Chapter 4 Identifying and Screening Potential Improvement Projects

Chapter 4 describes how projects were screened and packaged into the options considered for this Route Development Plan (RDP).

1 How were potential roadway improvements identified and screened?

Selecting and evaluating potential improvement projects for SR 169 entailed a lengthy and detailed process. The process included:

1. Compiling and analyzing existing and projected conditions for traffic, existing roadway design compared to current design standards, the surrounding natural environment, the surrounding built environment, and future population and employment growth.

2. In consideration of the above factors, identifying and developing potential projects to improve safety and address congestion along the SR 169 corridor.

3. Performing initial fatal flaw[1] screening of proposed improvement projects to eliminate some potential projects.

4. Performing a final screening and eliminating additional project proposals.

[1] A fatal flaw is a term often used when evaluating potential project designs or routes. If it is found that the proposed design/improvement would have a major engineering, environmental, or community impact which could not be avoided by redesign (or mitigation), the design/improvement would then be considered to have a fatal flaw.

5. Developing three improvement options containing packages of complementary projects with each successive option building upon the previous package of improvements.

6. Evaluating the three improvement options using a benefit-to-cost analysis.

7. Analyzing the improvement options' impact on traffic operations.

8. Recommending a preferred improvement option for inclusion in this Route Development Plan.

Exhibit 4.1 on the next page illustrates the steps taken for this evaluation.

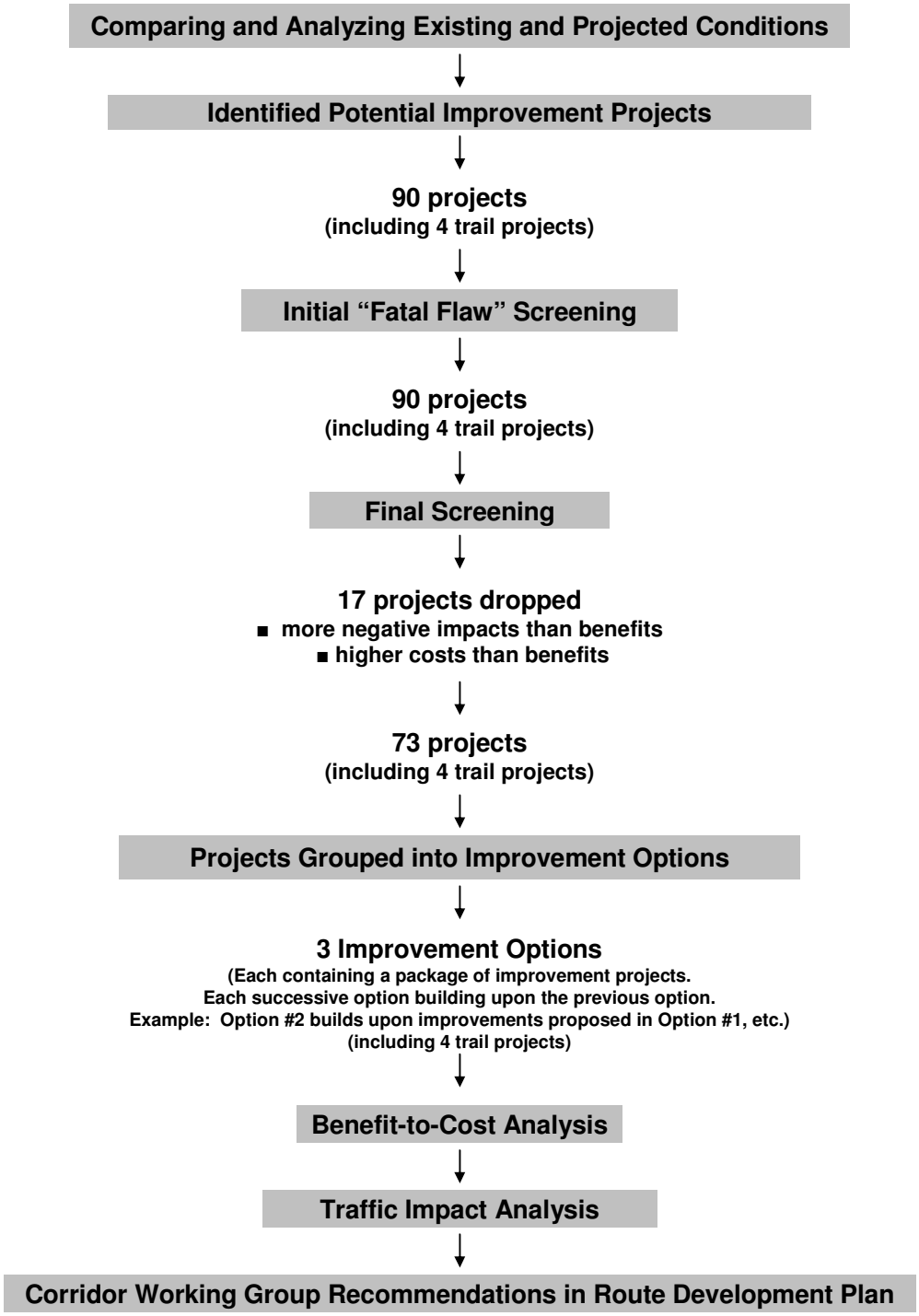
2 What were the Corridor Working Group's goals for the SR 169 Route Development Plan?

