Appendix K

Second Level Screening Methodology

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The p719 2ND AVENUE, SUITE 200 | SEATTLE, WA 98104 | P 206.394.3700

TECHNICAL MEMORANDUM

DATE: March 13, 2020

TO: Katie Ketterer

FROM: Alex Atchison, PE, PTOE
Michael Horntvedt

SUBJECT: Screening Methodology

CC:

PROJECT NUMBER: 554-1896-156

This screening methodology memorandum describes the proposed metrics and methodologies that will be used to complete the detailed second level screening evaluation for the SR 303 corridor study.

The purpose of the evaluation process was to study a range of potential strategies to see how the concepts performed against the study's goals. The study team used WSDOT's Draft Mobility Performance Framework to identify relevant data-driven performance measures and metrics that will help measure how different strategies address study needs. Measures and metrics will be evaluated for each of the study's six key goals, as shown below. A detailed description of the specific measures and the methodology of how they were applied is included in the discussion below.

Segments

For this study, improvements will be evaluated by segment, as context changes considerably along the length of the corridor within the study area. Analyzing performance by segment will allow the study team to determine what combination of solutions will provide the optimal corridor-wide performance while balancing trade-offs. The segments include:

1. Burwell Street to 16th Street
2. 16th Street to Sheridan Road
3. Sheridan Road to NE Riddell Road
4. NE Riddell Road to NE McWilliams Road

Cost Opinion

The team will develop preliminary cost opinions that will be shown as three levels: low, medium, and high. These levels of cost will be based on local engineering knowledge and general assumptions about level of cost for similar roadway improvements. The range of costs will not be selected until cost opinions are completed and the ranges can be more well defined. Cost opinions are expected to be shared as "below the line" information that will not be used in the ranking process but can be used by decision makers to understand how project funding could drive project phasing.

Performance Metrics and Ranking

Proposed concepts to the SR 303 corridor were grouped into three Build Alternatives. These three Build Alternatives will be evaluated along with the No Build Alternative. For each of the four corridor segments, each alternative will be assigned a score for each individual metric described below based on the proposed improvements to that corridor segment. The four alternatives will then be ranked in order of benefit from 1 to 4 based on these scores. Alternatives with the same individual metric score will be assigned the same ranking. The rankings for each individual metric will then be totaled and potentially weighted to determine an overall score for each alternative and segment.

Safety

Through the public and stakeholder outreach process the study team learned that one of the primary needs for the corridor is improved safety for all modes. Even though the crash rate data along the corridor represents an average level of crashes for similar facilities, the traveling public recognizes a need to improve upon that average to reduce crash potential along the corridor to benefit the community.

Total Crash Frequency

The Crash Modifications Factors Clearinghouse, funded by the U.S. Department of Transportation Federal Highway Administration, has developed a series of crash reduction factors that can be used to help planners understand how corridor design changes can affect crash rates. These factors are empirically based and are used as an industry standard for estimating crash frequency. The study team will use the crash reduction factors and the Highway Safety Manual analysis tools to estimate the change in total crash frequency expected after implementation of proposed corridor strategies. Alternatives will be ranked on the estimated total number of crash reductions. The target is a reduction of total crashes compared to the No Build Alternative.

Crash Severity

The Crash Modifications Factors Clearinghouse list of crash reduction factors also relates to crash severity. Again, the study team will use the crash reduction factors and the Highway Safety Manual analysis tools to estimate the change in crash severity expected after implementation of proposed strategies. Alternatives will be ranked by the level of reduction in serious injury and fatal crashes. The State target is to achieve zero serious injury and fatal crashes.

Non-Motorized

Comments received from the public and stakeholders through the outreach process outlined a need for the study to identify strategies that improve the bicycle and pedestrian facilities along the corridor. People noted concerns about availability of connection along the corridor, discomfort walking or riding along the corridor, and concerns about the number of driveway crossings where pedestrians and cars would possibly interact. People also noted that the bicycle route along the corridor does not exist in a clear and understandable configuration. Improving the connectivity for non-motorized access has been identified as a primary need.

Gaps in non-motorized system

Existing pedestrian and bicycle facilities will be documented using GIS data from the City of Bremerton. Locations where no pedestrian or bicycle facilities exist adjacent to the SR 303 corridor will be documented as gaps. Each alternative will work to improve the corridor by removing the gaps in the system. Alternatives will be evaluated by the length of improvements to existing gaps along SR 303. Alternatives will be ranked in order of which provides

the most benefit. The City would like to provide a corridor with a fully functional non-motorized system that has zero gaps.

