County can be provided via S10 and S6 corridors</td></tr>
<tr><td colspan="2">Relationship with Other Corridor Projects</td></tr>
<tr><td colspan="2">Corridor connects with S11, S10, and K27 corridors.
City of Everett signal system upgrade cost item included in S6 project estimate.</td></tr>
<tr><td colspan="2">Other Considerations</td></tr>
<tr><td colspan="2">Connection with K27 (SR 522) provides an alternative route into Seattle from Snohomish County and Bothell</td></tr>
</table>

S9 - Cost Summary

Corridor No.	Corridor	Agency Jurisdictions	Segment Start	Segment End	No. of Signals	Total Capital Costs	Operation Costs (2 Years)	Total Project Costs
S9	SR527	Everett	Everett Mall; I-5 Ramp	132nd St NE	12	$1,922,085	$72,000	**$1,994,085**
		Snohomish County	132nd St NE	208th St SE	9	$1,470,645	$54,000	**$1,524,645**
		Bothell (operated by Sno. County)	208th St SE	SR 522	12	$1,127,610	$72,000	**$1,199,610**
		WSDOT NW	I-5 and I-405 Ramps		3	$95,040	$18,000	**$113,040**
		Total Corridor	Everett Mall Ramp	SR 522	36	$4,615,380	$216,000	**$4,831,380**

S9 - Capital Cost Breakdown

	Total Equip. Costs	Total Design Costs	Construction Support Costs	Contingency Costs	Total Capital Costs
Everett	$1,309,500	$250,200	$187,650	$174,735	**$1,922,085**
Snohomish County	$1,002,000	$191,400	$143,550	$133,695	**$1,470,645**
Bothell (operated by Sno. County)	$778,000	$141,200	$105,900	$102,510	**$1,127,610**
WSDOT NW	$67,500	$10,800	$8,100	$8,640	**$95,040**
Total Corridor	$3,157,000	$593,600	$445,200	$419,580	**$4,615,380**

S9 - Equipment and Signal Timing Cost Breakdown

										Timing Plans			
	Controller & Cabinet Upgrades	System Detection	UPS	Transit Priority (1/3 inter.)	Fiber (mile)	Central System Upgrade	TMC Connect	CCTV (1/3 inter.)	DMS	*TOD/ Constr. Plans*	*Incidents/ Evac. Plans*	C2C	**Total Equip. & Timing Costs**
Unit Cost	$19,000	$25,000	$8,000	$10,000	$250,000	Varies	Varies	$10,000	$100,000	*$3,500*	*$1,000*	TBD	
Everett	0	1	12	0	4	$0	$0	3	1	*13*	*13*		**$1,309,500**
Snohomish County	0	0	9	0	3.5	$0	$0	1	0	*10*	*10*		**$1,002,000**
Bothell (operated by Sno. County)	0	1	12	0	1.5	$0	$0	1	2	*16*	*16*		**$778,000**
WSDOT NW	0	0	3	0	0	$0	$0	3	0	*3*	*3*		**$67,500**
Total Corridor	$0	$50,000	$288,000	$0	$2,250,000	$0	$0	$80,000	$300,000	*$147,000*	*$42,000*		**$3,157,000**

Notes

- The City of Everett has two signalized intersections in very close proximity to the corridor that have been added to total of *Timing Plans*.
- The City of Everett has been identified for central system upgrade in the S6 Corridor.
- Snohomish County has one signalized intersection in very close proximity to the corridor that has been added to total of *Timing Plans*.
- The City of Bothell has four signalized intersections in very close proximity to the corridor that have been added to total of *Timing Plans*.
- There is one signalized intersection located at the end of the corridor that is an integral part of the K27 Corridor; therefore this intersection has not been added to the total counts for the City of Bothell.
- System Detection and DMS identified for the following locations:
  SR527 at Broadway/SR526: one DMS for SB traffic
  SR527 at I-405: two DMS

