Washington State
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Strategic Planning and Programming Division
Urban Planning Office

State Route 9
Corridor Planning Study
FINAL

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Strategic Planning and Programming Division

Urban Planning Office

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Prepared by
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In association with
EnviroIssues

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Snohomish County Committee for Improved Transportation (SCCIT)

Washington State Department of Transportation

Northwest Region

State Route 9
Corridor Planning Study

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Acronyms

ADT	average daily traffic
ARM	accumulated route mile
BNSF	Burlington Northern Santa Fe (Railway)
CAC	Collision Analysis Corridor
CAL	Collision Analysis Location
CPS	Corridor Planning Study
CT	Community Transit
CWG	Corridor Working Group
B/C	benefit/cost
FF	financially feasible
GIS	Geographical Information Systems
GMA	Growth Management Act
HSP	Washington State Highway System Plan
LOS	level-of-service
mph	miles per hour
OFM	Office of Financial Management
PSRC	Puget Sound Regional Council
RDP	Route Development Plan
ROW	right-of-way
RTID	Regional Transportation Improvement District
SAFETEA-LU	Safe, Accountable, Flexible, Efficient Transportation Equity Act—A Legacy for Users
SCT	Snohomish County Tomorrow
SR	State Route
TPA	Transportation Partnership Account
UGA	urban growth area
V/C	volume-to-capacity ratio
VHT	vehicle hours of travel
VMT	vehicle miles traveled
WSDOT	Washington State Department of Transportation
WSESD	Washington Employment and Security Department
WTP	Washington Transportation Plan
WWE	Washington Workforce Explorer

Chapter 1 – Executive Summary

This document represents the culmination of work products for the State Route (SR) 9 Corridor Planning Study (CPS) process and presents a summary of the findings and outcomes. The SR 9 CPS stands as a consensus-driven set of recommendations for the study corridor based on technical analysis and public and stakeholder participation. It was developed in response to the mutual goals and objectives agreed upon by the Corridor Working Group (CWG) for the future stewardship and evolution of the corridor. The SR 9 CPS identifies corridor deficiencies that are based on adopted Washington State Department of Transportation (WSDOT) thresholds, and the CPS proposes actions to address those deficiencies. While this alone does not guarantee implementation funding, the plan allows future funding requests to be focused on areas of greatest need. It also provides recommendations on "funding packages" that should be considered at differing levels of investment.

Exhibit 1-1: Map of the Study Corridor

SR 9 is a critical transportation link in Snohomish County that serves as the only major north-south alternative to Interstate 5 (Exhibit 1-1). Use of SR 9 has increased as Snohomish County's population continues to grow. Between 1990 and 2000, the population of the county increased from 471,100 to 609,110. This amounts to approximately 30 percent growth in the county's population. The growth in population, however, has slowed down in recent years. From year 2000 to 2008 (683,700), the growth in population was only about 13 percent. The employment in the county has also grown in the recent years at a similar rate as the population. Employment in the County was 365,500 in 2007, which is approximately 13 percent growth from 2000. This growth in population and employment has resulted in increased travel demand on SR 9. The annual daily traffic on SR 9 near the Lake Stevens area (location where SR 9 carries the heaviest traffic) increased from 31,000 in year 2000 to 34,000 in year 2007, an increase of approximately 10 percent.

The Washington State Legislature has committed a significant level of funding to address safety and capacity deficiencies along state highways, including the SR 9 corridor. For the period 2005 to 2013, the legislature has allocated $300 million through the 2003 Nickel and 2005 Transportation Partnership Account (TPA) funding packages, which include roadway widening, intersection channelization improvements, signal upgrades, and safety enhancements along SR 9 between

Bothell and Arlington (additional information on the Nickel and TPA projects can be found on pages 4-15, 5-1, 6-1, 6-2 and 6-3.)

While the funded investments will help address the congestion and safety issues along SR 9, additional improvements will be needed in the future to accommodate projected travel demand.

To better integrate planning and future design work, preparation of a CPS for SR 9 was initiated in early 2007 to identify and propose remedial actions for corridor needs beyond those already funded. This CPS provides a 20+ year vision for the 30-mile study segment (from Bothell to Arlington) that establishes a blueprint for potential longer-range transportation improvements.

WSDOT's work on the SR 9 CPS is a continuation of the SR 9 Transportation Inventory Assessment (led by Snohomish County) conducted from 2006 to early 2007. WSDOT built upon the County's work to develop this comprehensive corridor plan that addresses existing gaps and future needs of the surrounding communities along the core 30-mile study segment.

Participants at one of several CWG meetings held for the project

The SR 9 CPS was developed and refined over the course of approximately 2.5 years and involved a series of meetings, deliverables, briefings, and key decisions that collectively guided the process and ensured support from stakeholders.

A project team consisting of WSDOT staff and consultants was formed early in the process to manage and execute the technical analysis and to develop improvement options. Stakeholders were also invited to participate on a CWG that was formed to advise and review work efforts by the project team. Members of the CWG included representatives from the following agencies and jurisdictions:

- City of Arlington
- City of Lake Stevens
- City of Marysville
- City of Snohomish
- Community Transit
- Puget Sound Regional Council
- Snohomish County
- WSDOT

The CWG established a vision statement and adopted four broad goals to guide development of the CPS at the initial

kickoff meeting of the group. The vision and goals for the SR 9 study corridor are as follows.

Vision

SR 9 is a highway corridor that accommodates safe and efficient regional movement of people and goods, supports the local economy, and provides for effective access sensitive to local land use conditions.

Stakeholder Participants

- Represented communities along the SR 9 corridor
- Also represented regional agencies and transit operators
- Primarily planning directors or senior engineering staff
- Each member/representative was responsible for conveying the outcomes and findings of the study to their constituents
- Will ultimately be responsible for pursuing funding for CPS improvement projects

Goals

The Project Team will develop recommendations that are endorsed by the study's CWG partners. These projects will address existing and future operational deficiencies in a manner that is cost effective, politically acceptable, sensitive to environmental conditions, and responsive to the vision above. The recommendations will address the following areas.

Safety

Identify and target locations where fatal and serious injury collisions have occurred or may occur within the study area by developing strategies that will minimize such collisions in the future.

Mobility

Enhance the performance of the corridor through existing transportation investments and operational strategies ranging from basic maintenance to advanced technologies. Mobility improvements should benefit existing and future operations for all transportation users, including transit, pedestrians, and non-motorized uses.

Accessibility

Develop strategic access options that address bottlenecks and support a safe and efficient regional network. Minimize impacts to existing access points to maintain the character and performance of the corridor within each community.

Public Involvement

Keep the public informed on the progress of the study and solicit input from the public by holding open houses, attending various local events, and maintaining the project website.

Outcomes

This corridor study will be considered a success if WSDOT, with the support of the public and CWG partners, creates an CPS in which

- The public and CWG partners are meaningfully involved in the development of recommendations
- CWG partners endorse the final CPS and its recommendations
- The CPS provides a clear phasing plan for implementation

Five CWG meetings were held during the course of the study that collectively shaped the evolution of the CPS from the background analysis stage to the development of the CPS improvement strategies and phasing plan. Through initial interaction with the CWG and preliminary traffic forecasting and analysis work, the project team identified a set of 10 intersection target locations that would become the evaluation focus for development of long-term (20+ years) improvement concepts. However, further discussion with the CWG resulted in an agreement to include one additional intersection for the purposes of the analysis and design efforts.

Screening criteria themes

- Safety
- Mobility and Access
- Community Support
- Environmental Impacts
- Constructability

Improvement concepts for the 11 intersections were prepared and a screening/scoring process was developed to rank options based on pre-defined criteria. This ranking process led to the selection of a preferred set of draft and final long-term improvements for each intersection that established the foundation of the CPS. The SR 9 highway segments in between the selected study intersections were also analyzed as part of the study effort. It became apparent that simply improving the operation of the critical intersections would not be sufficient to significantly improve mobility along the study corridor. Expanding the capacity of SR 9 between each intersection would also be required in the long term.

Connecting the dots

- Segment improvements were investigated separately after core intersection projects were formulated
- Such improvements would ensure that suitable roadway capacity is provided between the targeted intersections
- Improvements generally consisted of widening for additional travel lanes

During development of the intersection improvement options, discussions regarding the potential for expansion of urban growth area (UGA) boundaries were held for interested stakeholders. The intent of these discussions was to assess whether changes in land use not captured in current local comprehensive plans should be incorporated into the analysis and design of potential CPS improvements. Ultimately, the stakeholders decided not to include these speculative land use changes in the analysis due to the unknown nature and timeline of such zoning and boundary revisions. Following development

- Respond to WSDOT officials regarding financially feasible options

of the long-term improvement concepts for each of the 11 intersections, members of the project team investigated the potential for developing short-term improvements at selected locations. The goal was to establish a list of lower-cost improvements that could be implemented as funding becomes available; would allow incremental "phasing" of longer-term improvements over time; and builds upon already completed projects along the corridor.

Lastly, most of the identified current needs in transportation improvements along SR 9 are already addressed, or will be addressed in the six-year Capital Improvement and Preservation Program (CIPP). However, some locations still need immediate improvements. In order to identify low-cost, high-return safety and mobility improvement locations, additional safety and mobility analyses were performed along the corridor.

This included both a safety and mobility analysis; which found five intersections along the corridor were identified and in immediate need of approval.

The identified Safety or Mobility Need Location intersections are:

- SR 9/US 2/Bunk Foss Road, MP 12.33. **Safety and Mobility Need location**
- SR 9 and E. Sunnyside School Road (42nd St.) intersection, MP 17.92. **Safety Need location**
- SR 9 and 4th St SE intersection, MP 15.09. **Safety Need location**
- SR 9 and SR 530 Burke Avenue intersection, MP 29.56. **Mobility Need location**
- SR 9/Market Place, MP 15.42. **Mobility Need location**

WSDOT proposes these five locations be improved as soon as funding is available, based on priority.

Further and more detailed discussion of this safety and mobility analysis can be found on pages 4-17 through 4-19.

The result of this analysis and preliminary design work is a phasing plan of transportation improvements for the 11 study intersections and connecting highway segments that could be implemented as funding becomes available. The total planning-level cost for these improvements is estimated at $373 million (in 2007 dollars). The CPS components build upon previous and on-going transportation improvements developed as part of

the TPA and Nickel funding programs and also incorporate many of the projects previously identified in Proposition 1 or Regional Transportation Improvement District (RTID) package that in 2007 was rejected by voters.

Identified projects include intersection improvements, roadway widening, and bridge construction to help improve safety and mobility along the corridor (descriptions of these improvements are provided below). If all the projects are funded, SR 9 will be widened to a four- or five-lane highway from SR 522 to SR 92 with improved intersections. North of SR 92, proposed improvements along SR 9 will be made at key intersections. The improved highway will be able to accommodate future transit service, increased travel demand and provide for local access movements without impacting safety.

With the proposed improvements defined for each location, the phasing plan of improvements was then established to determine a reasonable and logical implementation structure.

Based on feedback from the Corridor Working Group and coordination with the WSDOT's NW Regional Administrator's list of proposed projects for the corridor; a series of 5 improvement packages representing a total of 21 improvement projects were developed. These packages describe the recommended improvements in sequence and combine improvements based on incremental funding levels.

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

Below are the five Improvement Packages. Additional detail regarding how the improvements and packages were developed and the prioritization process can be found in Chapter 6.

Improvement Package 1

- **176th Street SE to SR 96 Widening**
  - Short-term improvement
  - Widen SR 9 from three lanes to five lanes
  - Estimated cost (2007 dollars - rounded): $50.4 million

- **SR 204 Intersection Improvements**
  - Short-term improvement
  - Add third northbound through lane

- Add third southbound through lane
- Estimated cost (2007 dollars - rounded): $8.4 million

- **SR 530 (Burke Avenue) Intersection Improvements**
  - Short-term improvement
  - Intersection improvements to enhance access to and from SR 9
  - Minor shoulder widening and grading
  - Total Estimated cost (2007 dollars - rounded): $1.0 million

- **US 2 Ramp Interchange Enhancements**
  - Short-term improvement
  - Restripe bridge for four lanes (two each direction)
  - Add northbound and southbound through lanes at intersection approaches and receiving segments
  - Right-turn channelization improvements at ramp intersection approaches (eastbound and westbound)
  - Estimated cost (2007 dollars - rounded): $7.0 million

- **Market Place Intersection Improvements**
  - Short-term improvement
  - Add westbound right-turn lane
  - Add second northbound approach through lane
  - Add second southbound receiving lane
  - Estimated cost (2007 dollars - rounded): $4.4 million

Improvement Package 2

- **SR 204 to Lundeen Parkway Widening**
  - Long-term improvement
  - Widen SR 9 from four lanes to six lanes
  - Estimated cost (2007 dollars - rounded): $7.0 million

- **Lundeen Parkway Intersection Improvements**
  - Long-term improvement
  - Add third northbound through lane
  - Add third southbound through lane
  - Estimated cost (2007 dollars - rounded): $5.0 million

- **SR 530 (Division Street) Intersection Improvements**
  - Long-term improvement
  - Widen eastbound approach for dual left-turn lanes
  - Add northbound receiving to Burke Avenue
  - Estimated cost (2007 dollars - rounded): $3.0 million

Improvement Package 3

- **Marsh Road Intersection Improvements**
  - Long-term improvement
  - Add third northbound through lane
  - Add third southbound through lane
  - Widen eastbound approach for dual left-turn lanes
  - Estimated cost (2007 dollars - rounded): $5.7 million

- **Marsh Road to Snohomish River Bridge Widening**
  - Long-term improvement
  - Widen SR 9 from two lanes to four lanes
  - Estimated cost (2007 dollars - rounded): $8.7 million

- **Snohomish River Bridge Replacement (two spans)**
  - Long-term improvement
  - New four-lane main span across Snohomish River
  - New four-lane overflow bridge south of main span
  - Ramp and bridge improvements near Riverview Road/2nd Street (north of main span)
  - Estimated cost (2007 dollars - rounded): $109.2 million

Improvement Package 4

- **Snohomish River Bridge to Bickford Avenue Widening**
  - Long-term improvement
  - Widen SR 9 from two lanes to four lanes
  - Reconstruct Bickford Avenue bridge trestle
  - Estimated cost (2007 dollars - rounded): $40.4 million

- **Avenue D/Bickford Avenue Intersection Improvements**
  - Long-term improvement
  - Close Avenue D access to/from SR 9
  - Add new signal north at 20th Street SE
  - Build connector roads to/from new signal
  - Estimated cost (2007 dollars - rounded): $6.7 million

- **Bickford Avenue to US 2 Ramps Widening**
  - Long-term improvement
  - Widen SR 9 from two lanes to four lanes
  - Estimated cost (2007 dollars - rounded): $17.2 million

- **US 2 Interchange Enhancements—Full Concept**
  - Long-term improvement
  - Remove northbound left-turn movement at westbound ramps

- Remove southbound left-turn movement at eastbound ramps
- Construct new single-lane roundabout at intersection of New Bunk Foss Road/westbound ramps
- Construct new southbound-to-eastbound loop ramp
- Upgrade signal controller hardware
- Estimated cost (2007 dollars - rounded): $25.0 million

Improvement Package 5

- **US 2 Ramps to 20th Street SE Widening**
  - Long-term improvement
  - Widen SR 9 from two lanes to four lanes
  - Estimated cost (2007 dollars - rounded): $31.0 million

- **20th Street SE Intersection Improvements**
  - Long-term improvement
  - Add third northbound through lane
  - Add third southbound through lane
  - Widen westbound approach for dual left-turn lanes
  - Add eastbound right-turn pocket
  - Estimated cost (2007 dollars - rounded): $5.6 million

- **20th Street SE to Market Place Widening**
  - Long-term improvement
  - Widen SR 9 from two lanes to four lanes
  - Estimated cost (2007 dollars - rounded): $23.5 million

- **Market Place Intersection Improvements (Phase 2)**
  - Long-term improvement
  - Add third northbound through lane
  - Add third southbound through lane
  - Add eastbound right-turn pocket
  - Estimated cost (2007 dollars - rounded): $12.0 million

- **84th Street NE Intersection Improvements**
  - Long-term improvement
  - Widen southbound approach for dual left-turn lanes
  - Widen westbound approach for dual left-turn lanes
  - Add eastbound right-turn pocket
  - Estimated cost (2007 dollars - rounded): $2.3 million

The above improvement project candidates would be considered the highest priority transportation elements of the corridor to move forward into detailed design and environmental review. If and when funding has been identified and established for these improvements, implementation would

likely occur collaboratively between WSDOT and relevant partner agencies. However, if appropriate, some improvement projects may be delivered entirely by local agencies with minimal WSDOT involvement depending on the scope and scale of work. Once funding is available and appropriated, each project will undergo a formal design process and environmental analysis before plan, specification, and estimate (PS&E) and capital construction begins.

Chapter 2 – Introduction and Background

What is the history of SR 9?

Prior to the construction of SR 9, several other local roads were aligned along the current route of the highway. The first was a roadway extending from the current southern terminus to Snohomish established by 1895 and another road between Arlington and Sedro-Woolley by 1911. The current SR 542 concurrency was first established in 1925 when a branch of State Road 1 (Pacific Highway) from Bellingham to Mount Baker was added to the state highway system. These roads were combined and several other roads were added to create Secondary State Highway 1A (SSH 1A), which originally ran from Woodinville to Blaine in 1937. A highway renumbering in 1964 introduced the sign routes that would be co-signed with the existing system until 1970, one of which would replace SSH 1A to SR 9. SSH 1A/SR 9 extended south to Woodinville until 1965 when it was shortened to SR 202, later SR 522, which wasn't complete yet. SR 9 was not completed between Lake Stevens and Arlington until after 1966.

Evolution of a highway

- SR 9 began as a disjointed series of local roads
- State Road 1 (Pacific Highway) was first constructed from Bellingham to Mount Baker as the primary transportation corridor in the area.
- Secondary State Highway 1A spawned from State Road 1 and was later transformed into SR 9 through renumbering
- Today SR 9 is nearly 100 miles in length and extends north to the Canadian border.

Today, SR 9 consists of a 98-mile state highway that traverses Snohomish, Skagit, and Whatcom Counties in Washington State. In the south, the highway begins at an interchange with SR 522 in the vicinity of Woodinville and extends north through the cities of Snohomish, Lake Stevens, Arlington, Sedro-Woolley, and Nooksack to become British Columbia Highway 11 beyond the Canadian border in Sumas.

Why is a Corridor Planning Study needed for SR 9?

SR 9 serves Snohomish, Skagit, and Whatcom Counties and is used for local, commuter, recreation, and freight-related trip activity. The corridor changes character as it progresses north. At the southern end in Snohomish County it is a heavily traveled route that touches on all four trip types. At the far north end in Whatcom County it is primarily a rural farm-to-market highway.

Traffic demand along SR 9 has grown

- Annual daily traffic on SR 9 in the Lake Stevens area has increased by approximately 10 percent between 2000 and 2007.
- Drivers experience congestion at a number of intersections during peak traffic conditions
- Public feedback surveys show traffic congestion is a major concern for most residents

In Snohomish County, rapid growth in population and employment in the recent decades has contributed to increased traffic congestion along the SR 9 corridor, particularly during peak commuting hours. Sizable commitments toward improving SR 9 have been made through two major transportation funding packages. For the period from 2005 to 2015, the State Legislature has directed nearly $325 million on the SR 9

corridor in Snohomish County to enhance safety and reduce traffic congestion. Projects supporting these commitments have resulted in the planning, design, and construction of various roadway upgrades and intersection improvements. It was always understood that more investment in the corridor would be needed, and the SR 9 CPS is a study that helps to identify and prioritize those additional needs.

A recent effort undertaken by Snohomish County resulted in an SR 9 Transportation Inventory Assessment (2006–2007). The purpose of this initial study was to review the previous and on-going transportation studies, the collection of relevant background data, and analysis of peak-period traffic conditions in terms of vehicle delays, level of service, queues, etc., that could ultimately provide a starting point or frame-of-reference for this current CPS work. The final report summarizing the findings of the transportation inventory assessment can be found in Appendix C, SR 9 Transportation Inventory Assessment Report.

This CPS process provided a platform for identifying and assessing the additional corridor needs not addressed in current or previous work.

What is a Corridor Planning Study?

A Corridor Planning Study (CPS) identifies a vision for the future of the corridor and actions that should be taken to realize that future vision. The study identifies deficiencies based on adopted WSDOT deficiency thresholds and recommends short- and long-term improvement strategies that address those deficiencies. The improvement strategies are in alignment with the six investment guidelines found in RCW 47.04.280. Those guidelines are

- **Economic Vitality**—To promote and develop transportation systems that stimulate, support, and enhance the movement of people and goods to ensure a prosperous economy
- **Preservation**—To maintain, preserve, and extend the life and utility of prior investments in transportation systems and services
- **Safety**—To provide for and improve the safety and security of transportation customers and the transportation system
- **Mobility**—To improve the predictable movement of goods and people throughout Washington state

- **Environment**—To enhance Washington's quality of life through transportation investments that promote energy conservation, enhance healthy communities, and protect the environment
- **Stewardship**—To continuously improve the quality, effectiveness, and efficiency of the transportation system

A CPS is used to refine the mobility strategies for a state highway corridor in the state's 20-year highway plan, the State Highway System Plan. It should also be used by local jurisdictions when assessing probable state highway improvements during the update of the transportation element of their respective comprehensive plans.

Who are the SR 9 Corridor Planning Study partners?

Each jurisdiction along the 30-mile segment of the SR 9 corridor under study was invited to participate in the development of the CPS as members of a CWG. The CWG was formed to help develop consensus-based recommendations and represent the interests of individual jurisdictions and other stakeholders.

The CWG advised the project team (WSDOT and consultant staff) throughout the project, from conception to final recommendations of the CPS. The CWG kept the project team apprised of public concerns and kept local elected officials apprised of the study's progress and findings.

CWG members included representatives from the following:

- City of Arlington
- City of Lake Stevens
- City of Marysville
- City of Snohomish
- Snohomish County
- Community Transit
- Puget Sound Regional Council
- WSDOT

How has the public been involved in the process?

The SR 9 corridor study has benefited from the involvement and input of communities along SR 9. The project team worked with the public and representatives from cities, the County, and interested agencies within the corridor as it developed the SR 9 CPS.

Initial Agency Interviews

In late 2006 and early 2007, WSDOT conducted initial partner interviews with seven agencies located along the SR 9 corridor. The main purpose of the interviews was to introduce the SR 9 corridor study, review the planning process, seek local agency input on specific issues and concerns related to SR 9, and ask the agencies to provide a representative for the CWG.

Corridor Working Group

Local agencies along the corridor were invited to participate in the corridor study process and the development of the SR 9 CPS as members of the CWG. Seven agencies agreed to provide a representative to the CWG.

CWG members, along with WSDOT, guided the development of the study from an inventory of existing conditions, analysis of future conditions and potential needs, development of proposed improvements, and endorsement of final recommendations to be included in the SR 9 CPS.

In late 2007 and early 2008, WSDOT held meetings with the CWG to gather input on transportation-related needs in the study area.

Comments included the following:

- Limiting access to better recognize SR 9 as the major alternate parallel route to I-5
- Working with Community Transit to increase and encourage transit service with support for transit facilities
- Considering grade separation at major intersections as a means for facilitating higher throughout/capacity
- Providing no additional pedestrian facilities due to speeds on limited-access facility
- Enhancing the trail parallel to SR 9 for non-motorized movement.

The CWG met five times during the course of the study to review project updates and provide input. The group participated in four meetings and one corridor design charette. In addition, CWG members kept their local executives and elected officials informed on the status of the project, helped with outreach in their community, and will work together with other CWG partner agencies to seek funding for recommended projects. Lastly, the CWG was also provided updates on the

study's progress and development of recommendations through emails and phone calls with the WSDOT and PB project managers.

Public Involvement

In addition to the involvement of local agencies, efforts were made to involve the public in the corridor study. WSDOT attended local community events and gathered information through comment forms and the project web site.

The public involvement effort provided input to the study process and helped form the recommendations reflected in this document.

Community Events

During the summer of 2007, the project team attended four local fairs along the corridor and talked to over 1,100 people. These events included the following:

- Marysville Strawberry Festival
- Snohomish Kla Ha Ya Days
- Lake Stevens AquaFest
- Lake Stevens Farmers Market

SR 9 Information Booth at the Marysville Strawberry Festival

Visitors to the SR 9 booth could acquire project information, ask questions, and share feedback with the project team. A sampling of the commonly asked questions and comments heard at the community events included the following:

- Widen SR 9 to four or more lanes from Snohomish to Arlington
- The three consecutive traffic signals at the intersections of SR 9 and 20th Street SE and the westbound and eastbound US 2 on- and off-ramps are causing lengthy delays for drivers
- Developers should share in the cost of transportation updates
- Modify SR 9 to be grade-separated at key intersections
- The intersection of SR 9 and Marsh Road is congested and unsafe
- The Snohomish River Bridge needs to be replaced with a safer and wider bridge

Project Website and Public Comments

In addition to these events, information was available on the project website: http://www.wsdot.wa.gov/Projects/SR9/RoutePlan/

SR 9 corridor study information was provided via Snohomish County email updates, and comments were received and responded to via regular mail and email.

Most respondents were concerned about traffic congestion, short- and long-term capacity needs (including the request for additional lanes), and highway safety. Others had concerns and suggestions regarding specific intersection locations and corridor segments—primarily SR 9 at Cathcart Way, Marsh Road, Bickford Avenue, 56th Street SE, Highway (US) 2, Highway (SR) 204, Lundeen Parkway, Highway (SR) 528, and 108th Street NE. These comments were used by the CWG as it identified corridor needs, developed potential improvements, and finalized the recommendations for the CPS.

Corridor Planning Study Circulation

In early 2010, the Draft SR 9 CPS will be prepared, and a summary of the draft recommendations from the CPS process will be circulated to the public. An informational traveling display, accompanied by a project folio (fact sheet), will be temporarily placed for viewing at local libraries along the SR 9 corridor. This summary information will also be posted on the project website. In addition, WSDOT intends to provide briefings on the Draft CPS, as requested, to the agencies represented in the CWG. The Final CPS will be posted on the project website as public record.