The Corridor Working Group (CWG) was made up of local jurisdictions which have the responsibility to seek the necessary funding to implement the final RDP recommended transportation improvements. The CWG developed and adopted goals to guide the development of this RDP. These goals helped the CWG evaluate proposed transportation improvement projects within the context of regional, community, and environmental objectives. The goals adopted by the CWG were to:

- improve corridor safety;
- improve mobility and reduce delay;
- improve freight movement;
- minimize environmental impacts;
- incorporate effective public outreach; and
- maximize compatibility of immediate-term, short-term, and long-term improvements

These goals, together with technical analysis, guided the development of evaluation criteria used for identifying and screening potential improvement projects. The CWG Goals and Objectives can be seen in Appendix F on page 11.

Exhibit 4.1
SR 169 Route Development Plan Screening Process



3 How were projects identified?

Potential projects for this RDP were identified from a number of sources. WSDOT and each of the jurisdictions along the corridor identified projects for consideration. The resulting list included projects at all stages of advancement. Some projects are designed, environmental review is completed, funding sources have been identified, and construction is imminent. Other projects are planned and not funded, and have had limited or no design and environmental review. Still other projects were ideas that seemed worthy of consideration in response to identified transportation needs and problems identified along SR 169.

Appendix C

Appendix C provides additional information about the screening process.

The types of projects considered within the SR 169 corridor included:

- improvements to the existing roadway.
- transit service improvements.
- proposals for new or improved bike, pedestrian, and equestrian trails.

A total of 90 projects and 4 separate trail projects were initially considered in the SR 169 RDP screening process.

4 How were projects initially screened?

At the onset of the study process, the CWG identified and agreed upon a set of evaluation criteria to be used for initial screening. The evaluation criteria were:

Appendix F

Appendix F contains the evaluation criteria developed by the CWG to screen proposed projects.

- safety,
- impacts to the natural environment;
- impacts to historical, cultural, and architectural resources; and
- cost

The initial screening employed a number of measures with one or more measure developed from each evaluation criterion. These measures were used to perform the initial “fatal flaw”

screening. The purpose of this initial screening was to identify projects for elimination that did little to satisfy the project goals or were estimated to have impacts of sufficient severity to represent a fatal flaw to implementation. These projects would not be given further consideration.

The measurements were all qualitative evaluations and with the exception of cost, were based on a three-point scale. The initial screening criteria were applied using the following three point scale:

"+" indicates beneficial or positive aspect to the project

"-" indicates a harmful or negative aspect to the project.

"0" indicates unknown or neutral aspect to the project.

The values assigned were based on professional judgment and did not represent rigorous application of a quantitative method.

None of the 90 projects and 4 trail projects considered in the initial screening process was found to have fatal flaws. The projects considered in the initial screening process were found to reduce traffic and be feasible in terms of potential environmental effects. Therefore, the CWG retained all projects evaluated during initial screening for final screening.

5 How was the final screening performed?

In the final screening the list of potential RDP projects were subjected to a varied analysis. Each project was evaluated on the basis of its potential transportation benefits, financial costs, policy consistency, environmental impacts, and public support using the categories in the sidebar to the right. The evaluation was based on scoring each project using a series of identified measures. The measures were adapted from the *SR 169 Corridor Study Evaluation Criteria Technical Memorandum*, (this memorandum can be found in Appendix F). Adaptations were made on the basis of the available data, redundancy among the measures in the memorandum, and additional insight gained during the course of the study into topics needing measurement.

Final Screening Criteria

- Safety Benefits
- Mobility Benefits
- Transit Benefits
- Non-Motorized Benefits
- Environmental Impacts
- Land Use and Policy Consistency
- Costs
- Public Support

How was the scoring performed?
Each criteria area was given numeric variable scoring utilizing the “1”, “0”, and “-1” range of scores. Some of the criteria scoring values looked like this:

Environmental Impacts – a project was given a “-1” if it had a negative impact, or lacked support. Otherwise it was given a “0”.

Potential Transportation Benefits – a project was given a “1” if it would provide a potential benefit. A project was given a score of “0” if it would not provide a potential benefit.

Land Use and Policy Consistency – a project was given a “-1” if it had a negative impact, or lacked support. Otherwise it was given a “0”.

Project Cost – a project was given a “-1” for a high cost project, a project was given a “-0.5” for a medium cost project, and “0” for a low cost project.

Public Support – a project was given a “-1” if it had a negative impact, or lacked support. Otherwise it was given a “0”.

The scores were then weighted to account for the relative importance of each measure and any redundancy among the measures. The weights were equalized to normalize (or center) the measurement scale to zero. After equalizing the weights the range of possible scores was -90 to +90. Appendix C show the importance and equalization weighting of each measure. Finally, the evaluation scores for each project were totaled.

6 What were the results of the final screening?

A total of 90 projects and 4 trail projects were included in the final screening. Based on screening criteria developed by the CWG, total weighted and equalized scores were used to determine those projects with substantially more benefits than impacts and costs.

The scores for each project are shown in Appendix F. These scores were reviewed and endorsed by the CWG. Seventeen (17) projects were removed from further consideration because they had substantially more negative impacts and higher costs than benefits. The 73 remaining projects had scores indicating more benefits than impacts and cost. In addition, 4 trail projects were retained even though they did not have a positive impact/benefit score. The CWG retained the trail projects because they believed they merited additional consideration given their consistency with the SR 169 RDP goals of providing multi-modal transportation options and having low impact land use.

Results of Final Screening

- 90 projects screened
- 17 projects removed
- 73 projects and 4 trail projects retained and packaged into three improvement options.

Appendix D contains the final list of projects and Appendix F shows the screening results.