S10: Airport Road/128th Street SW/SR96/ Cathcart Way

Project Start: SR526	**Project End:** SR9
Operators: City of Everett, Snohomish County, and WSDOT NW Region	**Other Stakeholders:** Freight
Project Overview	***Project Significance***
This project will deploy the following ITS devices: • Development of new timing plans for incident and emergency management • System detection for traveler information data • Fiber optic communications along entire corridor • TMC Connections • Full CCTV camera coverage • DMS at key decision points • Transit signal priority	• V/C ratio is greater than 0.9 • Principal arterial • Metropolitan Transportation System (MTS) designated route • Multi-jurisdictional • Connects to areas where average income is less than 80% of the regional median income • T1/T2 freight route
Corridor Connectivity	
• Corridor intersects with I-5 and connectivity to WSDOT could be provided over the freeway fiber network. • Connectivity to the Everett City Hall could be provided via a tie-in with the S6 project. • Connectivity to Snohomish County can be provided via S6 corridor	
Relationship with Other Corridor Projects	
• Corridor connects with S9, S6, and S11 corridors. • City of Everett signal system upgrade cost item included in S6 project estimate.	
Other Considerations	
• None identified	

S10 - Cost Summary

Corridor No.	Corridor	Agency Jurisdictions	Segment Start	Segment End	No. of Signals	Total Capital Costs	Operation Costs (2 Years)	Total Project Costs
S10	Airport Rd/ 128th St SW/ SR96/ Cathcart Wy	Everett	SR526 Ramps	94th St SW	3	$1,119,690	$18,000	**$1,137,690**
		Snohomish County	94th St SW	SR9	28	$889,515	$168,000	**$1,057,515**
		WSDOT NW	I-5 Ramps		2	$85,635	$12,000	**$97,635**
		Total Corridor	SR526 Ramps	SR9	33	$2,094,840	$198,000	**$2,292,840**

S10 - Capital Cost Breakdown

	Total Equip. Costs	Total Design Costs	Construction Support Costs	Contingency Costs	Total Capital Costs
Everett	$757,500	$148,800	$111,600	$101,790	**$1,119,690**
Snohomish County	$634,000	$99,800	$74,850	$80,865	**$889,515**
WSDOT NW	$60,000	$10,200	$7,650	$7,785	**$85,635**
Total Corridor	$1,451,500	$258,800	$194,100	$190,440	**$2,094,840**

S10 - Equipment and Signal Timing Cost Breakdown

										Timing Plans			
	Controller & Cabinet Upgrades	System Detection	UPS	Transit Priority (1/3 inter.)	Fiber (mile)	Central System Upgrade	TMC Connect	CCTV (1/3 inter.)	DMS	*TOD/ Constr. Plans*	*Incidents/ Evac. Plans*	C2C	**Total Equip. & Timing Costs**
Unit Cost	$19,000	$25,000	$8,000	$10,000	$250,000	Varies	Varies	$10,000	$100,000	*$3,500*	*$1,000*	TBD	
Everett	0	1	3	0	2.3	$0	$10,000	1	1	*3*	*3*		**$757,500**
Snohomish County	0	1	28	1	0	$0	$0	4	2	*30*	*30*		**$634,000**
WSDOT NW	0	1	2	0	0	$0	$0	1	0	*2*	*2*		**$60,000**
Total Corridor	$0	$75,000	$264,000	$10,000	$575,000	$0	$10,000	$60,000	$300,000	*$122,500*	*$35,000*		**$1,451,500**

Notes

- This Corridor is a possible candidate for TSP from I-5 to Dumas Rd (3 Signals = 1 TSP).
- System Detection and DMS identified for the following locations:
  SR526 at Airport Rd: one DMS
  128th St at I-5: two DMS

S11: 168th St SW/ 44th Ave W/ 164 St SW/ Seattle Hill Road

Project Start: SR99	**Project End:** SR527
Operators: City of Lynnwood, Snohomish County, and WSDOT NW Region	**Other Stakeholders:** Freight, and Transit

Project Overview

This project will deploy the following ITS devices:

- Enable centralized signal control
- Development of new timing plans for incident and emergency management
- System detection for traveler information data
- Fiber optic communications along entire corridor
- TMC Connections
- Full CCTV camera coverage
- DMS at key decision points

Project Significance

- V/C ratio is greater than 0.9
- Principal arterial
- Metropolitan Transportation System (MTS) designated route
- Multi-jurisdictional
- T1/T2 freight route
- Bus Rapid Transit route

Corridor Connectivity

- Corridor intersects with I-5 and connectivity to WSDOT could be provided over the freeway fiber network.
- Connectivity to Snohomish County could be provided via S6 corridor
- Extending existing fiber conduit south on 44th Ave W could provide connectivity to Lynnwood TMC, or connectivity could be provided via S6 corridor.

