RH2 TECHNICAL

Memorandum

Client: Transpo Group

Project: Wenatchee SR 285 Safety Improvements

Project File: TG 213.079 **Project Manager:** Erik Howe, P.E.

Composed by: Erik Howe, P.E.

Reviewed by: Randy L. Asplund, P.E.

Subject: SR 285 Safety Study

Date: December 19, 2013

The City of Wenatchee (City) is evaluating potential improvements to traffic safety and operations in and around the downtown area. RH2 Engineering, Inc., (RH2) as a subconsultant to Transpo Group, is assisting with developing transportation system strategies that may improve the business climate in the area south of downtown as well as provide enhanced safety for the pedestrians and bicycles. The following serves as a supplement to the City's South Wenatchee Subarea Planning White Paper: Transportation Analysis, dated June 27, 2013.

Commercial – South Wenatchee Avenue

The following summarizes the methodology used in selecting the preferred roadway sections for South Wenatchee Avenue between Kittitas and Ferry Street. This task is part of several tasks associated with identifying safety improvements along State Route (SR) 285. The South Wenatchee Avenue configuration study workflow was developed using the following tasks:

1. Identify roadway section configurations that improve safety and mobility for all forms of travel;
2. Evaluate the options from task 1 against evaluation criteria; and
3. Refine and provide cost analysis for preferred alternatives.

Task 1 sought to provide a variety of options that were not limited to cost or preference to any one mode of travel. Options included additional travel lanes, reduced lanes, bike lanes, cycle tracks, additional sidewalk, reduced sidewalk, medians, center turn lanes, etc. The enclosed **Appendix B** (***Exhibit A***), illustrate the options considered.

South Wenatchee Avenue within the study area consists of four travel lanes, parallel parking, and sidewalk on both sides of the road. The existing curb to curb width is 61 feet. Sidewalk on the west side of the road is 14 feet wide, and sidewalk on the east side of the road is 14 feet wide from Kittitas Street to Bridge Street and 5 feet wide south of Bridge Street. There are street trees at various locations along both sides of the road. The posted speed limit is 25 miles per hour (mph) north of Spokane Street and 30 mph south of Spokane Street. The following photos show the existing configuration looking north and south.

Kittitas Street – Direction South

Spokane Street – Direction South

Spokane Street – Direction North

Benton Street – Direction South

Benton Street – Direction North

Ferry Street – Direction North

RH2 and Transpo Group staff met with City staff to discuss the options considered. From that meeting, some constraints were applied that included no additional right-of-way, and no changes to existing roadway width. These two constraints removed all but four of the options considered. In addition, other evaluation criteria discussed included ability to meet capacity, accommodation for pedestrian and bicyclists, parking, aesthetics, cost, and impacts to businesses.

Transpo Group then evaluated the study area based on existing and projected AM and PM traffic counts. **Appendix A** contains the Memorandum detailing the evaluation. From this analysis it was determined that a three-lane section is viable between Kittitas Street and Bridge Street. The roadway will need to transition back to the existing five-lane section from Bridge Street to match the existing configuration at Ferry Street. **Appendix B, (*Exhibit A*)** contains a plan view exhibit showing the possible configurations for South Wenatchee Avenue. Planning-level cost estimates are provided in **Appendix C**.

It should be noted that within each option there are a variety of sub-options with varying cost implications. For example, two-way left turn lanes between Kittitas Street and south of Spokane Street could be either hardscaped or landscaped medians. For an equal cost comparison between options, all median areas were considered landscaped.

As with many road projects, accepting change can be difficult for businesses and the traveling public. Adding medians will provide a managed access transportation system which typically improves flow and safety but limits the ability to enter and exit businesses. U-turns will likely be needed at major intersections to improve circulation. Adding U-turns will require signal modifications and may necessitate additional land acquisition. Working with business and property owners well in advance of proposed changes will greatly improve project implementation.

Commercial – Mission/Chelan/Chehalis Intersection

The following summarizes the methodology used in preparing pedestrian circulations improvements from Chelan Avenue across Mission Street in the vicinity of Chehalis Street. **Appendix B (*Exhibit B*)** shows a plan view exhibit of the recommended circulation plan.

Chelan Avenue is a two-lane southbound one-way arterial with parking and sidewalk on both sides of the road. Curb to curb width is 43 feet. The posted speed limit is 30 mph. There is a signalized intersection at Yakima Street but all other pedestrian crossings take place at unsignalized intersections or illegally at un-channelized mid-block crossings.

Mission Avenue begins a three-lane northbound one-way arterial at Chehalis Street with parking and sidewalk on both sides of the road and curb to curb width is 56 feet. The posted speed limit is 30 mph. The nearest signalized intersections are at Kittitas Street (approximately 1,570 feet north of Chehalis Street) and Ferry Street (approximately 2,220 feet south of Chehalis Street). All other pedestrian crossings take place at unsignalized intersections or illegally at un-channelized mid-block crossings.

The City is currently restriping the intersection where Chelan Avenue merges with Mission Avenue to better accommodate freight travel and crossings at Chehalis Street. After review of the proposed changes and discussions with City staff, RH2 prepared a pedestrian circulation plan that would take advantage of the proposed changes. One of the major changes to the current intersection is the proposed stop condition for vehicles traveling south on Chelan desiring to go north on Mission or east to Chehalis. This proposed stop condition provides an opportunity for a pedestrian crossing with a refuge island. Pedestrians can cross northbound traffic only and crossing distances are reduced. This proposed location requires a slight modification to the proposed striping plan on Mission Avenue as it crosses Chehalis Street. The parking lane would begin approximately 250 feet north of Chehalis Street. Additionally, pedestrian actuated rapid flashing beacon signs (or similar) are recommended on Mission Avenue to provide advanced warning for crossing pedestrians.

The pedestrian circulation plan also includes an alternate configuration where Chelan Avenue merges with Mission Avenue. This alternate configuration will more directly align Chelan Avenue with Chehalis Street, allowing for an easier transition for vehicles traveling onto Chehalis Street. This configuration will provide a large median with a pedestrian pathway and adequate space to accommodate landscaping to improve the aesthetic appeal of the area. The crossing distance for pedestrians will be reduced by providing a cross walk that only crosses northbound traffic. Pedestrian actuated rapid flashing beacon signs are also recommended on Mission Avenue for advanced warning of pedestrian crossing.

The proximity of signalized intersections on Chelan Avenue limits pedestrian mobility near Chehalis Street. As previously stated, the closest signalized intersection is located at Yakima Street approximately 2,100 feet north of Chehalis Street. For this reason, a channelized mid-block crossing with pedestrian actuated rapid flashing beacons (or similar) are recommended. The exact location of the mid-block crossing can vary somewhat and should be placed where adequate sight distance can be achieved along with adjacent property owner support. For planning purposes, the mid-block crossing was placed at a point near the middle of Kittitas Street and Spokane Street.

A shared use pedestrian/ bicycle path in the vicinity of Thurston Street connecting the mid-block crossing would aid in the overall circulation of pedestrians. This pathway would extend from the mid-block crossing on Chelan Avenue and extend towards Mission Avenue and Methow Street. The pathway would provide more accessibility for pedestrians and bicyclists between Chelan Avenue and Mission Avenue.

Other crossing locations considered included Spokane Street or requiring pedestrians to continue on Chelan Street to Ferry Street. This option, however, was considered too circuitous and would not likely get used as desired.

Loop Trail/Waterfront Access

As part of the South Wenatchee Avenue sub-area planning analysis, the City has hired Transpo Group and RH2 to perform a feasibility analysis and cost estimate for extending the existing pedestrian bridge west across the Burlington Northern Santa Fe (BNSF) railway to Bridge Street near the vicinity of Columbia Street. The following photo shows the general vicinity of where the bridge would touch down near Columbia Street.

View Looking West From the Existing Ped Bridge

Appendix B (*Exhibit C*) shows a plan and profile view. This report is intended to supplement the City's South Wenatchee Subarea Planning White Paper: Transportation Analysis.

The photo below shows the existing pedestrian bridge western terminus. There are a number of constraints that dictate the configuration of the proposed improvements. There is a 48-inch irrigation line running across and down along the existing loop ramp to the pedestrian bridge. The existing loop ramp has a running slope of approximately 13 percent, which does not meet current Americans with Disabilities Act (ADA) standards. BNSF railroad tracks must be crossed approximately 200 feet from the existing bridge take-off location and require a minimum 23.5 feet clearance from rails to bottom of deck. The South Columbia Street crossing requires a minimum clearance for non-freeway of 15.5 feet, which was assumed adequate for the truck traffic the road conveys.

Western Terminus of Existing Pedestrian Bridge

The proposed configuration contains two concepts with three bridge types. The primary differences between the two concepts are the loop ramp configuration and the western terminus location. The three bridge alternatives provide options for span length and bridge type. Each of the concepts and options considered do not include a covered structure.

The first concept shows a loop ramp similar to the existing loop ramp, however, the length of the ramp is longer to allow for a 5 percent running slope meeting current ADA standards. The western terminus is on Bridge Street just west of Columbia Street. Columbia Street would remain in its current configuration and the alleyway connection on Bridge Street would be closed.

The second concept shows a 'T'-intersection just west of the connection to the existing pedestrian bridge. Each leg of the 'T' maintains a maximum 5 percent running slope and there are no loops in the ramp. The new alignment of the current loop ramp would utilize the City-owned parcel north of the existing loop ramp. This concept requires the northern terminus to touch down approximately 500 feet north of the current location. This concept shows Columbia Street being re-graded along with utilities lowered to allow the western ramp terminus to touch down just east of the alleyway.

Each of these concepts will provide sufficient access across the BNSF railway, however, existing pedestrian access on Bridge Street to South Columbia Street will be eliminated under these scenarios. It is assumed that pedestrians will instead utilize the existing sidewalk network on South Wenatchee Avenue and Benton Street to access South Columbia Street.

The three bridge types include a weathering steel truss, a high-strength weathering steel truss, and a Tunable truss design. Cost estimates for these structures were provided by Big R Bridge Co. The primary differences between the three bridge types are span length between abutments and truss style.