7 How were the improvements packaged?

The remaining 73 projects were grouped together in packages to form three separate improvement options. Each improvement option contained projects addressing safety, operations, and chokepoints along the corridor. Each option builds upon the previous package. For example, Improvement Option 1 contains a specific list of improvements, while Improvement Option 2 contains all of the improvements listed in Option 1, but offers an additional capacity project. Improvement Option 3 offers the same improvements as Options 1 and 2, but extends the length of Option 2's additional capacity project.

Improvement Option 1

Improvement Option 1 (displayed in Exhibit 4.2 on page 4-9) includes operational, safety, and capacity improvements intended to address the safety and congestion issues along the corridor. Some of these projects are directed at sections of the corridor; other projects will be applied at specific intersections.

Appendix D

Appendix D contains a detailed list of the projects included in the improvement options and identifies their specific locations.

The types of corridor safety improvements are:

- implement access management strategies,
- construct sidewalks,
- improve shoulders,
- extend bike lanes,
- install guardrail,

- install rumble strips,
- install street lighting,
- install crosswalks,
- remove sight obstructions,
- stabilize steep slopes, and
- utilize restrictive medians and U-turns at appropriate intersections.

The intersection improvements are:

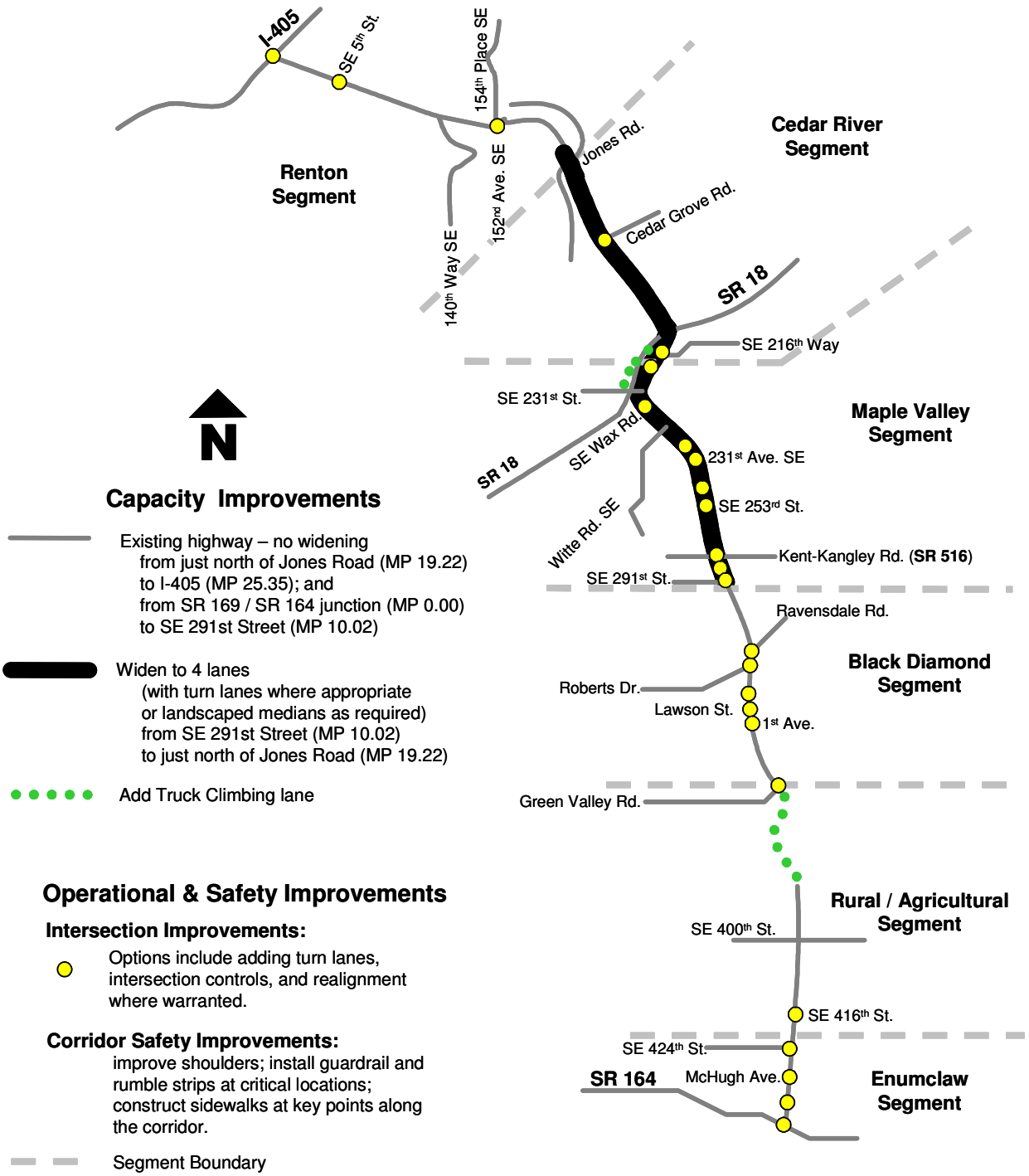
- realign approaches,
- implement access management strategies,
- improve pedestrian crosswalks,
- remove sight obstructions,
- restricting access to and from driveways by installing a median or C curb and allowing for U-turns at the next stop controlled intersection;
- install street lighting,
- widen intersection,
- stabilize steep slopes,
- install bus pullouts, and
- install or extend turn pockets.
- install intersection controls which include: adding turn lanes, signals, stop signs, roundabouts, and realignment where warranted.