The public involvement effort helped inform the Final CPS that included corridor improvements that are supported by WSDOT, local agencies, and the public.

What is contained in this CPS?

In addition to an overview of the SR 9 CPS process and how the project was initiated, this CPS includes information regarding the existing and future conditions along the corridor, the final long-term and short-term improvements that are proposed, and recommended next steps for implementation of the CPS.

Chapter 3 summarizes coordination efforts undertaken as part of the project, including the vision and goals of the CWG and key decisions that were part of the development of the CPS.

Existing conditions are discussed in Chapter 4. Specifically, the chapter describes

- The physical extents of the corridor and study area
- How the area along SR 9 is changing in terms of population and employment growth
- The physical characteristics of the roadway
- Environmental constraints along the corridor
- Safety issues in the project area.

Chapter 5 presents future traffic conditions and discusses how growth is affecting traffic on SR 9 and the development of traffic volume forecasts for a "baseline" snapshot.

Chapter 6 covers proposed improvement projects, including investments that WSDOT has made along SR 9, descriptions of the proposed long-term improvements, and how the improvements were identified and ranked. The final options selected for each intersection, including near-term improvements, are also listed in this chapter.

Chapter 7 discusses the next steps that need to be taken to promote implementation of the CPS elements. These next steps include specific implementation investments at various funding levels, source of funding considerations, and the long-term vision of the corridor.

Technical data and supporting supplemental information is found in the appendices. Technical memorandums provided in the appendices cover key studies and topics related to public involvement planning, traffic forecasts, preliminary project costs, environmental constraints, existing design conditions, CWG meeting minutes, options screening, and CPS program elements and costs.

Key CPS Report Components

- Overview and background of the study approach and process
- Summary of project coordination efforts within the project team, with the CWG, and the public
- Description and analysis of existing transportation and land use conditions
- Investigation of future growth in traffic demands and impacts on the transportation system
- Development of potential improvement options and screening of candidate projects
- Next steps

Chapter 3 – Project Coordination

Extensive coordination within the project team and with the CWG was critical in the development of the CPS improvement recommendations and preparation of the summary document. Project team members worked closely with CWG partners early in the study process to develop and refine the vision and goals statement for the overall effort, thus establishing the key themes for achieving objectives and outcomes. In addition, active dialogue between WSDOT staff, the consultant team, and the CWG led to a cohesive and collective understanding of what was needed from the technical analysis and the development of improvement concepts, thereby ensuring consistency and transparency throughout the study process.

Coordination elements for this study are described in the sections below. Key topics include development of the vision and goals statement, the overall study process and critical decisions and special considerations that facilitated the development and preparation of the CPS.

What were the vision and goals of the CWG?

At the May 9, 2007, kickoff meeting for the SR 9 CPS study, the CWG established a vision statement to provide overarching guidance of the CPS process. In addition, the CWG adopted four broadly categorized goals to direct the development and screening of corridor improvement recommendations.

The vision and goals for the SR 9 corridor were defined by the following.

Vision

SR 9 is a highway corridor that accommodates safe and efficient regional movement of people and goods, supports the local economy, and provides for effective access sensitive to local land use conditions.

Goals

The project team will develop recommendations that are endorsed by the study's CWG partners. These projects will address existing and future operational deficiencies in a manner that is cost effective, politically acceptable, sensitive to environmental conditions, and responsive to the vision above. The recommendations will address the following areas.

Safety

Identify and target locations where serious injury collisions and documented fatalities have occurred within the study area by developing strategies that will eliminate, or at a minimum reduce, such collisions in the future.

Mobility

Enhance the performance of the corridor through existing transportation investments and operational strategies ranging from basic maintenance to advanced technologies. Mobility improvements should benefit existing and future operations for all transportation users, including transit, pedestrians, and other non-motorized modes.

Accessibility

Develop strategic access options that address bottlenecks and support a safe and efficient regional network. Minimize impacts to existing access points to maintain the character and performance of the corridor within each community.

Public Involvement

Keep the public and stakeholders informed on the progress of the study and solicit input from the public by holding open houses, providing information at various local events, and maintaining and updating a project website.

Outcomes

This corridor study will be considered a success if WSDOT, with the support of the CWG partners and the public, creates an CPS in which

- The public and CWG partners are meaningfully involved in the development of recommendations
- CWG partners endorse the final CPS and its list of recommendations
- The CPS outlines and describes a phasing plan for project implementation
- The CWG partners work together to solidify project funding for the improvement recommendations

What was the study process for the development of the CPS?

A project team consisting of WSDOT staff and consultants was formed early in the project to conduct technical analysis and develop a wide range of improvement options. Concurrently, a CWG was assembled to advise and review the project team's

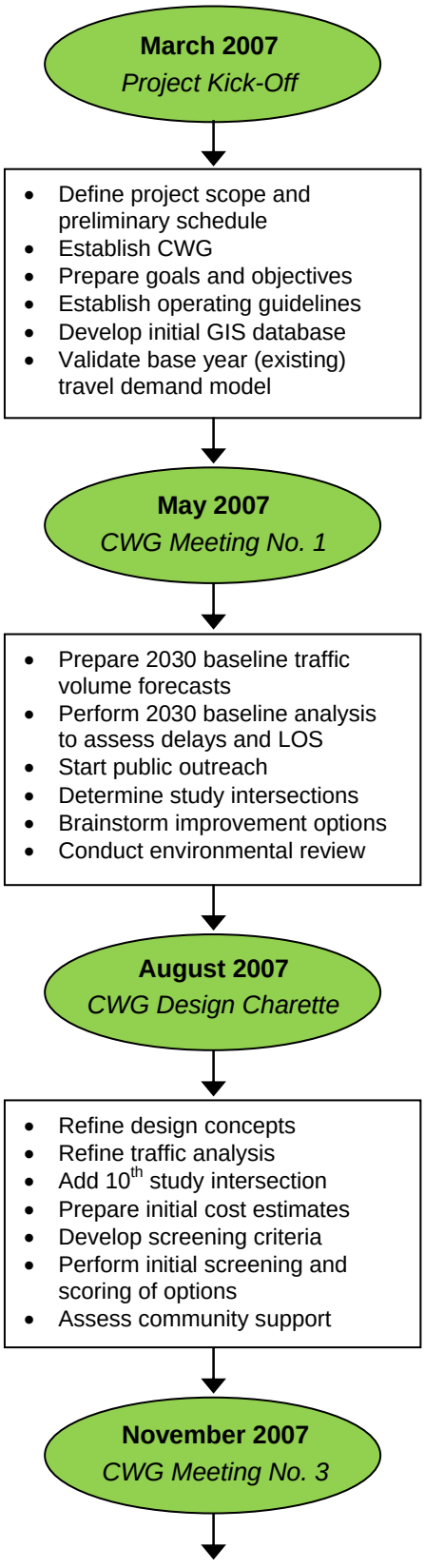
technical findings and progress. Members of the CWG included representatives from the City of Arlington, the City of Lake Stevens, the City of Marysville, the City of Snohomish, Snohomish County, Community Transit, the Puget Sound Regional Council, WSDOT, and members of the project consultant team.

Development and preparation of the SR 9 CPS involved extensive coordination between the project team and stakeholders (CWG partners). Together, they participated in a number of discussions, meetings, and workshops in addition to reviewing a significant amount of supporting technical work to better understand the current and future needs along the SR 9 corridor. The CWG's involvement resulted in strong feedback from the stakeholder community along with balanced geographic representation along the corridor to help direct outcomes during the CPS process. A project timeline and overview that highlights key dates and accomplishments is shown to the right.

As shown in the flowchart, the CPS process began with the opening task of developing the corridor vision and adopting a goals and objectives statement as well as a list of CWG operating guidelines. Following this effort, the initial tasks involved gathering existing conditions information and developing a public involvement plan.

The next phase of the project involved the selection of 10 intersections to be studied in detail (from the original list of 19 identified in the 2007 Transportation Inventory Assessment), analysis of the operational characteristics of each intersection, and development of potential operational improvement strategies/options for these selected locations. The 10 intersections identified for further evaluation were based on CWG vision and goals, traffic operations findings, collision history, initial agency interviews, and public feedback.

Major tasks associated with this phase included a high-level environmental overview, preliminary traffic analysis work to determine problem areas, preparation of design concepts, preliminary cost estimating, follow-on analysis to assess the effectiveness of each improvement option, and various public outreach efforts at local fairs and festivals.



The second CWG meeting consisted of a two-day design charette where the various improvement strategies for the 9 selected intersections were reviewed. The following goals were developed for this two-day session:

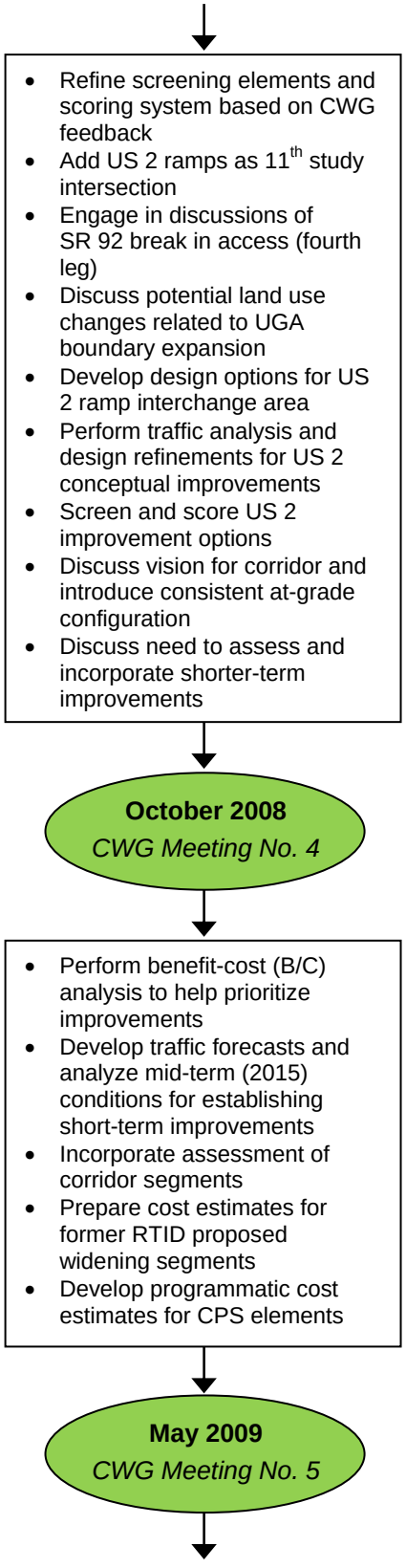
- Review the list of improvement options for selected intersections
- Agree upon a list of potential improvements that are supported by the CWG members
- Ensure the potential improvements are in alignment with the SR 9 CPS vision and goals
- Focus on improving congestion by addressing capacity needs and property-damage-only collisions that contribute to increased congestion
- Account for currently funded projects on SR 9 and improvements previously identified for future funding during development of a regional transportation ballot measure between 2002 and 2007

Regional Transportation Investment District (RTID)

In 2002, the Washington State Legislature passed E2SSB 6140 which authorized Snohomish, King and Pierce Counties to send to voters a ballot measure that would enact various taxes to fund highway improvements. Widening SR 9 between Clearview and SR 92 was included on the project list. The measure was defeated by public vote in November 2007

Improvement options were subsequently refined for each study intersection based on comments received from CWG members at the charette. The technical analysis involved the development and application of future (2030) traffic volume forecasts that were derived from a refined version of the Puget Sound Regional Council's (PSRC) forecasting model. The refined model included all TPA and Nickel funded projects, as well as RTID projects between Clearview and SR 92. An environmental overview identifying all potential environmental constraints was used to inform the design of the improvement options.

Once the improvement options were finalized for each study location, a screening process was undertaken to determine which options would produce the greatest benefit and least-negative effect. Criteria items were developed by the project team along with a comprehensive scoring system defined by criteria themes and category weighting. The screening process was introduced at the CWG design charette (August 16–August 17, 2007) and was updated over the following two weeks based on CWG comments and feedback.

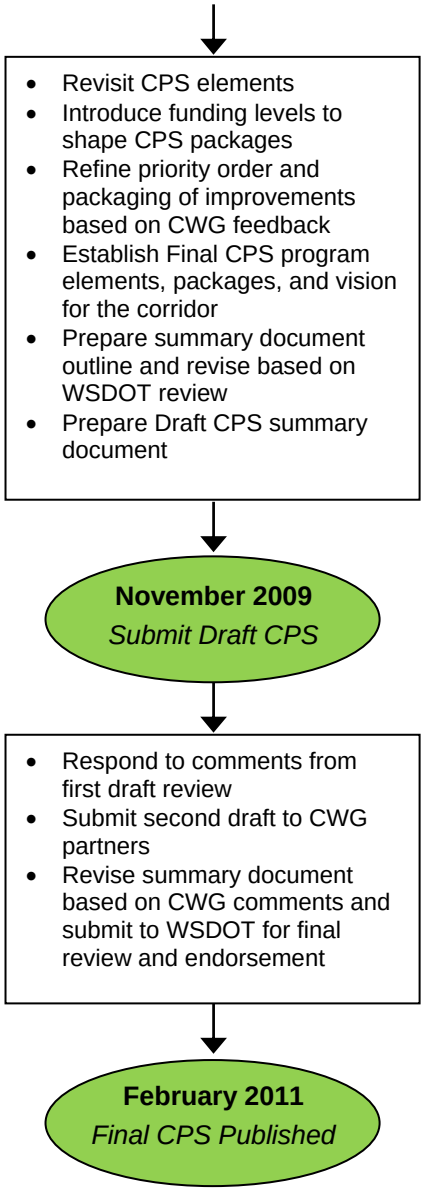


A third CWG meeting (November 1, 2007) was held to present the findings of the screening and scoring process and to begin gathering support for the most promising improvement options for each study location. Feedback regarding the scoring system was provided by the CWG, and minor refinements were made accordingly.

After the options screening process, the strategy options were prioritized by the CWG. Options were prioritized by how the options ranked in the screening process in combination with scores assigned for community support, which measured an agency's and community's support for a particular option, as assigned by the CWG members.

City and county council briefings were held in fall and winter 2007 and the first quarter of 2008 to inform and update city and county council members on the findings of the screening process and ranking of improvement options, as well as to receive additional feedback. Following these briefings, the US 2/SR 9 interchange was added to the list of study locations. Additional technical analysis and design work was then performed specifically for the US 2/SR 9 interchange to develop strategies for improving operations at this location.

A fourth CWG meeting was held on October 22, 2008, to present and discuss the results of the analysis for the US 2 interchange, including the options scoring and ranking results. This meeting also served as an opportunity to discuss possible approaches for prioritizing the CPS elements, such as using benefit-cost analysis or simplified cost-effectiveness measures. Another highlight of this meeting was a discussion of a refined vision for the corridor that would reflect only at-grade improvements (versus a mix of at-grade and elevated improvements along the corridor), provide a more consistent character for the highway, reduce capital cost, and yet not preclude the possibility of higher-cost elevated improvements in the future. The CWG was receptive to this refined vision and agreed to support an at-grade program of intersection and segment improvements within the framework of the CPS.



Following the fourth CWG meeting, prioritization of the improvements was initiated that included the widening of segments between intersections. These initial priorities were presented to the CWG at a fifth and final meeting on May 13, 2009, to gather feedback in terms of guiding the prioritization process. Based on comments from the CWG, the approach was refined to address issues specifically related to improvement cost and potential funding. As a result, more defined improvement packages were developed to represent high-priority, short-term strategies, and more logical groupings of long-range improvements by cost and geography.

Strong coordination between the project team and CWG resulted in productive and constructive decision making throughout the study process.

What major decisions influenced the CPS?

The evolution of the study involved a number of key decisions and meetings that helped to direct the development of the CPS. These decisions primarily involved expansion of scope items but also included a number of discussions of critical issues, such as potential changes to land use assumptions (for traffic forecasting purposes) and the methodology for improvement concept prioritization. The following topics capture the primary considerations and points of discussion:

- Study intersections (how many, which ones?)
- UGA boundary changes
- Community support (screening process)
- Short-term improvements
- SR 92 break-in-access (fourth intersection leg)
- Frontier Village access at SR 204
- At-grade corridor vision (character of the corridor)
- Program packaging and funding relationships

Study Intersections

The number and specific locations of intersections selected for analysis and design evolved over the course of the study. At the start of the study process, an upper limit of 10 intersections was defined based on the scope contents and available budget. During the initial intersection screening process (prior to the two-day design charette) that aimed to narrow the list of 19 intersections down to 10, a total of 9 locations were selected for further investigation with a "choice" location defined for the City of Snohomish. The tenth "choice" location consisted of either the Avenue D/Bickford Avenue intersection or the ramp intersection tandem at the SR 9/US 2 interchange due, in part, to the upper limits of the project scope and budget and the desire to investigate at least one improvement location within the City of Snohomish boundaries.

Defining what to study

- Scope originally allowed for up to 10 intersections to be assessed for the CPS
- First screening narrowed list of 19 intersections down to 10 (9 intersections + 1 "choice" location in City of Snohomish)
- One more intersection tandem at the US 2 ramps was added based on interest from various agencies to increase the total study list to 11 locations

At the conclusion of the second CWG meeting (two-day design charette), the Bickford Avenue location was ultimately selected as the tenth intersection. However, due to strong interest on the part of specific CWG partners and to address public feedback regarding the interface between US 2 and SR 9, the US 2/SR 9 interchange was added as an out-of-scope study element. As such, a total of 11 intersections were ultimately carried forward into the analysis and design work for further testing and screening of potential options.

Urban Growth Area Boundary

Concurrent with the discussions leading to the inclusion of the US 2/SR 9 interchange as a study element, potential land use changes associated with revisions to the UGA boundary near the US 2 ramps were contemplated by the Cities of Snohomish and Lake Stevens, with review and input provided by Snohomish County. An expansion of the UGA boundary would increase land-use density to specific areas adjacent to SR 9 and in the vicinity of the US 2/SR 9 interchange (generally to the north and west).

Preliminary City of Snohomish land use projections related to the UGA boundary expansion allowed up to 1,900 new residential dwelling units and up to 850,000 square feet of new commercial space to be developed as a result of the proposed re-zoning for the affected area (now primarily a forested parcel). Traffic estimates corresponding to these land-use projections showed the potential for up to 2,500 to 3,000 new vehicular trips generated during either the AM or PM peak hour from the proposed development.

Potential UGA boundary changes were intended to be reflected in the US 2/SR 9 interchange analysis/design work. However, specific trip generation assumptions were not agreed upon by the participating agencies due to differences in policy and conflicting land-use proposals. In addition, the issue of whether the UGA boundary changes would be adopted in the near term was raised repeatedly by various parties.

Additionally, concerns were raised by the project management team about incorporating into the technical analysis land use changes not yet approved. It is not standard practice to incorporate potential but unofficial land-use changes into traffic modeling analysis. Therefore, the project management team believed that basing traffic forecasts on potential trips would lead to flawed recommendations and would leave the

technical analysis vulnerable to any review and scrutiny. Ultimately, the agencies agreed to omit potential changes to the UGA boundary for the purposes of conducting the US 2/SR 9 interchange analysis and to allow the CPS process to advance into the screening and prioritization phase.

Community Support

As part of the options screening process that determined which improvements were most attractive for each study location, community support was assessed through coordination with the CWG to gain an understanding of how well a particular option would be received by agencies and council groups. This measure of support was also intended to gauge how compatible a given option would be with agency land use and transportation policies and visions.

Gauging support for the improvement options

- Community support was one of five key screening themes
- It was assessed through close coordination and interaction with CWG members at the third meeting
- Scores were given by lead agencies and discussed by the larger group
- Positive results: greater participation and more focused "buy-in" from CWG members

The assessment was based on a scoring process conducted at the third CWG meeting. CWG members were asked to rate their support for the improvement options based on a scale of 1 to 5, with 1 representing little to no support (no endorsement) and 5 representing strong support and likely endorsement. Lead agencies (agencies corresponding to where a particular study intersection resides) were responsible for the preliminary scoring of community support for the various improvement options within their respective jurisdiction.

For example, to assess community support for the SR 204 improvement options, the CWG member from the City of Lake Stevens was asked to provide a preliminary score of 1 to 5. Supporting feedback by other CWG members followed each scoring round until all options for each study intersection were given a specific score. The end result of this additional coordination was a greater assurance of acceptance from CWG members regarding the options-selection process.

Short-term Improvements

Following the screening process and determination of suitable long-term improvement options (around the time of CWG Meeting 4), the decision was made by the project team to refine the improvement list to include near-term strategies. The goal of this effort was to identify lower cost improvements that could be implemented in the short-term preceding the more capital-intensive improvements envisioned as part of the long-range plan. A supporting goal was to minimize the amount of "throw away" investment, such that a short-term improvement

Incorporating Improvements for the Near Term Future

- Initially proposed by the project team following the 4th CWG meeting in October 2008
- Intent was to ensure that near term improvements were identified that could be implemented quickly if funding became available "now"
- One goal was to minimize "throw away" improvements that are eventually phased into longer term projects
- Agreed to by stakeholders prior to final CWG meeting

could essentially be a first phase of the long-term strategy. CWG members agreed prior to the fifth and final CWG meeting that identification of a set of short-term strategies would be a useful component of the final plan.

SR 92 Break-in Limited Access

In early 2008, the City of Marysville proposed a break in the SR 9 limited access at SR 92 to allow for the construction of a fourth (west) intersection leg. The resulting link west of SR 9 would establish a new east-west arterial, thereby improving network connectivity between SR 9 and Interstate 5 through the City of Marysville. In order to meet future traffic demands, the City recognized the need to improve and expand its network of arterials. According to City reviews of land use and transportation, the current roadway network is insufficient, and prior development did not account for adequate infrastructure to meet those future demands. The City of Marysville has, therefore, taken a proactive approach to accommodate growth and ensure that the infrastructure is in place to support future demands. The access break is identified as an amendment to the City's comprehensive plan and would comply with and support the Regional Growth Management Act (GMA).

Based on the results of internal studies conducted by the city, the introduction of a fourth leg at the intersection of SR 9 and SR 92 will result in benefits to the area (Exhibit 3-1). The redirection of eastbound and westbound traffic onto SR 9 from SR 92 will be reduced by adding a continuous arterial from SR 92 that will ultimately connect SR 9 to Interstate 5 through Marysville. The arterial will also reduce traffic levels on Soper Hill Road, Sunnyside School Road, and SR 528. This reduced traffic onto these streets will also minimize volumes to and from SR 9.

One of the primary goals in developing proposed solutions for this section of SR 9 was to ensure that the funded Lundeen Parkway to SR 92 widening work led by WSDOT reasonably incorporates (or allows for) the channelization needs associated with a future fourth intersection leg. In late 2009, a Letter of Understanding was developed between WSDOT and the City of Marysville to postpone final design of the intersection element for the Lundeen to SR 92 project. This postponement would allow for the fourth leg to be included in the final design of the intersection.

Adding a new connection

- A break in limited access would allow for a fourth (west) leg of the intersection of SR 9 and SR 92 to be constructed
- Extensive coordination with on-going projects was needed to ensure that any future improvements are not precluded
- As of May 2010 proposed SR 92 intersection improvements in the CPS are beginning design and anticipated for construction in the summer of 2012.
- Request for a break in access for a fourth leg at the intersection of SR 9/SR 92 has been approved by WSDOT.

Because formal design of a new fourth leg at the SR 92 intersection is just starting development, the SR 9 CPS may need to be amended in the future. Such an amendment would be intended to capture the final design of the intersection in the CPS.

Exhibit 3-1: Proposed West Leg at Intersection of SR 9/SR 92 (shaded area)

Frontier Village Access at SR 204

During the development of mobility improvements at the major crossing of SR 9 and SR 204, a number of meetings and discussions involving project team members and City of Lake Stevens representatives were initiated to review vehicular access and circulation around the Frontier Village shopping area. These meetings were intended to investigate how the proposed improvements established from the CPS screening process at SR 204 could potentially be integrated or, at a minimum, not preclude future access enhancements for the Frontier Village retail zone. In early 2010, additional state funding was allocated to perform study work to address access, circulation, and operational improvements in the vicinity of Frontier Village between Market and SR 204 intersection along SR 9. The study will be a coordinated effort between WSDOT and the City of Lake Stevens. Due to on-going congestion and circulation issues with the east (driveway) leg of the SR 9/SR 204 intersection, City of Lake Stevens officials presented to the project team a planning-level proposal to redefine the internal street network within the Frontier Village site (Exhibit 3-2).

Exhibit 3-2: Frontier Village Shopping Area in Lake Stevens (shaded area)

As described in this document, the improvements proposed for the SR 9/SR 204 intersection as part of the CPS include conventional at-grade widening of the northbound and southbound approaches to accommodate additional lanes (one in each direction). While the CPS process was structured in a consensus-driven format to ensure sensitivity toward community needs, access to and from Frontier Village was considered a local circulation issue in the context of developing corridor-level transportation improvements. As such, the options developed for the CPS were crafted to address regional, macroscopic travel patterns not specific to any single traffic generator, such as Frontier Village.

However, in the interest of accommodating future phasing and integration of local improvements, a review of the proposed access enhancements for Frontier Village was conducted to assess the feasibility of incorporating them within the CPS improvements. While no quantitative conclusions were

developed from this review, preliminary findings indicate that the access enhancements, or variations of these enhancements, could be integrated with the CPS improvements with minimal "throw away" during any Frontier Village transitions. Future planning efforts to address Frontier Village access and circulation by Lake Stevens and other entities should be integrated and coordinated with the proposed widening recommendations in this CPS.

At-grade Corridor Configuration

The project team held a project review session in September 2008 to discuss the need for a cohesive strategy for the corridor. Approaching this meeting, one key concern regarding the selected improvements that resulted from the screening process was that the options represented a dissimilar group of projects in terms of scale and design. Another critical issue was the potential cost of the overall CPS program based on the initial cost estimates for the more capital-intensive projects.