Obstructions to non-motorized facilities

Existing obstructions to non-motorized pathways (e.g. sub-standard sidewalk widths, utility poles in the sidewalk, etc.) will be documented using GIS data from the City of Bremerton. Locations with obstructions will be documented. Alternatives will be evaluated by the number of improvements to existing obstructions along SR 303. Alternatives will be ranked in order of which provides the most benefit. Again, the City would prefer to have a non-motorized system that is free of obstructions so that pedestrians and cyclists will feel more comfortable using the system.

Walkability

Currently there are long distances between marked pedestrian crossings along SR 303. To evaluate walkability, pedestrian crossings per mile for each alternative will be documented. Alternatives will be evaluated based on the increase in the number of marked pedestrian crossings across SR 303. Alternatives will be ranked in order of which provides the most benefit. The target is to improve upon the number of crossings compared to the No Build Alternative.

Traffic Operations

Public input clearly noted that people experience an inconsistency in their travel time along the SR 303 corridor. People noted that they would experience different travel times from one day to the next because of transit stops, signal delay, and delay associated with crashes. This section focuses on measuring delays associated with signal timing for the general-purpose traffic and for transit modes.

Segment Delay

One way to measure traffic congestion is to measure impact to delay along the corridor segments. Delay data will be pulled from Synchro for the northbound 2040 PM peak hour. The peak-direction (northbound) for the peak hour (PM Peak) will be evaluated as it represents the direction and time period of travel with the highest delay in the year 2040 No Build Alternative. Directional delay at each signalized intersection in the segment and total peak-direction delay by segment will be used to evaluate alternatives.

Improvements in segment delay for transit will be calculated for strategies that would specifically benefit transit, such as transit signal priority, transit lanes, or transit queue jumps. Calculations will be based on output from Synchro and some post processing to account for travel time benefits that cannot be captured in the Synchro modeling platform. For strategies not involving transit specific improvements (e.g. general signal timing improvements) the percent change for transit will be assumed to be the same as for autos, as transit and autos would still be traveling in the same lanes. Alternatives will be ranked in order of delay time savings. The target is to improve upon the segment delay compared to the No Build Alternative.

Person Mobility (Non-Transit)

To provide a more comprehensive evaluation of overall corridor mobility, this study will evaluate person mobility, or the ratio of people by mode / travel time by mode. Two modes of travel will be estimated for this metric: transit and other vehicles (personal vehicle, freight, delivery, HOV, etc.). This section describes the person mobility for non-transit vehicles. Person mobility for transit is described in a following section.

Person mobility will be evaluated for the peak-direction (northbound) in the peak hour (PM Peak) as it represents the direction and time period of travel with the highest delay in the year 2040 No Build Alternative. To estimate the year 2040 total number of travelers in the northbound direction during the PM peak hour, the study team will assume an average vehicle occupancy of 1.13 passengers per car on each segment to determine the total number of people traveling. The travel time estimate will consist of general delay, which will be calculated for the measure above. Alternatives will be ranked in order of benefit. The target is to improve the person mobility compared to the No Build Alternative.

Freight Access

Working with the City of Bremerton, the study team will outline existing freight routes to businesses along the corridor. Alternatives will be evaluated based on the number of freight routes that could be potentially redirected as a result of proposed improvements. Alternatives will be ranked in order of benefit. The target is zero diversions for freight traffic.

Transit

Transit accessibility and availability was highlighted as a need for the study. People noted that transit stops needed improvement, accessibility to the transit stops needed improvement, and reliability of transit travel times was also needed. This category works to address many of the needs outlined by the public and stakeholders.

Accessibility

This measure evaluates the non-motorized system that provides pedestrian accessibility to transit facilities (e.g. bus stops, transit stations or park-and-rides.) Alternatives will be evaluated based on whether the proposed improvements reduce the walking distance between transit facilities and neighborhoods. Alternatives will be ranked in order of benefit. The target is to improve the walking distance compared to the No Build Alternative.

Person Mobility (Transit)

To provide a more comprehensive evaluation of overall corridor mobility, this study will evaluate person mobility, or the ratio of people by mode / travel time by mode. Two modes of travel will be estimated for this metric: transit and other vehicles (personal vehicle, freight, delivery, HOV, etc.). This section describes the person mobility for transit vehicles. Person mobility for non-transit vehicles is described above.

Person mobility will be evaluated for the peak-direction (northbound) in the peak hour (PM Peak) as it represents the direction and time period of travel with the highest delay in the year 2040 No Build Alternative. The 2040 total number of transit travelers in the northbound direction during the PM peak hour will be calculated based on information collected from Kitsap Transit. The travel time estimate will consist of two types of delay: general delay – which will be similar to non-transit delay, as transit currently travels with regular auto traffic in the No Build Alternative – and the addition of delays at bus stops for picking up and dropping off passengers. Alternatives will be ranked in order of benefit. The target is to improve the person mobility compared to the No Build Alternative.