Capacity improvements included in Improvement Option 1 are:

- add truck climbing lanes from north and south of the Green River (approximately milepost 4.90 to milepost 5.20 and milepost 5.33 to milepost 6.02).
- add truck climbing lane on the southbound side of the highway south of Cedar River (approximately milepost 14.14 to milepost 15.00).
- widen SR 169 to four lanes from SE 291st Street (milepost 10.02) to just north of Jones Road (milepost 19.22).

Exhibit 4.2

SR 169 Improvement Option 1



Improvement Option 2

Improvement Option 2 builds upon the list of proposed projects in Improvement Option 1. Improvement Option 2 (displayed in Exhibit 4.3 on the next page) includes all of the operational, safety, and capacity improvements listed in Improvement Option 1 and adds:

- a capacity improvement project to widen SR 169 from four lanes to six lanes from 140th Way SE (milepost 22.99) to I-405 (milepost 25.26).

Improvement Option 3

Improvement Option 3 (displayed in Exhibit 4.4 on page 4-12) contains all of the operational, safety and capacity improvements provided in Options 1 and 2 and extends:

- the capacity improvement from Improvement Option 2 – to widen SR 169 from four lanes to six lanes from Jones Road (milepost 19.22) to I-405 (milepost 25.26).

  This option extends the capacity project an additional 3.77 miles.

Exhibit 4.3
SR 169 Improvement Option 2

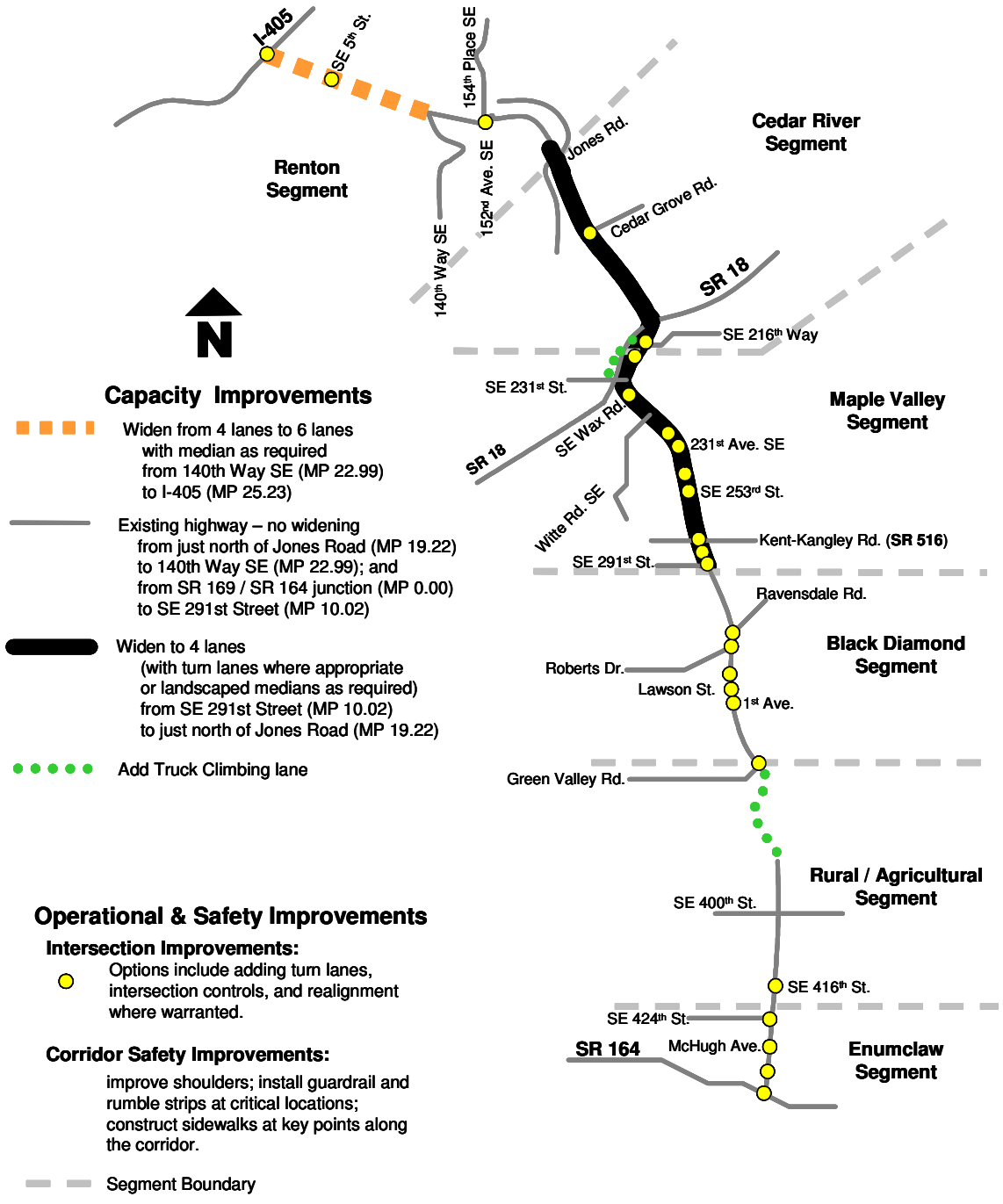
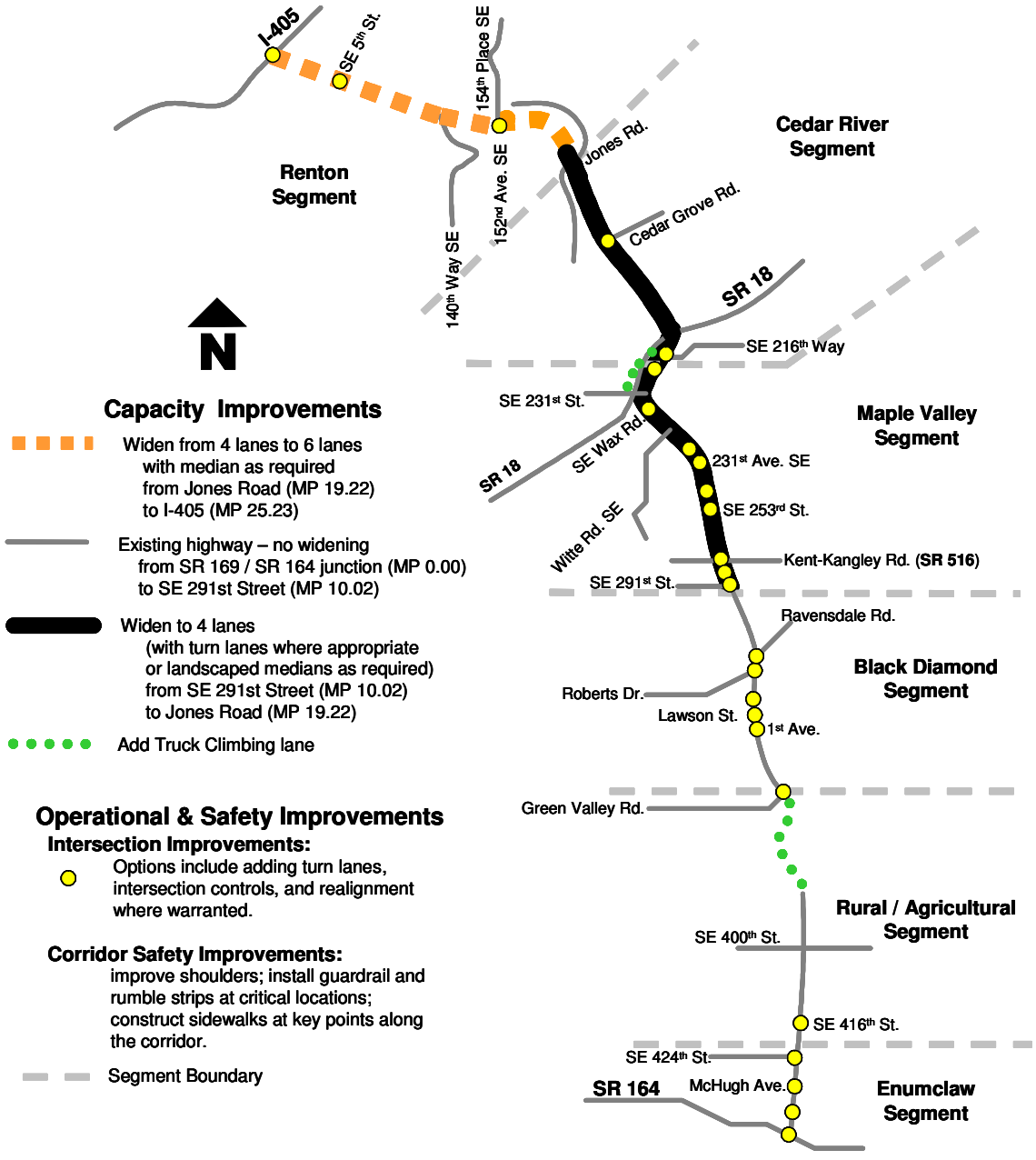