Relationship with Other Corridor Projects

- Corridor connects with S6, S9, and S10 corridors
- City of Everett signal system upgrade cost item included in S6 project estimate.

Other Considerations

- WSDOT fiber along I-5 and SR527 may require linkage to intersection signals.
- Existing Transit Signal Priority on 164th St SW.

S11 - Cost Summary

Corridor No.	Corridor	Agency Jurisdictions	Segment Start	Segment End	No. of Signals	Total Capital Costs	Operation Costs (2 Years)	Total Project Costs
S11	168th St SW/ 44th Ave W/ 164th St SW/ Seattle Hill Rd	Lynnwood	Olympic View Dr	164th St SW	5	$269,775	$30,000	**$299,775**
		Snohomish County	164th St SW	SR96 Lowell Larimer Rd	17	$3,238,785	$102,000	**$3,340,785**
		WSDOT NW	I-5 Ramps and SR527		3	$415,058	$18,000	**$433,058**
		Total Corridor	Olympic View Dr	SR96 Lowell Larimer Rd	25	$3,923,618	$150,000	**$4,073,618**

S11 - Capital Cost Breakdown

	Total Equip. Costs	Total Design Costs	Construction Support Costs	Contingency Costs	Total Capital Costs
Lynnwood	$187,500	$33,000	$24,750	$24,525	**$269,775**
Snohomish County	$2,202,000	$424,200	$318,150	$294,435	**$3,238,785**
WSDOT NW	$283,000	$53,900	$40,425	$37,733	**$415,058**
Total Corridor	$2,672,500	$511,100	$383,325	$356,693	**$3,923,618**

S11 - Equipment and Signal Timing Cost Breakdown

	Controller & Cabinet Upgrades	System Detection	UPS	Transit Priority (1/3 inter.)	Fiber (mile)	Central System Upgrade	TMC Connect	CCTV (1/3 inter.)	DMS	*Timing Plans* *TOD/ Constr. Plans*	*Timing Plans* *Incidents/ Evac. Plans*	C2C	Total Equip. & Timing Costs
Unit Cost	$19,000	$25,000	$8,000	$10,000	$250,000	Varies	Varies	$10,000	$100,000	*$3,500*	*$1,000*	TBD	
Lynnwood	0	1	5	0	existing	$0	$0	0	1	*5*	*5*		**$187,500**
Snohomish County	0	0	17	0	5.6	$25,000	existing	6	5	*18*	*18*		**$2,202,000**
WSDOT NW	0	1	3	0	existing or proposed	$500	$20,000	0	2	*3*	*3*		**$283,000**
Total Corridor	$0	$50,000	$200,000	$0	$1,400,000	$25,500	$20,000	$60,000	$800,000	*$91,000*	*$26,000*		**$2,672,500**

Notes

- Snohomish County has one signalized intersection in very close proximity to the corridor that has been added to total of *Timing Plans* .
- **The Snohomish County system upgrade cost based on an assumed upgrade to existing QuicNet system for software module for DMS.**
- The WSDOT System upgrade cost includes adding two signals on I-5 connecting ramps to software configuration.
- WSDOT has existing or planned fiber along I-5 and SR527 but may still require linkages to intersection signals.
- System Detection and DMS identified for the following locations:
  168th St SW at SR99: one DMS
  164th St SW at I-5: two DMS

P1: 16th Ave S/ SR161/ Enchanted Parkway South/ Meridian Ave E

Project Start: SR99	**Project End:** 224th St E
Operators: City of Federal Way, WSDOT NW Region, WSDOT Olympic Region, and City of Puyallup	**Other Stakeholders:** Freight

Project Overview

This project will deploy the following ITS devices:

- Upgrade, interconnect and synchronize signals
- Enable centralized signal control
- Development of new timing plans for incident and emergency management
- System detection for traveler information data
- Fiber optic communications along entire corridor
- TMC Connections
- Full CCTV camera coverage
- DMS at key decision points
- Transit signal priority