At-grade improvements would retain the existing character and profile of the corridor (shown: SR 9 near SR 92 in Lake Stevens)

This discussion centered on the southern portion of the route from approximately SR 522 to SR 92. Several intersections along this section of SR 9 included improvement options for at-grade intersection-level investments as well as construction of more intensive grade-separated interchanges.

Discussion highlights are summarized below:

- The grade-separation options under consideration at several intersections south of SR 92 were considered too dissimilar from the more traditional at-grade intersection improvements proposed elsewhere on the corridor (such as widening for additional lanes)
- Costs for the grade-separation options were considerably higher than the at-grade options
- The performance of the grade-separation options (generally higher than traditional at-grade improvements) was not sufficient to justify the significantly higher cost
- A fully limited-access SR 9 facility should not be precluded regardless of the interim strategy

Intersections crossing would continue to be signal-controlled after improvements are made (shown: signal at SR 9 & SR 530 in Arlington)

The result of this discussion influenced selection of the preferred intersection improvements. Maintaining an at-grade configuration for the SR 9 corridor over the next 20-year period was debated at the fourth and fifth CWG meetings. Full support of an at-grade configuration was ultimately given by the CWG.

Program Packaging and Funding Relationships

At the fifth and final CWG meeting (May 13, 2009), the prioritization of the CPS program elements and options was conveyed to the CWG and feedback was solicited. Several comments were made that related to the packaging of options and the order of implementation. Key suggestions included the following:

- Packages should be better defined in terms of incorporating intersection-level improvements and segment-widening improvements
- References to "low-cost" improvements should be removed since some of the supposedly short-term, low-cost options are actually fairly expensive (more than $5 million in some cases)
- Proposed improvements should be "packaged" to inform stakeholders and legislators what could be accomplished at different funding levels

As a result of these suggestions, the project team reassessed the program priority and packaging of options and developed a more refined list of potential corridor investments. The final list of CPS improvement elements addresses the suggestions above and was endorsed by the CWG for inclusion in the final document.

Refer to Appendix K, Corridor Planning Study Program Elements and Costs, for a complete list of the CPS improvement elements which highlights project components and estimated planning-level implementation.

Chapter 4 – Existing Conditions

SR 9 is a designated state highway that runs north and south through Snohomish County to the Canadian border, roughly paralleling I-5. It functions as an alternative to I-5 for northbound and southbound travel, particularly for the communities through which it passes. The highway serves local, regional, and freight-related travel and connects to other state facilities, such as SR 522, US 2, SR 204, SR 92, SR 528, SR 531, and SR 530 within the SR 9 CPS study area.

This chapter describes the existing conditions along the study segment related to traffic demands and congestion levels. Also included is a discussion of how the SR 9 corridor is changing and highlights of the current environmental constraints, land use issues, and safety concerns within the study area. More detailed information on the existing conditions is found in the Environmental Constraints Review and Existing Design Conditions in Appendices D and E, respectively.

What is the extent of the study area?

From south to north, SR 9 begins at SR 522, north of Woodinville, and roughly parallels I-5 (northerly) to its terminus at the Canadian border in Whatcom County near Sumas. SR 9 serves Snohomish, Skagit, and Whatcom Counties.

Study Corridor Definition

The SR 9 CPS study corridor consists of a 30-mile segment (approximately) between SR 522 and Schloman Road just north of the City of Arlington. The breadth of the study area for the purposes of the technical analysis extends 500 feet on each side of the highway's centerline. Refer to Exhibit 4-1 for a visual representation of the study corridor.

For the purpose of the environmental analysis the study area was divided into four nearly equal linear segments. Separating the corridor into these segments was intended to provide a reasonably detailed representation of the environmental issues and constraints along the entire 30-mile corridor for the environmental review (Appendix F, Environmental Constraints Review). The character of the roadway and land uses along the study corridor varies considerably from rural farmland to dense urban villages. As such, it was deemed suitable to divide the corridor into four segments based on physical distance. Mileposts were used as dividing lines from the southern end of

Exhibit 4-1: Map of the Study Corridor and Segmentation

the corridor at Milepost 0.0 just north of Woodinville to the northern end at Milepost 30.0 just north of Arlington (Exhibit 4-1).

Section 1 extends from Milepost 0.0 to Milepost 6.0. Milepost 0.0 is approximately one-half mile north of Woodinville and the Snohomish County line at the point where SR 9 connects to SR 522. This section is largely suburbanized and mostly falls within unincorporated Snohomish County. A certain portion of segment 1 passes through the unincorporated community of Clearview. The main intersections along the segment corridor include SR 522, 228th Street SE, Maltby Road, and 180th Street SE. Although Section 1 is not aligned through any incorporated cities, it is located near the Cities of Woodinville, Bothell, and Kenmore and in close proximity to key transportation corridors, such as SR 522 and I-405.

Section 2 begins at Milepost 6.0 and continues to Milepost 14.0. The segment is located within unincorporated Snohomish County but travels through the City of Snohomish north of Milepost 9.0 to approximately Milepost 12.0. Key intersections through which SR 9 passes within Section 2 include E Lowell Larimer Road, Marsh Road, Lowell Snohomish River Road, Riverview Road/2nd Street, Bickford Avenue, US 2, Lake Stevens Road S, and 20th Street SE. Land uses along this segment are characterized by the developed areas through which it passes, large agricultural areas, and industrial areas. The Snohomish River and Blackmans Lake are prominent natural features in this segment. SR 9 crosses over the river and is within close proximity of the lake.

Section 3 begins at Milepost 14 and ends at Milepost 22. In this segment, SR 9 passes through the Cities of Lake Stevens and Marysville, in addition to unincorporated Snohomish County. Major intersections in the segment include SR 204, N Davies Road, Soper Hill Road, SR 92, 64th Street NE, and 84th Street NE. Three lakes lie to the east of SR 9 within the corridor—Lake Stevens, Lake Cassidy, and Lake Martha. This segment has more residential dwellings compared to other segments along the corridor.

Section 4 begins at Milepost 22 and ends at Milepost 30 at approximately Schloman Road, one-quarter mile north of the City of Arlington. The segment passes through unincorporated Snohomish County and the City of Arlington for almost equal lengths. Major intersections in the corridor include 132nd

Avenue, 172nd Street NE, 204th Street NE, and SR 530. This segment is characterized by suburban, industrial, and agricultural uses.

How is the area along SR 9 changing?

Population Growth and the Primary Drivers of Growth

Snohomish County is the third-most populous county in Washington State. The County has experienced significant growth in recent decades. From the mid-1960s to the present, the County has grown by over 200 percent (Snohomish County Tomorrow [SCT] 2008). The County's population was 471,100 in year 1990 and reached 609,110 in year 2000, which is an increase of approximately 30 percent. Though the population growth within the County was particularly pronounced in the 1990s, it has slowed in recent years; in 2008, the County's population was 683,700, an increase of only 13 percent since year 2000.

The average annual growth rate for the County in the 1990s was 2.7 percent (highest of the four counties in the Puget Sound region) compared to the average annual growth rate of 1.8 percent thus far from 2000 to 2007. Despite the recent slowing of population growth, Snohomish County is still expected to outpace all but one other county between 2000 and 2030 with aggregated growth of 14.9 percent based on WSDOT's population growth compared to other counties published in 2003.

For additional information
http://www.wsdot.wa.gov/planning/wtp/datalibrary/population/PopGrowthCounty.htm)

According to the State's Office of Financial Management's 2002 population forecasts, the County's population is likely to reach at least 900,000 by 2025. Growth in Snohomish County is attributed to its location within the rapidly growing Puget Sound metropolitan area. Major population gains occurred after construction of I-5 through the County and Boeing's decision to build the 747 jet in the City of Everett.

Employment Growth

Employment in the County has also grown in recent years and at a similar rate as the population between 2000 and 2007 (approximately 13 percent). The labor force in 2007 was at 365,500 according to Washington Employment and Security Department (WSESD) data published in 2008**.** Important to note is that many Snohomish County residents commute to other counties, particularly King County, for work. In 2000, the Snohomish-County-to-King-County commute was the most

common county-to-county commute pattern in the state (OFM 2003). The employment forecast for 2025 is 358,355 jobs, an increase from the 2000 employment estimate of 127,917 jobs based on the population and employment information published by Snohomish County in 2008 (Snohomish 2008a). Between 2005 and 2007, employment in the County grew by an average of 6.5 percent per year, and between 2006 and 2007, 20,000 jobs were added county-wide, the largest one-year increase since 1980 based on the population and employment information published by SCT's 2007 Growth Monitoring Report released in 2008 (Snohomish 2008b). The statewide average of employment growth between 2005 and 2007 is 2 percent per year based on the employment data published by Bureau of Labor Statistics (http://www.bls.gov/schedule/archives/laus_nr.htm).

Development of Area, Land Use Changes, Influence of GMA Legislation, and Regulations

Snohomish County is made up mostly of resource lands and rural lands. Only a small portion of the County is classified as urban. In recent years, the County and local jurisdictions have been largely containing new growth within the UGA boundaries in accordance with GMA comprehensive plans. Within the UGA boundaries, there has been significant development in unincorporated areas. For example, in 2005, over half of the residential building permits issued were for new development in unincorporated UGAs based on the data published in the 2006 Snohomish County Comprehensive plan (Snohomish 2006a). Based on the data published in SCT 2008 Growth Monitoring Report, the total housing units that were permitted within the UGA were 5,870 (in 2005) and dropped to 2,429 (in 2008) and the total housing units that were permitted outside the UGA (non-UGA) were 1,111 (in 2005) and dropped to 398 (in 2008).

According to the County's 2007 Buildable Lands Report, the County is achieving urban densities consistent with GMA comprehensive plans. Land use changes have also included the conversion of undeveloped land to developed land and the increasing geographic size of urban growth areas and local jurisdictions through annexations. Residential growth is presumed to continue; although the number of residential permits issued peaked in 2005 then dropped in 2006–2007, new recorded lot applications were at the highest level ever recorded in 2007.

Since 2006, more than 26 square miles of land have been annexed by various municipalities throughout the County. Some (although few) of these annexations have occurred adjacent to the SR 9 corridor in cities such as Arlington, Marysville, Lake Stevens, and Snohomish. While Marysville and Snohomish have been active with regard to overall annexations, Lake Stevens in particular has absorbed a large number of land parcels near or adjacent to SR 9. Continued annexations by these and other jurisdictions are expected in the near-term future as local municipalities strive to establish larger geographic footprints by expanding their city boundaries and intensifying and diversifying their land use mix.

SR 9's Relationship to I-5 and Other Regional Highways and Interstates

SR 9 is a designated Highway of Statewide Significance. Highways of Statewide Significance are interstate highways and other principal arterials that provide for interregional travel and connect major communities across the state.

SR 9 served a similar function to that of I-5 in Snohomish and Whatcom Counties before I-5 was constructed. The highway runs roughly parallel to I-5 and within the study area, the distance between the two roadways varies between approximately 3.5 miles to 8 miles. SR 9 is used as an alternative to I-5. It serves as an important alternate north-south corridor connecting the communities located to the east of I-5.

What are the characteristics of SR 9?

The physical characteristics of SR 9 include such features as lane and shoulder widths, horizontal and vertical alignments, and other elements, such as speed limits and right-of-way. Physical characteristics provide insight regarding how the roadway functions and how the facility is able to meet today's travel demand. The study segment of SR 9 between SR 522 and SR 530 varies from a five-lane section at the southern end to a two-lane undivided rural highway. The majority of SR 9 within the study area is a two-lane roadway. With the exception of I-5, there are no other state highways or locally owned arterial roadways that provide a continuous north-south connection through Snohomish County. For that reason, most north-south traffic within the CPS study is concentrated on SR 9

Speed Limits along the Corridor

The speed limit along the corridor varies from 40 miles per hour (mph) to 55 mph (Exhibit 4-2). The speed limit for the majority of Segment 1 is 45 mph until it passes through the unincorporated community of Clearview, where the speed limit increases to 55 mph. The speed limit is 55 mph along Segment 2 of SR 9. Along Segment 3, the speed limit is 40 mph between Market Place and SR 204 and for the rest of the segment the speed limit is 55 mph. Segment 4 has a speed limit of 55 mph except for the segment between Highland Drive and SR 530 (Division Street) where the speed limit is 45 mph. The speed limit north of SR 530 drops to 40 mph.

Exhibit 4-2: Map of Speed Limits along the Corridor

Bicycle Routes, Sidewalks, and Transit Routes

There are no designated bicycle routes and sidewalks along this corridor within the study segment. Three park-and-ride lots are located along SR 9 in the CPS study section:

- Snohomish Park-and-Ride at 1700 Avenue D, just east of SR 9 at Avenue D. Routes using this park-and-ride are 271, 275, 277, and 424; capacity is 104.
- Lake Stevens Transit Center at 9600 Market Place, just east of SR 9 at Market Place. Routes using this park-and-ride are 221, 280, and 425; capacity is 207.
- Arlington Park-and-Ride at the intersection of SR 9 and 4th Street, just south of SR 530 (Division Street). Routes using this park-and-ride are 227 and 230; capacity is 25.
- Believe Church Park-and-Ride at 20th Street SE.

Transit service currently along SR 9 is very limited and only covers short distances on the corridor. Of the routes serving areas close to SR 9, the majority either cross the corridor or originate/terminate at adjacent park and ride facilities. Key routes noted from reviews of the Community Transit service program include Route 221 which travels on SR 9 in Lake Stevens from 64th Street NE to Lake Stevens Transit Center. This route provides an important direct connection between Marysville and Lake Stevens. Routes 271 and 275 use SR 9 within the City of Snohomish between 56th Street SE and Snohomish Park-and-Ride. Route 277 travels on SR 9 between the US 2 interchange and the Snohomish Park-and-Ride. Route 280 also uses SR 9 between Vernon Road and Lake Stevens Transit Center. The designated park-and-ride lots described above serve a series of additional east-west routes to and from communities along SR 9.

The corridor has been identified by Community Transit as a "transit emphasis corridor" in their 2008–2013 Transit Development Plan. As such, the corridor is recognized as having potential for significant future transit service. The plan describes preliminary service on SR 9 as follows: "…an important new linkage between north, east and south Snohomish County extending service running between Marysville and Lake Stevens south along SR 9 to Cathcart Way and then west along 132nd St SE and 128th St to Mariner park & ride. This proposal would link the SR 528, SR 9 and 128th St/132nd St transit emphasis corridors and provide an alternative transit link to employment and retail centers in both northwest and southwest Snohomish County." (page 128 of 2008–2013 Transit Development Plan).

It should be noted that recent economic conditions have required deferral and re-prioritization of many initiatives described in the Transit Development Plan. Future implementation of service on SR 9 will be dependent upon available funding, market readiness, and improvements to the facility.

Bridges and Major Structures

There are 13 bridges along SR 9 between SR 522 and SR 530. They include the Snohomish River Bridge, an overflow bridge located just south of the Snohomish River Bridge, another bridge just north of the Snohomish River Bridge crossing Riverview Road/2nd Street, the US 2 interchange bridge, and the Skykomish River Bridge just north of SR 530. Details regarding these bridges are provided in Exhibit 4-3.

An **overflow bridge** is usually a separate structure from the main bridge that allows the water passage when the river is "overflowing" the river bank. Typically, the overflow bridges are built near or within flood plains.

Exhibit 4-3: Bridges and Structures

Milepost	Type of Structure/ Structure ID	Crossing Description
MP 0.00 to MP 0.07	Bridge /#009/101	SR 522
MP 8.88 to MP 8.95	Bridge/ #009/117	Snohomish River Overflow
MP 9.17 to MP 9.38	Bridge/ #009/118	Snohomish River
MP 9.56 to MP 9.60	Bridge/ #009/119	Second Street
MP 10.69 to MP 10.74	Bridge/ #009/121	72nd Street SE
MP 11.88 to MP 11.87	Bridge/ #009/122	Undercrossing Old SR 2
MP 11.88 to MP 11.89	Bridge/ #009/124.25	Water Main
MP 12.21 to MP 12.25	Bridge/ #009/124.7	US 2
MP 13.99 to MP 14.00	Bridge/ #009/125	Water Main
MP 21.09 to MP 21.14	Bridge/ #009/128	Getchell Road
MP 28.38 to MP 28.39	Bridge/ #009/129.25	Portage Creek
MP 28.88 to MP 28.94	Bridge/ #009/130	BNSF Crossing
MP 29.70 to MP 29.83	Bridge/ #009/132	Stillaguamish River

Right-of-Way

Right-of-way (ROW) width is critical for a roadway widening project because of the potential costs associated with acquiring ROW. The ROW width along SR 9 in the study area varies between 100 and 200 feet (this is the land owned by WSDOT and is measured from one ROW line to the other), according to WSDOT's various design drawings. Detailed ROW surveys will be required to determine the ROW boundaries of SR 9 if and when the CPS improvement projects progress to more advanced stages of analysis and design.

Annual Average Daily Traffic

Most of the existing conditions information described in this document is taken from the technical memo prepared as part of the earlier work. (Refer to the *SR 9 Corridor Improvement Project Transportation Inventory Assessment* submitted to Snohomish County Public Works Department in January 2007.) Average Daily Traffic (ADT) is defined as the total volume of vehicles passing a point or segment of a roadway facility, in both directions, during a 24-hour period. ADT

counts were collected for 20 locations along the SR 9 corridor for a full week in June 2006.[1]

Exhibit 4-4 shows the average daily traffic profile for the SR 9 study area. Northbound and southbound volumes are approximately the same, which is typical of a corridor used predominately by commuters who travel in one direction in the morning and in the reverse direction in the evening. The total (both directions) ADT is between 20,000 and 28,000 vehicles per day in the south end of the corridor. Near Lake Stevens, the ADT spikes to 37,000 vehicles per day, by far the highest traffic volume in the SR 9 study corridor. To the north of Lake Stevens, ADT levels fall to between 10,000 and 20,000 vehicles per day.

Peak-hour Intersection Operations

As part of the earlier study, 19 intersections (listed in Exhibit 4-5) were evaluated (for AM and PM peak hours) along the 30-mile segment of SR 9 between SR 522 and SR 530. These intersections were selected based on the high levels of congestion that has been observed and where intersection improvements may be warranted in the future. The AM and PM peak-hour intersection volumes are shown in Exhibit 4-6 and Exhibit 4-7.

Exhibit 4-5: Intersections Evaluated

Signalized Intersections	
SR 9 and SR 530 (Division Street)	SR 9 and Market Place
SR 9 and SR 531 (172nd Street NE)	SR 9 and 20th Street SE
SR 9 and 84th Street NE (Getchell Road)	SR 9 and US 2 Westbound Ramps
SR 9 and SR 528 (64th Street NE)	SR 9 and US 2 Eastbound Ramps
SR 9 and SR 92	SR 9 and 56th Street SE
SR 9 and Soper Hill Road	SR 9 and Marsh Road
SR 9 and Lundeen Parkway	SR 9 and SR 96 (Lowell-Larimer Road)
SR 9 and SR 204	SR 9 and Cathcart Way
Unsignalized Intersections	
SR 9 and SR 530 (Burke Avenue)	SR 9 and 164th Street SE
SR 9 and Bickford Avenue	

Exhibit 4-4: Average Daily Traffic by Segment (2006)

*All ADT volumes are given in vehicles per day

[1] ADT by vehicle classification was also recorded at four locations throughout the SR 9 corridor to validate truck volumes from the peak-hour intersection traffic counts.

Exhibit 4-6: AM Peak Hour Traffic Volumes

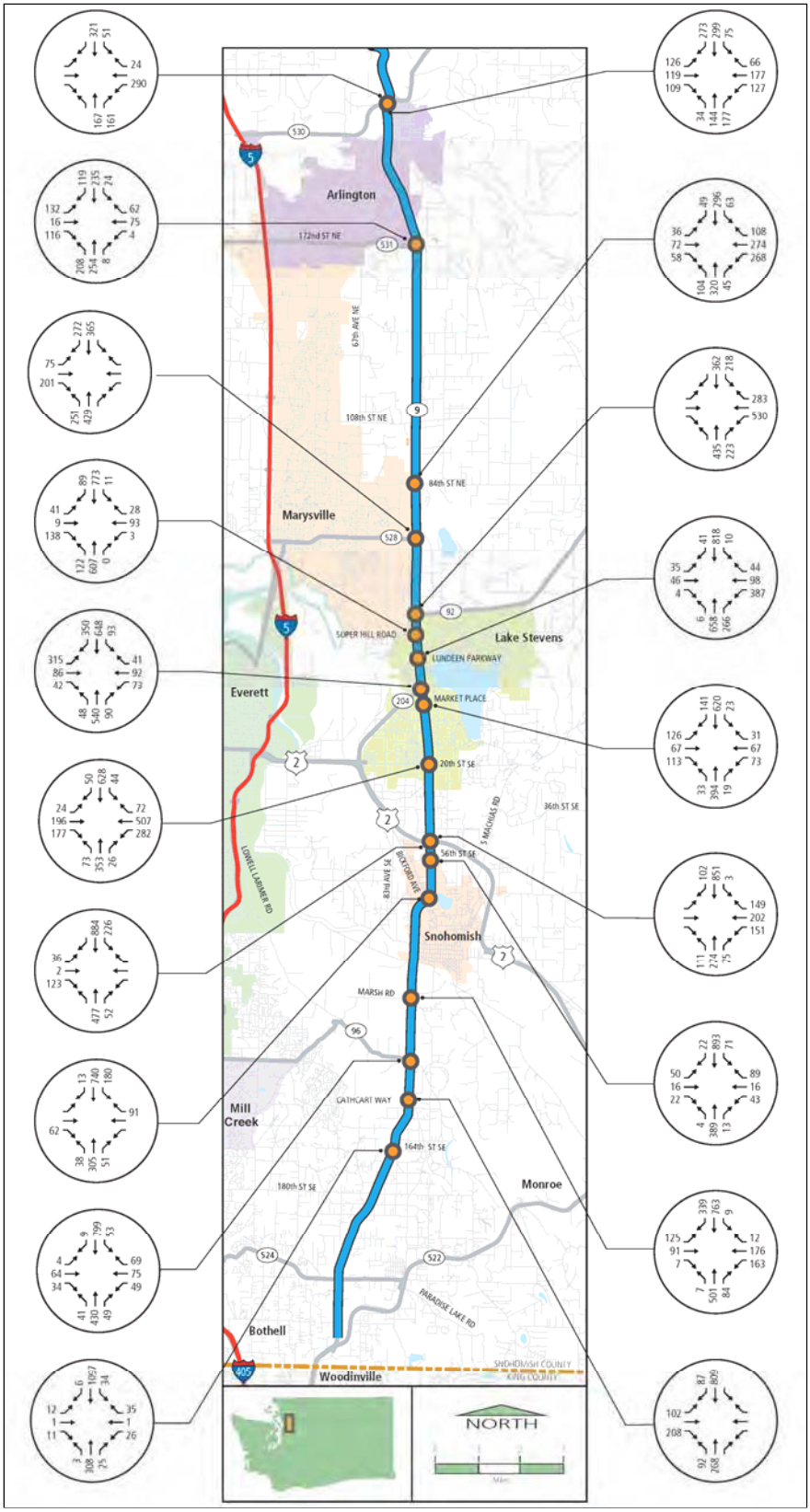
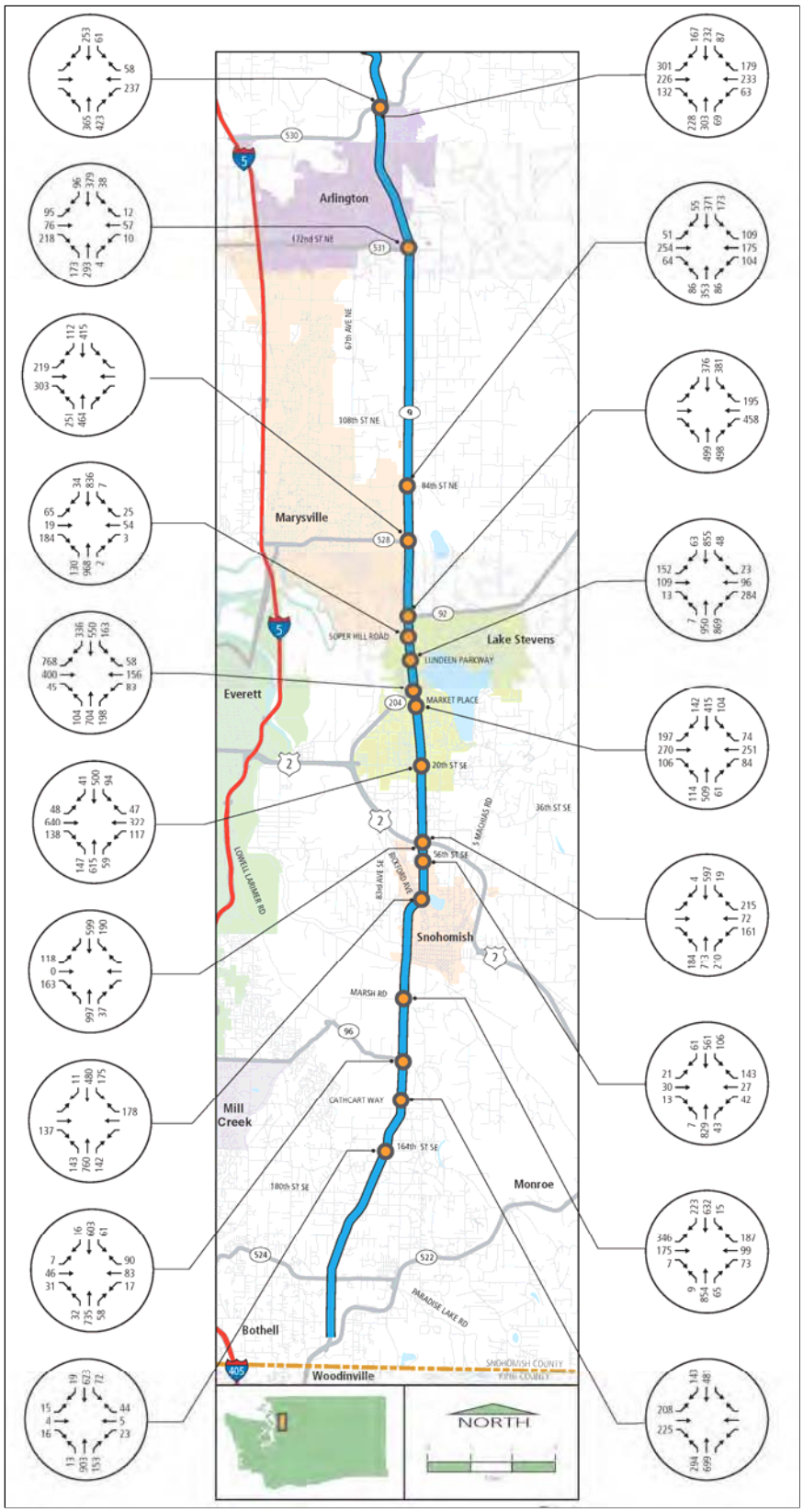


Exhibit 4-7: PM Peak Hour Traffic Volumes



The intersection analysis from the previous assessment of existing conditions shows that vehicle delay (i.e., congestion levels) is typically worse during the PM peak hour than during the AM peak hour. The SR 9 intersections with the most delay include SR 92, 20th Street SE, and 164th Street SE. These intersections operate at level-of-service (LOS) E or F during one or both of the evaluated peak hours. The intersection of SR 9/164th Street SE is currently unsignalized and controlled by stop signs. The other two intersections are near Lake Stevens in the Frontier Village area, the most congested part of the SR 9 study corridor.