Exhibit 4.4

SR 169 Improvement Option 3



8 How were the benefits of the three improvement options compared to the costs?

The next step in the evaluation process involved determining the benefit-to-cost (B/C) ratio for each of the improvement options. The B/C analysis compared the benefits of an improvement option project to the project's costs. The resulting ratio was used to compare the three improvement options. If the B/C ratio is near one, the benefits and costs are about equal. The higher the B/C ratio, the more the potential benefits outweigh the costs.

What was the cost estimating methodology?

Preliminary project costs were prepared by WSDOT for each of the SR 169 improvement options. The cost estimate methodology was developed as part of a Congestion Relief Analysis (CRA) for Washington State's three metropolitan areas – Central Puget Sound, Spokane, and Vancouver. The methodology is intended for planning purposes only. The preliminary project costs are in 2005 dollars, are planning level and not based on engineering analysis. The methodology provided a generalized total for each segment based upon WSDOT experience with other projects of similar size and type. They do not account for potential environmental mitigation (including right-of-way), rising material costs or other unforeseen expenditures that may occur during design or construction. These factors may increase the final costs of individual projects.

A unit price approach is used that accounts for regional differences, as well as differences in land use types and development density within a region. Quantities per lane mile and unit costs have been developed from historical data on WSDOT projects. Some unit costs are adjusted for differences in area prices, terrain, ground conditions, and design assumptions. Little geotechnical information is assumed.

What was the benefit calculating methodology?

Benefits were calculated based on reductions in collisions and travel delay forecast over the course of a 20 year period. Collision benefits were based on expected collision reductions

What are the benefit-to-cost ratios for the three improvement options?