Project Significance

- VMT is between 75,000 and 100,000
- V/C ratio is greater than 0.9
- Principal arterial
- MTS Designated
- Multi-jurisdictional
- May be used as an alternative route for SR7.
- Connects to areas where average income is less than 80% of the regional median income
- T1/T2 freight route

Corridor Connectivity

- Corridor intersects with I-5 and SR167 and connectivity to WSDOT could be provided over the freeway fiber network.
- Connection to Federal Way City Hall at 33325 8th Ave S. could be provided via a short build-out from Pacific Hwy S. along S 336th St.
- Connection to Puyallup City Hall at 1100 39th Ave SE. could be provided via a short build-out along 37th Ave SE/39th Ave SE.

Relationship with Other Corridor Projects

- Corridor begins at SR 99 in King County (K17)

Other Considerations

- Puyallup will require upgrade to an NTCIP compliant central system.

P1 - Cost Summary

Corridor No.	Corridor	Agency Jurisdictions	Segment Start	Segment End	No. of Signals	Total Capital Costs	Operation Costs (2 Years)	**Total Project Costs**
P1	16th Ave S/ SR161/ Enchanted Parkway S/ Meridian St	Federal Way	SR99	16th Ave S	0	$987,525	$0	**$987,525**
		WSDOT NW	SR161; Milton Rd S to Military Rd		4	$275,220	$24,000	**$299,220**
		WSDOT Oly	Military Rd	31st Ave	4			
			47th Ave SE	224th St E	16			
			Total		*20*	$7,021,080	$120,000	**$7,141,080**
		Puyallup	31st AveS E	47th Ave SE	23	$2,263,140	$138,000	**$2,401,140**
		Total Corridor	SR99	224th St E	47	$10,546,965	$282,000	**$10,828,965**

P1 - Capital Cost Breakdown

	Total Equip. Costs	Total Design Costs	Construction Support Costs	Contingency Costs	**Total Capital Costs**
Federal Way	$672,000	$129,000	$96,750	$89,775	**$987,525**
WSDOT NW	$190,000	$34,400	$25,800	$25,020	**$275,220**
WSDOT Oly	$4,773,500	$919,600	$689,700	$638,280	**$7,021,080**
Puyallup	$1,548,500	$290,800	$218,100	$205,740	**$2,263,140**
Total Corridor	$7,792,000	$1,373,800	$1,030,350	$958,815	**$10,546,965**

P1 - Equipment and Signal Timing Cost Breakdown

										Timing Plans			
	Controller & Cabinet Upgrades	System Detection	UPS	Transit Priority (1/3 inter.)	Fiber (mile)	Central System Upgrade	TMC Connect	CCTV (1/3 inter.)	DMS	*TOD/ Constr. Plans*	*Incidents/ Evac. Plans*	C2C	**Total Equip. & Timing Costs**
Unit Cost	$19,000	$25,000	$8,000	$10,000	$250,000	Varies	Varies	$10,000	$100,000	*$3,500*	*$1,000*	TBD	
Federal Way	0	1.2	0	2	1.5	$0	$0	2	2	*6*	*6*		**$672,000**
WSDOT NW	0	0	4	2	0	$0	$100,000	2	0	*4*	*4*		**$190,000**
WSDOT Oly (Milton)	7	1	4	1	4	$0	$0	3	2	*8*	*8*		**$1,466,000**
WSDOT Oly (47th Ave)	25	2	16	6	8	$175,000	$0	8	2	*31*	*31*		**$3,307,500**
WSDOT Oly (Total)	32	3	20	7	12	175000	0	11	4	39	39		**$4,773,500**
Puyallup	0	1	23	8	3	$175,000	$0	4	2	*21*	*21*		**$1,548,500**
Total Corridor	$1,216,000	$130,000	$376,000	$190,000	$4,125,000	$350,000	$100,000	$190,000	$800,000	$245,000	$70,000		**$7,792,000**

Notes

- The City of Federal Way proposed system upgrade has been identified in Corridor K17.
- The City of Federal Way has existing video detection at SR18, only requiring an additional two cameras at $15,000 apiece, and has existing UPS at each intersection.
- The WSDOT Oly proposed system upgrade is to IQCentral or i2TMS models, as existing system is not NTCIP compliant.
- The City of Puyallup will require an upgrade to an NTCIP compliant central system.
- System Detection and DMS identified for the following locations:
  SR161 at SR18: two DMS
  SR161 at SR167: two DMS
  SR161 at SR512: two DMS
  SR161 at 31st Ave SW: two DMS