Some of the characteristics of weathering steel bridges, as shown in the photo below are:

Example of a Weathering Steel Bridge

- Has a stable rust layer that adheres to the base metal, creating a protective barrier that greatly decreases the corrosion rate;
- Eliminates the need for paint; and
- Requires minimal maintenance.

Some of the characteristics of tunable truss bridges, as shown in the photo left are:

Example of Tunable Truss Bridge

- Combines the physics of a hinged tied arch with a standard steel truss system
- Pins and connectors visible for easy inspection
- Adjustable "tuning" structural system allows for a lighter, lower-cost material

These bridge concepts and options range in cost from $3.5 million to $4.5 million (these estimates do not include right-of-way, BNSF permitting, or PUD relocation costs). A planning-level cost estimate is included in **Appendix C**.

Appendices

Appendix A – Transpo Group Traffic Evaluation

Appendix B – Exhibits

1) Exhibit A – South Wenatchee Avenue Overview and Concepts
2) Exhibit B – Pedestrian Circulation Plan
3) Exhibit C – Loop Trail/Waterfront Access Plan and Profile

Appendix C – Cost Estimates

Appendices

Appendix A
Transpo Group Traffic Evaluation

transpoGROUP
WHAT TRANSPORTATION CAN BE.

MEMORANDUM

Date:	July 31, 2013	**TG:**	13033.00
To:	Matt Leonard, City of Wenatchee Gary Owen, City of Wenatchee		
From:	Larry Toedtli		
cc:	Erik Howe, RH2 Engineering		
Subject:	South Wenatchee Avenue Capacity Needs		

The City of Wenatchee is evaluating alternative configurations of S Wenatchee Avenue between Kittitas and Ferry Streets. This segment of S Wenatchee Avenue currently has four travel lanes – two in the northbound direction and two in the southbound direction. On-street parking is generally allowed on both sides of S Wenatchee Avenue between Kittitas and Bridge Streets.

Traffic forecasts for the PM peak hour were prepared and evaluated to determine the capacity needs of the corridor. The PM peak hour has the highest volume of traffic along the corridor so it will be the controlling element for the capacity requirements. The following summarizes existing PM peak hour volumes, forecast volumes, and analysis of capacity needs in the corridor.

Existing PM Peak Hour Traffic Volumes

Available traffic count data were assembled for roadway segments and intersections along the corridor. These provide the baseline for preparing the forecasts. As shown in Table 1, the existing counts north of Kittitas Street are approximately 850 vph. The 2013 volumes north of Spokane Street increase to over 1,000 vph, which are lower than the May 2008 volume of 1,130 vph at the same location.

South of Spokane Street, volumes increase to 1,300 vph. The increase is primarily associated with the west-to-south left turn movement for vehicles connecting from the waterfront. Continuing further south, PM peak hour traffic volumes on S Wenatchee Avenue north of Ferry Street were 1,800 vph in 2007. South of Ferry Street, the 2007 traffic count showed over 2,100 vph.

Forecast PM Peak Hour Traffic Volumes

Traffic forecasts were prepared for the S Wenatchee Avenue corridor by factoring the existing counts by growth rates developed from review of the WVTC regional travel demand model. The WVTC regional model shows growth rates of approximately 1.3 percent per year in the southbound direction of the segment of S Wenatchee Avenue. In the northbound direction, growth rates ranged from 0.5 percent to 1 percent per year.

The growth rates were applied to the existing volumes to estimate 2030 PM peak hour volumes. In addition adjustments were applied to reflect the decrease in traffic counts between 2008 and 2013. Table 1 shows the resulting forecasts at various locations along S Wenatchee Avenue. Southbound volumes grew at a faster rate compared to northbound volumes. Forecast volumes between Kittitas and Spokane Streets range from 1,000 to 1,200 vph. The forecasts show 2,200 vph north of Ferry Street, with over 2,600 vph south of Ferry Street.

We also reviewed the prior traffic forecasts prepared for the WSDOT improvements to the west end of the Sellar Bridge. Those forecasts also show the need to maintain the five lane cross-section on S Wenatchee avenue north of Ferry Street.

Table 1. S Wenatchee Avenue Traffic Volumes and Forecasts

		Existing			2030 Forecast		
S Wenatchee Avenue:	**Year**	**Southbound**	**Northbound**	**Total**	**Southbound**	**Northbound**	**Total**
- north of Kittitas Street	2013	520	335	855	645	370	1,015
- south of Kittitas Street	2013	565	340	905	705	370	1,075
- north of Spokane Street	2013	585	420	1,005	730	455	1,185
- north of Ferry Street	2007	1,165	635	1,800	1,450	750	2,200
- south of Ferry Street	2007	1,415	730	2,145	1,755	865	2,620

Capacity Needs Evaluation

The forecast PM peak hour traffic volumes were evaluated to determine the appropriate lane configuration needed to provide adequate capacity. Typically a two-lane arterial with left-turn lanes (as appropriate) would have a generalized capacity in the range of 800 to 1,200 vph depending on side street volumes, number and spacing of traffic signals, and signal timing parameters.

Between Kittitas and Spokane Streets, the forecast, directional PM peak hour volumes are well below the capacity of a two-to-three lane arterial. Just south of Spokane Street the forecast volumes will be approaching the upper limit of the generalized capacity values. An operations analysis was conducted for the intersection of S Wenatchee Avenue/ Spokane Street based on the 2030 forecast PM peak hour traffic volumes to confirm that a two lane plus left-turn lane configuration would provide adequate capacity at the intersection. The 2030 forecast PM peak hour was estimated to operate at LOS C with the revised lane configuration which indicates that the signalized intersection would not restrict the overall capacity of S Wenatchee Avenue.

The forecast traffic volumes north of Ferry Street will exceed the generalized capacity values in the southbound direction with 1,450 vph. Therefore, the two/three lane roadway configuration south of Spokane Street will need to transition to the existing configuration (four lanes plus turn lanes) at Ferry Street. The specific location for the transition will depend of design elements, including parking, bicycle lanes, and design speeds and tapers. The transition could occur at or before the unsignalized intersection at Bridge Street or prior to the signalized intersection at Benton Street.

Summary

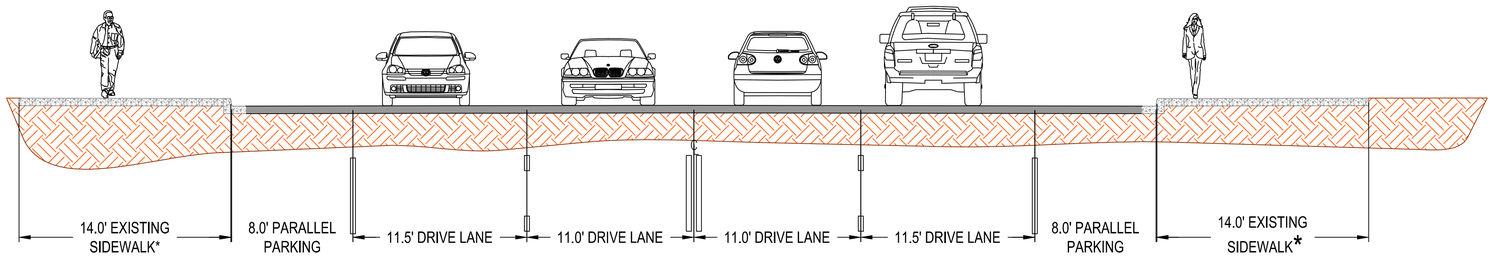
Based on forecast 2030 PM peak hour traffic volumes, S Wenatchee Avenue does not need four travel lanes to meet traffic demands from Kittitas Street to a location south of Spokane Street. A two lane roadway with left turn lanes at key intersections should operate adequately. The two/three lane roadway will need to transition to match the existing four lanes plus turn lane configuration of S Wenatchee Avenue at Ferry Street. The transition should occur in the vicinity of Bridge or Benton Streets depending on overall design factors such as transition lengths, parking, bicycle facilities and intersection turn movements.

Appendix B
Exhibits

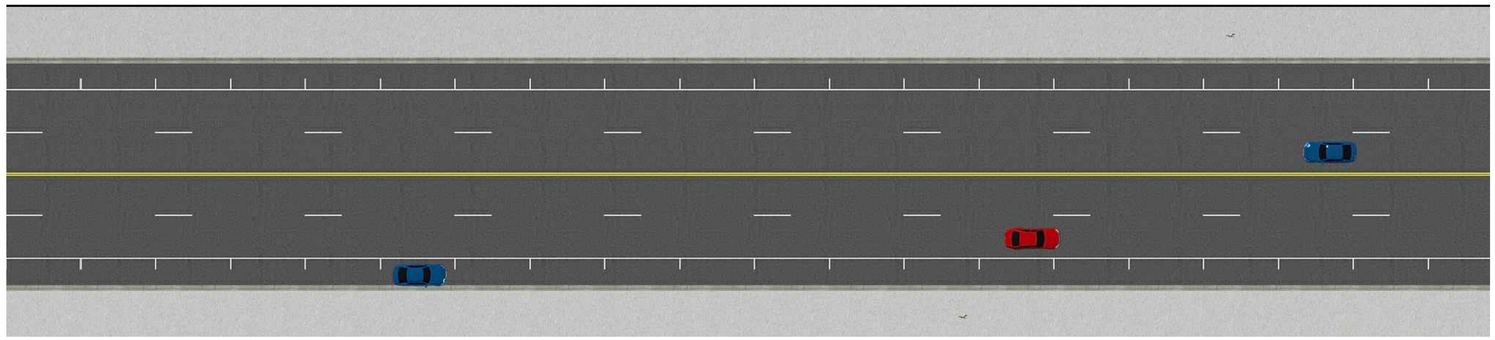
OPTION A (EXISTING):

- 4 DRIVING LANES
- PARALLEL PARKING BOTH SIDES

TOTAL CURB TO CURB WIDTH = 61'



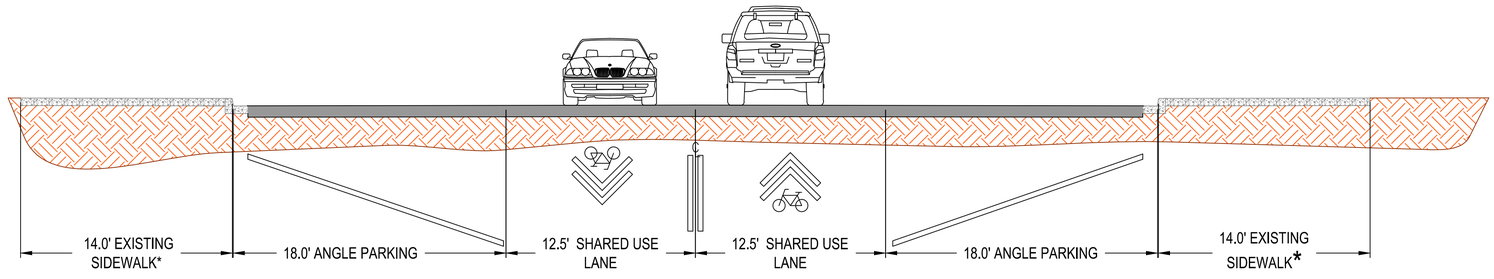
NOTE:
- 5' SIDEWALKS BETWEEN BRIDGE ST. AND FERRY ST.