What are the environmental constraints of the study area and how were they identified?

The SR 9 CPS study area was reviewed for potential environmental issues or constraints that should be considered when future roadway improvements along the corridor are developed. The environmental constraints review represents an overview of elements to be considered in determining the potential design and placement of improvements within the study corridor.

Geographic Information System (GIS) data provided by WSDOT was the primary source of information used for the review. Supplemental data and information were obtained from online sources, including Snohomish County, the U.S. Fish and Wildlife Service National Wetlands Inventory, the U.S. Census Bureau, the City of Arlington, and aerial photography. A site visit was also performed to verify information contained in the GIS maps. Historic and cultural resources information was obtained from the WSDOT Northwest Regional Office and is discussed in this report. Vegetation and wildlife habitat information is discussed by each study area segment.

Information on public utilities was obtained from the Snohomish County Comprehensive Plan. The maps consulted provided only enough detail to describe the general location of utilities in the study area and do not reflect a thorough identification of all potential utility lines that may be present. All other elements were primarily analyzed with the use of GIS data.

Based on the above data and resources available, a number of elements of the natural and built environment were reviewed for the portion of the corridor that extends 500 feet east and west from the centerline of SR 9. These elements included

Elements of the Natural Environment

Streams and floodplains
Improvements adjacent to streams and water bodies may affect plant and animal runoff and could result in water quality issues associated with roadway runoff and related pollutants.

Wetlands
Encountering and/or altering wetlands may be harmful to plant and animal habitat and the natural filtration of ground and surface water bodies.

Groundwater
The introduction of impervious surfaces can affect groundwater systems including aquifer recharge areas and sole source aquifers, which provide important sources of portable water for local communities.

Steep Slopes and potential liquefaction zones
Steep slopes and liquefiable soils may represent unstable surfaces for roadway improvements.

Vegetation and wildlife habitat
The presence of threatened or endangered plant or animal species should be considered during improvement planning to avoid impacts harmful to their survival.

streams and floodplains, wetlands, groundwater, steep slopes and potential liquefaction zones, vegetation and wildlife habitat, land use, farmland, public facilities, public utilities, environmental justice, cultural and archaeological resources, hazardous materials, and noise. A detailed description of each of these elements can be found in Appendix F.

The environmental constraints analysis is summarized by corridor section below. More detailed information on each corridor section by element is found in Appendix F.

Section 1

The three primary constraints noted in Section 1 were hazardous materials, groundwater, and slopes/soils. Section 1 had the largest number of potential hazardous material sites among the four sections; however, the majority of these sites are not considered a concern because they are sites that treat, store, or handle hazardous materials, but have not had a documented hazardous material release or environmental violation. Much of this section lies within a sole source aquifer area, and new impervious surfaces could affect groundwater. Additionally, liquefaction and critical slope areas were noted from Milepost 0.0 to a point just north of Milepost 1.0. Such geological hazards could represent unstable surfaces for roadway improvements.

Section 2

In Section 2, the main constraints noted were streams, wetlands, and vegetation/wildlife habitat. The roadway crosses several streams and the Snohomish River, as well as the Snohomish River floodplain. Numerous small wetland areas lie along this section of the corridor and could be affected by potential improvements. Three wildlife habitat areas were noted, indicating the potential that plant or animal species may be affected by future improvements in this section

Section 3

The three main constraints noted within Section 3 are wetlands, utilities, and farmland. Several wetland areas are located near SR 9 along this section. Water, sewer, gas, and high voltage lines were identified near the roadway. The majority of soil types along this section were characterized as Prime Farmland.

Elements of the Built Environment

Land use
Considerations include the proximity of the roadway to land zoned for various purposes including commercial residential, agricultural, as well as public open space and protection.

Farmland
The potential loss of prime and unique farmland, or other farmland categories of local or regional importance, could occur as a result of potential corridor improvements.

Public facilities
Encroachment on, or displacement of, government or public buildings or service centers, as a well as recreational areas such as parks and trails, could occur as a result of potential corridor improvements.

Public utilities
The location of water, sewer and high voltage power lines near the roadway is noted.

Environmental Justice
The presence of minority populations and low-income populations is considered because these groups may be disproportionately affected by potential corridor improvements

Cultural and archaeological resources
Potential sites of historic and/or cultural significance in the vicinity of the roadway could be affected by potential corridor improvements.

Hazardous materials
Areas of potential hazardous material concern were evaluated in terms of sites that have had documented releases to the environment and sites that have handled, treated, or stored hazardous materials.

Noise
Sensitive noise receptors may include such uses as residences, churches, schools, libraries, medical facilities, park space and other land uses where a quiet environment is desired.

Section 4

In Section 4, the potential constraints included utilities, hazardous materials, and public facilities. This section contains several water and sewer lines, as well as high voltage electrical lines near the roadway. Several typical potential hazardous materials sites were also observed. Of the four sections, this section has the most public facilities. Several public buildings, a trail, and a park-and-ride lot are located near the roadway.

What are the safety issues in the project area?

The SR 9 corridor experiences varying levels of collision activity for some of the corridor segments and locations within the study area based on the most recent five years of collision reporting (2004 and 2008).

In September 2009, the WSDOT Highway Safety Executive Committee issued new guidelines for analyzing, compiling, and documenting safety data for state routes. These new guidelines are highlighted by two analysis procedures that make use of GIS data to screen locations across the state. Analysis findings would be used to identify locations for potential safety projects.

The first procedure is Collision Analysis Location (CAL). The CAL is a quarter-mile analysis, using the last five years of collision data, and entered into MS Excel to generate results that are then mapped in GIS. Fatal, serious, and evident injury collisions become points for each accumulated route mile (ARM) along a route. These points are compared to adjacent points and, if they are located within one-half mile of each other, it becomes a segment and assigned a segment number with a beginning and ending ARM value. The segments are analyzed to determine the various (fatal, serious, or evident injury) collision totals. If the segment has six or more evident injury collisions and four or more fatal and serious collisions, as well as no planned safety (subprogram I-2) project over the next six years, the segment is retained on the CAL. If not, no additional analysis is performed.

The second procedure is the Collision Analysis Corridor (CAC). The CAC is an analysis, using the latest five-year period of collision data, and MS Excel to generate results that are then mapped in GIS. Fatal and serious collisions become points along a route. Any five-mile segment with a history of 11 or more fatal or serious collisions should be included in the CAC.

Assumptions and Exclusions

- All collisions, barring those occurring on spurs, couplets, and alternate routes, are considered to be mainline collisions.
- All collisions occurring within managed access areas with populations greater than 25,000, turnbacks, and ferry terminals are excluded.
- Property-damage-only and possible-injury collisions are excluded.
- Only collisions occurring on state highways within a five-year period are included.

In order to provide greater consistency and less confusion regarding the likelihood of project recommendations and construction, the following guidance is also given:

- Use the "Potential Safety Projects List" approved by the Highway Safety Executives. The regions will analyze crash frequency, severity, and contributing factors and identify cost-based incremental solutions, low cost to ultimate fix. A benefit cost analysis will be provided for each solution.
- Do not refer to design standards as criteria for identifying safety needs or recommending safety solutions.
- Include only those collision locations that are consistent with current WSDOT methodology.
- Do not propose safety projects that do not meet current WSDOT safety criteria.
- Avoid words that are not clear in meaning or that could be misinterpreted or that may express one's personal opinion.
- Project identification is to be done solely through the priority array and in accordance with RCW 47.05.

For the SR 9 corridor, the most recent safety data assembled (2004–2008) for the CAC and CAL analysis reveal no CAL along the 30-mile segment. However, one CAC was identified for a 5-mile section from Milepost 5 (just north of 164th Street SE in unincorporated Snohomish County) to Milepost 10 (just north of 7th Street in the City of Snohomish.)

According to documented safety data, there were 327 collisions along this CAC. None of these collisions resulted in fatalities. Details of the analysis findings show that the predominant collision type was rear end (204 or 62 percent) with speeding

(143 or 44 percent) and following too closely (80 or 24 percent) identified as the leading contributing factors for the 327 collisions.

The data also shows that there were no reported injuries (191 or 58 percent) of the 327 collisions. Of the remaining 136 collisions, 96 collisions reported a possible injury and 37 collisions reported evidence of or a serious injury. It should be noted that these figures are derived from local and state police reports.

How Safety Issues Are Being Addressed

The identified CAC is being addressed through both the recommendations of this CPS plus recent improvements that were completed in December 2009 as part of the Nickel and TPA packages. The Nickel and TPA are two gas-tax-funded programs approved by the legislature in 2003 and 2005 that have dedicated dollars to specific road improvements.

The Nickel and TPA project consists of safety, congestion, and environmental improvements from 176th Street to Marsh Road (Milepost 7 to Milepost 8.42). Improvements include

- Widening from two to four lanes
- New guardrail from SR 96 to Marsh Road
- New intersection improvements at SR 9/Marsh Road
- New intersection configuration at the Marsh/Airport Way/Springhetti intersection
- New traffic signal at 164th Street SE
- New turn lanes at four major intersections to help reduce collisions
- New interconnected traffic signals to enhance vehicle progression and reduce backups
- Seven new roadway cameras from 164th Street to just north of Marsh Road to provide drivers with up-to-date, visual real-time traffic status
- Drainage projects, such as new and upgraded culverts and ditches, to help mitigate erosion during storms
- Storm water treatment ponds constructed as needed to treat runoff

A total of $53.4 million in project funding has been allocated for these improvements with financing through

- 2003 gas tax (Nickel Package)—$5.3 million
- 2005 gas tax (TPA)—$45.7 million
- Existing state funds—$2.4 million

- Total funding from all sources—$53.4 million

Additionally, this CPS is proposing recommendations that will also address this CAC. Chapter 6 details the recommendations and background analysis behind the development of the recommendations and the estimated planning cost of each recommendation. All the proposed recommendations were subject to a rigorous screening process plus a benefit/cost analysis.

The screening criteria elements were based on the project goals and objectives and consisted of five categories—Safety, Mobility and Accessibility, Community Support, Environmental, and Constructability. Four of the key screening criteria were further split into subcategories, resulting in 17 screening criteria elements (see Chapter 6 for further discussion.)

The recommendations were "packaged" or broken down into projects that would build upon each other. The segment of the identified CAC between 164th Street SE and SR 96 would be addressed in Package 3, which includes widening SR 9 from three lanes to five lanes.

The segment of the CAC between Marsh Road and the Snohomish River Bridge would be addressed in Package 4 which calls for the following at Marsh Road:

- Add third northbound and southbound through lane
- Widen the eastbound approach for dual left-turn lanes

From Marsh Road to the Snohomish River Bridge, Package 4 calls for widening SR 9 from two lanes to four lanes plus replacing the Snohomish River Bridge, or a parallel span of the existing bridge. Either option would result in four lanes across the Snohomish River.

From the north terminus of the Snohomish River Bridge to the end of the identified CAC, Package 5 calls for widening SR 9 from two to four lanes.

As part of a federal safety stewardship agreement, the WSDOT Safety Executives identified the analysis tools and the minimum acceptable performance levels required to obtain the Target Zero goals on state highways to reduce fatalities and serious injury accidents to zero in the State of Washington by 2030. For more information on Target Zero, please see http://targetzero.com/

WSDOT receives a federal safety apportionment on an annual basis for addressing statewide safety needs. These safety funds will be used to address the safety needs identified from the Collision Analysis Locations (CAL), Collision Analysis Corridors (CAC), and Intersection Analysis Location List (IALL), as part of federal safety stewardship agreement.

Several locations on the SR 9 corridor fall below the Highway System Plan (HSP) performance criteria. In order to sustain mobility and continue reducing safety risks on SR 9, more highway improvements will be required than those already discussed in this corridor plan.

Most of the identified current needs in transportation improvements along SR 9 are already addressed, or will be addressed in the six-year Capital Improvement and Preservation Program (CIPP). However, some locations still need immediate improvements. In order to identify low-cost, high-return safety and mobility improvement locations, additional analyses were performed along the corridor.

First, a safety analysis compared the intersections from the SR 9 study to the IALL. This is a list of prioritized safety improvement needs that ranks intersections by a statewide, average societal cost per each target intersection, depending on the type of collision. These costs are generated from fatal, serious, and evident injury collisions for the last five years. Please see more detail at: http://wwwi.wsdot.wa.gov/NR/rdonlyres/5B4AF8D1-E685-4603-B1D7175B4C2E15C6/0/IntersectionAnalysisLocationList8Collisions_20100218.pdf%20%20%20IALL

For the SR 9 corridor, there are eleven intersections on the IALL list. Of these, eight intersections are programmed and funded for either safety or mobility improvements:

- 172ND ST NE (Milepost -MP- 26.05), Mobility project: **Roundabout**
- 84TH ST NE (MP 20.55), Mobility project: **Add lanes**
- 20TH ST SE (MP 14.03), Mobility project: **Add lanes** (completed)
- 32ND ST SE (MP 13.3), Safety project: **Roundabout**
- 108TH ST NE (MP 21.92), Safety project: **Add lanes**
- SOPER HILL RD Intersection (MP 17.05), Mobility project: **Add lanes** (under construction)
- SR 92 Intersection (MP 17.49), Mobility project: **Add lanes and signal**

- MARSH RD (MP 8.42), Mobility project: **Add lanes** (completed)

Secondly, a mobility analysis along the SR 9 corridor was performed. Based on the traffic analysis of the SR 9 corridor study, five intersections were identified. Two intersections were identified as Mobility Need Locations; two were identified as a Safety Need Locations and one was identified as both a Mobility and Safety Needs Location. WSDOT proposes these five locations be improved as soon as funding is available, based on priority.

The recommendations from the SR 9 Study will be used as the starting point in formulating the recommended improvements. While specific recommendations and improvements have not yet been identified they could include either roundabouts or signals. WSDOT will work with the local jurisdictions to determine the best improvements for each intersection.

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

The identified Safety or Mobility Need Location intersections are:

- SR 9/US 2/Bunk Foss Road, MP 12.33. **Safety and Mobility Need location**
- SR 9 and E. Sunnyside School Road (42nd St.) intersection, MP 17.92. **Safety Need location**
- SR 9 and 4th St SE intersection, MP 15.09. **Safety Need location**
- SR 9 and SR 530 Burke Avenue intersection, MP 29.56. **Mobility Need location**
- SR 9/Market Place, MP 15.42. **Mobility Need location**

Chapter 5 – Future Traffic Conditions

Introduction

As discussed in Chapter 2, weekday traffic congestion on SR 9 is typically more pronounced during the PM peak period than during the AM peak period. Peak traffic volumes are higher in the southbound direction for the AM peak hours and higher in the northbound direction for the PM peak hours. Based on field observations, the heavy directional emphasis in traffic volumes typically translates to significant peak direction queuing along the corridor. Key problem areas identified early in the analysis process include the intersections of SR 92, 20th Street SE, and 164th Street SE, which operate at LOS E or F.

This chapter discusses the different model platforms used for generating future year forecasts and traffic operational analysis, the methodology used for conducting intersection level analysis, and a discussion of the analysis results. This chapter also discusses future traffic on SR 9 and how growth has affected traffic on SR 9.

How were traffic volumes forecasts derived?

Year 2030 traffic volume forecasts were generated using the PSRC's travel demand model. Based on discussions and agreement between WSDOT, PSRC, and the consultant team, the PSRC 2030 Financially Feasible (FF) model network (released in March 2007) was used as the foundation for the SR 9 CPS future baseline model network. Though reasonably well-represented in the Snohomish County region, the PSRC's 2030 FF model required some modification to suit the purposes of the CPS. During the process of updating the model, various refinements were identified and agreed upon for incorporation into the PSRC 2030 FF highway and transit networks.

Key improvements to the highway network reflected in the model include the 2003 (Nickel) and 2005 (TPA) state funding packages, as well as the proposed widening of SR 9 between 176th Street SE and SR 92 that was included in the RTID project list. For a detailed list of highway and transit network changes to the 2030 baseline model, refer to the "2030 Baseline Volume Forecast Summary Technical Memorandum" in Appendix D, Traffic Forecasts.

Future Year Forecasts

Once refinements to the travel demand model were completed, it was used to obtain future volume forecasts. Exhibit 5-1 shows the daily forecasts and the traffic growth for certain locations along the SR 9 corridor. The forecasts indicated that between 2005 and 2030 there would be considerable growth in traffic volumes within the SR 9 study area. A supporting screenline analysis that captured the north-south arterials (including SR 9, I-5, and other major arterials between I-5 and SR 9) showed average growth estimates in traffic volume for the AM peak period (6 a.m. to 9 a.m.) of roughly 29 percent in the northbound direction and 33 percent in the southbound direction. However, forecasts for the PM peak period (3 p.m. to 6 p.m.) reflected even higher growth with potential increases of 46 percent and 33 percent in the northbound and southbound directions, respectively.

Exhibit 5-1: 2005 and 2030 Daily Traffic Volumes on SR 9

Daily			
Location	2005 Estimates (Both Directions)	2030 Baseline Estimates (Both Directions)	Growth Factor
North of SR 531	8,840*	15,090	1.71
North of Soper Hill Road	30,940	47,350	1.53
South of US 2	10,050	27,670	2.75
North of SR 96	26,310	54,140	2.06
AM Peak Period			
Location	2005 Estimates (Both Directions)	2030 Baseline Estimates (Both Directions)	Growth Factor
North of SR 531	1,630	2,580	1.58
North of Soper Hill Road	4,960	7,240	1.46
South of US 2	1,520	4,070	2.68
North of SR 96	4,260	8,050	1.89
PM Peak Period			
Location	2005 Estimates (Both Directions)	2030 Baseline Estimates (Both Directions)	Growth Factor
North of SR 531	2,010	3,330	1.66
North of Soper Hill Road	5,550	8,370	1.51
South of US 2	2,140	5,890	2.75
North of SR 96	5,640	10,890	1.93

*indicates number of vehicles

As shown in Exhibit 5-1, traffic volumes are projected to grow substantially within the study limits, particularly south of Lake Stevens. A specific area of projected high-traffic growth along

SR 9 is indicated between Soper Hill Road and SR 96. The growth factors for SR 9 (both directions combined) vary between 1.46 and 2.68 in the AM peak and 1.51 and 2.75 in the PM peak. The growth factor in traffic jargon (and in the current context) is a factor that determines the growth in traffic volumes from existing conditions to future-year conditions. Future-year traffic is forecasted using the regional travel demand model that takes into account any changes to the socioeconomic and land use data as well as any planned future project development. The highest traffic volume growth along SR 9 projected by the travel demand model is in the northbound direction just south of US 2, where the volumes increase by more than 200 percent. The SR 9 corridor showed potentially high-traffic volume growth in the vicinity of US 2 for all time periods.

The future year volume-to-capacity (V/C) ratio (shown in Exhibit 5-2) on SR 9 exceeded 1.0 (or 100 percent of the roadway's capacity) in the peak hours, especially in the sections south of Soper Hill Road. The maximum congestion during the peaks would likely occur near Soper Hill Road and near SR 96 with V/C ratios of 1.81 (northbound) and 1.16 (southbound), respectively, in the AM peak and a V/C ratio of 1.49 (northbound) and 2.33 (southbound), respectively, in the PM peak. This higher V/C indicates that the corridor is not only experiencing severe congestion during the peak hours but V/C greater than 1.0 indicates that the congestion would spill over outside of the peak hours resulting in peak spreading.

Volume to capacity ratio (V/C) is the ratio of the number of vehicles on a roadway compared to the number of vehicles the roadway was designed to handle.

Vehicle miles traveled (VMT) is a measure that is commonly used to describe vehicle use on a daily or annual basis

Exhibit 5-2: 2030 Volume-to-Capacity Ratios

Location	AM Peak Hour		PM Peak Hour	
	Northbound	Southbound	Northbound	Southbound
North of SR 531	0.47	0.39	0.44	0.67
North of Soper Hill Road	1.52	1.16	1.49	1.61
South of US 2	1.09	0.42	0.74	1.43
North of SR 96	1.81	0.87	1.30	2.33

Vehicle miles traveled (VMT) and vehicle hours traveled (VHT) for SR 9 (from SR 531 to SR 522) are summarized in Exhibit 5-3. The model project's VMT on SR 9 will significantly increase by 2030, showing growth of 89 percent, 98 percent, and 101 percent in the AM peak, PM peak, and daily, respectively. There is also a substantial growth in VHT on SR 9, which is more pronounced in the PM peak (143 percent) compared to the AM peak (95 percent). This

Vehicle hours of travel (VHT) is the total vehicle hours expended traveling on the roadway network in a specified area during a specific time period

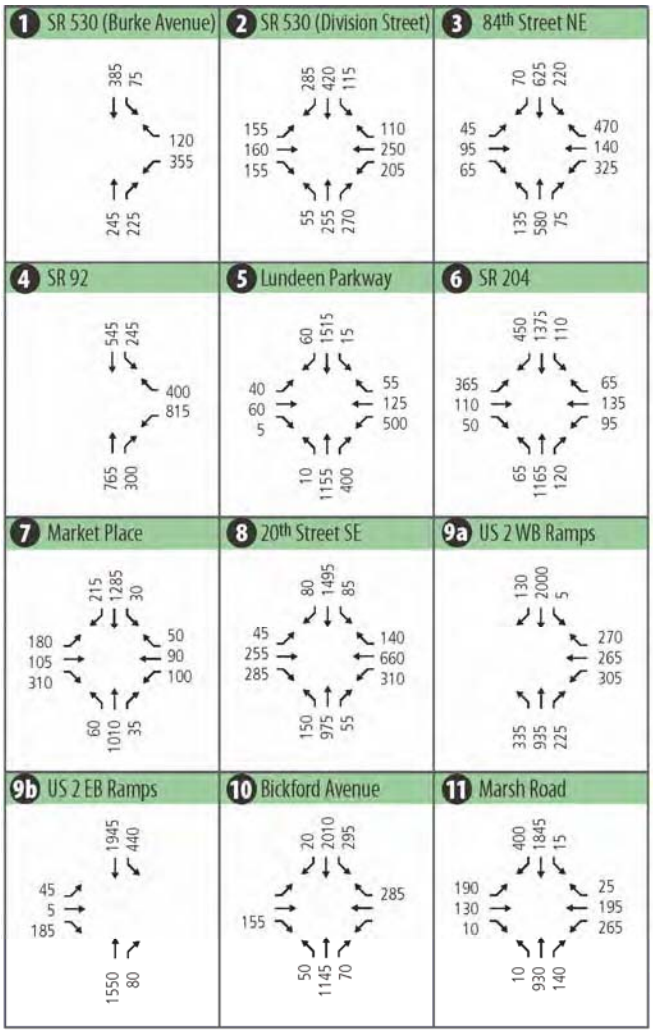
growth in VHT makes sense since it is a reflection of more vehicles (i.e., congestion) on the roadway and, therefore, a trip taking longer to complete.

Exhibit 5-3: Vehicle Miles Traveled and Vehicle Hours Traveled

Vehicle Miles of Travel	SR 9 (from SR 522 to SR 530)		
	2005	2030 Baseline	Growth
AM Peak	89,800	169,900	1.89
PM Peak	113,800	225,800	1.98
Daily	558,500	1,125,000	2.01
Vehicle Hours of Travel	SR 9 (from SR 522 to SR 530)		
	2005	2030 Baseline	Growth
AM Peak	2,100	4,100	1.95
PM Peak	3,000	7,300	2.43
Daily	13,100	28,300	2.16

Upon completion of the future-year 2030 baseline forecasts, the link level growth estimates were used to develop peak-hour traffic volumes in conjunction with actual traffic count volumes using a simplified post-processing procedure. This post-processing method involved compiling link level growth (at the intersection approach level) and applying this growth to existing traffic-turning movement counts. Further adjustments were made to these post-processed volumes to balance the upstream and downstream traffic flows and ensure conservation of volumes for each highway segment. Ultimately, the process produced intersection-level turning-movement volumes that were used as input items for the analysis of intersection congestion and LOS. The post-processed 2030 intersection volumes for the AM and PM peak hours are shown in Exhibit 5-4 and Exhibit 5-5.