The benefit-to-cost ratios for the three options were as follows:

- Improvement Option 1 = 1.7
- Improvement Option 2 = 2.1
- Improvement Option 3 = 2.5

Appendix C describes, in more detail, the methodology used to determine the benefit-to-cost ratios for the three options.

resulting from specific types of roadway improvements. Each collision that can be alleviated by an option results in a savings. A minimum three-year collision data set along with appropriate AASHTO (American Association of State Highway and Transportation Officials) reduction factors was used to generate collision reduction benefits for the 20-year benefit period for each option.

Travel delay reduction benefit calculations were based on:

- average vehicle occupancy (AVO)
- truck percentage
- traffic volume
- growth rate
- posted speed

Operating speeds were used to calculate travel-time savings based on build and no build conditions. Dollar values for these time savings were then assigned to each vehicle. Values varied for different vehicle types. Each passenger vehicle was assigned a value of $14.07 and each truck $56.26 for each vehicle hour reduction in travel time. Benefits were calculated for the 20-year analysis period based on 260 working days per year.

The sum of the monetary savings over 20 years from collision reduction and travel time savings is the benefit of the project for purposes of the B/C analysis.

9 What are the Benefit-Cost Results?

The value of the 20-year benefits is divided by the 20-year project costs to obtain the B/C ratio. The B/C ratios for the three options are shown in Exhibit 4.5.

Exhibit 4.5
Benefit-to-Cost Analysis Results[1]

Option	20-Year Benefits			Costs		20-Year B/C Ratio[2]
	Travel Time	Safety	**Total**	Construction Costs	**Total Costs w/20-Year Depreciation**	
Improvement Option 1	$246	$34	**$280**	$212	**$162**	1.7
Improvement Option 2	$379	$39	**$418**	$259	**$197**	2.1
Improvement Option 3	$527	$46	**$573**	$303	**$232**	2.5

1. All costs are estimated in 2005 dollars and do not include inflation

2. The B/C Ratio equals the total 20-year benefits divided by the total costs with depreciation

All three options score ratios over "1," but the difference between them are not too significant. A difference of more than a few whole numbers (say a 2 to a 7) might sway a decision toward one option or another. While the difference between Option 3 and Option 1 are notable, these scores did not offer any determining factor.

10 How do the improvement options affect traffic conditions and mobility?

The B/C analysis did not help in determining which improvement option to recommend. The CWG requested the study team perform additional traffic analysis based on turning movements at key intersections. The three improvement options were evaluated to assess each proposal's impact on the 2030 traffic conditions along SR 169.

The analysis also assumed all current programmed projects presented in Chapter 2, Exhibit 2.22 on page 2-44 were completed. The results of the analyses were compared to the 2030 No Build conditions. The comparison evaluated the effectiveness of each option in addressing increased traffic

volumes and level of service reductions along SR 169 in the year 2030.

The traffic analyses included evaluating:

- PM peak hour travel time;
- Average daily traffic volumes (ADT);
- Intersection level of service;
- Intersection turning movements; and
- Roadway segment level of service.

Traffic results for the SR 169 corridor are summarized in Exhibit 4.6.

Exhibit 4.6
SR 169 Corridor Comparison of Traffic Operations

Transportation Element	Existing 2004	No Build 2030	Improvement Option 2030		
			Option 1	Option 2	Option 3
Corridor PM Peak Travel Time	45 minutes	54 minutes	45 minutes	44 minutes	43 minutes
Change in Corridor PM Peak Travel Time	NA	20% (over 2004)	(-17%) (over No Build)	(-19%) (over No Build)	(-20%) (over No Build)
Average Travel Speed	34 mph	28 mph	34 mph	35 mph	36 mph
Corridor ADT Volume Range	8,200–55,200	11,400–71,800	11,700–71,800	11,700–77,200	11,700–79,500
Change in Corridor ADT Volume	NA	30% to 39% (over 2004)	0% to 3% (over No Build)	3% to 8% (over No Build)	3% to 11% (over No Build)
Number of Failing Intersections during PM Peak Hour (LOS E or F)	3	10	8	9	8

Source: TRANSPO, February 2006

PM Peak Travel Times

The traffic analysis shows that all three of the proposed improvement options would improve traffic operations on SR 169 compared to the 2030 No Build. Options 1, 2, and 3 would keep travel times along the corridor similar to what they are today despite an increase of 30 percent or more in average daily traffic volumes (ADT).

Average Travel Speed

Similar to corridor travel times, the proposed improvement options are also expected to maintain or even slightly improve average travel speeds along SR 169.

Intersection Operations

Compared to the 2030 No Build, each of the options will have slightly fewer intersections operating over capacity during the PM Peak hour; however, the general trend for any of the options in 2030 is that the number of congested intersections will increase as the population and associated traffic volumes increase and traffic signals or roundabouts are added along SR 169 to help manage traffic and provide for safe turning movements at busy intersections.

As shown below in Exhibit 4.7, differences in traffic operations between Options 1, 2, and 3 are relatively minor. This is to be expected, since the only distinction between the options is how much of the Renton segment is widened to six lanes. As such, the Renton segment is the only segment analyzed where there are notable differences in traffic operations between each of the improvement options. Changes to traffic operations in each segment along SR 169 are described below.