OPTION B:

- 2 SHARED USE LANES
- ANGLE PARKING BOTH SIDES

TOTAL CURB TO CURB WIDTH = 61'



NOTE:
- CONSIDER ALSO BACK-IN PARKING.
- 5' SIDEWALKS BETWEEN BRIDGE ST. AND FERRY ST.

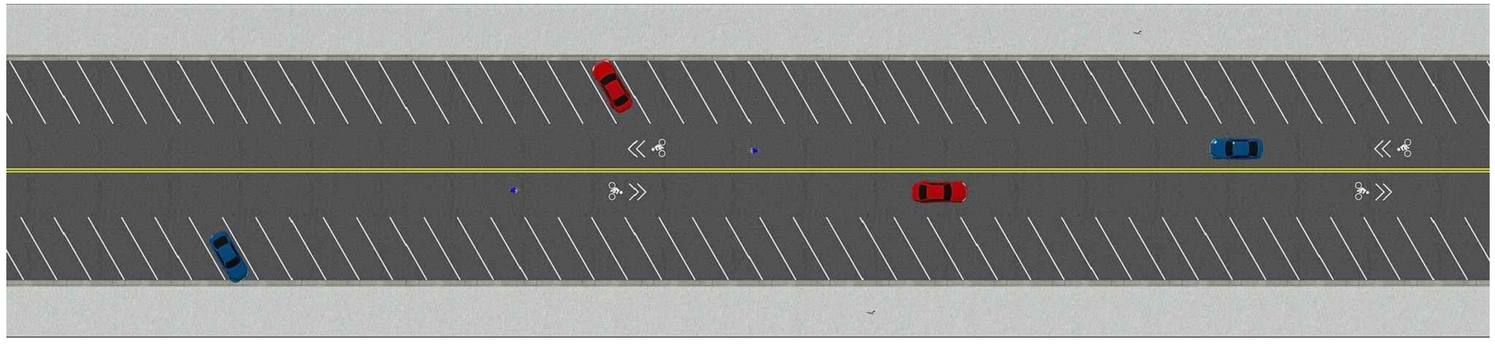


EXHIBIT A

SR 285 SAFETY CORRIDOR STUDY
SOUTH WENATCHEE AVENUE

SHEET 1 OF 3 OPTIONS A & B

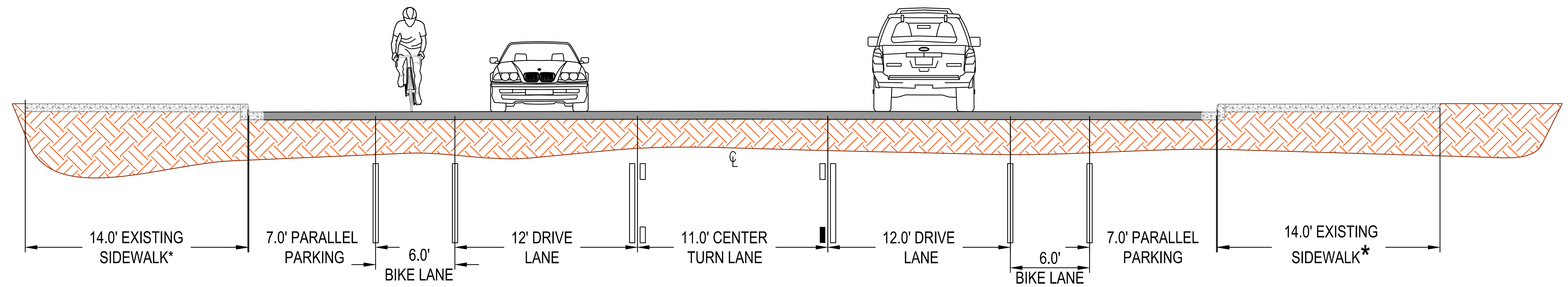
City of Wenatchee

RH2 ENGINEERING, INC.
www.rh2.com 1.800.720.8052
EAST WENATCHEE, WA
300 Simon Street, Suite 5

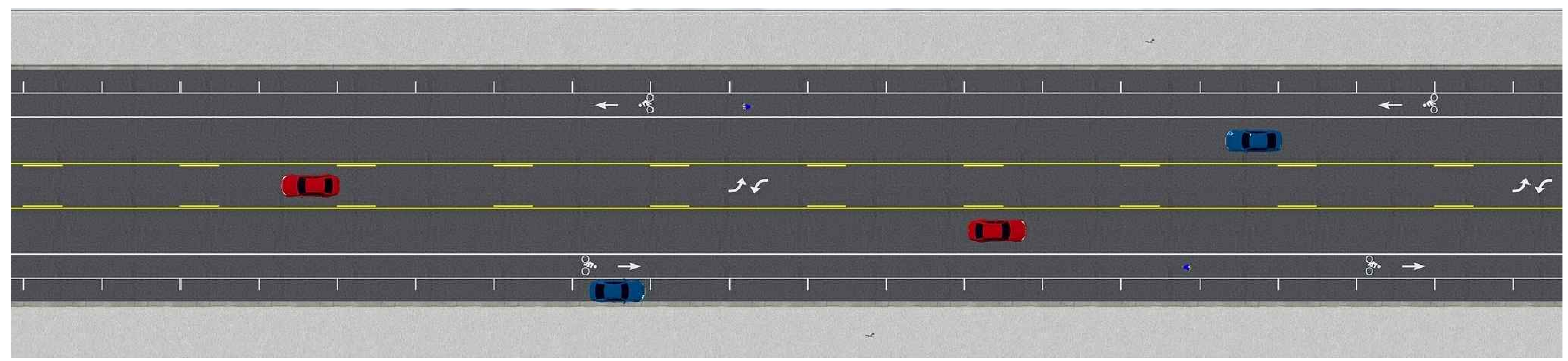
OPTION C:

- 2 DRIVING LANES
- BIKE LANES BOTH SIDES
- PARALLEL PARKING BOTH SIDES
- CENTER TURN LANE

TOTAL CURB TO CURB WIDTH = 61'



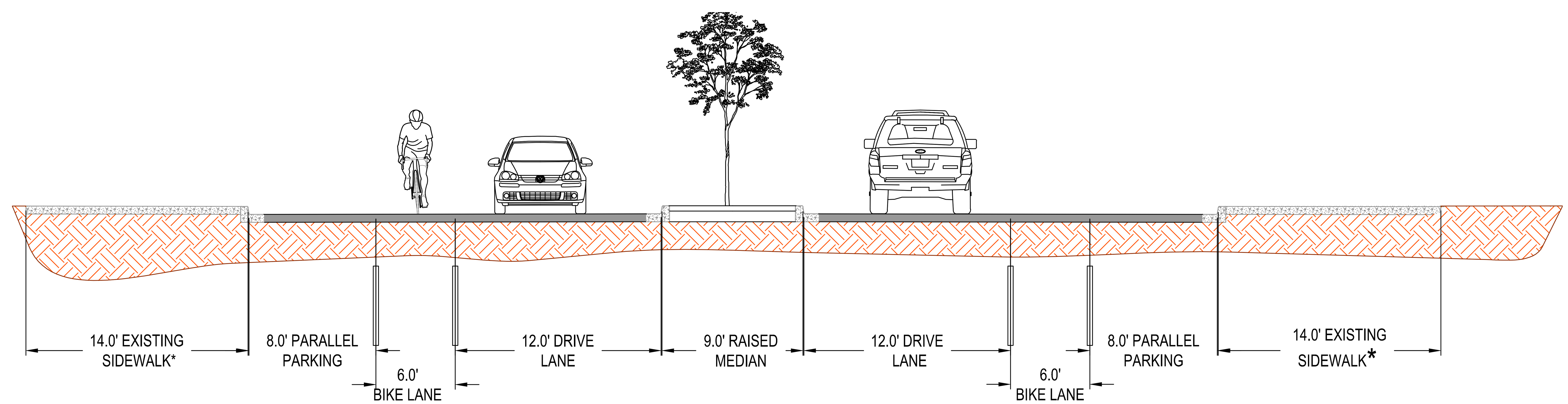
NOTE:
- 5' SIDEWALKS BETWEEN BRIDGE ST. AND FERRY ST.



OPTION D:

- 2 DRIVING LANES
- BIKE LANES BOTH SIDES
- PARALLEL PARKING BOTH SIDES
- CENTER MEDIAN

TOTAL CURB TO CURB WIDTH = 61'



NOTE:
- IDENTIFIED AS PREFERRED OPTION FOR N WENATCHEE AVENUE FROM 2ND ST. TO 5TH ST.
- 5' SIDEWALKS BETWEEN BRIDGE ST. AND FERRY ST.