Exhibit 5-4: 2030 AM Peak-Hour Volumes



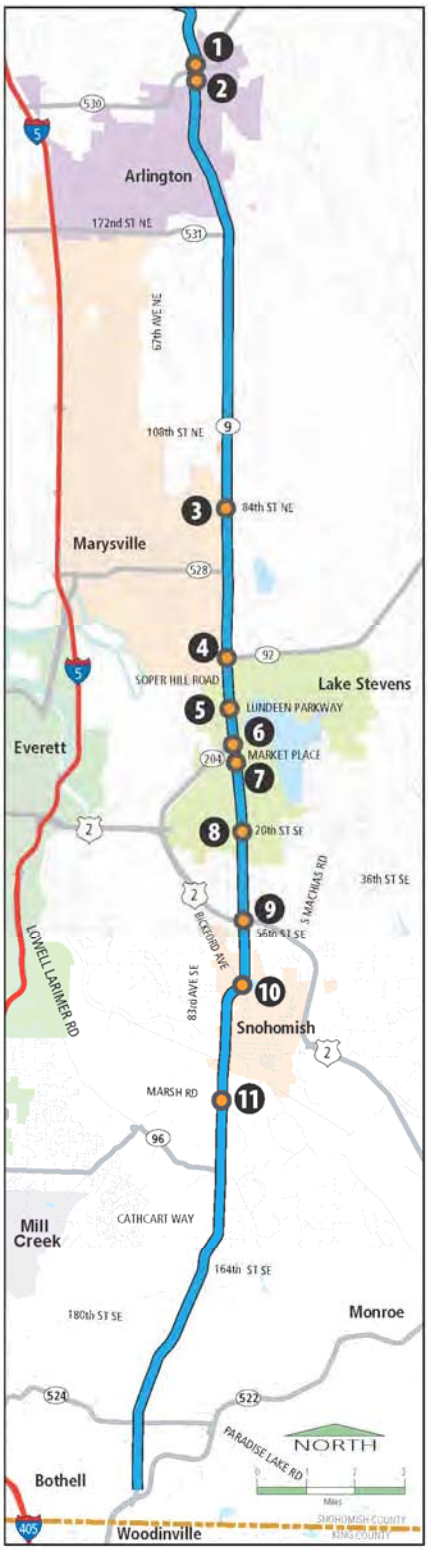
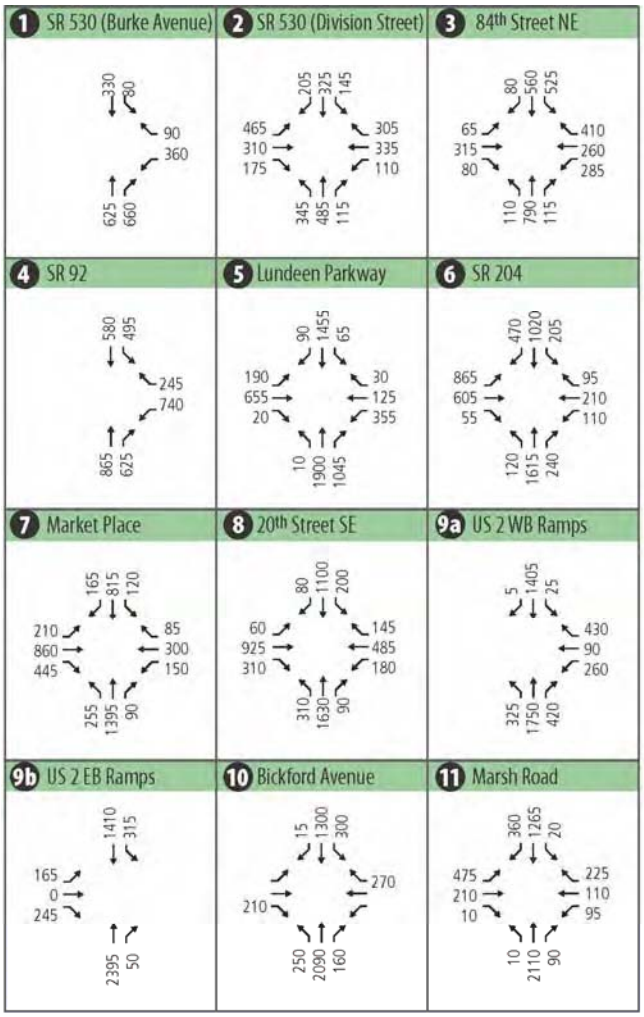


Exhibit 5-5: 2030 PM Peak-Hour Volumes



Intersection-level Analysis and Traffic Growth Impacts on SR 9

Following the development of future-year 2030 intersection turning movement volumes, a detailed analysis of vehicle delay and LOS was conducted for the 11 study intersections. The analysis of roadway and intersection operational performance was performed through the use of Synchro traffic analysis software (Trafficware, Inc.). Use of Synchro was consistent with the previous intersection analysis conducted for the existing conditions inventory. Key inputs used for the Synchro analysis relate primarily to traffic data items such as traffic volumes, number of lanes, lane widths, turn-lane storage, signal timing data, pedestrian and bicycle volumes, and bus and heavy vehicle traffic levels.

Level-of-service (LOS) is a measure that characterizes operating conditions as perceived by a driver on a highway, street, or other transportation facility. While qualitative in nature, LOS is used to describe operational conditions using quantitative measures such as speed, travel time, and driver perceptions of comfort and freedom to maneuver in a traffic stream. A range of six LOS designations, ranging from "A" to "F" are defined in the *Highway Capacity Manual*.

Exhibit 5-6 shows the LOS definitions for signalized and unsignalized intersections, following the Transportation Research Board's *2000 Highway Capacity Manual* methodology.

LOS A represents ideal, uncongested operating conditions

LOS B, LOS C, and LOS D designate intermediate operating conditions

LOS E indicates that operating conditions are at or near the roadway's capacity level

LOS F designates extremely congested, breakdown conditions

Exhibit 5-6: Intersection Level-of-Service

Level-of-Service (LOS)	Signalized Intersections (seconds of delay)	Unsignalized Intersections (seconds of delay)
A	<10	0-10
B	>10-20	>10-15
C	>20-35	>15-25
D	>35-55	>25-35
E	>55-80	>35-50
F	>80	>50

Source: 2000 Highway Capacity Manual, Chapters 15 and 16.

The 2030 baseline intersection LOS results are shown in Exhibit 5-7. The existing conditions (2006) LOS results have also been reported for comparison purposes. Even after the currently funded improvements along SR 9 are completed, the model indicates there would be significant delay and congestion along the corridor due to future transportation demand on SR 9 as a result of the projected growth of the communities bordering the route and with no improvements to the roadway beyond what has already been cited previously in this report. As shown in Exhibit 5-7, in the AM peak hour, one of the 11 intersections operates at LOS A, four intersections operate at LOS C, two intersections operate at LOS D, and four intersections fail (i.e., LOS F). In the PM peak hour, one of the

11 intersections operates at LOS D, two intersections operate at LOS E, and nine intersections operate at failure conditions (i.e., LOS F).

Exhibit 5-7: 2030 Baseline Intersection Level-of-Service Summary

Intersection	Mile-post	Signalized?	2006 Existing Conditions				2030 Baseline			
			AM Peak		PM Peak		AM Peak		PM Peak	
			Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
SR 530 (Burke Avenue)	29.57	N	33.1	D	48.8	E	67.4	F	138.3	F
SR 530 (Division Street)	29.46	Y	28.4	C	37.6	D	22.5	C	67.7	E
84th Street NE	20.55	Y	47.4	D	47.9	D	102.2	F	219.7	F
SR 92	17.49	Y	64.4	E	75.3	E	92.7	F	103.6	F
Lundeen Parkway	16.48	Y	23.1	C	35.0	D	23.9	C	62.4	E
SR 204	15.76	Y	24.8	C	37.6	D	33.2	C	91.4	F
Market Place	15.42	Y	28.6	C	51.2	D	50.2	D	259.3	F
20th Street SE	14.03	Y	49.9	D	55.9	E	60.4	E	128.7	F
US 2 Westbound Ramps	12.30	Y	45.2	D	23.6	C	104.5	F	39.5	D
US 2 Eastbound Ramps	12.14	Y	13.8	B	25.6	C	29.3	C	102.6	F
Bickford Avenue	10.96	N	16.2	C	28.1	D	7.0	A	52.6	F
Marsh Road	8.42	Y	26.5	C	54.3	D	35.6	D	95.0	F

The results of the intersection-level analysis show that due to the large increases in traffic volumes expected in the future, the currently proposed improvements along SR 9 may not be sufficient to address future congestion levels and delay at key SR 9 intersections.

Chapter 6 – Proposed Improvement Projects

What are the currently funded investments on SR 9?

The Washington State Legislature has provided over $300 million toward safety and mobility enhancements along the corridor from SR 522 near Woodinville to SR 530 north of Arlington. Funding for these improvements comes primarily through the state's 2003 and 2005 transportation funding packages.

The funded improvements along SR 9 vary from upgrading pavement markings to widening the highway to four lanes in strategic locations. The primary focus of these improvements is to relieve congestion, improve traffic flow, and enhance safety throughout the SR 9 corridor. The planned projects along SR 9 between SR 522 and SR 530 as part of the 2003 and 2005 funding packages are listed below along with their anticipated completion dates.[2] Exhibit 6-1 shows the location of these projects.

Exhibit 6-1: Location of TPA/Nickel Projects along SR 9

SR 522 to SR 524

- Widen SR 9 from two to four lanes with raised center median
- Add right and left-turn lanes at intersections
- Complete project in summer 2008

SR 524 to Clearview

- Widen SR 9 to four lanes
- Add turn lanes at major intersections
- Install a raised median to separate oncoming traffic and reduce sideswipe collisions
- Upgrade guardrails, pavement markings, and shoulders to increase safety
- Begin construction in spring 2011 and finish in fall 2013

Clearview to SR 96 (Lowell-Snohomish River Road)

- Widen SR 9 to four lanes from SR 96 to Marsh Road
- Add turn lanes at four major intersections
- Install a new traffic signal at 164th Street SE

[2] Source: WSDOT SR 9 Corridor Program at http://www.wsdot.wa.gov/projects/sr9.

- Interconnect traffic signals and install seven new traffic cameras
- Began construction in spring 2008 and finished in spring 2010

S. Lake Stevens Road to 20th Street SE

- Snohomish County Public Works will widen SR 9 from 20th Street SE to S. Lake Stevens Road in this segment
- Provide through lanes and turn lanes
- Upgrade street lights and traffic signals
- Started construction in summer 2008 and finished in spring 2010

Lundeen Parkway to SR 92

- Widen SR 9 to four lanes in this segment
- Add new turn lanes at two major intersections
- Upgrade traffic signals at three major intersections
- Improve lighting
- Begin construction in spring 2010 and finished in fall 2012

SR 528 (64th Street NE)

- Add a new lane for through traffic traveling on 64th Street NE
- Restripe to provide through, left-turn, and right-turn lanes for all traffic
- Improve lighting and traffic signals
- Begin construction in spring 2011 and finish in fall 2012

84th Street NE

- Construct new turn lanes
- Upgrade street lighting and traffic signals
- Begin construction in spring 2011 and finish in fall 2012

108th Street NE

- Add left- and right-turn lanes at the Lauck Road intersection
- Install updated signs and lighting
- Completed project in winter 2007

SR 531 (172nd Street NE)

- Add through lanes and turn lanes at the SR 531 (172nd Street NE) intersection to improve traffic flow and safety
- Begin construction in spring 2011 and finish in fall 2012

Additional projects completed by WSDOT along the SR 9 corridor within the study area include the following:

- SR 9—56th Street SE to 60th Street NE Paving and Safety—Completed June 2006
- SR 9—Lake Stevens weigh station—Completed November 2005
- SR 9—SR 528 Intersection—Completed October 2004
- SR 9—US 2 interchange modifications—Completed January 2006

A folio of current SR 9 projects funded under the TPA and Nickel packages is provided in Appendix B, SR 9 TPA and Nickel Package Folio.

What long-term improvement options were originally considered?

The initial 10 study intersections considered for the SR 9 CPS included 4 intersections from SR 92 to SR 530 and 6 intersections south of SR 92 to SR 522. These intersections were selected based on the key criteria (i.e., collision history, intersection delay, and accessibility) as identified in the CWG adopted Vision and Goals (US 2 intersections were added later in the study). The project team came up with a number of improvement options for each of the 10 intersections.

These improvement options were presented at the second CWG Meeting comprised of a two-day design workshop or charette. The purpose of the design charette was to provide an opportunity for the CWG members to share their local knowledge of the study corridor to help develop and refine the improvement options that will be included in the SR 9 CPS. The list of initial improvement options for each intersection that were presented at the design charette are described in Appendix I, Originally Considered Long-Term Improvement Options.

The original set of options and the traffic analysis summaries associated with these options (see Appendix I) were distributed to the CWG members at the design charette (CWG Meeting

No. 2). The outcome of the design charette was the development and refinement of potential improvement options for each of the intersections based on the findings of the traffic analysis, the established design criteria, and any outstanding environmental issues associated with those options. The preliminary set of options carried forward was heavily influenced by input received from CWG members at the design charette. Additionally, as a result of follow-up discussions with the CWG, the intersections of SR 9 at the US 2 ramps (two adjacent ramp intersections) were added to the list of 10 intersections to be evaluated in the CPS.

Which improvement options were carried forward into the screening process?

The revised list of improvement options that went forward to be screened are described below, followed by the environmental and traffic assessment for these options.

- **SR 530 (Burke Avenue)**
  - Option 1—Conventional traffic signal and synchronize with signal at SR 530 (Division Street, just south of Burke Avenue)
  - Option 2—Realign SR 530 west of SR 9 to the north to create a four-leg signalized intersection with SR 9.

- **SR 530 (Division Street)**
  - Option 1—Widen eastbound approach for dual left-turn lanes. This requires two northbound receiving lanes and this would work with signal at Burke Avenue (i.e., improvement Option 1 for Burke Avenue)
  - Option 2—Realign SR 530 to the north to create a four-legged intersection to the north (see Option 2 above for Burke Ave.)

- **84th Street NE**
  - Option 1—Two-lane roundabout with dual-lane entries and exits
  - Option 2—Northbound and southbound additional through lanes (one lane in each direction) tapering back down to single northbound and southbound lanes plus dual left-turn lanes for southbound—would require two southbound receiving lanes

- **SR 92**
  - Option 1—Dual left-turn lanes for westbound direction

- **Lundeen Parkway**
  - Option 1—Widen northbound and southbound to accommodate three lanes each direction—northbound direction would include one exclusive right-turn lane and one shared right turn/through lane to handle heavy right-turn traffic
  - Option 2—Grade separation that reflects four-lane northbound and southbound elevated facility

- **SR 204**
  - Option 1—Widen northbound and southbound to accommodate three lanes in each direction
  - Option 2—Grade separation that reflects four-lane northbound and southbound elevated facility

- **Market Place**
  - Option 1—Widen northbound and southbound to accommodate three lanes in each direction
  - Option 2—Option 1, but with eastbound widening on Market Street to create two through lanes
  - Option 3—grade separation for northbound and southbound through traffic

- **20th Street SE**
  - Option 1—Widen northbound and southbound to accommodate three lanes in each direction, dual westbound-to-southbound left-turn lanes, and eastbound right-turn pocket
  - Option 2—Grade separation with 20th Street NE elevated over SR 9

- **Bickford Avenue**
  - Option 1— Close intersection and redirect Bickford Avenue traffic to new signal at 20th Street
  - Option 2—Interchange facility at Bickford Avenue using ramps to/from overpass

- **Marsh Road**
  - Option 1—Widen northbound and southbound to accommodate three lanes in each direction and dual eastbound-to-northbound left-turn lanes
  - Option 2—Grade separation with SR 9 elevated over Marsh Road
  - Option 3—Eastbound-to-northbound flyover (one-lane structure)

The US 2 ramp interchange was added to the list of study locations following City and County Council briefings and the third CWG meeting. Three improvement options were developed for this intersection as listed below.

- **US 2 Ramp Interchange**
  - Option 1—Widen ramp at the eastbound and westbound ramp intersections. It also includes a roundabout just east of the SR 9 and westbound ramps intersection (northern intersections). This roundabout accommodates traffic to/from New Bunk Foss Road and US 2 westbound ramp traffic (includes westbound US 2 off-ramp traffic to SR 9 and westbound US 2 ramp traffic from northbound SR 9).
  - Option 2—A partial cloverleaf for the southbound SR 9 to eastbound US 2 movement and northbound SR 9 to westbound US 2 movement. It also includes ramp widening at the east and west ramp intersections.
  - Option 3—This hybrid option includes all elements from Option 1 above and a new loop ramp for the southbound-to-eastbound (SR 9 to US 2) movement.

Traffic Analysis

Additional traffic analysis was performed for the revised set of improvement options with the intent of supporting the screening process (described in a later section). The results of this refined analysis are shown in Exhibit 6-2. Based on the reduced delay and resultant LOS improvements summarized below, substantial reduction in intersection delay would be expected with the proposed improvements in place. The intersections that were originally shown as failing (defined by LOS F) in the 2030 Baseline are mitigated to various degrees based on the different intersection options analyzed.

Exhibit 6-2: 2030 Intersection Level-of-Service Results for Revised Set of Improvement Options

Intersection	Improvement Options	AM Peak		PM Peak	
		Delay	LOS	Delay	LOS
SR 530 (Burke Avenue)	*Baseline*	*67.4*	*F*	*138.3*	*F*
	Option 1—New traffic signal and improvements	22.6	C	22.8	C
	Option 2—Realignment of SR 530	22.1	C	28.6	C
SR 530 (Division Street)	*Baseline*	22.5	C	67.7	E
	Option 1—Eastbound and northbound intersection improvements	21.2	C	39.5	D
	Option 2—Signal modification	23.7	C	38.2	D
84th Street NE	*Baseline*	*102.2*	*F*	*219.7*	*F*
	Option 1—Roundabout	68.5	E	201.8	F
	Option 2—At-grade intersection improvements	28.7	C	44.3	D
	Option 3—Grade separation	19.0	B	21.9	C
SR 92	*Baseline*	*92.7*	*F*	*103.6*	*F*
	Option 1—Westbound approach improvements	34.4	C	52.0	D
Lundeen Parkway	*Baseline*	*23.9*	*C*	*62.4*	*E*
	Option 1—At-grade intersection improvements	23.4	C	41.3	D
	Option 2—Grade separation	4.1	A	9.9	A
SR 204	*Baseline*	*33.2*	*C*	*91.4*	*F*
	Option 1—At-grade intersection improvements	27.1	C	54.9	D
	Option 2—Grade separation	12.2	B	16.6	B
Market Place	*Baseline*	*50.2*	*D*	*259.3*	*F*
	Option 1—At-grade widening for northbound and southbound	24.1	C	66.7	E
	Option 2—At-grade widening for northbound and southbound, eastbound and westbound improvements	19.2	B	54.4	D
	Option 3—Grade separation	4.9	A	20.5	C
20th Street SE	*Baseline*	*60.1*	*E*	*128.7*	*F*
	Option 1—At-grade intersection improvements	30.9	C	43.6	D
	Option 2—Grade separation	8.7	A	17.4	B
Bickford Avenue	*Baseline*	*7.0*	*A*	*52.6*	*F*
	Option 1—Close Bickford intersection, add a signal at 20th Street	37.5	D	39.3	D
	Option 2—Full interchange at Bickford Avenue	31.4	C*	36.4	D*
Marsh Road	*Baseline*	*35.6*	*D*	*95.0*	*F*
	Option 1—At-grade intersection improvements	22.5	C	25.7	C
	Option 2—Grade separation	6.8	A	6.8	A
	Option 3—Eastbound-to-northbound flyover	31.1	C	26.4	C
SR 9 and US 2 Westbound Ramps (North Intersection)	*Baseline*	*104.5*	*F*	*39.5*	*D*
	Option 1—Modified Option 1**	81.3	F	28.6	C
	Option 2—Partial cloverleaf	22.3	C	14.1	B
	Option 3—Hybrid	23.2	C	16.3	B
SR 9 and US 2 Eastbound Ramps (South Intersection)	*Baseline*	*29.3*	*C*	*102.6*	*F*
	Option 1—Modified Option 1**	15.1	B	40.9	D
	Option 2—Partial Cloverleaf	2.4	A	6.4	A
	Option 3—Hybrid	3.8	A	7.8	A

* Includes Bickford Avenue arterial traffic at SPUI intersection

**Modified Option 1 includes elements from Option 1 (ramp widening) and Option 3 (hybrid). They include the following:

Element 1—The ramp widening is adopted from Option 1 for the westbound-to-northbound movement at the north intersection and eastbound-to-southbound movement at the south intersection

Element 2—The roundabout at New Bunk Foss Road intersection with the westbound off-ramp is adopted from the Hybrid Option

Element 3—Access from northbound SR 9 to westbound US 2 is provided by adding new ramp from roundabout

How were individual projects screened?

Potential improvement options along the study corridor were subjected to a thorough screening process in an effort to quantitatively assess which options would provide the most transportation benefit and least disruption to both the natural and built environments.

Description of Ranking Process

Screening criteria measures were selected based on the previously established project goals and objectives and represented five main categories—Safety, Mobility and Accessibility, Community Support, Environmental, and Constructability. Four of the key screening criteria were further split into subcategories, resulting in 17 screening criteria measures in total. Certain measures were modified or added based on feedback from the CWG. The final list of measures, excluding the community support category measures, is given below.

Collision Reduction

- Collision reduction benefit
- Non-motorized conflicts and crossings

Mobility and Accessibility

- Traffic operations
- Non-motorized movements
- Accommodation of future transit service/elements
- Consistency with State Access Management Plan

Environmental

- Wetlands
- Wildlife/habitat
- Streams/waterways
- Floodplains
- Farmlands
- Visual quality

Constructability

- Construction cost
- Right-of-way acquisition
- Utility relocations
- Residential and/or business displacements

Detailed descriptions of each measure were then developed which defined thresholds for impact variations and definitions for scoring the options. A summary of these descriptions and definitions can be found in Appendix J, Options Screening.

Examples of specific scoring thresholds and definitions for selected criteria measures are provided in the section below.

For the *collision reduction benefit* criteria, a score of 1 was given to an option that showed less than $100,000 in collision reduction benefit (value) annually and a score of 5 was used to characterize an option that showed greater than $750,000 in collision reduction benefit annually. Dollar values for the collision reduction measures were determined based on the WSDOT benefit-cost analysis spreadsheet tool.

For the *traffic operations* criteria in the Mobility and Accessibility category, a score of 1 was given to an option that would result in high levels of congestion, defined by LOS F or peak hour delays greater than 80 seconds per vehicle. A score of 5 was given for options that showed modest congestion, defined by LOS A or LOS B, with peak-hour delays of less than 20 seconds per vehicle.

For the *construction cost* criteria in the Constructability category, a score of 1 was given if the cost of the improvement option was considered significant, defined by values over $50 million. A score of 5 was given if the improvement option cost considered modest or under $5 million. The screening criteria worksheet used to assess the improvement options and the Screening Criteria Scoring Definitions are included in Appendix J.

In addition, the element categories of Collision Reduction, Mobility and Accessibility, Community Support, Environmental, and Constructability were assigned weights to account for their varying importance based on stated CPS goals. Since collision reduction and mobility were identified as primary goals, they were assigned a scoring "weight" of 25 percent each. Community support was weighted at 20 percent to reflect the importance of buy-in from the stake-holders. Environmental and Constructability categories were each assigned a 15-percent weighting level; they were assigned lower weightings since they reflected planning level estimates and qualitative assessments for their respective measures with less tangible supporting data (compared to other categories).

Following the screening process, scores were totaled and the options were ranked. The intent of this process was to determine which option should be pursued for each individual intersection.

What were the results of the screening?

The results of the screening process to determine suitable options for each intersection are described in following pages.

Collision Reduction

As shown in Exhibit 6-3, the improvement options with the least *collision reduction benefit* include Option 2 for SR 530 (Division Street), Option 1 for SR 92, and Option 1 for Bickford Avenue. Under the *non-motorized conflicts and crossings* category, the options that do not provide any reduction to the non-motorized conflicts and that provide no signal crossings are Option 1 for SR 530 (Division Street), Option 1 and 2 for 84th Street NE, SR 92, Option 1 for Lundeen Parkway, Option 1 for SR 204, Options 1 and 2 for Market Place, and Option 1 for 20th Street SE.

Mobility and Access

As summarized in Exhibit 6-4, the improvement options that show comparatively greater peak hour delay (LOS E or LOS F) are Option 1 for 84th Street NE and Option 1 for Market Place. The grade separation options (typically Option 2 or 3) for 84th Street NE, Lundeen Parkway, SR 204, Market Place, 20th Street SE, and Marsh Road would result in lower delays as a result of physically separating the major conflicting traffic streams from one another.

Non-motorized movements were also assumed to be more efficiently accommodated when traffic conflicts are minimized and crossing distances are reduced. As such, the grade separation options achieve this to some degree by reducing vehicular volumes (traffic streams are separated) and minimizing intersection-level conflicts between vehicles and pedestrians/bicyclists. However, it is recognized that in the case of grade separation structures, some interchange designs may limit visibility and promote higher speed, free-flowing vehicular movements at crosswalks. Such designs, while not part of the design concepts for this CPS, could result in a reduction of non-motorized safety.