Exhibit 4.7

SR 169 Comparison of Traffic Operations – Enumclaw Segment

Transportation Element	Existing 2004	No Build 2030	Improvement Option 2030		
			Option 1	Option 2	Option 3
PM Peak Hour Travel Time	2.6 minutes	2.6 minutes	2.6 minutes	2.6 minutes	2.6 minutes
ADT Volume Range	8,300–9,900	11,400–16,000	11,700–16,300	11,700–16,300	11,700–16,300
Change in Corridor ADT	NA	37% to 62% (over 2004)	2% (over No Build)	2% (over No Build)	2% (over No Build)
Number of Failing Intersections during PM Peak Hour (LOS E or F)	–	–	–	–	–
Failing Intersections	–	–	–	–	–

Source: TRANSPO, February 2006

As shown above in Exhibit 4.7, PM Peak travel times in the Enumclaw segment will remain similar to existing conditions under the 2030 No Build and all of the improvement options even though ADT volumes are expected to increase by 37 to 62 percent. The proposed improvements in this segment are more safety related than capacity or operational and thus would display less of a positive affect on travel time.

Exhibit 4.8
SR 169 Comparison of Traffic Operations – Rural / Agricultural Segment

Transportation Element	Existing 2004	No Build 2030	Improvement Option 2030		
			Option 1	Option 2	Option 3
PM Peak Hour Travel Time	7.5 minutes	8.2 minutes	7.5 minutes	7.5 minutes	7.5 minutes
ADT Volume Range	8,200–9,300	13,900–16,800	14,900–18,000	14,900–18,000	14,900–18,000
Change in Corridor ADT	NA	70% to 81% (over 2004)	7% (over No Build)	7% (over No Build)	7% (over No Build)
Number of Failing Intersections during PM Peak Hour (LOS E or F)	–	1	1	1	1
Failing Intersections	–	SE Green Valley Rd.	SE 400th St.	SE 400th St.	SE 400th St.

Source: TRANSPO, February 2006

Exhibit 4.8 above displays an expected increase in ADT volumes in this segment by up to 81 percent between now and 2030. As a result, travel times are expected to increase with the 2030 No Build. In each of the build options, PM Peak travel times are expected to be similar to 2004 conditions in the Rural / Agricultural segment because the addition of truck climbing lanes near the Green River Bridge will provide some additional roadway capacity and allowing traffic to move around slower moving vehicles in this segment.

Exhibit 4.9
SR 169 Comparison of Traffic Operations – Black Diamond Segment

Transportation Element	Existing 2004	No Build 2030	Improvement Option 2030		
			Option 1	Option 2	Option 3
PM Peak Hour Travel Time	8.2 minutes	9.8 minutes	10.5 minutes	10.5 minutes	10.5 minutes
ADT Volume Range	8,400–13,200	16,000–23,700	17,200–24,700	17,200–24,700	17,200–24,700
Change in Corridor ADT		80% to 90% (over 2004)	4% to 8% (over No Build)	4% to 8% (over No Build)	4% to 11% (over No Build)
Number of Failing Intersections during PM Peak Hour (LOS E or F)	1	4	2	2	2
Failing Intersections	–	Lawson St.	–	–	–
	–	Baker St.	–	–	–
	–	Roberts Dr.	Roberts Dr.	Roberts Dr.	Roberts Dr.
	Ravensdale Rd.	Ravensdale Rd.	Ravensdale Rd.	Ravensdale Rd.	Ravensdale Rd.

Source: TRANSPO, February 2006

In Exhibit 4.9 above data shows average daily traffic in the Black Diamond segment is expected to nearly double between now and 2030. As a result, travel times are expected to increase during the PM Peak hour for the 2030 No Build and all of the 2030 improvement options. Travel times through the Black Diamond segment are slightly higher under Options 1, 2, and 3 than the 2030 No Build because proposed improvements in this segment might include adding signalization at two of the failing intersections listed in Exhibit 4.9 above. These intersections are currently unsignalized. Adding signals at these intersections will improve intersection LOS and safety along the highway, but the tradeoff is a slight increase in travel times.

SR 169 has a Class 4 Access Classification in this 0.65 mile portion of Black Diamond. Class 4 restrictions require at least a half mile in signal spacing between signals, which means a maximum of two signals could be installed in this area. The utilization of realignment at the Roberts Drive / Ravensdale Road / SR 169 intersection and other intersection controls might provide better level of service and travel times.

Exhibit 4.10
SR 169 Comparison of Traffic Operations – Maple Valley Segment

Transportation Element	Existing 2004	No Build 2030	Improvement Option 2030		
			Option 1	Option 2	Option 3
PM Peak Hour Travel Time	7.5 minutes	9.6 minutes	6.0 minutes	6.0 minutes	6.0 minutes
ADT Volume Range	11,900–39,700	15,600–58,100	19,000–70,600	19,000–70,600	19,000–70,600
Change in Corridor ADT		31% to 46% (over 2004)	22% (over No Build)	22% (over No Build)	22% (over No Build)
Number of Failing Intersections during PM Peak Hour (LOS E or F)	1	2	4	4	4
Failing Intersections	SR 516	SR 516	SR 516	SR 516	SR 516
	–	–	Witte Rd.	Witte Rd.	Witte Rd.
	–	Wax Rd.	Wax Rd.	Wax Rd.	Wax Rd.
	–	–	SE 231st St.	SE 231st St.	SE 231st St.

Source: TRANSPO, February 2006

Exhibit 4.10 above shows that ADT is expected to increase by 31 to 46 percent for the 2030 No Build compared to existing conditions. This will result in increased travel times during the PM peak hour if improvements are not made to this section of roadway. Options 1, 2, and 3 all propose to widen SR 169 to four lanes in this segment. As a result, PM peak travel times are expected to decrease compared to both the 2030 No Build and existing conditions.