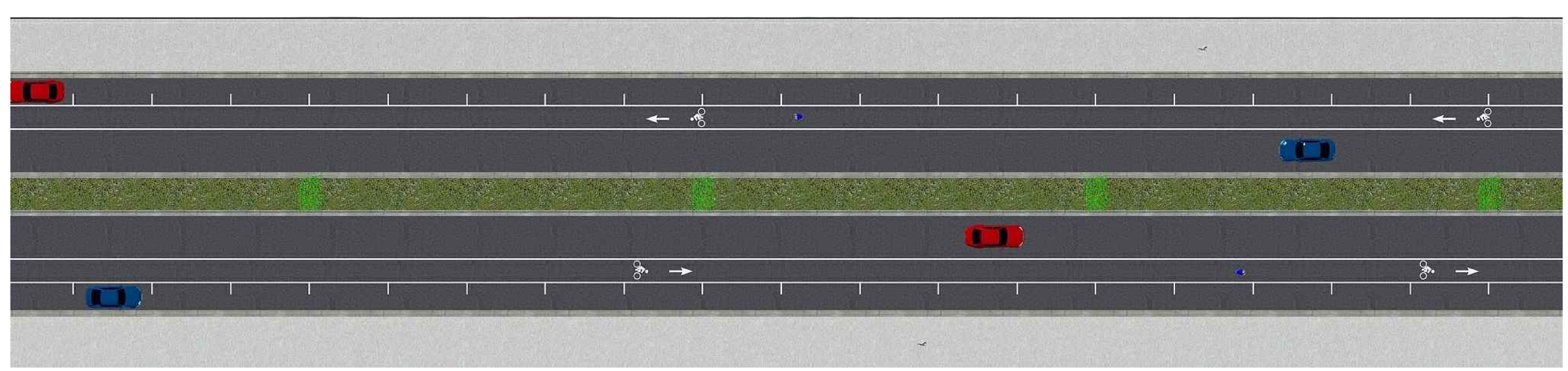


EXHIBIT A

SR 285 SAFETY CORRIDOR STUDY
SOUTH WENATCHEE AVENUE

SHEET 2 OF 3

OPTIONS C & D

City of Wenatchee

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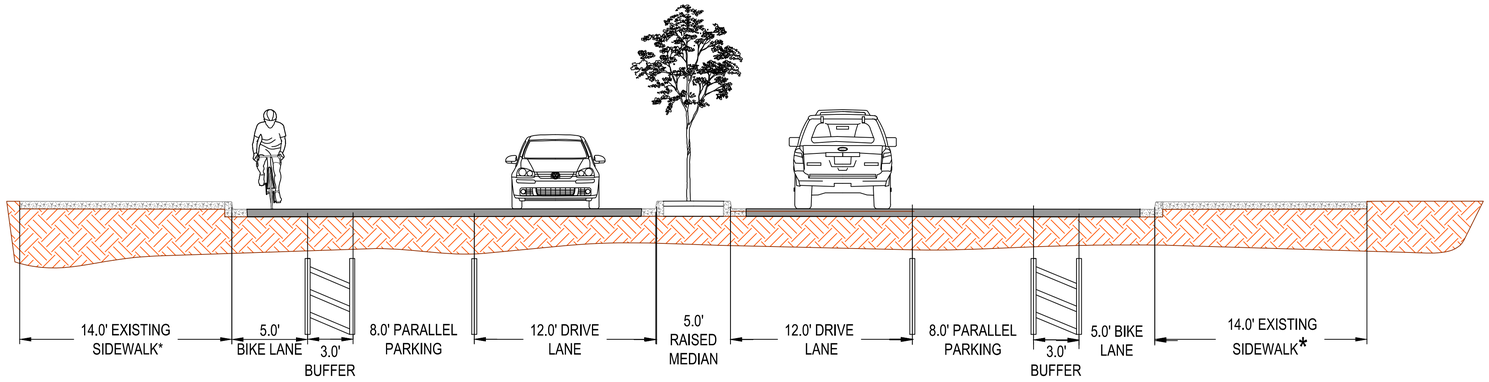
EAST WENATCHEE, WA

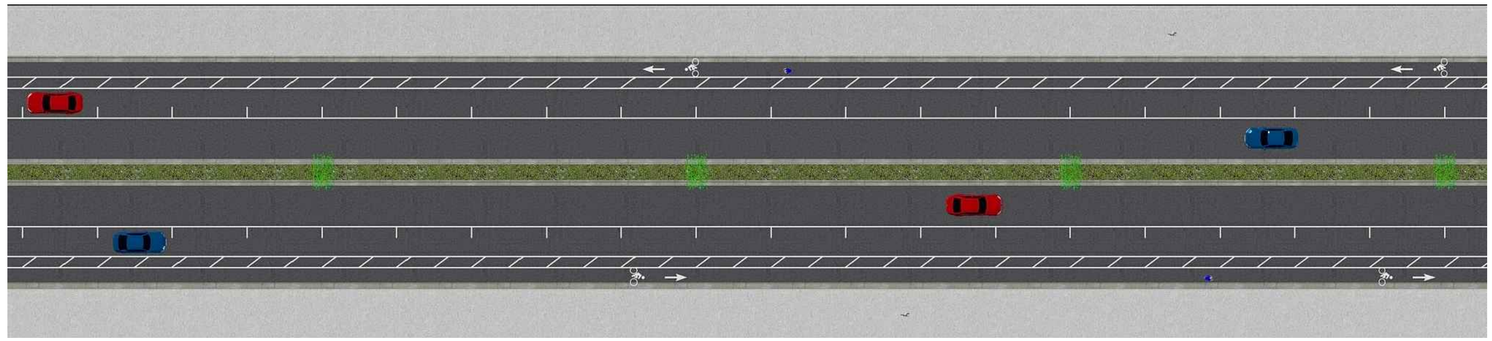
OPTION I:

- 2 DRIVING LANES
- BIKE LANES BOTH SIDES
- PARALLEL PARKING BOTH SIDES
- CENTER MEDIAN

TOTAL CURB TO CURB WIDTH = 61'

NOTE:
- 5' SIDEWALKS BETWEEN BRIDGE ST. AND FERRY ST.



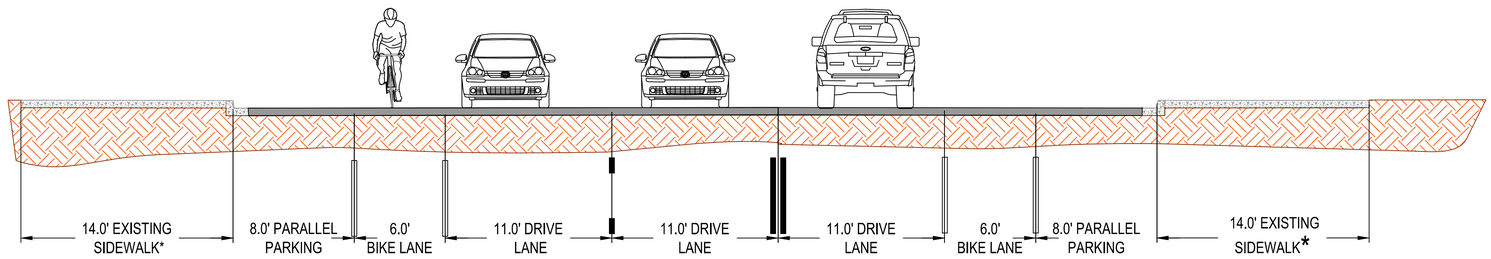


OPTION L:

- 3 DRIVING LANES
- BIKE LANES BOTH SIDES
- PARALLEL PARKING BOTH SIDES

TOTAL CURB TO CURB WIDTH = 61'

NOTE:
- 5' SIDEWALKS BETWEEN BRIDGE ST. AND FERRY ST.