Exhibit 6-3: Collision Reduction Screening Results

Intersection	Collision Reduction Benefit	Non-Motorized Conflicts and Crossings
SR 530 (Burke Avenue)		
Option 1—New traffic signal and improvements	3	3
Option 2—Realignment of SR 530	3	3
SR 530 (Division Street)		
Option 1—Eastbound and northbound intersection improvements	2	1
Option 2—Signal Modifications	1	2
84th Street NE		
Option 1—Roundabout	4	1
Option 2—At-grade intersection improvements	3	1
Option 3—Grade separation	4	3
SR 92		
Option 1—Westbound approach improvements	1	1
Lundeen Parkway		
Option 1—At-grade intersection improvements	4	1
Option 2—Grade separation	5	3
SR 204		
Option 1—At-grade intersection improvements	2	1
Option 2—Grade Separation	3	3
Market Place		
Option 1—At-grade widening for northbound and southbound	3	1
Option 2—At-grade widening for northbound and southbound, eastbound and westbound improvements	3	1
Option 3—Grade separation	3	4
20th Street SE		
Option 1—At-grade intersection improvements	3	1
Option 2—Grade separation	4	4
Bickford Avenue		
Option 1—Close Bickford intersection, add a signal at 20th Street	1	3
Option 2—Full interchange at Bickford Avenue	2	3
Marsh Road		
Option 1—At-grade intersection improvements	2	2
Option 2—Grade separation	2	3
Option 3—Eastbound-to-northbound flyover	2	4
US 2		
Option 1—Ramp widening	4	4
Option 2—Partial cloverleaf	4	3
Option 3—Hybrid	4	3

Note: scores reflect predefined (1-5) rating scale specific to each criteria measure

Exhibit 6-4: Mobility and Accessibility Screening Results

Intersection	Traffic Operations	Non-Motorized Movements	Accommodates Future Transit Service/Elements	Consistent with State Access Management Plan
SR 530 (Burke Avenue)				
Option 1—New traffic signal and improvements	4	4	3	3
Option 2—Realignment of SR 530	4	4	3	3
SR 530 (Division Street)				
Option 1—Eastbound and northbound intersection improvements	3	3	3	3
Option 2—Signal modifications	3	4	3	3
84th Street NE				
Option 1—Roundabout	1	4	4	3
Option 2—At-grade intersection improvements	3	3	3	3
Option 3—Grade separation	4	5	4	3
SR 92				
Option 1—Westbound approach improvements	3	3	3	3
Lundeen Parkway				
Option 1—At-grade intersection improvements	3	3	4	3
Option 2—Grade separation	5	5	4	3
SR 204				
Option 1—At-grade intersection improvements	3	3	5	3
Option 2—Grade separation	5	5	4	3
Market Place				
Option 1—At-grade widening for northbound and southbound	2	3	4	3
Option 2—At-grade widening for northbound and southbound, eastbound and westbound improvements	3	3	5	3
Option 3—Grade separation	5	5	4	3
20th Street SE				
Option 1—At-grade intersection improvements	3	3	4	3
Option 2—Grade separation	5	5	4	3
Bickford Avenue				
Option 1—Close Bickford intersection, add a signal at 20th Street	3	4	4	3
Option 2—Full interchange at Bickford Avenue	5	5	4	2
Marsh Road				
Option 1—At-grade intersection improvement	4	3	4	3
Option 2—Grade separation	5	5	4	3
Option 3—Eastbound-to-northbound flyover	4	4	4	3
US 2				
Option 1—Ramp widening	4	4	3	3
Option 2—Partial cloverleaf	5	4	3	3
Option 3—Hybrid	5	4	3	3

Note: scores reflect predefined (1-5) rating scale specific to each criteria measure

In terms of transit service and accommodating future transit movements at an intersection, the majority of options were shown to not preclude intersection treatments that could enhance and promote potential transit service on SR 9. Specific treatments discussed at the CWG meetings included the following:

- Transit Priority at intersections (queue-jumps, signal priority, etc.)
- Assurance of speed and reliability along the corridor (HOV treatment)
- Access—the ability for transit to board/disembark passengers without costly entry/exit to surrounding surface streets
- Safe pedestrian/bike access to transit stops and across the corridor (required at stop locations)
- Preservation of transit access at existing facilities, such as Lake Stevens Transit Center
- Ensuring adequate right-of-way for transit movements, such as U-turns when this is the preferred service configuration
- Provide efficient transit access at the existing or reconfigured future park-and-rides as well as safe access to transit for pedestrians

Most scores under this measure were assigned a 3 or 4 for this reason. For the "access" measure, the majority of the options would not add or significantly modify access to/from the SR 9 corridor. These options were assigned a score of 3. However, the Bickford Avenue option (Option 2) that proposes to close the existing intersection movements at SR 9/Bickford Avenue and relocate these movements slightly north to a new signal at 20th Street would not be consistent with the Access Management Master Plan since it violates one access control criterion. This option was assigned a score of 2 as a result.

Community Support

Community support scoring was primarily dictated by the CWG and its representatives as a way to gauge the level of local "buy-in" for a particular option from the perspective of not only elected officials but the community as a whole. As summarized in Exhibit 6-5, the scoring showed neutral to substantial community and agency support for all the options, except for Option 2 for Marsh Road (i.e., the eastbound-to-northbound flyover option) that received moderate opposition by CWG representatives from Snohomish County.

Exhibit 6-5: Community Support Screening Results

Intersection	Community Support
SR 530 (Burke Avenue)	
Option 1—New traffic signal and improvements	5
Option 2—Realignment of SR 530	3
SR 530 (Division Street)	
Option 1—Eastbound and northbound intersection improvements	5
Option 2—Signal modifications	3
84th Street NE	
Option 1—Roundabout	4
Option 2—At-grade intersection improvements	5
Option 3—Grade separation	5
SR 92	
Option 1—Westbound approach improvements	5
Lundeen Parkway	
Option 1—At-grade intersection improvements	5
Option 2—Grade separation	4
SR 204	
Option 1—At-grade intersection improvements	5
Option 2—Grade separation	5
Market Place	
Option 1—At-grade widening for northbound and southbound	3
Option 2—At-grade widening for northbound and southbound, eastbound and westbound improvements	5
Option 3—Grade separation	5
20th Street SE	
Option 1—At-grade intersection improvements	4
Option 2—Grade separation	4
Bickford Avenue	
Option 1—Close Bickford intersection, add a signal at 20th Street	5
Option 2—Full interchange at Bickford Avenue	3
Marsh Road	
Option 1—At-grade intersection improvement	3
Option 2—Grade separation	3
Option 3—Eastbound-to-northbound flyover	2
US 2	
Option 1—Ramp widening	5
Option 2—Partial cloverleaf	2
Option 3—Hybrid	5

Note: scores reflect predefined (1-5) rating scale specific to each criteria measure

Environmental Impacts

Options for each of the intersections were screened for potential environmental impacts to the natural environment. This screening was primarily based on available GIS data and layers provided by Snohomish County.

Potential impacts to the natural environment included those to wetlands, wildlife and habitat, streams and waterways, floodplains, farmlands, and visual quality. Results of the environmental screening are provided in Exhibit 6-6.

Of the 11 study intersections, 9 were identified as locations where improvement options could result in significant impacts to elements of the natural environment. These intersections are discussed below.

84th Street NE

Option 3 would have potentially high impacts to wetlands. Between 0.5 and 1.0 acre of wetlands could be affected. In addition, this option would substantially change existing rural views.

Exhibit 6-6: Environmental Impacts Screening Results

Intersection	Wetlands	Wildlife/ Habitat	Streams/ Waterways	Floodplains	Farmlands	Visual
SR 530 (Burke Avenue)						
Option 1—New traffic signal and improvements	5	5	5	4	3	5
Option 2—Realignment of SR 530	5	5	4	4	3	3
SR 530 (Division Street)						
Option 1—Eastbound and northbound intersection improvements	5	5	5	4	3	4
Option 2—Signal modifications	5	5	5	5	5	5
84th Street NE						
Option 1—Roundabout	4	5	5	5	3	4
Option 2—At-grade intersection improvements	4	5	5	5	3	4
Option 3—Grade separation	2	5	5	5	3	2
SR 92						
Option 1—Westbound approach improvements	1	5	5	5	4	5
Lundeen Parkway						
Option 1—At-grade intersection improvements	3	2	1	5	4	4
Option 2—Grade separation	2	2	1	5	4	3
SR 204						
Option 1—At-grade intersection improvements	3	5	5	5	4	4
Option 2—Grade separation	2	5	5	5	3	2
Market Place						
Option 1—At-grade widening for northbound and southbound	3	4	5	5	4	4
Option 2—At-grade widening for northbound and southbound, eastbound and northbound improvements	3	4	5	5	4	4
Option 3—Grade separation	2	4	5	5	3	2
20th Street SE						
Option 1—At-grade intersection improvements	4	5	2	5	4	4
Option 2—Grade separation	4	5	2	5	4	2
Bickford Avenue						
Option 1—Close Bickford intersection, add a signal at 20th Street	5	5	5	5	3	5
Option 2—Full interchange at Bickford Avenue	4	5	5	5	3	2
Marsh Road						
Option 1—At-grade intersection improvement	5	5	4	1	3	4
Option 2—Grade separation	3	5	4	1	3	2
Option 3—Eastbound-to-northbound flyover	5	5	4	2	3	2
US 2						
Option 1—Ramp widening	4	5	5	5	5	3
Option 2—Partial cloverleaf	2	5	1	5	5	3
Option 3—Hybrid	2	5	1	5	5	3

Note: scores reflect predefined (1-5) rating scale specific to each criteria measure

SR 92

The improvement option for this intersection would have potentially high impacts to wetlands. More than 1.0 acre of wetlands could be affected (Exhibit 6-7).

Lundeen Parkway

Option 2 would have potentially high impacts to wetlands. Between 0.5 and 1.0 acre of wetlands could be affected. Both Options 1 and 2 would potentially have very high impacts to streams and waterways. Improvements associated with both options would encroach within 25 feet of a waterway or require relocation of a waterway with a known fish habitat. Additionally, both options would call for roadway improvements within a priority wildlife or habitat buffer area (Exhibit 6-8).

SR 204

Option 2 would have potentially high impacts to wetlands. Between 0.5 and 1.0 acre of wetlands could be affected. Additionally, the grade separation recommended by this option would alter the existing visual character of the area.

Market Place

Of the three improvement options, Option 2 would have potentially high impacts to wetlands. Between 0.5 and 1.0 acre of wetlands could be affected. The grade separation proposed by this option would also alter the existing visual character of the area.

20th Street SE

Option 2 would alter the existing visual character of the area.

Bickford Avenue

Option 2 would have potentially high impacts to visual quality. The full interchange proposed by this option would substantially change existing rural views.

Marsh Road

All three improvement options would have potential impacts to floodplains. Both Options 1 and 2 are considered to have very high impacts and could affect over 10 acres of floodplains. Option 3 is considered to have a high impact and could affect between 7 and 10 acres of floodplains. In addition, Options 1 and 2 are considered to have high impacts to visual quality and would substantially change existing views (Exhibit 6-9).

Exhibit 6-7: Potential Wetland Impacts for Improvements at SR 92

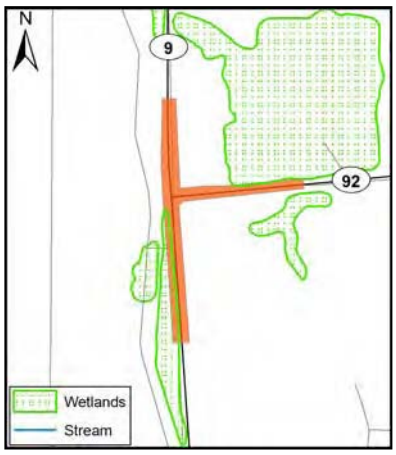
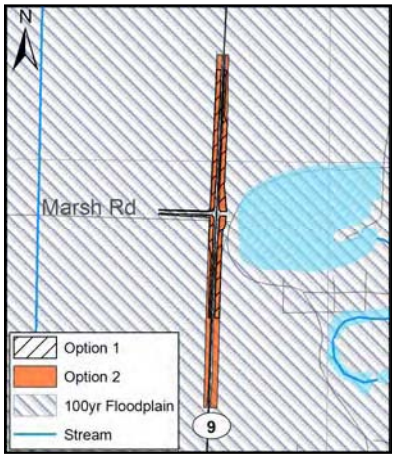


Exhibit 6-8: Potential Wetland and Stream Impacts for Improvements at Lundeen Parkway

Exhibit 6-9: Potential Floodplain Impacts for Improvements at Marsh Road



US 2 Ramps

Options 2 and 3 would have potentially high impacts to wetlands. Between 0.5 and 1.0 acre of wetlands could be affected. Additionally, all three options include improvement elements that could encroach within 25 feet of a stream running under US 2 (Exhibit 6-10).

Exhibit 6-10: Potential Wetland and Stream Impacts for Improvements at US 2

Constructability

Under the *construction cost* category, improvement options that exceed $50 million in estimated construction cost were assigned a score of 1 since such values would be considered to lie at the higher end of the cost-spectrum compared to other options. Improvements that fell into this range of costs include Option 2 for SR 204 and Option 3 for Market Place, which represent the grade-separated options at these locations. Improvements with estimated costs between $25 and $50 million were assigned a score of 2 and included Option 2 for 20th Street SE and Option 2 for Marsh Road. These options also represent grade-separated structures and interchanges but in more residential (less-commercial/retail intensive) areas on the SR 9 corridor.

Remaining options were assigned scores of 3, 4, and 5 based on the cost thresholds established as part of the screening process. At the lower end of the cost spectrum, Option 1 at SR 530 Burke Avenue, which calls for the installation of a new signal and minor channelization upgrades, was assigned a 5 due to an estimates cost of less than $1 million.

In terms of right-of-way acquisition, options that require over $1 million in property “takes” were assigned a 1 to cover cases where properties with various types of land uses could be accounted for. Only two options fell into this range of potential right-of-way needs—Option 2 for SR 204 and Option 3 for Market Place (both reflecting grade-separation improvements). Remaining options fell below the $1-million threshold and were assigned scores of 3, 4, or 5.

Under the *utility relocations* category, the options that have the highest impact, i.e. those potentially requiring extensive transmission pipe/line relocation, include Option 2 for 20th Street SE, Option 2 for Bickford Avenue, and Options 2 and 3 for Marsh Road. Based on site surveys and GIS analysis, utility corridors are located near or at these intersections so proposed intersection improvements that involve roadway widening or new structures would likely result in direct impacts to utilities.

A score of 1 was assigned to these locations and options. For remaining options, a wide range of scores (2 to 5) were assigned due to variations in widening and realignment requirements for each location and the proximity of utility lines to the improvement areas.

The scoring for the *residential and business displacements* category showed that there would be only modest impacts (i.e., up to two residences or businesses would be affected) associated with the various improvement options. A score of 5 was assigned to the majority of the options examined. Exhibit 6-11 summarizes the results for the Constructability category.

Exhibit 6-11: Constructability Screening Results

Intersection	Construction Cost	Right-of-Way Acquisition	Utility Relocations	Residential and/or Business Displacements
SR 530 (Burke Avenue)				
Option 1—New traffic signal and improvements	5	5	5	5
Option 2—Realignment of SR 530	4	4	3	5
SR 530 (Division Street)				
Option 1—Eastbound and northbound intersection improvements	5	5	3	5
Option 2—Signal modifications	5	5	5	5
84th Street NE				
Option 1—Roundabout	5	4	4	5
Option 2—At-grade intersection improvements	5	4	4	5
Option 3—Grade separation	3	3	4	4
SR 92				
Option 1—Westbound approach improvements	5	3	3	5
Lundeen Parkway				
Option 1—At-grade intersection improvements	5	5	3	5
Option 2—Grade separation	3	5	3	5
SR 204				
Option 1—At-grade intersection improvements	5	5	3	5
Option 2—Grade Separation	1	1	2	5
Market Place				
Option 1—At-grade widening for northbound and southbound	5	4	2	5
Option 2—At-grade widening for northbound and southbound, eastbound and westbound improvements	5	4	2	5
Option 3—Grade separation	1	1	2	5
20th Street SE				
Option 1—At-grade intersection improvements	4	4	4	5
Option 2—Grade separation	2	4	1	5
Bickford Avenue				
Option 1—Close Bickford intersection, add a signal at 20th Street	5	5	5	5
Option 2—Full interchange at Bickford Avenue	3	2	1	3
Marsh Road				
Option 1—At-grade intersection improvement	5	4	3	5
Option 2—Grade separation	2	4	1	5
Option 3—Eastbound-to-northbound flyover	3	4	1	5
US 2				
Option 1—Ramp widening	5	5	3	5
Option 2—Partial cloverleaf	4	5	3	5
Option 3—Hybrid	4	5	3	5

Note: scores reflect predefined (1-5) rating scale specific to each criteria measure

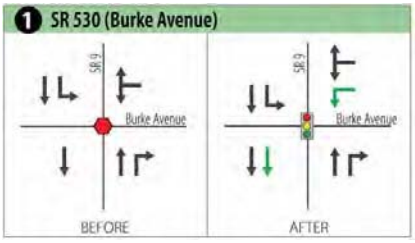
Which long-term options were selected for each intersection?

The options that scored the highest in the screening process were initially considered to be the preferred option for each intersection. However, as discussed in the coordination section, based on several factors, the CWG established a refined vision for the corridor that would reflect only at-grade improvements (versus a mix of at-grade and elevated improvements along the corridor). As such, some options for a particular intersection may have scored higher but were not selected. However, as discussed previously, the performance of the selected at-grade improvements, though perhaps scoring lower overall compared to their grade-separated counterparts, was not appreciably different.

The final selected improvement options for the 11 study intersections and the lane channelization changes for before and after conditions are described below.

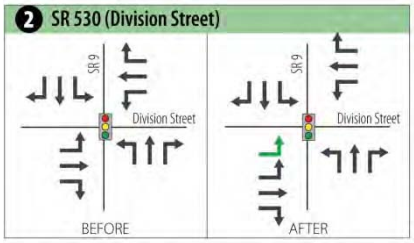
SR 530 (Burke Avenue)

Option 1—Conventional traffic signal; synchronize with signal at Division Street.



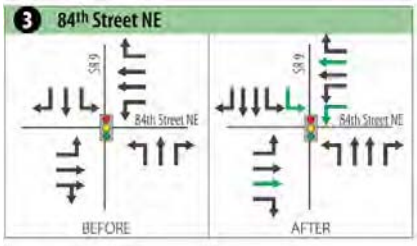
SR 530 (Division Street)

Option 1—Widen eastbound approach for dual left-turn lanes—requires two northbound receiving lanes; match with Burke Avenue Option 1. Also include widening to the south to accommodate an additional southbound receiving lane.



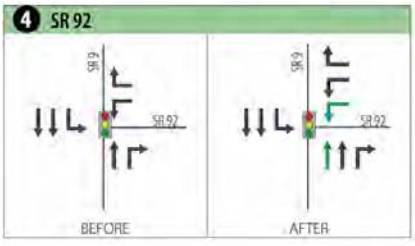
84th Street NE

Option 2—Northbound and southbound additional through lanes (one lane in each direction) tapering back down to single northbound and southbound lanes plus dual left-turn lanes for southbound; requires two southbound receiving lanes.



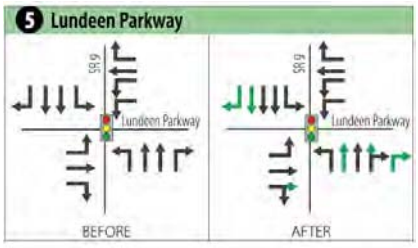
SR 92

Option 1—Widen westbound approach to provide dual left-turn lanes. Carry additional northbound through lane just north of SR 92.



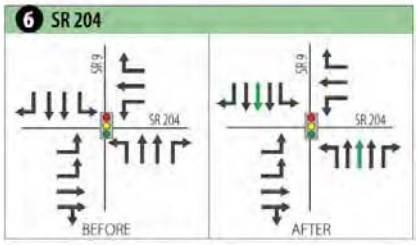
Lundeen Parkway

Option 1—Widen the northbound and southbound approaches to accommodate three lanes in each direction (for northbound, include one exclusive right-lane turn and one shared right-turn/through lane to handle heavy right turns).



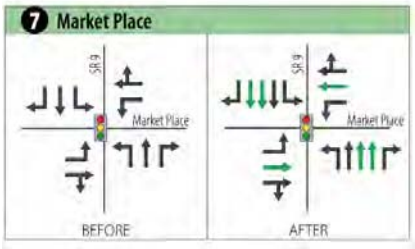
SR 204

Option 1—Widen the northbound and southbound approaches to accommodate three lanes in each direction.



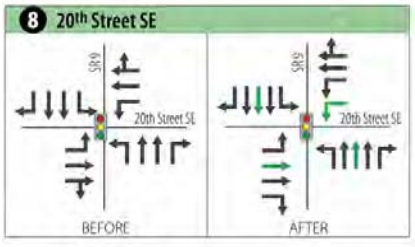
Market Place

Option 1—Widen the northbound and southbound approaches to accommodate three lanes in each direction; add new eastbound and westbound turn lanes.



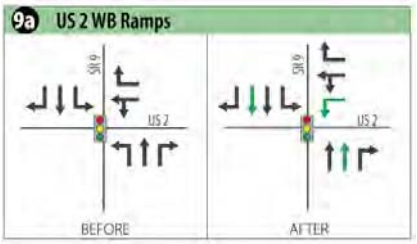
20th Street SE

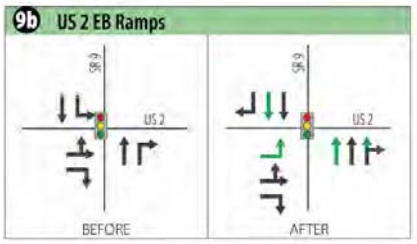
Option 1—Widen the northbound and southbound approaches to accommodate three lanes in each direction, dual westbound-to-southbound left-turn lanes, and eastbound right-turn pocket.



US 2 Ramps

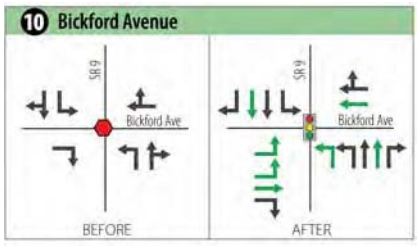
Option 3—Implement hybrid configuration with loop ramp (southbound to eastbound) with new roundabout.





Bickford Avenue

The preferred option would close Avenue D access to/from SR 9 and add a new signal at 20th Street with new roadway connections.



Marsh Road

Option 1—Widen the northbound and southbound approaches to accommodate three lanes in each direction.

Exhibit 6-12 through Exhibit 6-17 on the following pages show the intersection improvements and lane configurations for the entire SR 9 study corridor from south to north.

Were there any near-term improvements identified?

Following the screening process and final development of the long-term improvement options for the 11 study intersections, development of a set of short-term improvements was discussed within the project team and later with the CWG.

The goal was to identify several low-cost investments that could be implemented in the short term providing for some level of congestion relief along the corridor. A supporting goal was to minimize the amount of "throw away" investment such that a short-term improvement would essentially be a first phase of the longer-term strategy.

After further investigation, 3 of the 11 study intersections were determined to be suitable candidates for short-term investments. These locations (ordered from north to south) are as follows:

- SR 530 (Burke Avenue)
- Market Place
- US 2 ramp intersections

Existing interchange configuration at SR 9 and US 2

Year 2015 was chosen as the specific analysis year for the short-term analysis period. Volume forecasts for this horizon year were generated by examining recent traffic growth trends along SR 9. As a result, an annualized traffic volume growth rate of 1.5 percent per year from 2005 to 2015 was utilized north of Marsh Road. South of Marsh Road, a growth rate of 2 percent per year was utilized. A slightly higher growth rate was assigned in this section due to the recent widening of SR 9 north of SR 522 which will likely attract additional traffic to that portion of the SR 9 corridor. Projected 2015 intersection volumes for both the AM and PM peak hour periods are shown on Exhibit 6-18.