ADT is expected to increase with the improvement options compared to the 2030 No Build because SR 169 will be widened to four lanes north of SE 291st St and the additional capacity on SR 169 in this segment will attract more vehicles to this portion of SR 169.

Exhibit 4.11
SR 169 Comparison of Traffic Operations – Cedar River Segment

Transportation Element	Existing 2004	No Build 2030	Improvement Option 2030		
			Option 1	Option 2	Option 3
PM Peak Hour Travel Time	9.1 minutes	10.5 minutes	6.5 minutes	6.5 minutes	6.5 minutes
ADT Volume Range	19,000–19,400	25,300–25,600	28,600–33,600	29,900–35,100	30,800–36,100
Change in Corridor ADT		32% to 33% (over 2004)	13% to 31% (over No Build)	18% to 37% (over No Build)	22% to 41% (over No Build)
Number of Failing Intersections during PM Peak Hour (LOS E or F)	–	1	–	–	–
Failing Intersections	–	SE 216th Way	–	–	–

Source: TRANSPO, February 200

Similar to the other segments and as shown in Exhibit 4.11, ADT is expected to increase by about 32 percent for the 2030 No Build compared to existing conditions. This will result in increased travel times during the PM peak hour if improvements aren't made to this section of roadway. Options 1, 2, and 3 all propose to widen SR 169 to four lanes in this segment. As a result, PM peak travel times are expected to decrease compared to both the 2030 No Build and existing conditions.

Similar to the Maple Valley segment, ADT is expected to increase with the improvement options compared to the 2030 No Build because the additional capacity on SR 169 in this segment will allow more vehicles to travel through the area.

On the far north end of this segment near Jones Road there is a slight difference in the projected ADT between the three improvement options. This difference is due to the additional proposed roadway capacity in options 2 and 3 not provided for in Option 1.

Exhibit 4.12
SR 169 Comparison of Traffic Operations – Renton Segment

Transportation Element	Existing 2004	No Build 2030	Improvement Option 2030		
			Option 1	Option 2	Option 3
PM Peak Hour Travel Time	10.3 minutes	12.9 minutes	12.0 minutes	10.8 minutes	10.2 minutes
ADT Volume Range	19,900–55,100	37,000–71,800	38,200–71,800	41,300–77,200	42,500–79,500
Change in Corridor ADT		30% to 86% (over 2004)	0% to 3% (over No Build)	8% to 12% (over No Build)	11% to 15% (over No Build)
Number of Failing Intersections during PM Peak Hour (LOS E or F)	1	2	1	2	1
Failing Intersections		140th Way SE	–	140th Way SE	–
	–	–	I-405 SB On-Ramp	I-405 SB On-Ramp	I-405 SB On-Ramp
	I-405	I-405	–	–	–

Source: TRANSPO, February 2006

Exhibit 4.12 above shows that ADT is expected to increase by 30 to 86 percent by 2030. As a result PM peak travel times are expected to increase for both the 2030 No Build and Option 1. Option 1 proposes some intersection and turn-lane improvements in this section, but these changes will not have much of an effect on travel times compared to the 2030 No Build. Option 2, however, will result in only a slight increase in travel times compared to existing conditions because with this option, SR 169 would be widened to six lanes from 140th Way SE to I-405. This will increase capacity in this section to accommodate the projected increase in trips. Option 3 would essentially maintain travel times in this segment compared to existing conditions because the entire segment would be widened from Jones Road to I-405.

11 How would the proposed improvement options enhance safety?

The many ways in which the proposed improvement options will enhance safety on SR 169 include:

- improving sight distance and roadway geometrics (such as the width of the roadway or the alignment of the roadway) to provide drivers with improved visibility;
- providing additional truck lanes in areas where steep grades slow traffic down;
- adding turn lanes to help reduce rear-end and other collisions;
- adding signals or improve roadway channelization to provide protected turning movements;
- adding or widen roadway shoulders;
- closing access at awkward intersections or realign awkward intersections;
- restricting access to and from driveways by installing a median or C curb and allowing for U-turns at the next stop controlled intersection;
- providing lighting along the roadway; and
- adding sidewalks in areas where commercial, residential, or other uses (such as schools) warrant provisions for pedestrians

Appendix D

Appendix D contains a complete list of the projects proposed in this RDP and it identifies possible safety improvements associated with the proposed projects.

12 Are the proposed improvements consistent with state and local plans?

The Washington State Highway System Plan (HSP) is the element of Washington's Transportation Plan that addresses the state's highway system. The HSP is an assessment of existing and projected 20-year deficiencies on the state's highway system. It also lists conceptual solutions that address these deficiencies. An RDP is one of the primary methods in which

the conceptual strategies identified in the HSP are refined. A number of HSP strategies indicate that further study of highways is needed to identify the appropriate action. This RDP provides the needed detailed analysis to help identify refinements to HSP strategies. Appendix C identifies how improvements proposed in this RDP meet the objectives of the State's HSP.

In addition to consistency with state objectives, this RDP must also be consistent with regional and local plans. The limits of the SR 169 corridor traverse five jurisdictions, including the cities of Enumclaw, Black Diamond, Maple Valley, and Renton and unincorporated portions of King County. All of the jurisdictions' comprehensive plans must be in accord with the multi-county planning policies that are adopted by the Puget Sound Regional Council (PSRC). All of these jurisdictions and the PSRC had representatives on the SR 169 Corridor Working Group and actively participated throughout the entire study process. Some suggestions for improvements along the corridor came from jurisdictions' comprehensive plans. The recommended projects were endorsed by those CWG members, indicating consistency with local and regional planning efforts.