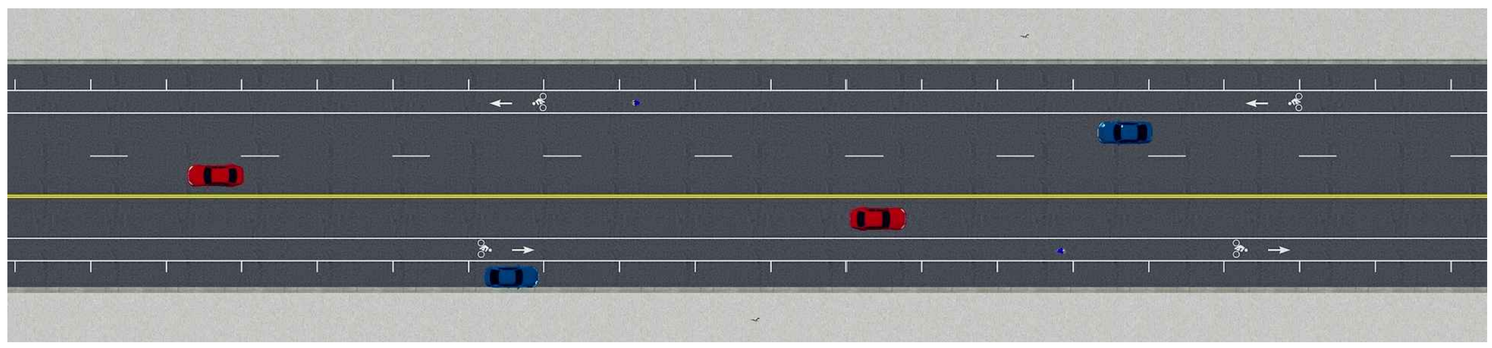


EXHIBIT A

SR 285 SAFETY CORRIDOR STUDY
SOUTH WENATCHEE AVENUE

SHEET 3 OF 3 OPTIONS I & L

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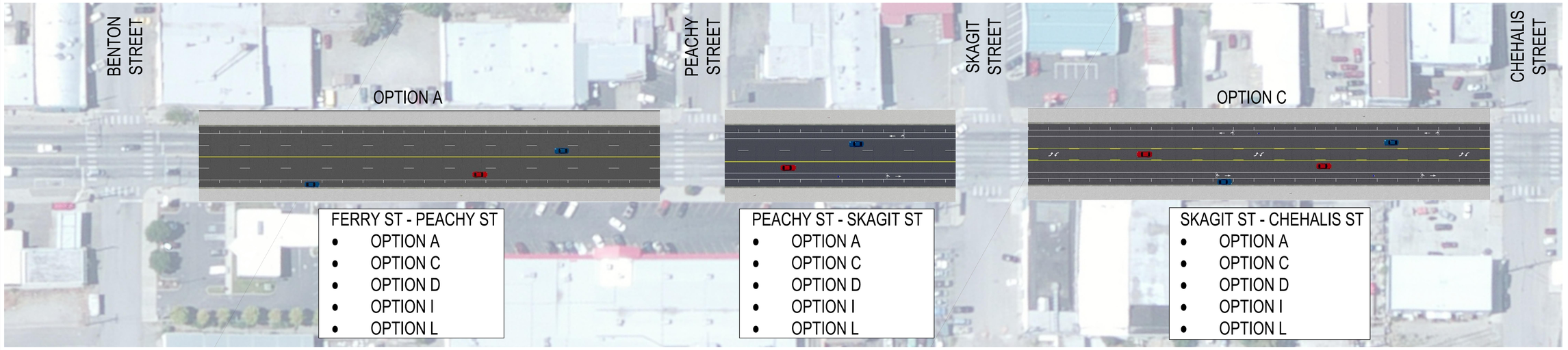

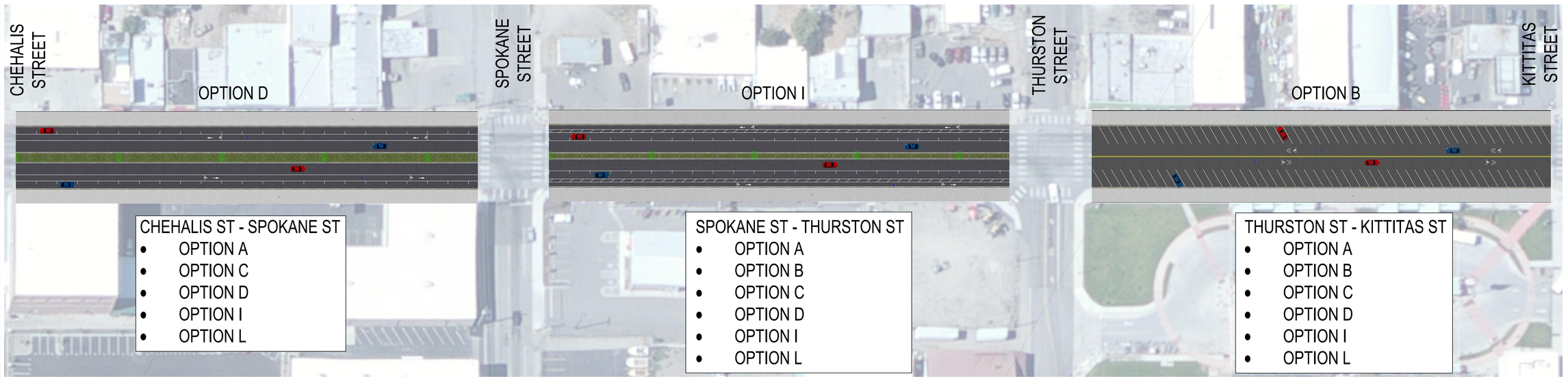

1" = 100'

EXHIBIT A

SR 285 SAFETY CORRIDOR STUDY
SOUTH WENATCHEE AVENUE

OPTIONS OVERVIEW

City of Wenatchee

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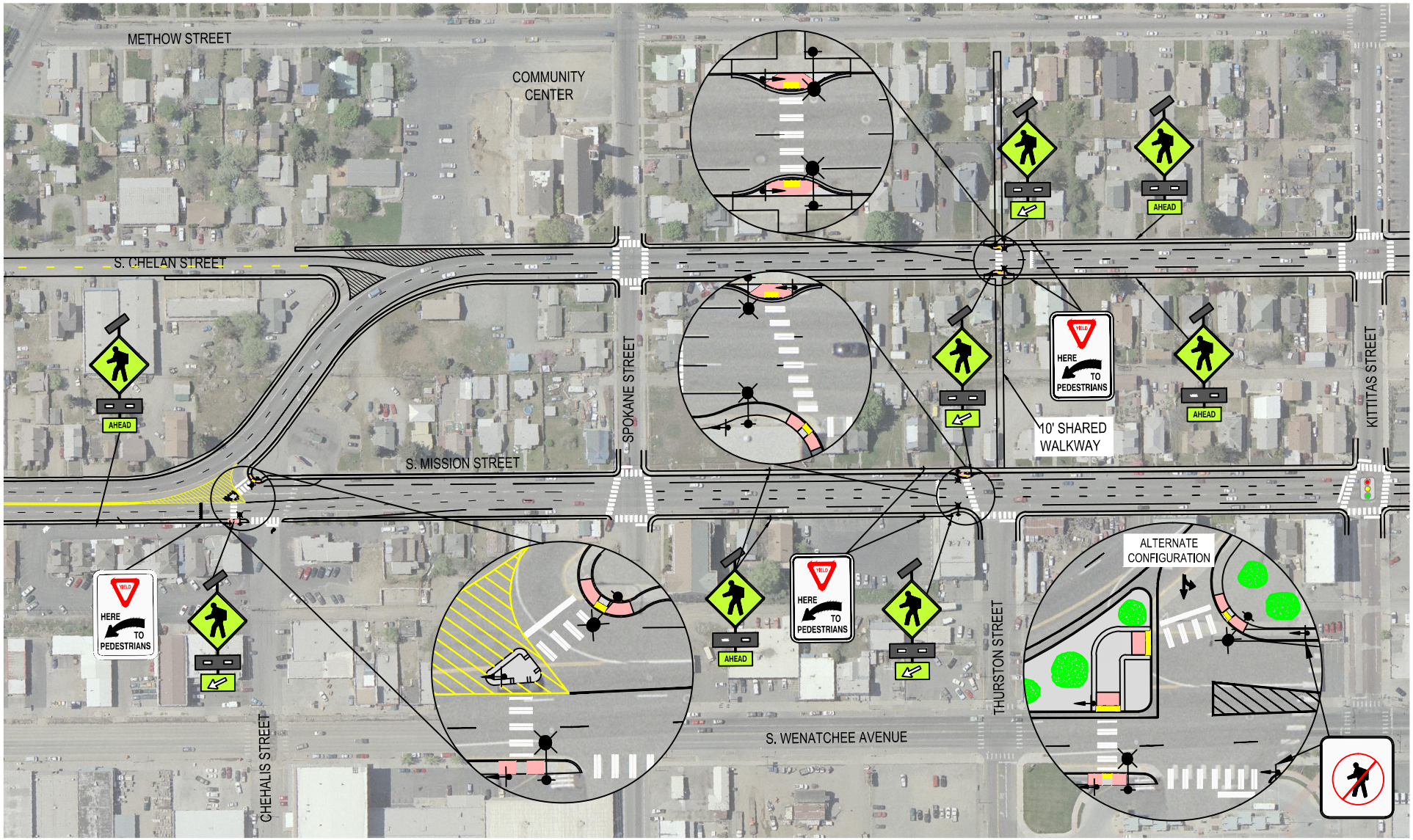

PEDESTRIAN CIRCULATION PLAN

1" = 200'

0 0.5" 1"