P3: Auburn Ave/ A Street NE/ E Valley Highway/ SR162

Project Start: Main St.	**Project End:** South City of Orting Limits
Operators: City of Auburn and WSDOT Olympic Region	**Other Stakeholders:** Freight

Project Overview	***Project Significance***
This project will deploy the following ITS devices: • Upgrade, interconnect and synchronize signals • Development of new timing plans for incident and emergency management • System detection for traveler information data • Fiber optic communications along entire corridor • TMC Connections • Full CCTV camera coverage • DMS at key decision points	• V/C ratio is greater than 0.9 • Metropolitan Transportation System (MTS) designated route • Multi-jurisdictional • May be used as an alternative route for SR161. • No alternate routes • Connects to areas where average income is less than 80% of the regional median income • T1/T2 freight route

Corridor Connectivity

- Existing fiber on 2nd St SW provides connectivity to Auburn City Hall located at 25 W Main St
- Connectivity to WSDOT may be possible via connection with WSDOT fiber on SR 18

Relationship with Other Corridor Projects

- North end of project connects with K58. Combined, the corridors provide connectivity between manufacturing centers in south King County and rural Pierce County.

Other Considerations

- Route is primary arterial serving the community of Orting and is critical for emergency responders.

P3 - Cost Summary

Corridor No.	Corridor	Agency Jurisdictions	Segment Start	Segment End	No. of Signals	Total Capital Costs	Operation Costs (2 Years)	**Total Project Costs**
P3	Auburn Ave./ A Street NE/ E Valley Highway/ SR162	Auburn	Auburn Way	8th St. E	11	$915,255	$66,000	**$981,255**
		WSDOT Oly	8th St. E	S. Orting City Limits	12	$7,987,815	$72,000	**$8,059,815**
		Total Corridor	Main St	COUNTY LINE/ Pioneer Way E	23	$8,903,070	$138,000	**$9,041,070**

P3 - Capital Cost Breakdown

	Total Equip. Costs	Total Design Costs	Construction Support Costs	Contingency Costs	**Total Capital Costs**
Auburn	$642,000	$108,600	$81,450	$83,205	**$915,255**
WSDOT Oly	$5,393,000	$1,067,800	$800,850	$726,165	**$7,987,815**
Total Corridor	$6,035,000	$1,176,400	$882,300	$809,370	**$8,903,070**

P3 - Equipment and Signal Timing Cost Breakdown

										Timing Plans			
	Controller & Cabinet Upgrades	System Detection	UPS	Transit Priority (1/3 inter.)	Fiber (mile)	Central System Upgrade	TMC Connect	CCTV (1/3 inter.)	DMS	*TOD/ Constr. Plans*	*Incidents/ Evac. Plans*	C2C	**Total Equip. & Timing Costs**
Unit Cost	$19,000	$25,000	$8,000	$10,000	$250,000	Varies	Varies	$10,000	$100,000	*$3,500*	*$1,000*		
Auburn	0	1	11	0	0.8	$0	$0	3	2	*22*	*22*	TBD	**$642,000**
WSDOT Oly	12	1	12	0	18.4	$0	$100,000	9	2	*12*	*12*		**$5,393,000**
Total Corridor	$228,000	$50,000	$184,000	$0	$4,800,000	$0	$100,000	$120,000	$400,000	*$119,000*	*$34,000*		**$6,035,000**

Notes

- The City of Auburn has 13 signalized intersections in very close proximity to the corridor that have been added to total of *Timing Plans*.
- The City of Auburn controllers are unknown but are assumed to meet project needs based on their ownership of the Icons central system.
- A new central system for WSDOT Oly has been identified in the P1 Corridor. Assume new controllers or upgrades will be needed to configure onto system.
- System Detection and DMS identified for the following locations:
  Auburn Way S at SR18: two DMS
  SR162 at SR410: two DMS

P6: Pacific Avenue/ SR7

Project Start: Stadium Way	**Project End:** SR507
Operators: City of Tacoma, and WSDOT Olympic Region	**Other Stakeholders:** Freight and Transit