Right-of-Way (ROW)

ROW was not identified as a primary need; however, it is included in this second level screening evaluation to ensure the City and public understand what level of impacts could be associated with each alternative. Impacts to ROW will affect alternative schedules and budgets. ROW impacts will be developed based on planning level estimates and not on design.

Property Impacts

This measure will account for properties that could be physically impacted by the alternatives and would require some level of property purchase to move forward with implementing the alternative. This does not include full parcel acquisition. The total number of properties impacted by alternatives will be estimated based on the preliminary alternative layouts and the cost will be estimated based on approximate property values. Alternatives with the greatest cost for property impacts will be ranked lowest. The target is to have zero property impacts.

Property Acquisitions

The number of full property acquisitions necessary for each potential alternative will be documented. The total number of full property acquisitions for each alternative will be estimated based on the preliminary alternative layouts and the cost will be estimated based on approximate property values. Alternatives with the greatest cost for full property acquisitions will be ranked lowest. The target is to have zero full property acquisitions.

Economic Vitality

The public provided comments through the in-person open house, online open house, and project website. Some of the comments received noted that additional work on the corridor would be beneficial to attract new businesses and fill vacant properties. This measure will assess how the corridor look and feel can affect the local land value. Improvements in land value would improve the economic vitality of the area by providing opportunity for new business, improved housing, and a more inviting area to shop and live. This metric was outlined as a primary need for the corridor.

Property Values adjacent to SR 303

The team will evaluate similar projects in the region (e.g. Aurora Ave in Shoreline, WA) to determine how property values adjacent to a corridor improvement project changed as a result of the project. This data will be used to help the team understand how the proposed alternatives might improve property values, have no effect, or degrade property values. The potential change in property value resulting from corridor improvements will be documented. Alternatives will be ranked in order of the number of benefits. The target is an improvement in overall property values along the corridor compared to the No Build Alternative.

Access to Business

The team will qualitatively evaluate how access to existing business will be impacted by the proposed alternatives. Alternatives will be ranked in order of the number of benefits. The target is an improvement in access to businesses along the corridor compared to the No Build Alternative.

Table 1: SR 303 Corridor Study: Screening Metrics

Category	Metric	Measure	Method	Target	Ratings			
					1	2	3	4
Safety	**Total Crash Frequency**	Total number of crashes	Potential to reduce total crashes	Improved compared to No Build	Alternatives will be ranked on total number of crash reductions; reduction estimates based on predictive analysis			
	Crash Severity	Number of serious and fatal crashes	Potential to reduce serious and fatal crashes	Zero serious injury or fataliites	Alternatives will be ranked on total number of reductions in severe and fatal crashes; reduction estimates based on predictive analysis			
Non-Motorized	**Gaps in non-motorized system**	Number of gaps in non-motorized system along SR 303	Measure length of gaps in non-motorized system	Zero gaps in non-motorized system	Alternatives will be ranked in order of reduction in gaps in non-motorized system			
	Obstructions to non-motorized facilities	Number of obstructions to non-motorized facilities along SR 303	Count number of obstructions to non-motorized facilities	Zero obstructions to non-motorized facilities	Alternatives will be ranked in order of reduction in obstructions to non-motorized facilities			
	Walkability	Marked pedestrian crossings per mile along SR 303	Count number of marked pedestrian crossings per mile	Improved compared to No Build	Alternatives will be ranked in order of benefit			
Traffic Operations	**Segment Delay**	Delay	Measure intersection and roadway delay with industry standard models	Improved compared to No Build	Alternatives will be ranked in order of delay time savings			
	Person Mobility	Ratio of number of persons to person travel time for SOV	Measure number of people and travel time by segment	Improved compared to No Build	Alternatives will be ranked in order of benefit			
	Freight Access	Number of impacted freight routes	Determine how many freight routes would be diverted	Zero diversions	Alternatives will be ranked in order of benefit			
Transit	**Accessibility**	Pedestrian accessibility directly to transit facilities	Measure shortest walking distance within 1/4 mile radius of transit facilitiy	Improved compared to No Build	Alternatives will be ranked in order of benefit			
	Person Mobility	Ratio of number of persons to person travel time for bus	Measure number of people and travel time by segment	Improved compared to No Build	Alternatives will be ranked in order of benefit			
ROW	**Property Impacts**	Number of properties impacted by alternative	Estimate number of properties impacted	Zero impacts	Alternatives will be ranked in order of impact			
	Property Acquisitions	Number of full property aquistions	Estimate number of properties impacted	Zero impacts	Alternatives will be ranked in order of impact			
Economic Vitality	**Adjacent Property Values**	Value of property adjacent to SR 303	Compare similar corridor impacts to property value	Improve value	Alternatives will be ranked in order of acquistion			
	Access to Business	Access to existing businesses		Improved compared to No Build	Alternatives will be ranked in order of benefit			