DRAWING IS NOT TO SCALE IF BAR IS NOT 1" LONG

RH2 ENGINEERS PLANNERS SCIENTISTS

EXHIBIT B

SR 285 SAFETY CORRIDOR STUDY
SOUTH WENATCHEE AVENUE

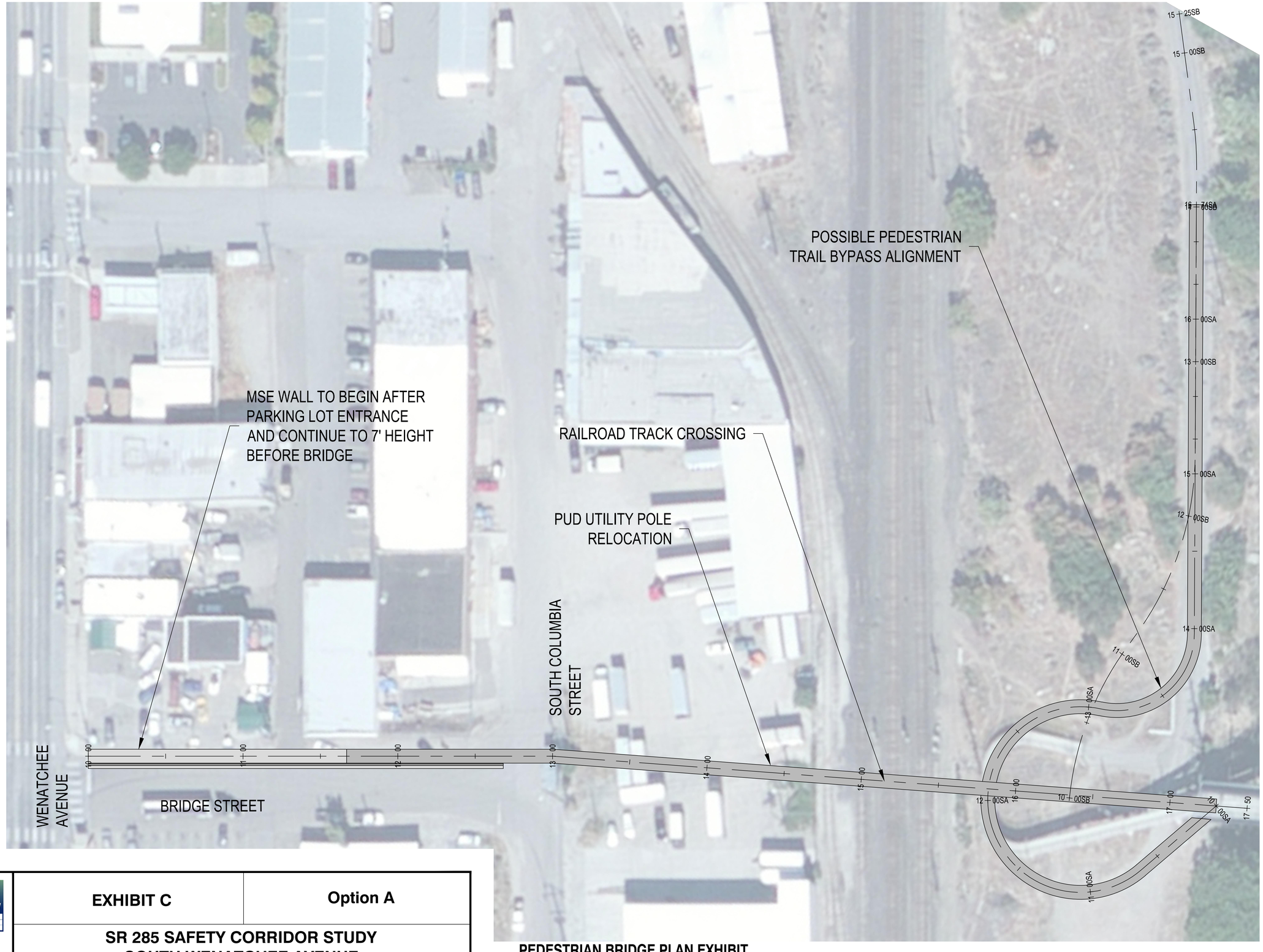

EXHIBIT C	**Option A**
SR 285 SAFETY CORRIDOR STUDY **SOUTH WENATCHEE AVENUE**	

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EAST WENATCHEE, WA
300 Simon Street, Suite 5

PEDESTRIAN BRIDGE PLAN EXHIBIT

1" = 30'

EXTRA GRADING AND PAVING REQUIRED TO MAINTAIN CLEARANCE OVER ROADWAY

ADJUSTMENTS REQUIRED FOR STORMWATER SYSTEM, WATERMAIN AND SANITARY SEWER

MSE WALL TO BEGIN AT ALLEY AND CONTINUE TO 7' HEIGHT BEFORE BRIDGE

RAILROAD TRACK CROSSING

POSSIBLE PEDESTRIAN TRAIL BYPASS ALIGNMENT

PUD UTILITY POLE RELOCATION

WENATCHEE AVENUE

BRIDGE STREET

STREET

10+00 11+00 12+00 13+00 14+00 15+00 16+00 17+00 17+50

12+00SA 16+00SB 10+00SA 11+00SA

+13+00SA 11+00SB 14+00SA 15+00SA 12+00SB 15+00SB 16+00SA 13+00SB

EXHIBIT C	**Option B**
SR 285 SAFETY CORRIDOR STUDY SOUTH WENATCHEE AVENUE	

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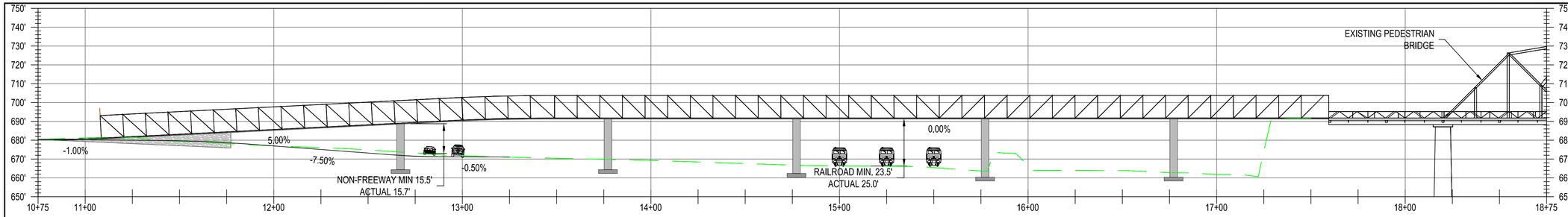
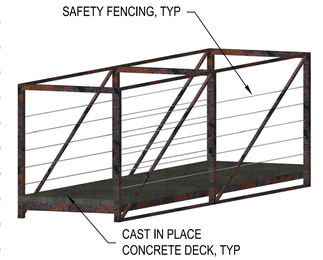
PEDESTRIAN BRIDGE PLAN EXHIBIT

1" = 30'



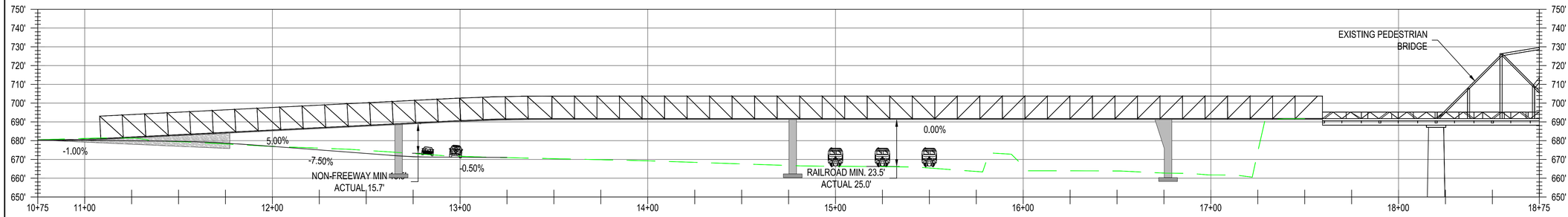
WEATHERING STEEL TRUSS - OPTION A PROFILE

H: 1" = 30', V: 1" = 30'



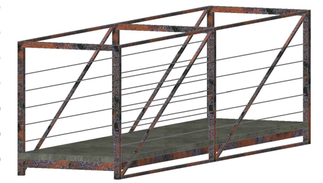
WEATHERING STEEL TRUSS SECTION

1" = 5'



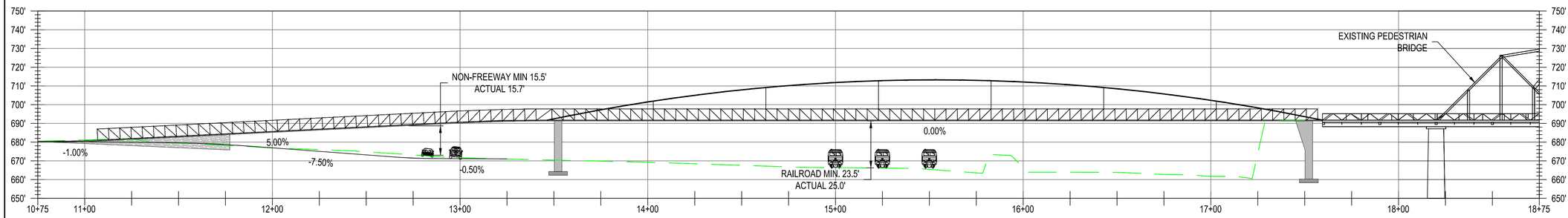
HIGH STRENGTH WEATHERING STEEL TRUSS - OPTION A PROFILE

H: 1" = 30', V: 1" = 30'



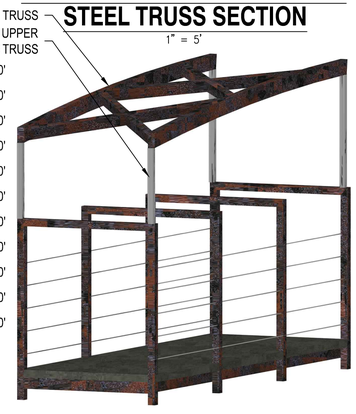
HIGH STRENGTH WEATHERING STEEL TRUSS SECTION

1" = 5'



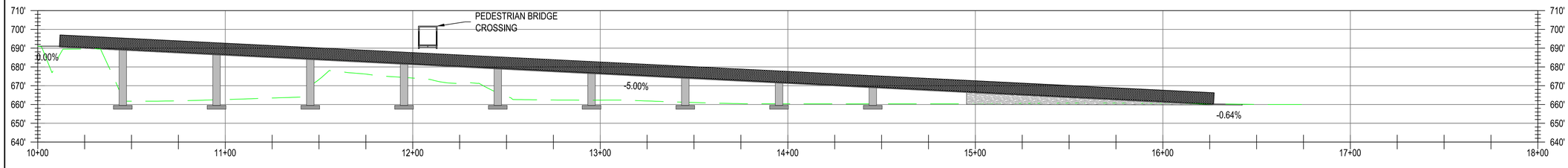
TUNABLE TRUSS - OPTION A PROFILE

H: 1" = 30', V: 1" = 30'



TUNABLE TRUSS SECTION

1" = 5'



PEDESTRIAN TRAIL BYPASS - OPTION A PROFILE

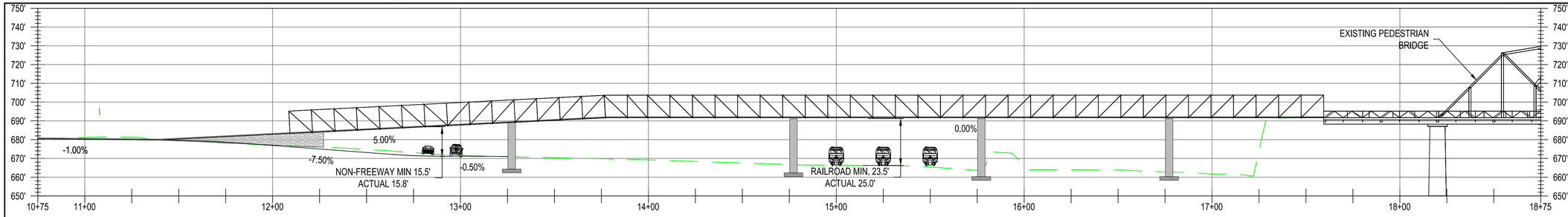
H: 1" = 30', V: 1" = 30'