Project Overview	***Project Significance***
This project will deploy the following ITS devices: • Upgrade, interconnect and synchronize signals • Development of new timing plans for incident and emergency management • System detection for traveler information data • Fiber optic communications along entire corridor • TMC Connections • Full CCTV camera coverage • DMS at key decision points	• V/C ratio is greater 0.9 • Principal arterial • Metropolitan Transportation System (MTS) designated route • May be used as an alternative route for I-5. • Connects to areas where average income is less than 50% of the regional median income • T1/T2 freight route • Bus Rapid Transit route • Connects multiple urban centers

Corridor Connectivity

- Corridor intersects with I-5 and connectivity to WSDOT could be provided over the freeway fiber network.
- Connection to Tacoma City Hall at 747 Market St. could be provided via a short build-out from Pacific Ave along S 9th St.

Relationship with Other Corridor Projects

- Corridor connects with P8 corridor.

Other Considerations

- Bus Rapid Transit corridor on SR99
- Existing transit signal priority on Pacific Ave.

P6 - Cost Summary

Corridor No.	Corridor	Agency Jurisdictions	Segment Start	Segment End	No. of Signals	Total Capital Costs	Operation Costs (2 Years)	**Total Project Costs**
P6	Pacific Avenue/ SR7	Tacoma	Schuster NB Ramp	99th St S	30	$4,519,350	$180,000	**$4,699,350**
		WSDOT Oly	99th St S	224th St E	18	$4,538,160	$108,000	**$4,646,160**
		Total Corridor	Schuster NB Ramp	224th St E	48	$9,057,510	$288,000	**$9,345,510**

P6 - Capital Cost Breakdown

	Total Equip. Costs	Total Design Costs	Construction Support Costs	Contingency Costs	**Total Capital Costs**
Tacoma	$3,079,500	$588,000	$441,000	$410,850	**$4,519,350**
WSDOT Oly	$3,077,000	$599,200	$449,400	$412,560	**$4,538,160**
Total Corridor	$6,156,500	$1,187,200	$890,400	$823,410	**$9,057,510**

P6 - Equipment and Signal Timing Cost Breakdown

										Timing Plans			
	Controller & Cabinet Upgrades	System Detection	UPS	Transit Priority (1/3 inter.)	Fiber (mile)	Central System Upgrade	TMC Connect	CCTV (1/3 inter.)	DMS	*TOD/ Constr. Plans*	*Incidents/ Evac. Plans*	C2C	**Total Equip. & Timing Costs**
Unit Cost	$19,000	$25,000	$8,000	$10,000	$250,000	Varies	Varies	$10,000	$100,000	*$3,500*	*$1,000*		
Tacoma	30	1	30	0	6.3	$230,000	$0	10	2	*31*	*31*	TBD	**$3,079,500**
WSDOT Oly	18	1	18	0	8.5	$0	$100,000	6	2	*18*	*18*		**$3,077,000**
Total Corridor	$912,000	$50,000	$384,000	$0	$3,700,000	$230,000	$100,000	$160,000	$400,000	*$171,500*	*$49,000*		**$6,156,500**

Notes

- The City of Tacoma has one signalized intersection in very close proximity to the corridor that has been added to total of *Timing Plans*.
- A new central system is proposed for the City of Tacoma with modules for DMS and CCTV.
- The new central system for WSDOT Oly has been identified in P1 Corridor. Assume new controllers or upgrades will be needed to configure onto system.
- System Detection and DMS identified for the following locations:

  Pacific Ave at S 21st St (beside UW Tacoma campus): one DMS for SB traffic
  Pacific Ave S at S at E 40th St: one DMS for NB traffic
  Pacific Ave S at SR512: two DMS

P8: SR99/ South Tacoma Way/ Pacific Way SW/ Gravelly Lake Road SW

Project Start: King County Line	**Project End:** SR512
Operators: WSDOT Olympic Region, City of Tacoma, and City of Lakewood	**Other Stakeholders:** Freight, and Transit

Project Overview

This project will deploy the following ITS devices:

- Upgrade, interconnect and synchronize signals
- Enable centralized signal control
- Development of new timing plans for incident and emergency management
- System detection for traveler information data
- Fiber optic communications along entire corridor
- TMC Connections
- Full CCTV camera coverage
- DMS at key decision points

Project Significance

- V/C ratio is greater than 0.9
- Principal arterial
- Multi-jurisdictional
- May be used as an alternative route for I-5.
- Connects to areas where average income is less than 50% of the regional median income
- T1/T2 freight route
- Bus Rapid Transit route
- Connects multiple urban centers
- Connects an urban center to a manufacturing/industrial center

Corridor Connectivity

- Corridor intersects with I-5 and connectivity to WSDOT could be provided over the freeway fiber network.
- Lakewood does not currently have any fiber used for ITS. Connection to Lakewood City Hall at 6000 Main Street SW would require additional fiber build-out, possibly from Pacific Hwy SW along 108th St SW.
- Connectivity to Tacoma City Hall could be provided via a tie-in with the P6 project.

Relationship with Other Corridor Projects

- Combining K17, P9 and S6 corridors would create a regional SR 99 ITS corridor extending from Everett to Tacoma.

Other Considerations

- If project was implemented before the P6 corridor, another means of connecting to the City of Tacoma may be needed.
- Existing Transit Signal Priority on Pacific Way and South Tacoma way in downtown.

P8 - Cost Summary

Corridor No.	Corridor	Agency Jurisdictions	Segment Start	Segment End	No. of Signals	Total Capital Costs	Operation Costs (2 Years)	Total Project Costs
P8	SR99 / South Tacoma Way/ Pacific Way SW/ Gravelly Lake Road SW	WSDOT Oly	COUNTY LINE	N. Levee Rd.	4	$2,182,455	$24,000	**$2,206,455**
		Tacoma	N. Levee Rd.	S 80th St	24	$4,505,490	$144,000	**$4,649,490**
		Lakewood	S 80th St	Nyanza Rd SW	11	$2,855,655	$66,000	**$2,921,655**
		Total Corridor	COUNTY LINE	Nyanza Rd SW	39	$9,543,600	$234,000	**$9,777,600**

P8 - Capital Cost Breakdown

	Total Equip. Costs	Total Design Costs	Construction Support Costs	Contingency Costs	Total Capital Costs
WSDOT Oly	$1,475,500	$290,600	$217,950	$198,405	**$2,182,455**
Tacoma	$3,062,000	$590,800	$443,100	$409,590	**$4,505,490**
Lakewood	$1,947,500	$370,600	$277,950	$259,605	**$2,855,655**
Total Corridor	$6,485,000	$1,252,000	$939,000	$867,600	**$9,543,600**

P8 - Equipment and Signal Timing Cost Breakdown

	Controller & Cabinet Upgrades	System Detection	UPS	Transit Priority (1/3 inter.)	Fiber (mile)	Central System Upgrade	TMC Connect	CCTV Cameras (1/3 inter.)	DMS	*Timing Plans* *TOD/ Constr. Plans*	*Timing Plans* *Incidents/ Evac. Plans*	C2C	Total Equip. & Timing Costs
Unit Cost	$19,000	$25,000	$8,000	$10,000	$250,000	Varies	Varies	$10,000	$100,000	*$3,500*	*$1,000*	TBD	
WSDOT Oly	4	4	4	0	4.5	$0	$100,000	2	0	*5*	*5*		**$1,475,500**
Tacoma	3	24	24	0	6.9	$0	$100,000	8	2	*24*	*24*		**$3,062,000**
Lakewood	0	11	11	0	4.2	$200,000	$0	4	2	*21*	*21*		**$1,947,500**
Total Corridor	$133,000	$975,000	$312,000	$0	$3,900,000	$200,000	$200,000	$140,000	$400,000	*$175,000*	*$50,000*		**$6,485,000**

Notes

- WSDOT Oly has one signalized intersection in very close proximity to the corridor that has been added to total of *Timing Plans* .
- The new central system for WSDOT Oly has been identified in P1 Corridor. Assume new controllers or upgrades will be needed to configure onto system.
- A new central system has been proposed for City of Tacoma in the P6 Corridor.
- The City of Lakewood has ten signalized intersections in very close proximity to the corridor that have been added to total of *Timing Plans* .
- A new central system is proposed for the City of Lakewood to integrate CCTV and DMS to provide ability to transmit and receive information from other systems (cost based on IQCentral system by IDC). Assumes existing Multisonics controllers are compatible.
- System Detection and DMS identified for the following locations:
  S Tacoma Way at Pacific Ave S: two DMS adjacent to intersection
  S Tacoma Way at SR512/I-5 Intersection: two DMS