Exhibit 6-12: Intersection Improvements and Lane Configurations—Segment 1

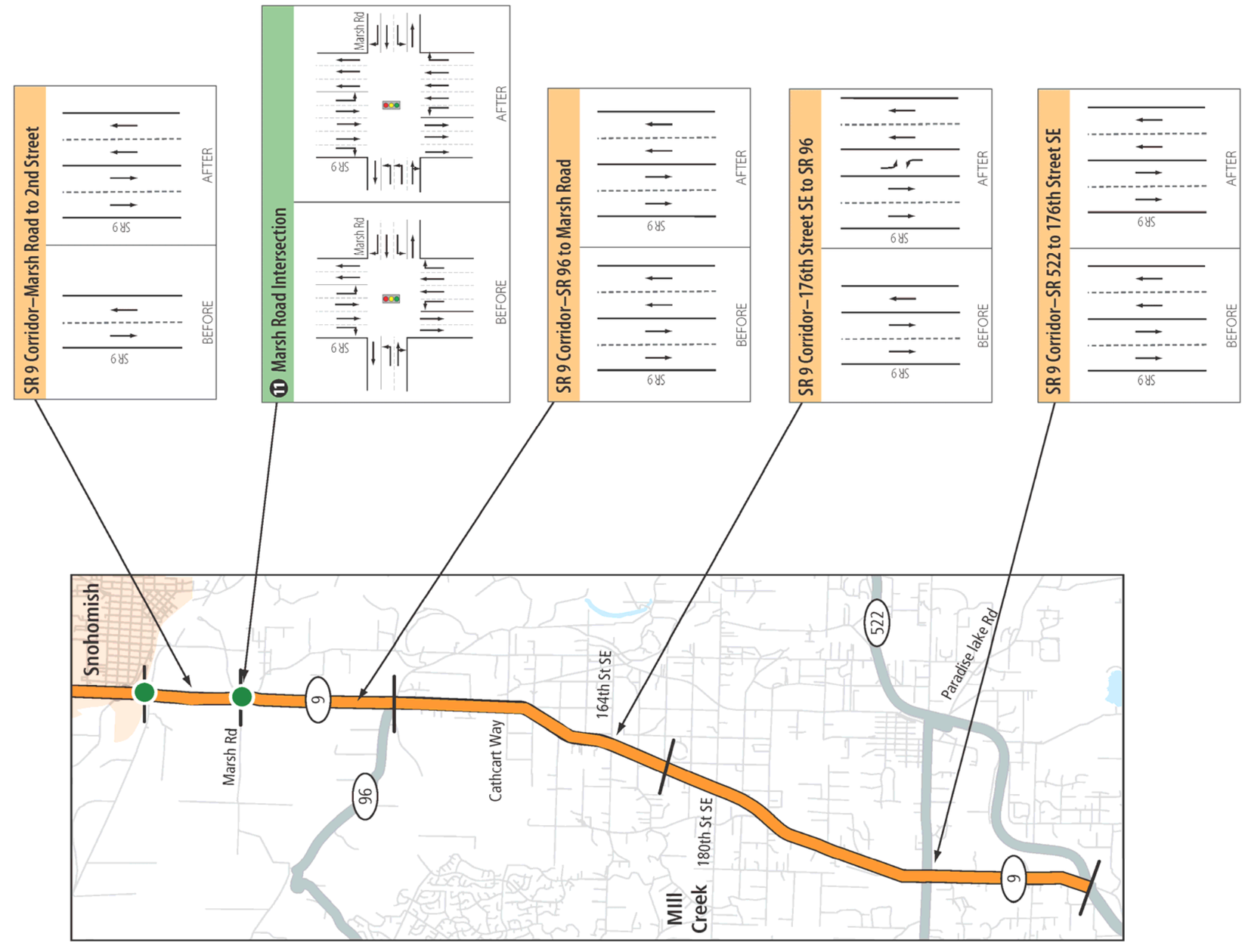


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Exhibit 6-13: Intersection Improvements and Lane Configurations—Segment 2

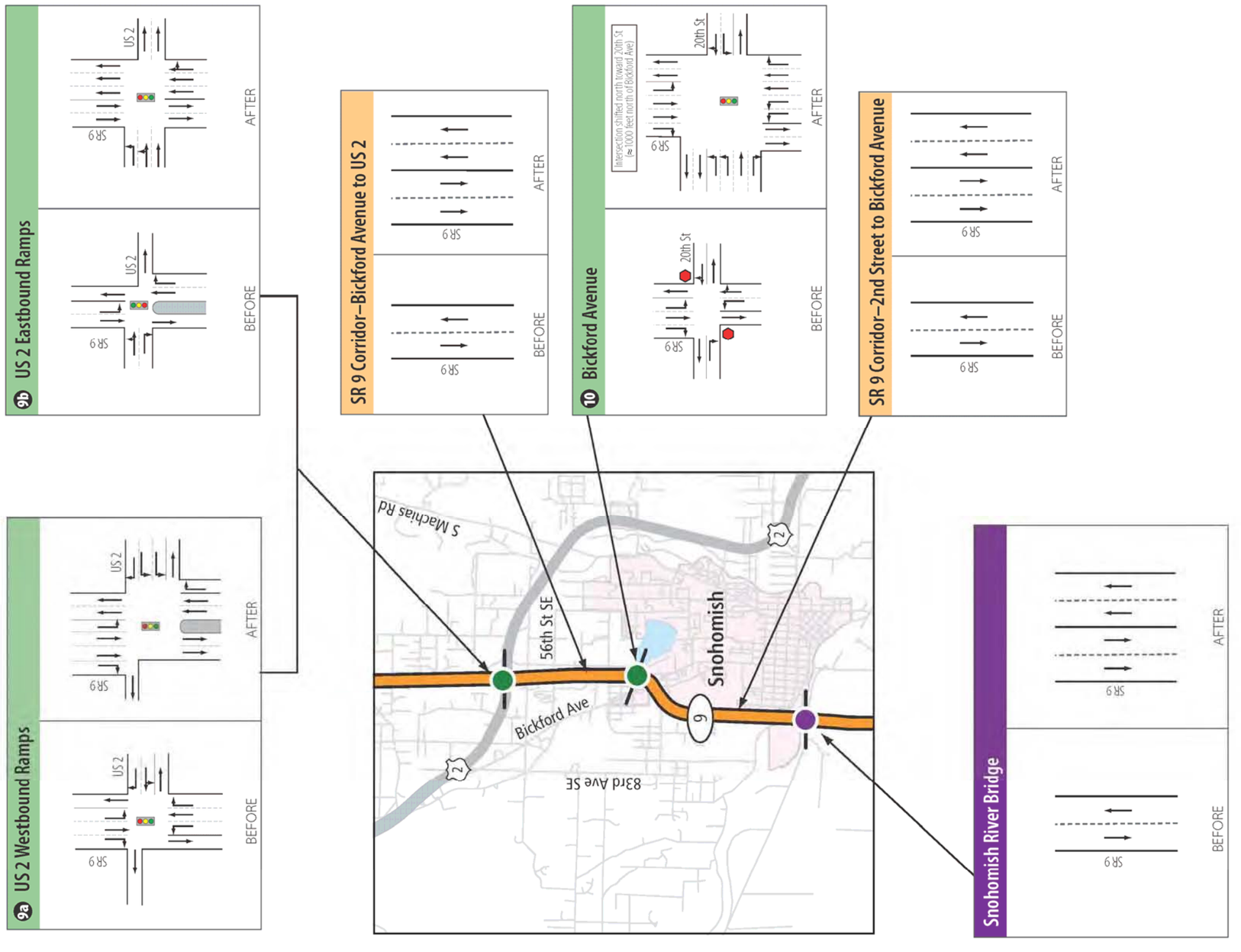

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Exhibit 6-14: Intersection Improvements and Lane Configurations—Segment 3

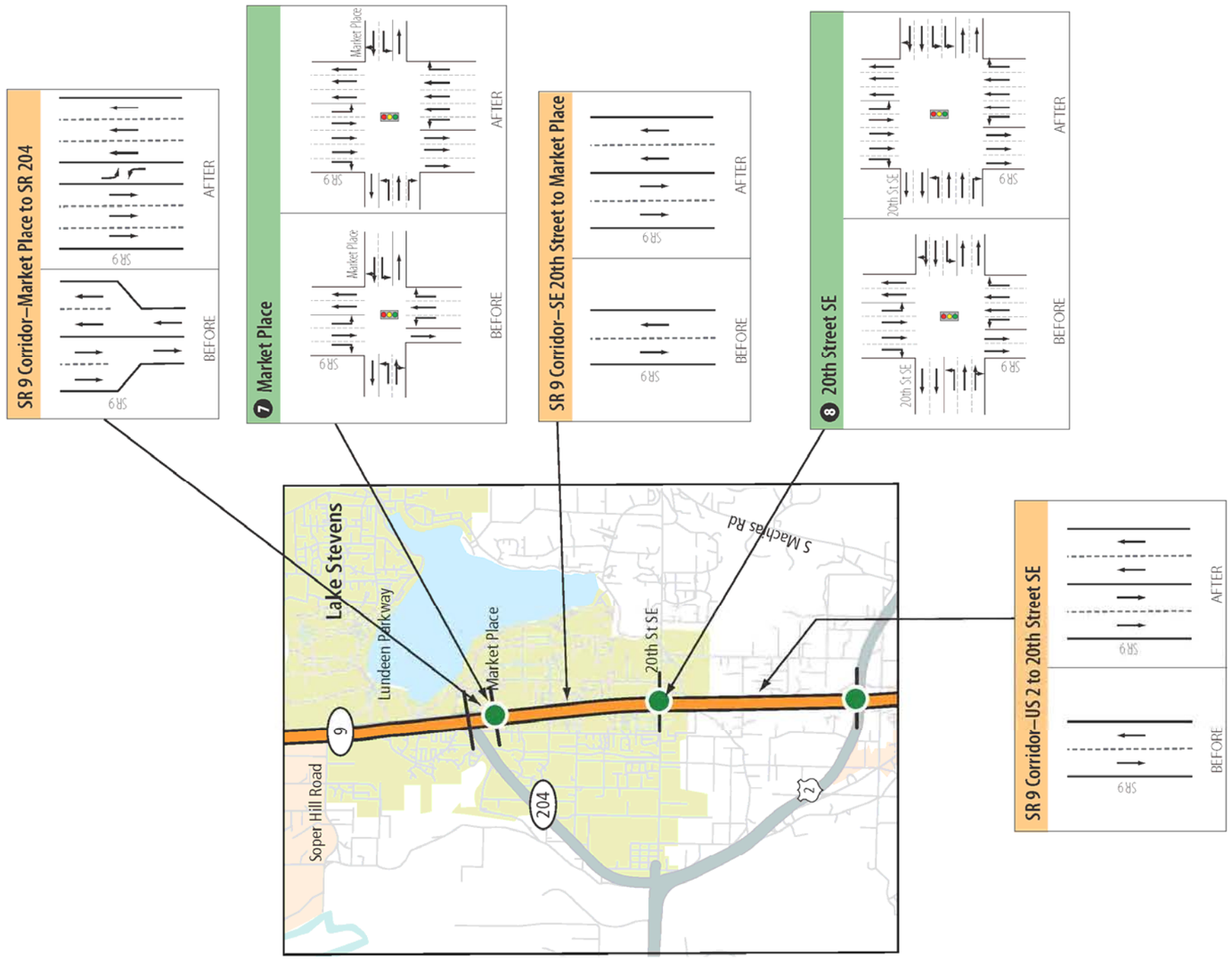

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Exhibit 6-15: Intersection Improvements and Lane Configurations—Segment 4

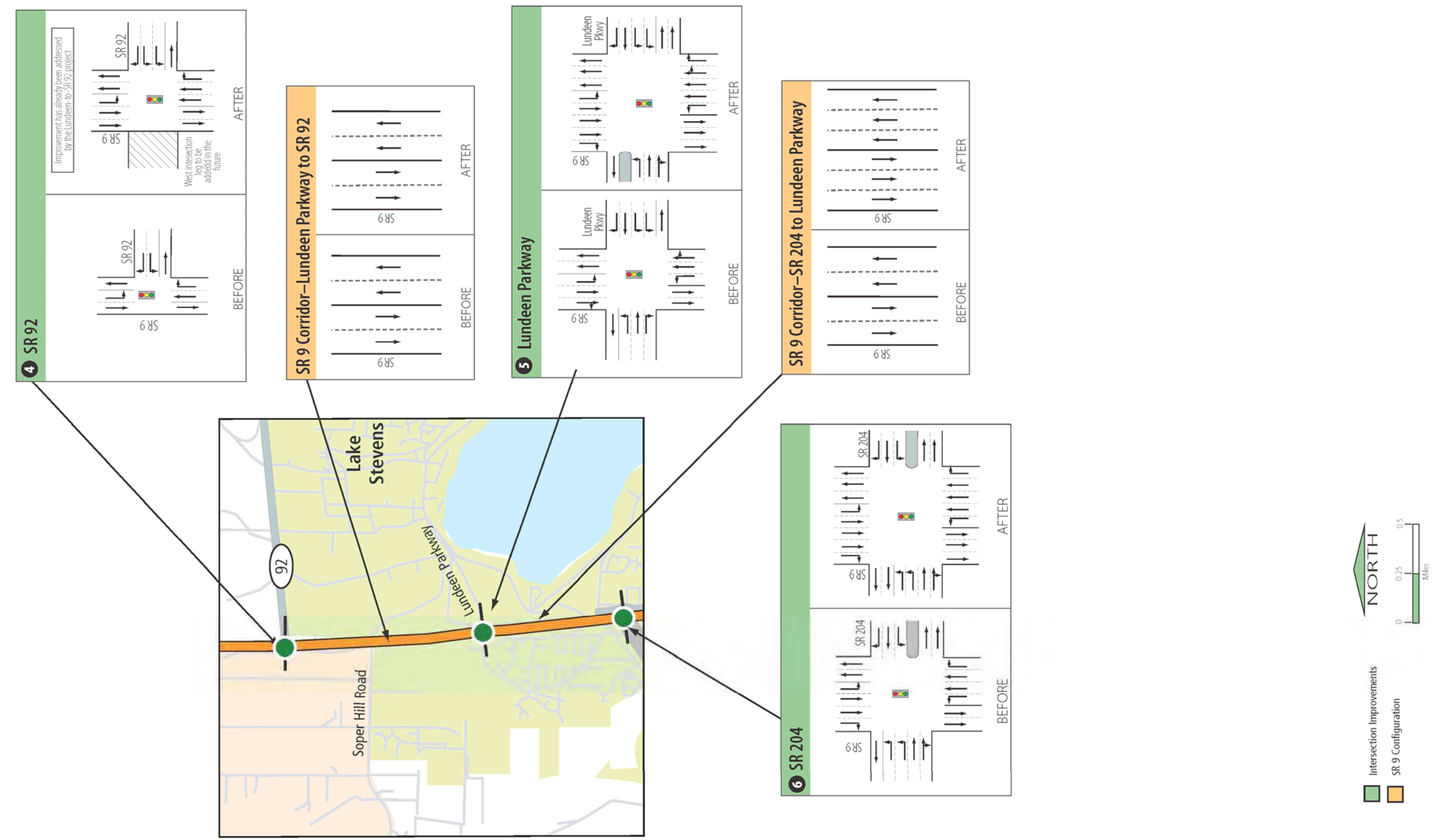

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Exhibit 6-16: Intersection Improvements and Lane Configurations—Segment 5

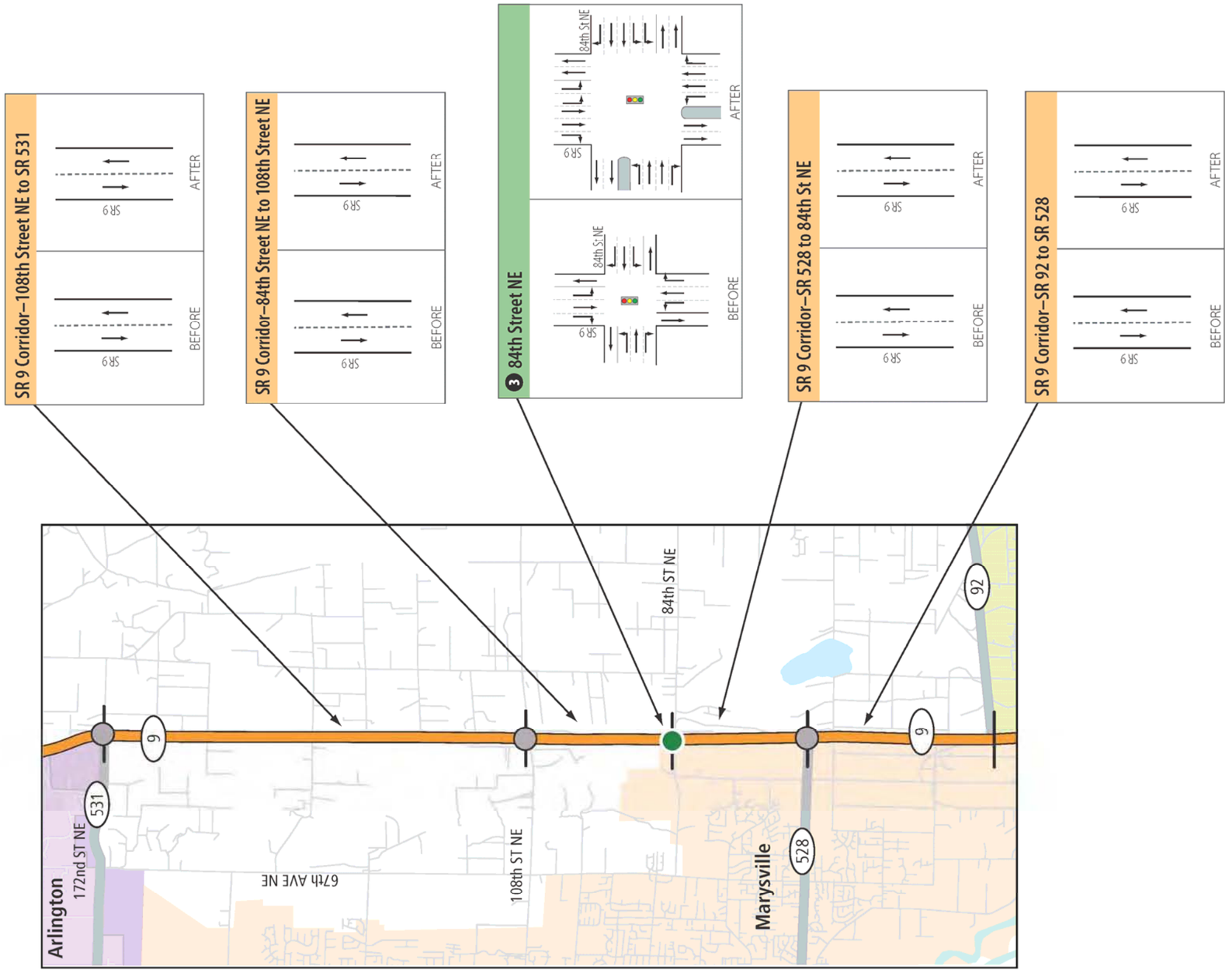

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Exhibit 6-17: Intersection Improvements and Lane Configurations—Segment 6

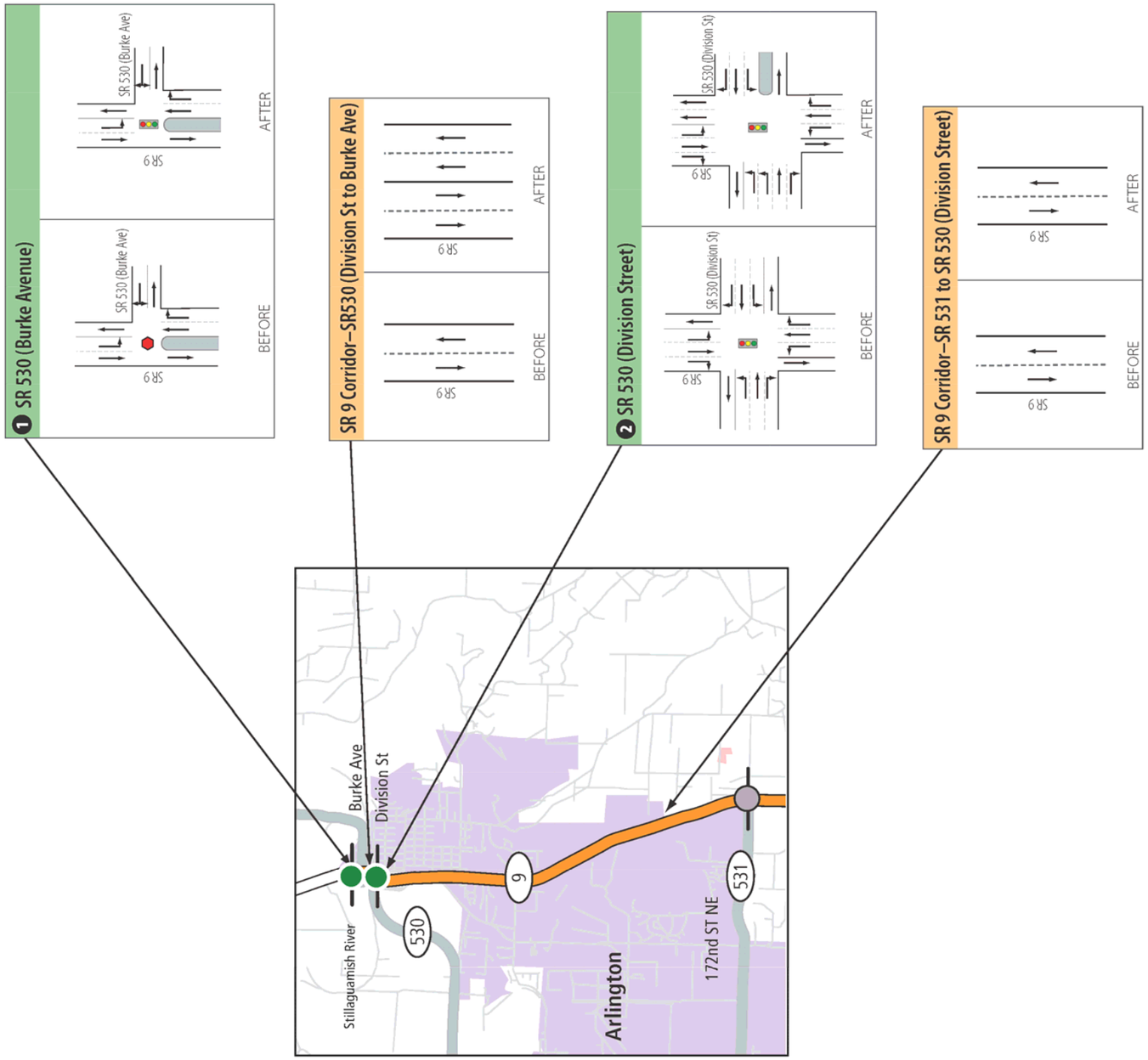

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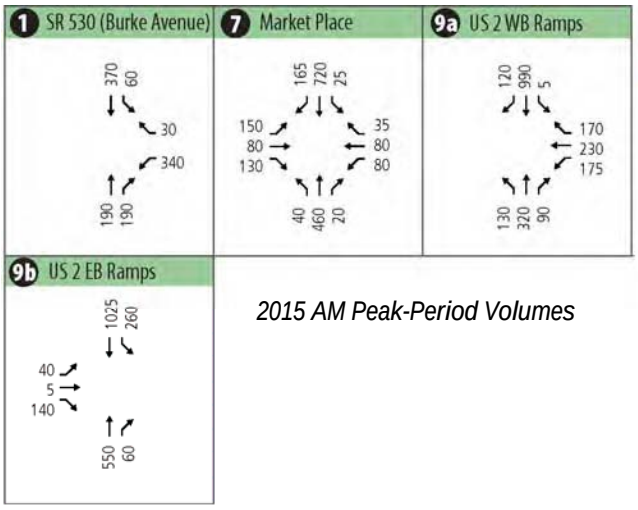
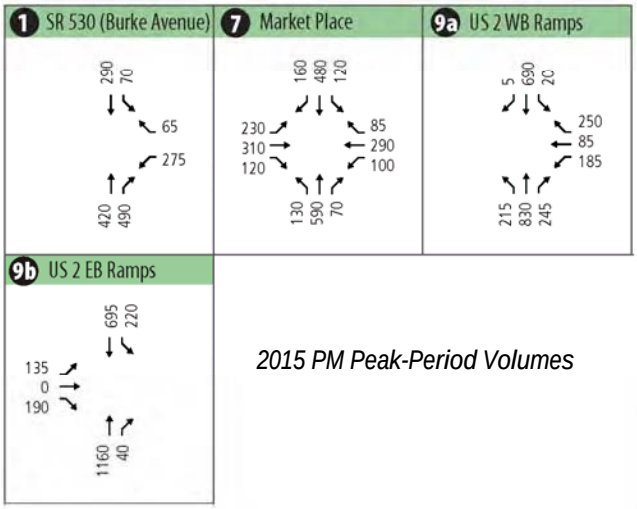
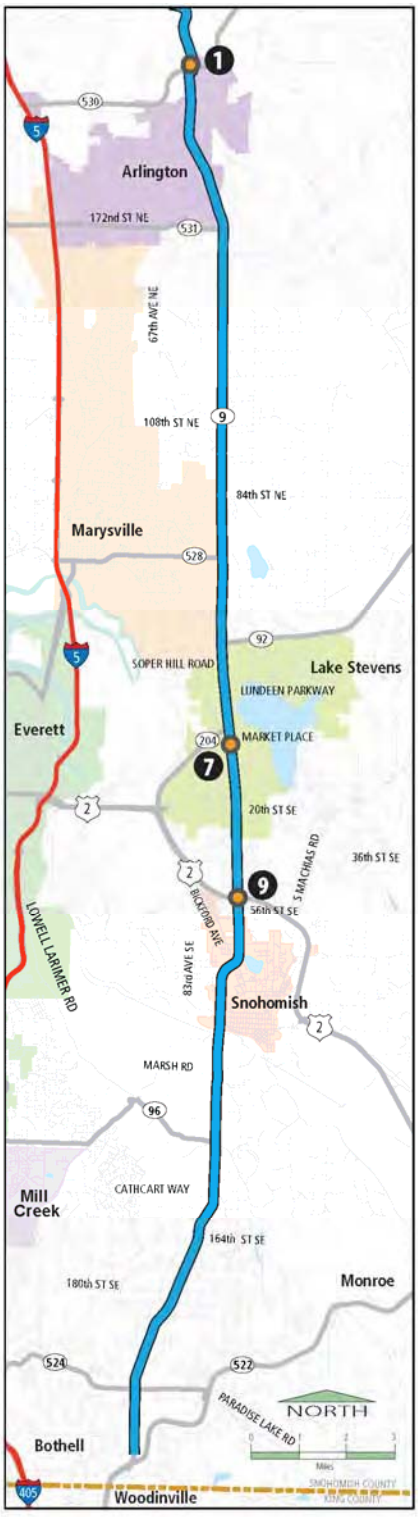
Exhibit 6-18: 2015 AM & PM Peak-Period Volumes



2015 AM Peak-Period Volumes



2015 PM Peak-Period Volumes

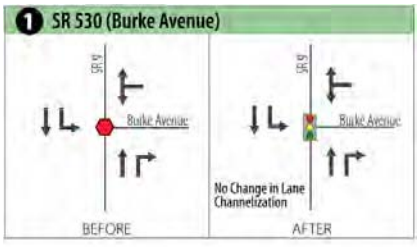


Description of the Near-term Improvement Options

A detailed description of the near-term improvement options, along with the environmental assessment and traffic analysis, is provided below.

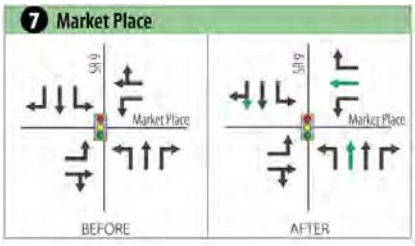
SR 530 Burke Avenue

Install a new signal with minor widening for shoulders on the west side of SR 9.



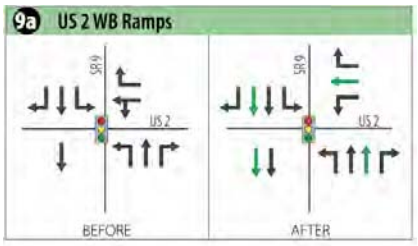
Market Place

Northbound direction improvements would include adding a through lane and lengthening the left-turn pocket from 160 to 350 feet. Southbound direction improvements would include converting the current right-turn pocket to through/right lane and lengthening the left-turn pocket from 200 to 400 feet. It would also include adding a southbound receiving lane. The westbound direction would include adding a right-turn pocket.