RH2 ENGINEERS PLANNERS SCIENTISTS
RH2 ENGINEERING, INC.
www.rh2.com 1.800.720.8052
EAST WENATCHEE, WA
300 Simon Street, Suite 5

EXHIBIT C

Option A
PROFILES & SECTION VIEWS

SR 285 SAFETY CORRIDOR STUDY
SOUTH WENATCHEE AVENUE

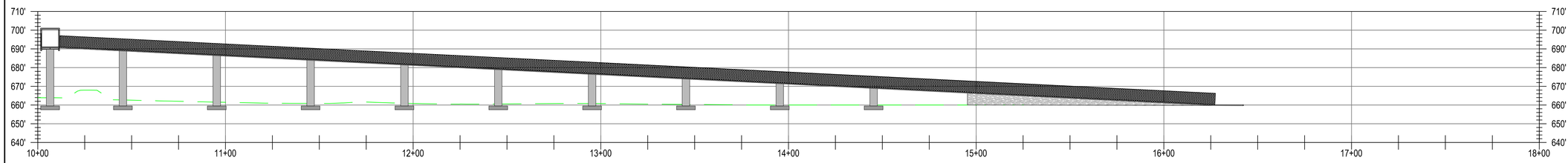


WEATHERING STEEL TRUSS - OPTION B PROFILE

H: 1" = 30', V: 1" = 30'

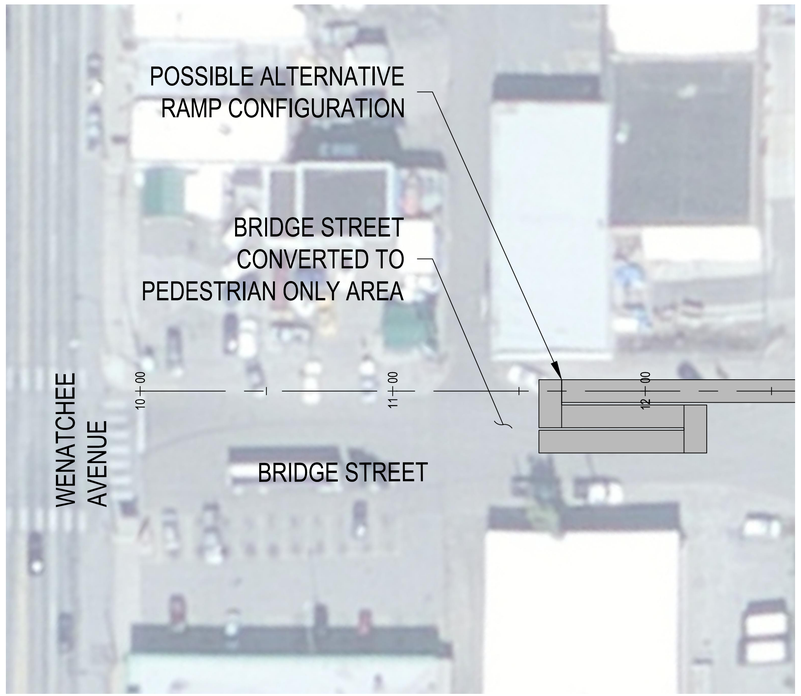
WEATHERING STEEL TRUSS SECTION

1" = 5'



PEDESTRIAN TRAIL BYPASS - OPTION B PROFILE

H: 1" = 30', V: 1" = 30'



PEDESTRIAN BRIDGE PLAN EXHIBIT

1" = 30'

RH2 ENGINEERS PLANNERS SCIENTISTS

RH2 ENGINEERING, INC.
www.rh2.com 1.800.720.8052
EAST WENATCHEE, WA
300 Simon Street, Suite 5

EXHIBIT C

Option B
PROFILES & SECTION VIEWS

SR 285 SAFETY CORRIDOR STUDY
SOUTH WENATCHEE AVENUE

Appendix C
Cost Estimates

SOUTH WENATCHEE AVENUE

The following estimate reflects 1000 feet of roadway section.

Option A					
Item No.	**Quantity**	**Unit**	**Item**	**Unit Cost**	**Total Cost**
			PREPERATION		
1	L.S.	L.S.	MOBILIZATION	8%	$ 2,923.84
2	0	L.F.	REMOVING PAINT LINE	$0.35	$ -
3	0	EACH	REMOVING PAINTED TRAFFIC MARKING	$120	$ -
4	0	S.F.	REMOVING PAINTED CROSSWALK LINE	$2	$ -
			LIQUID ASPHALT		
5	0	TON	ASPHALT FOR FOG SEAL	$1,000	$ -
			TRAFFIC		
6	0	L.F.	CEMENT CONC.TRAFFIC CURB	$15	$ -
7	0	TON	HMA CL. 1/2 IN. PG	$85	$ -
8	0	TON	CRUSHED SURFACING TOP COURSE	$30	$ -
9	5000	L.F.	PLASTIC LINE	$1.50	$ 7,500.00
10	3808	S.F	PLASTIC CROSSWALK LINE	$6.00	$ 22,848.00
11	500	L.F.	PLASTIC STOP LINE	$10.00	$ 5,000.00
12	6	EACH	PLASTIC TRAFFIC ARROWS	$200.00	$ 1,200.00
13	0	EACH	PLASTIC BICYCLE LANE SYMBOL	$160.00	$ -
14	L.S	L.S.	TEMPORARY TRAFFIC CONTROL	15%	$ 5,482.20
			OTHER ITEMS		
15	0	EACH	SIGNAL MODIFICATION (PER MAST ARM)	$10,000	$ -
16	0	EACH	CAMERA DETECTION (PER INTERSECTION)	$40,000	$ -
17	0	L.S.	LANDSCAPING/ IRRIGATION	$50,000	$ -
				Subtotal	**$ 44,954.04**
				5% Contingency	**$ 2,247.70**
				15% Engineering/ Permitting	**$ 6,743.11**
				Construction Total	**$ 53,944.85**

Option A Description: 2 lanes each direction/ parallel parking (Re-stripe Existing Condition)

Note: Assume 1 signalized intersection per 1000'

SOUTH WENATCHEE AVENUE

The following estimate reflects 1000 feet of roadway section.

Option B					
Item No.	**Quantity**	**Unit**	**Item**	**Unit Cost**	**Total Cost**
			PREPERATION		
1	L.S.	L.S.	MOBILIZATION	8%	$ 8,814.28
2	4000	L.F.	REMOVING PAINT LINE	$0.35	$ 1,400.00
3	6	EACH	REMOVING PAINTED TRAFFIC MARKING	$120	$ 720.00
4	3810	S.F.	REMOVING PAINTED CROSSWALK LINE	$2	$ 7,620.00
			LIQUID ASPHALT		
5	2	TON	ASPHALT FOR FOG SEAL	$1,000	$ 2,263.78
			TRAFFIC		
6	0	L.F.	CEMENT CONC.TRAFFIC CURB	$15	$ -
7	0	TON	HMA CL. 1/2 IN. PG	$85	$ -
8	0	TON	CRUSHED SURFACING TOP COURSE	$30	$ -
9	5444	L.F.	PLASTIC LINE	$1.50	$ 8,166.67
10	3808	S.F	PLASTIC CROSSWALK LINE	$6.00	$ 22,848.00
11	500	L.F.	PLASTIC STOP LINE	$10.00	$ 5,000.00
12	6	EACH	PLASTIC TRAFFIC ARROWS	$200.00	$ 1,200.00
13	6	EACH	PLASTIC BICYCLE LANE SYMBOL	$160.00	$ 960.00
14	L.S	L.S.	TEMPORARY TRAFFIC CONTROL	15%	$ 16,526.77
			OTHER ITEMS		
15	2	EACH	SIGNAL MODIFICATION (PER MAST ARM)	$10,000	$ 20,000.00
16	1	EACH	CAMERA DETECTION (PER INTERSECTION)	$40,000	$ 40,000.00
17	0	L.S.	LANDSCAPING/ IRRIGATION	$50,000	$ -
				Subtotal	**$ 135,519.49**
				10% Contingency	**$ 13,551.95**
				25% Engineering/ Permitting	**$ 33,879.87**
				Construction Total	**$ 182,951.31**

Option B Description: 1 lane each direction/ angled parking each side

Note: Assume 1 signalized intersection per 1000'

SOUTH WENATCHEE AVENUE

The following estimate reflects 1000 feet of roadway section.

Option C					
Item No.	**Quantity**	**Unit**	**Item**	**Unit Cost**	**Total Cost**
			PREPERATION		
1	L.S.	L.S.	MOBILIZATION	8%	$ 8,832.94
2	4000	L.F.	REMOVING PAINT LINE	$0.35	$ 1,400.00
3	6	EACH	REMOVING PAINTED TRAFFIC MARKING	$120	$ 720.00
4	3810	S.F.	REMOVING PAINTED CROSSWALK LINE	$2	$ 7,620.00
			LIQUID ASPHALT		
5	2	TON	ASPHALT FOR FOG SEAL	$1,000	$ 2,263.78
			TRAFFIC		
6	0	L.F.	CEMENT CONC.TRAFFIC CURB	$15	$ -
7	0	TON	HMA CL. 1/2 IN. PG	$85	$ -
8	0	TON	CRUSHED SURFACING TOP COURSE	$30	$ -
9	6000	L.F.	PLASTIC LINE	$1.50	$ 9,000.00
10	3808	S.F	PLASTIC CROSSWALK LINE	$6.00	$ 22,848.00
11	500	L.F.	PLASTIC STOP LINE	$10.00	$ 5,000.00
12	3	EACH	PLASTIC TRAFFIC ARROWS	$200.00	$ 600.00
13	6	EACH	PLASTIC BICYCLE LANE SYMBOL	$160.00	$ 960.00
14	L.S	L.S.	TEMPORARY TRAFFIC CONTROL	15%	$ 16,561.77
			OTHER ITEMS		
15	2	EACH	SIGNAL MODIFICATION (PER MAST ARM)	$10,000	$ 20,000.00
16	1	EACH	CAMERA DETECTION (PER INTERSECTION)	$40,000	$ 40,000.00
17	0	L.S.	LANDSCAPING/ IRRIGATION	$50,000	$ -
				Subtotal	**$ 135,806.49**
				10% Contingency	**$ 13,580.65**
				25% Engineering/ Permitting	**$ 33,951.62**
				Construction Total	**$ 183,338.76**

Option C Description: 1 lane each direction/ bike lane each direction/ left center turn lane/ parallel

Note: Assume 1 signalized intersection per 1000'

SOUTH WENATCHEE AVENUE

The following estimate reflects 1000 feet of roadway section.