<table>
<tr><th colspan="2">KT1: SR304/ SR303</th></tr>
<tr><td>Project Start: SR3</td><td>Project End: Bremerton Ferry Terminal</td></tr>
<tr><td>Operators: WSDOT Olympic Region</td><td>Other Stakeholders: Freight, Washington State Ferries</td></tr>
<tr><td>Project Overview</td><td>Project Significance</td></tr>
<tr><td>This project will deploy the following ITS devices:
Upgrade, interconnect and synchronize signals
Development of new timing plans for incident and emergency management
System detection for traveler information data
Fiber optic communications along entire corridor
TMC Connections
Full CCTV camera coverage
DMS at key decision points
Transit signal priority</td><td>Principal arterial
Metropolitan Transportation System (MTS) designated route
No alternate routes
T1/T2 freight route
Connects multiple urban centers
Connects an urban center to a manufacturing/industrial center</td></tr>
<tr><td colspan="2">Corridor Connectivity</td></tr>
<tr><td colspan="2">Corridor is relatively remote compared to other corridors. Connectivity may be an option through the Ferry Terminal via the WSDOT network.</td></tr>
<tr><td colspan="2">Relationship with Other Corridor Projects</td></tr>
<tr><td colspan="2">Corridor does not intersect with any other ITS Plan corridors</td></tr>
<tr><td colspan="2">Other Considerations</td></tr>
<tr><td colspan="2">Corridor serves rural area and provides an important connection to state ferry terminal.</td></tr>
</table>

KT1 - Cost Summary

Corridor No.	Corridor	Agency Jurisdictions	Segment Start	Segment End	No. of Signals	Total Capital Costs	Operation Costs (2 Years)	**Total Project Costs**
KT1	SR304/ SR303	WSDOT Oly	SR3	Bremerton Ferry Terminal	20	$5,861,295	$120,000	**$5,981,295**
		Total Corridor	SR3	Bremerton Ferry Terminal	20	$5,861,295	$120,000	**$5,981,295**

KT1 - Capital Cost Breakdown

	Total Equip. Costs	Total Design Costs	Construction Support Costs	Contingency Costs	**Total Capital Costs**
WSDOT Oly	$3,968,000	$777,400	$583,050	$532,845	**$5,861,295**
Total Corridor	$3,968,000	$777,400	$583,050	$532,845	**$5,861,295**

KT1 - Equipment and Signal Timing Cost Breakdown

										Timing Plans			
	Controller & Cabinet Upgrades	System Detection	UPS	Transit Priority (1/3 inter.)	Fiber (mile)	Central System Upgrade	TMC Connect	CCTV (1/3 inter.)	DMS	*TOD/ Constr. Plans*	*Incidents/ Evac. Plans*	C2C	**Total Equip. & Timing Costs**
Unit Cost	$19,000	$25,000	$8,000	$10,000	$250,000	Varies	Varies	$10,000	$100,000	*$3,500*	*$1,000*	TBD	
WSDOT Oly	18	4	20	5	11.1	$0	$100,000	6	3	*18*	*18*		**$3,968,000**
Total Corridor	$342,000	$100,000	$160,000	$50,000	$2,775,000	$0	$100,000	$60,000	$300,000	*$63,000*	*$18,000*		**$3,968,000**

Notes

Using Google Street View, Corridor KT1 has 18 Signalized Intersections that should be added to the map book - See scanned map

This Corridor is a candidate for TSP from Callow to Fairgrounds (15 Signals = 5 TSP).

- System Detection and DMS identified for the following locations:

  Burwell St and Warren Ave: one DMS (for traffic from ferry).
  NE Waaga Way at SR3: one DMS
  Charleston Blvd at SR3: one DMS

APPENDIX A: MAP BOOKS

A DETAILED CORRIDOR MAP BOOK IS PROVIDED FOR EACH ITS PROJECT.