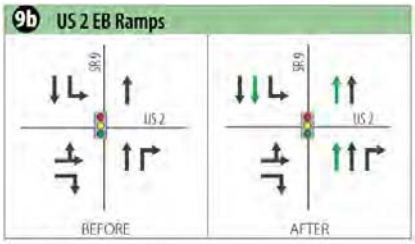
US 2 Westbound Ramp Intersection

The US 2 bridge would be restriped to accommodate four travel lanes (two in each direction). In the northbound direction, a through lane and new right-turn channelization would be added. For the southbound direction, a through lane and similar right-turn channelization are included. The westbound direction would incorporate a left-turn lane and a right-turn pocket. Finally, new northbound and southbound receiving lanes would be added to better facilitate through movements. Initial bridge load data shows that the structure would accommodate an additional striped lane across the span.



US 2 Eastbound Ramp Intersection

The northbound direction would include a new striped through lane and right-turn channelization. The southbound direction would include a new through lane. The west leg would add right-turn channelization, and the east leg would include lengthening to two lanes for roughly 300 feet. New northbound and southbound receiving lanes would also be incorporated. As described above, initial bridge load data shows that the structure across US 2 would accommodate an additional striped lane across the span.



Environmental Assessment

An environmental assessment was performed for the three intersection locations listed above using available GIS data. Potential impacts to both the natural and built environments were considered as part of the assessment. The primary potential constraints for each intersection location are listed below. For further information, please see Appendix F.

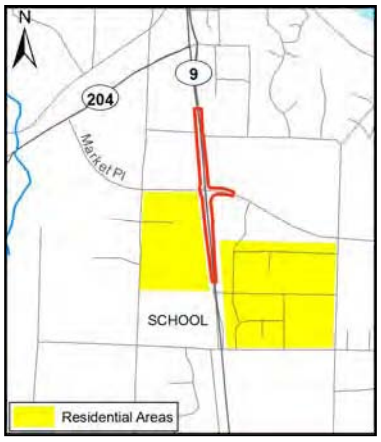
SR 530 Burke Avenue

There are no expected environmental constraints for near-term improvements at this intersection.

Market Place

The only potential environmental constraint for near-term improvements at this intersection would be those caused by noise. Residential areas are located to the east and west of SR 9 and south of Market Place. Near-term improvements may result in noise impacts at these nearby residences and at Hillcrest Elementary School. Playfields at Hillcrest Elementary School are located just south of the near-term project improvements (Exhibit 6-19).

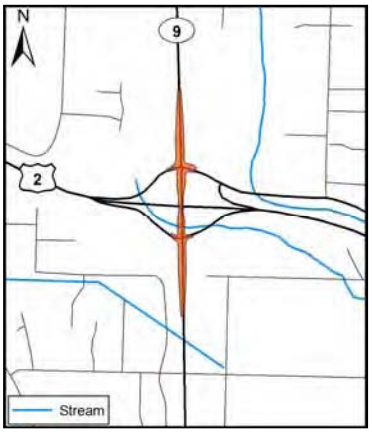
Exhibit 6-19: Potential Noise Sensitive Areas near Market Place



US 2 Ramps

Stream impacts are the only potential environmental constraint for near-term improvements at the intersection of SR 9 and US 2. GIS data identify a stream running under SR 9 about 140 feet north of the US 2 eastbound on-ramp that could be affected by near-term improvements. Although wetlands are nearby, they are outside of the boundaries of the improvements (Exhibit 6-20).

Exhibit 6-20: Potential Key Environmental Constraints for Near-term Improvements at the SR 9/US 2 Ramp Interchange



Traffic Analysis

Intersection analysis was performed for the four intersections identified as the potential locations for the short-term improvements. The analysis was performed using Synchro software. Exhibit 6-21 shows the short-term analysis results.

The short-term improvement options provide some reduction in delay and improve overall intersection operations for each location. The LOS at the US 2 interchange (westbound ramp intersection) improves from LOS D to LOS C in the AM peak hour, and the US 2 eastbound ramp intersection improves from LOS E to LOS B in the PM peak hour.

All short-term improvements are consistent with the long-term vision at each of the three intersections. As such, any "throw-away" improvement elements are minimized when progressing

from the first phase of improvement (short-term) to the long-term build out.

Exhibit 6-21: 2015 Near-term Intersection Delay/Level-of-Service Summaries

Intersection	Improvement Options	AM Peak		PM Peak	
		Delay**	LOS	Delay**	LOS
SR 530 (Burke Avenue)	Existing (2005)	33.1*	NA	48.8*	NA
	2015 Baseline	74.7*	NA	137.2*	NA
	2015 Build	19.0	B	13.0	B
84th Street NE	Existing (2005)	49.7	D	50.4	D
	2015 Baseline	41.3	D	43.9	D
	2015 Build	31.8	C	34.0	C
Market Place	Existing (2005)	31.3	C	54.2	D
	2015 Baseline	33.9	C	50.5	D
	2015 Build	24.2	C	37.4	D
US 2 Westbound Ramps	Existing (2005)	46.7	D	24.7	C
	2015 Baseline	53.4	D	28.4	C
	2015 Build	28.0	C	25.9	C
US 2 Eastbound Ramps	Existing (2005)	15.3	B	27.7	C
	2015 Baseline	16.6	B	55.4	E
	2015 Build	6.6	A	14.2	B

*This is a stop-controlled intersection, and the delay shown indicates the cross-street delay.
**Delay is listed in seconds

What are the CPS Potential Improvement Packages?

As described in previous chapters, the initial focus of the CPS process was geared towards long-term intersection improvements for the 11 key locations along the study corridor. With these locations identified and the proposed improvement strategies defined for each location, the prioritization of improvements was then established to determine a reasonable and logical implementation structure.

Segment-widening improvements were incorporated into the larger framework of the CPS, and a final prioritization framework was presented to the Corridor Working Group (CWG.) Based on feedback from the CWG and coordination with the WSDOT's NW Regional Administrator's list of priority projects for the corridor; a series of 5 improvement packages representing a total of 21 improvement projects were developed. These packages describe the recommended improvements in sequence based on potential funding levels and response to the legislature of project prioritization for

potential funding within a short term time period (within 10 years.)

The preliminary project cost for the SR 9 CPS elements totals approximately $375 million (in 2007 dollars). This cost estimate is considered a programmatic estimate for planning purposes and is intended to serve as a starting point when determining a final cost estimate for recommended program items. Contingencies for environmental mitigation and right-of-way have been incorporated into the improvement costs. However, these are expected to change as the conceptual work progresses to the preliminary and final design stages.

A summary of the program elements is provided below and includes descriptions of the key improvement items for each location, how they are packaged, and associated costs for these improvements. Detailed descriptions of conceptual project costs can be found in Appendix E, Conceptual Project Costs, and a comprehensive table representing the list of packages and elements is provided in Appendix K.

Improvement Package 1

- **176th Street SE to SR 96 Widening**
  - Short-term improvement
  - Widen SR 9 from three lanes to five lanes
  - Estimated cost (2007 dollars - rounded): $50.4 million

- **SR 204 Intersection Improvements**
  - Short-term improvement
  - Add third northbound through lane
  - Add third southbound through lane
  - Estimated cost (2007 dollars - rounded): $8.4 million

- **SR 530 (Burke Avenue) Intersection Improvements**
  - Short-term improvement
  - New signal to enhance access to/from SR 9
  - Minor shoulder widening and grading
  - Total Estimated cost (2007 dollars - rounded): $1.0 million

- **US 2 Ramp Interchange Enhancements**
  - Short-term improvement
  - Restripe bridge for four lanes (two each direction)
  - Add northbound and southbound through lanes at intersection approaches and receiving segments

- Right-turn channelization improvements at ramp intersection approaches (eastbound and westbound)
- Estimated cost (2007 dollars - rounded): $7,000,000

- **Market Place Intersection Improvements**
  - Short-term improvement
  - Add westbound right-turn lane
  - Add second northbound approach through lane
  - Add second southbound receiving lane
  - Estimated cost (2007 dollars - rounded): $4.4 million

Improvement Package 2

- **SR 204 to Lundeen Parkway Widening**
  - Long-term improvement
  - Widen SR 9 from four lanes to six lanes
  - Estimated cost (2007 dollars - rounded): $7.0 million

- **Lundeen Parkway Intersection Improvements**
  - Long-term improvement
  - Add third northbound through lane
  - Add third southbound through lane
  - Estimated cost (2007 dollars - rounded): $5.0 million

- **SR 530 (Division Street) Intersection Improvements**
  - Long-term improvement
  - Widen eastbound approach for dual left-turn lanes
  - Add northbound receiving to Burke Avenue
  - Estimated cost (2007 dollars - rounded): $3.0 million

Improvement Package 3

- **Marsh Road Intersection Improvements**
  - Long-term improvement
  - Add third northbound through lane
  - Add third southbound through lane
  - Widen eastbound approach for dual left-turn lanes
  - Estimated cost (2007 dollars - rounded): $5.7 million

- **Marsh Road to Snohomish River Bridge Widening**
  - Long-term improvement
  - Widen SR 9 from two lanes to four lanes
  - Estimated cost (2007 dollars - rounded): $8.7 million

- **Snohomish River Bridge Replacement (two spans)**
  - Long-term improvement
  - New four-lane main span across Snohomish River
  - New four-lane overflow bridge south of main span

- Ramp and bridge improvements near Riverview Road/2nd Street (north of main span)
- Estimated cost (2007 dollars - rounded): $109.2 million

Improvement Package 4

- **Snohomish River Bridge to Bickford Avenue Widening**
  - Long-term improvement
  - Widen SR 9 from two lanes to four lanes
  - Reconstruct Bickford Avenue bridge trestle
  - Estimated cost (2007 dollars - rounded): $40.4 million

- **Avenue D/Bickford Avenue Intersection Improvements**
  - Long-term improvement
  - Close Avenue D access to/from SR 9
  - Add new signal north at 20th Street SE
  - Build connector roads to/from new signal
  - Estimated cost (2007 dollars - rounded): $6.7 million

- **Bickford Avenue to US 2 Ramps Widening**
  - Long-term improvement
  - Widen SR 9 from two lanes to four lanes
  - Estimated cost (2007 dollars - rounded): $17. 2 million

- **US 2 Interchange Enhancements—Full Concept**
  - Long-term improvement
  - Remove northbound left-turn movement at westbound ramps
  - Remove southbound left-turn movement at eastbound ramps
  - Construct new single-lane roundabout at intersection of New Bunk Foss Road/westbound ramps
  - Construct new southbound-to-eastbound loop ramp
  - Upgrade signal controller hardware
  - Estimated cost (2007 dollars - rounded): $25.0 million

Improvement Package 5

- **US 2 Ramps to 20th Street SE Widening**
  - Long-term improvement
  - Widen SR 9 from two lanes to four lanes
  - Estimated cost (2007 dollars - rounded): $31 million

Improvement Package 5 (continued)

- **20th Street SE Intersection Improvements**
  - Long-term improvement
  - Add third northbound through lane
  - Add third southbound through lane
  - Widen westbound approach for dual left-turn lanes
  - Add eastbound right-turn pocket
  - Estimated cost (2007 dollars - rounded): $5.6 million

- **20th Street SE to Market Place Widening**
  - Long-term improvement
  - Widen SR 9 from two lanes to four lanes
  - Estimated cost (2007 dollars - rounded): $23.5 million

- **Market Place Intersection Improvements (Phase 2)**
  - Long-term improvement
  - Add third northbound through lane
  - Add third southbound through lane
  - Add eastbound right-turn pocket
  - Estimated cost (2007 dollars - rounded): $12.0 million

- **84th Street NE Intersection Improvements**
  - Long-term improvement
  - Widen southbound approach for dual left-turn lanes
  - Widen westbound approach for dual left-turn lanes
  - Add eastbound right-turn pocket
  - Estimated cost (2007 dollars - rounded): $2. 3 million

Chapter 7 – Next Steps

Numerous factors have contributed to and resulted in a depressed environment for new transportation improvement funding. At the state level, revenue from the 2003 and 2005 transportation funding packages is dedicated to projects already selected by the state legislature. These transportation funding streams have been bonded against, which will encumber this revenue for many years to come. On the federal side, the Safe, Accountable, Flexible, and Efficient Transportation Equity Act—A Legacy for Users (SAFETEA-LU) has expired and a new national transportation funding bill has not yet been adopted by congress.

In such an era of constrained transportation funding, it is important to identify improvement packages representing a range of investment levels. By so doing, legislators can be provided with a list of improvement options at different funding levels which are all designed to provide a good return for the level of investment. This CPS strives to meet that challenge by identifying 6 improvement packages representing various levels of investment. These improvement packages provide a good return on investments and builds upon currently funded projects in the SR 9 corridor from the 2003 and 2005 state transportation funding packages.

The SR 9 CPS provides the stakeholders and endorsers of the plan with a blueprint of how the corridor should be improved. It provides a consistent vision of the corridor and will serve as a useful tool as the local agencies and the area's elected officials seek improvement funding for the SR 9 corridor.

As with most long-range planning reports, this CPS should be updated if future conditions along the corridor evolve differently than anticipated in this plan. Such updates would be necessary to properly capture changes in the local transportation network, reflect major land use adjustments and city annexations, and to account for potential shifts in regional travel patterns.

Specific "next step" actions that would help to facilitate and ensure project implementation include the following:

- Integrate the various CPS elements into state and regional transportation plans
- Encourage local agencies to adopt the SR 9 CPS strategies into their comprehensive plans

The next steps for the SR 9 CPS will be critical for program implementation:

- Alignment of the various partner agencies will be needed to develop a cohesive lobbying message
- Integration of CPS elements into various regional and local transportation plans will establish a foundation and provide necessary exposure
- Securing funding will ensure project can be implanted
- Updates to the CPS will capture on-going changes in local conditions

- Encourage CWG partner agencies to develop a coordinated approach for funding requests

Stakeholder agencies will be expected to promote the list of CPS improvement projects in order to solicit and obtain funding from local, state, and federal lawmakers, as well as potential private-sector sources. Improvement projects recommended in this CPS may move forward as WSDOT-led efforts, may be implemented collaboratively with partner agencies, or could be delivered entirely by local agencies. Once funding is available, each project will undergo a formal design process and environmental analysis.

The next steps for this CPS process are summarized below.

Integrate the CPS Elements with Regional and State Transportation Planning Documents

The recommended mobility improvements in this CPS should be included in the Central Puget Sound region's transportation plan, *Transportation 2040*, prepared by PSRC.

PSRC is the metropolitan planning organization for the counties of King, Pierce, Snohomish, and Kitsap. The PSRC coordinates transportation and growth planning for the Puget Sound region. *Vision 2040*, adopted in 2008, is PSRC's most recent regional growth management, environmental, economic, and transportation policy plan adopted under the authority provided to PSRC by federal and state laws. *Transportation 2040* is the supporting transportation plan for the region.

Additionally, the CPS elements should be incorporated into WSDOT's Highway System Plan (HSP). The HSP is the state's 20-year plan for state highways. The current HSP is for the years 2007–2026. The plan identifies current and forecasted highway needs and is updated every two years. Results from ongoing analyses, such as the SR 9 CPS, are used to refine the strategies in the HSP.

Adopt this CPS into Local Transportation Plans

Local agencies along the corridor can use this CPS to identify future SR 9 needs and incorporate them into their local transportation plan so there is consistency between the CPS recommendations, state and regional transportation plans, and local comprehensive plans. It also demonstrates to funding agencies that the CPS has support at the local, regional, and state levels.

CPS Implementation Action Matrix

Overall, the SR 9 CPS identified 20 projects needed to meet the corridor vision and 2030 needs. To assist with the implementation of the improvements, an action matrix was developed based on the guidelines outlined in WSDOT's 2007 *Planning Studies Guidelines and Criteria Report*. This action matrix, as presented in Exhibit 7-1, lists the project by their priority and classifies them in terms of the Washington Transportation Guidelines and the Highway System Plan implementation strategies. This action matrix will ultimately be used as a tool to track implementation progress for corridor improvements and quickly assess where funding gaps remain.

What are the potential sources of funding for SR 9 improvements?

Funding has not yet been identified for the SR 9 improvements recommended in this CPS. Partner agencies represented in the CWG and elected officials for these communities should collaboratively promote the list of CPS improvement projects in order to solicit and obtain funding from local, state, and federal lawmakers, as well as potential private-sector sources.

A variety of funding sources should be pursued as part of any effort to obtain funding for the SR 9 corridor by agency partners. These sources fall under the categories of federal, state, and local government and the private sector. A summary of potential funding sources that could be used for implementing the CPS elements is discussed below.

Federal Funding Sources

One source of funding for highway projects is through the federal transportation act. The last such federal transportation act was the SAFETEA-LU. Per the provisional statement by the Federal Highway Administration, between 2005 and 2009, SAFETEA-LU represented the largest surface transportation investment in U.S. history with over $240 billion in total funding for highways, safety, and public transportation. This program was extended by Congress and will expire on December 31, 2010.

Exhibit 7-1: SR 9 CPS Implementation Action Matrix

Priority Ranking	State Route/ Project Number	Recommendation	WTP Investment Guideline[1]	HSP Implementation[2]	Estimated Costs[3]	Funding Resources	Funding Programmed (Biennium)	Agency responsible for securing funding	Partners/ Resources
1	SR 9/SR 530 (Burke Avenue) Intersection Improvements	- New signal to enhance access to/from SR 9 - Minor shoulder widening and grading	M	S	$930,000	TBD	TBD	TBD	TBD
1	SR 9/US 2 Ramp Interchange Enhancements	-Restripe bridge for four lanes (two each direction) -Add northbound and southbound through lanes at intersection approaches and receiving segments -Right-turn channelization improvements at ramp intersection approaches (eastbound and westbound)	M	S	$6,960,000	TBD	TBD	TBD	TBD
1	SR 9/Market Place Intersection Improvements	-Add westbound right-turn lane - Add second northbound approach through lane - Add second southbound receiving lane	M	S	$4,400,000	TBD	TBD	TBD	TBD
2	SR 9/SR 204 Intersection Improvements	- Add third northbound through lane - Add third southbound through lane	M	L	$8,380,000	TBD	TBD	TBD	TBD
2	SR 9 from SR 204 to Lundeen Parkway Widening	- Widen SR 9 from four lanes to six lanes	M	L	$7,060,000	TBD	TBD	TBD	TBD
2	SR 9/Lundeen Parkway Intersection Improvements	- Add third northbound through lane - Add third southbound through lane	M	L	$4,890,000	TBD	TBD	TBD	TBD
2	SR 9/SR 530 (Division Street) Intersection Improvements	- Widen eastbound approach for dual left-turn lanes - Add northbound receiving to Burke Avenue	M	L	$2,890,000	TBD	TBD	TBD	TBD
3	SR 9 from 176th Street SE to SR 96	- Widen SR 9 from three lanes to five lanes	M	L	$50,440,000	TBD	TBD	TBD	TBD
4	SR 9/Marsh Road Intersection Improvements	- Add third northbound through lane - Add third southbound through lane - Widen eastbound approach for dual left-turn lanes	M	L	$5,690,000	TBD	TBD	TBD	TBD
4	SR 9 from Marsh Road to Snohomish River Bridge	- Widen SR 9 form two lanes to four lanes	M	L	$8,660,000	TBD	TBD	TBD	TBD

Exhibit 7-1: SR 9 CPS Implementation Action Matrix (continued)

Priority Ranking	State Route/ Project Number	Recommendation	WTP Investment Guideline[1]	HSP Implementation[2]	Estimated Costs[3]	Funding Resources	Funding Programmed (Biennium)	Agency responsible for securing funding	Partners/ Resources
4	Snohomish River Bridge Replacement (two spans)	- New four-lane main span across Snohomish River - New four-lane overflow bridge south of main span - Ramp and bridge improvements near Riverview Road/2nd Street (north of main span)	M	L	$109,220,000	TBD	TBD	TBD	TBD
5	SR 9 from Snohomish River Bridge to Bickford Avenue	- Widen SR 9 from two lanes to four lanes - Reconstruct Bickford Avenue bridge trestle	M	L	$40,440,000	TBD	TBD	TBD	TBD
5	SR 9/Avenue D/Bickford Avenue Intersection Improvements	- Close Avenue D access to/from SR 9 - Add new signal north at 20th Street SE - Build connector roads to/from new signal	M	L	$6,740,000	TBD	TBD	TBD	TBD
5	SR 9 from Bickford Avenue to US 2 Ramps	- Widen SR 9 from two lanes to four lanes	M	L	$17,240,000	TBD	TBD	TBD	TBD
5	SR 9/US 2 Interchange Enhancements (Full concept)	- Remove northbound left-turn movement at westbound ramps - Remove southbound left-turn movement at eastbound ramps - Construct new single-lane roundabout at intersection of New Bunk Foss Road/westbound ramps - Construct new southbound-to-eastbound loop ramp - Upgrade signal controller hardware	M	L	$25,130,000	TBD	TBD	TBD	TBD
6	SR 9 from US 2 Ramps to 20th Street SE	- Widen SR 9 from two lanes to four lanes	M	L	$30,870,000	TBD	TBD	TBD	TBD
6	SR 9/20th Street SE Intersection Improvements	- Add third northbound through lane - Add third southbound through lane - Widen westbound approach for dual left-turn lanes - Add eastbound right-turn pocket	M	L	$5,575,000	TBD	TBD	TBD	TBD

Exhibit 7-1: SR 9 CPS Implementation Action Matrix (continued)

Priority Ranking	State Route/ Project Number	Recommendation	WTP Investment Guideline[1]	HSP Implementation[2]	Estimated Costs[3]	Funding Resources	Funding Programmed (Biennium)	Agency responsible for securing funding	Partners/ Resources
6	SR 9 from 20th Street SE to Market Place	- Widen SR 9 from two lanes to four lanes	M	L	$23,490,000	TBD	TBD	TBD	TBD
6	SR 9/Market Place Intersection Improvements (Phase 2)	- Add third northbound through lane - Add third southbound through lane - Add eastbound right-turn pocket	M	L	$11,860,000	TBD	TBD	TBD	TBD
6	SR 9/84th Street NE Intersection Improvements	- Widen southbound approach for dual left-turn lanes - Widen westbound approach for dual left-turn lanes - Add eastbound right-turn pocket	M	L	$2,280,000	TBD	TBD	TBD	TBD

Notes:
[1] P=Preservation S=Safety EV=Economic Vitality M=Mobility EQ=Environmental Quality
[2] S=Short-term M=Mid-term L=Long-term
[3] Current year (2007) dollars

State and Local Funding Sources

A number of local and state funding sources exist that may provide core levels of funding for the recommended SR 9 CPS corridor improvements. These sources are presented below.

Gas Tax, Licenses, Permits and Fees

The state gas tax is the primary funding source for state highway funding in Washington State. The current rate in Washington State is 37.5 cents per gallon. Revenue from vehicle licenses, permits, and fees is the second largest source of state funding for transportation. In addition, a portion of the state gas tax is allocated to cities and counties providing an important funding source to address local highway needs.

Rural Arterial Program

This is a state fund managed by the County Roads Administration Board and funded through the state gas tax that finances arterial road improvements in rural areas. Funds are distributed to counties in the form of project grants to improve rural arterial and collector roads and to provide transportation engineering assistance. Counties compete regionally for funding by submitting projects that are rated against objective criteria established for each region.

Public Works Trust Fund

This is a loan program developed by the State Department of Community, Trade, and Economic Development and administered by the Public Works Board to provide low interest loans to local governments to complete needed infrastructure improvements.

Freight Mobility Strategic Investment Board

The Freight Mobility Strategic Investment Board provides state funds to be combined with partnership funding for freight mobility and freight mitigation projects along strategic freight corridors.

Community Transit Funding

Community Transit (CT) is the primary public transit agency that provides bus service in Snohomish County. Currently, CT does not provide point-to-point service along the corridor but does serve east-west connections via transit. However, CT has future plans to provide transit service in the SR 9 corridor and

would be responsible for funding this service from their portion of the local sales tax.

Private Funding From Developers

As the population continues to grow in Snohomish County, both residential and business-related developments will increase. These developments create traffic impacts that should be mitigated by each individual developer. It is important to ensure new developments pay their fair share of required transportation improvements so the highway continues to operate in an acceptable fashion.

What is the long-term vision for the corridor?

Primarily due to a desire to maintain consistent continuity for the corridor coupled with the high cost of replacing at-grade intersections with grade-separated interchanges, an at-grade corridor profile was developed that ultimately defined how the corridor should be improved over the next 20+ years. The proposed investments contained in this CPS represent a cohesive set of at-grade improvements that provide additional traffic capacity, improve intersection operations, reduce collisions, allow for more efficient transit movement, and maintain the character of the existing highway.

The SR 9 corridor will ultimately represent:

- A safe and efficient regional highway that supports the local economy and provides effective access
- A facility that is sensitive to local land use conditions
- Securing funding will ensure project can be implemented
- Updates to the CPS will capture on-going changes in local conditions
- Will be replaced by a new funding bill sometime in 2009 or early 2010

Beyond the 20+ year timeframe, the recommended vision for the corridor may change significantly based on population and employment trends, land use policy, and the performance of the transportation system. At some point in the future, an at-grade highway facility with signalized intersections may not be suitable to serve traffic demand along the SR 9 corridor. Concepts reflecting a fully limited access freeway for the SR 9 corridor have been suggested based on public feedback at fairs and festivals, during discussions within the CWG (for the SR 9 CPS study), and by WSDOT officials. Such a corridor would require large-scale investments that are sufficient to implement grade-separation structures, either above or below grade, at most (if not all) intersection crossings.

Regardless of the corridor vision that develops beyond the 20-year timeline, whether it maintains an at-grade profile or reflects a fully limited access, grade-separated freeway facility, the recommendations contained in the CPS would not preclude any further improvements for the SR 9 corridor beyond the 2030 horizon.

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