Option D					
Item No.	**Quantity**	**Unit**	**Item**	**Unit Cost**	**Total Cost**
			PREPERATION		
1	L.S.	L.S.	MOBILIZATION	8%	$ 15,899.84
2	4000	L.F.	REMOVING PAINT LINE	$0.35	$ 1,400.00
3	6	EACH	REMOVING PAINTED TRAFFIC MARKING	$120	$ 720.00
4	3810	S.F.	REMOVING PAINTED CROSSWALK LINE	$2	$ 7,620.00
			LIQUID ASPHALT		
5	2	TON	ASPHALT FOR FOG SEAL	$1,000	$ 2,000.00
			TRAFFIC		
6	2000	L.F.	CEMENT CONC.TRAFFIC CURB	$15	$ 30,000.00
7	80	TON	HMA CL. 1/2 IN. PG	$85	$ 6,800.00
8	140	TON	CRUSHED SURFACING TOP COURSE	$30	$ 4,200.00
9	4000	L.F.	PLASTIC LINE	$1.50	$ 6,000.00
10	3808	S.F	PLASTIC CROSSWALK LINE	$6.00	$ 22,848.00
11	500	L.F.	PLASTIC STOP LINE	$10.00	$ 5,000.00
12	6	EACH	PLASTIC TRAFFIC ARROWS	$200.00	$ 1,200.00
13	6	EACH	PLASTIC BICYCLE LANE SYMBOL	$160.00	$ 960.00
14	L.S	L.S.	TEMPORARY TRAFFIC CONTROL	15%	$ 29,812.20
			OTHER ITEMS		
15	2	EACH	SIGNAL MODIFICATION (PER MAST ARM)	$10,000	$ 20,000.00
16	1	EACH	CAMERA DETECTION (PER INTERSECTION)	$40,000	$ 40,000.00
17	1	L.S.	LANDSCAPING/ IRRIGATION	$50,000	$ 50,000.00
				Subtotal	**$ 244,460.04**
				15% Contingency	**$ 36,669.01**
				25% Engineering/ Permitting	**$ 61,115.01**
				Construction Total	**$ 342,244.06**

Option D Description: 1 lane each direction/ bike lane each direction/ 8' center landscaping/ parallel

Note: Assume 1 signalized intersection per 1000'

SOUTH WENATCHEE AVENUE

The following estimate reflects 1000 feet of roadway section.

Option I					
Item No.	**Quantity**	**Unit**	**Item**	**Unit Cost**	**Total Cost**
			PREPERATION		
1	L.S.	L.S.	MOBILIZATION	8%	$ 16,259.84
2	4000	L.F.	REMOVING PAINT LINE	$0.35	$ 1,400.00
3	6	EACH	REMOVING PAINTED TRAFFIC MARKING	$120	$ 720.00
4	3810	S.F.	REMOVING PAINTED CROSSWALK LINE	$2	$ 7,620.00
			LIQUID ASPHALT		
5	2	TON	ASPHALT FOR FOG SEAL	$1,000	$ 2,000.00
			TRAFFIC		
6	2000	L.F.	CEMENT CONC.TRAFFIC CURB	$15	$ 30,000.00
7	80	TON	HMA CL. 1/2 IN. PG	$85	$ 6,800.00
8	140	TON	CRUSHED SURFACING TOP COURSE	$30	$ 4,200.00
9	7000	L.F.	PLASTIC LINE	$1.50	$ 10,500.00
10	3808	S.F	PLASTIC CROSSWALK LINE	$6.00	$ 22,848.00
11	500	L.F.	PLASTIC STOP LINE	$10.00	$ 5,000.00
12	6	EACH	PLASTIC TRAFFIC ARROWS	$200.00	$ 1,200.00
13	6	EACH	PLASTIC BICYCLE LANE SYMBOL	$160.00	$ 960.00
14	L.S	L.S.	TEMPORARY TRAFFIC CONTROL	15%	$ 30,487.20
			OTHER ITEMS		
15	2	EACH	SIGNAL MODIFICATION (PER MAST ARM)	$10,000	$ 20,000.00
16	1	EACH	CAMERA DETECTION (PER INTERSECTION)	$40,000	$ 40,000.00
17	1	L.S.	LANDSCAPING/ IRRIGATION	$50,000	$ 50,000.00
				Subtotal	**$ 233,735.20**
				15% Contingency	**$ 35,060.28**
				25% Engineering/ Permitting	**$ 58,433.80**
				Construction Total	**$ 327,229.28**

Option I Description: 1 lane each direction/ bike lane each direction/ 4' center landscaping/ parallel

Note: Assume 1 signalized intersection per 1000'

SOUTH WENATCHEE AVENUE

The following estimate reflects 1000 feet of roadway section.

Option L					
Item No.	**Quantity**	**Unit**	**Item**	**Unit Cost**	**Total Cost**
			PREPERATION		
1	L.S.	L.S.	MOBILIZATION	8%	$ 8,880.94
2	4000	L.F.	REMOVING PAINT LINE	$0.35	$ 1,400.00
3	6	EACH	REMOVING PAINTED TRAFFIC MARKING	$120	$ 720.00
4	3810	S.F.	REMOVING PAINTED CROSSWALK LINE	$2	$ 7,620.00
			LIQUID ASPHALT		
5	2	TON	ASPHALT FOR FOG SEAL	$1,000	$ 2,263.78
			TRAFFIC		
6	0	L.F.	CEMENT CONC.TRAFFIC CURB	$15	$ -
7	0	TON	HMA CL. 1/2 IN. PG	$85	$ -
8	0	TON	CRUSHED SURFACING TOP COURSE	$30	$ -
9	6000	L.F.	PLASTIC LINE	$1.50	$ 9,000.00
10	3808	S.F	PLASTIC CROSSWALK LINE	$6.00	$ 22,848.00
11	500	L.F.	PLASTIC STOP LINE	$10.00	$ 5,000.00
12	6	EACH	PLASTIC TRAFFIC ARROWS	$200.00	$ 1,200.00
13	6	EACH	PLASTIC BICYCLE LANE SYMBOL	$160.00	$ 960.00
14	L.S	L.S.	TEMPORARY TRAFFIC CONTROL	15%	$ 16,651.77
			OTHER ITEMS		
15	2	EACH	SIGNAL MODIFICATION (PER ARM)	$10,000	$ 20,000.00
16	1	EACH	CAMERA DETECTION (PER INTERSECTION)	$40,000	$ 40,000.00
17	0	L.S.	LANDSCAPING	$50,000	$ -
				Subtotal	**$ 127,663.54**
				10% Contingency	**$ 12,766.35**
				25% Engineering/ Permitting	**$ 31,915.89**
				Construction Total	**$ 172,345.79**

Option L Description: 2 lanes south bound/ 1 lane north bound/ bike lane each direction/ parallel

Note: Assume 1 signalized intersection per 1000'

City of Wenatchee Pedestrian Path Overpass

Summary of Quantities			Quantity		Unit Cost		Extended Cost	
Item	Item	Unit	Concept A	Concept B	Concept A	Concept B	Concept A	Concept B
	PREPARATION							
1	MOBILIZATION	L.S.	1	1	$169,200	$183,700	$ 169,200	$ 183,700
2	CLEARING AND GRUBBING	L.S.	1	1	$5,000	$5,000	$ 5,000	$ 5,000
3	REMOVAL OF STRUCTURES AND OBSTRUCTION	L.S.	1	1	$74,000	$135,000	$ 74,000	$ 135,000
	STORM SEWER							
4	CATCH BASIN TYPE 1	Each	2	6	$2,000	$2,000	$ 4,000	$ 12,000
5	MANHOLE 48 IN. DIAM. TYPE 1	Each	0	4	$4,000	$4,000	$ -	$ 16,000
6	CPEP STORM SEWER PIPE 24 IN. DIAM	L.F.	150	325	$100	$100	$ 15,000	$ 32,500
	WATERMAIN							
7	12" DI WATERMAIN	L.F.	0	200	$75	$75	$ -	$ 15,000
8	12" DI GATE VALVE	Each	0	4	$3,000	$3,000	$ -	$ 12,000
	SANITARY SEWER							
9	12" PVC SEWER PIPE	L.F.	0	200	$100	$100	$ -	$ 20,000
10	MANHOLE 48 IN. DIAM.	Each	0	3	$4,000	$4,000	$ -	$ 12,000
	STRUCTURAL							
7	WEATHERING STEEL TRUSS	L.S.	1	1	$1,174,824	$1,104,388	$ 1,174,824	$ 1,104,388
8	PEDESTRIAN BYPASS STRUCTURE	L.S.	1	1	$674,886	$674,886	$ 674,886	$ 674,886
	SURFACING							
9	CRUSHED SURFACING TOP COURSE	Ton	60	280	$80	$80	$ 4,800	$ 22,400
10	CRUSHED SURFACING BASE COURSE	Ton	60	810	$50	$50	$ 3,000	$ 40,500
	HOT MIX ASPHALT							
11	HMA	Ton	20	320	$150	$150	$ 3,000	$ 48,000
	TRAFFIC							
12	CEMENT CONC. TRAFFIC CURB AND GUTTER	L.F.	270	270	$30	$30	$ 8,100	$ 8,100
13	PERMANENT SIGNING	L.S.	1	1	$5,000	$5,000	$ 5,000	$ 5,000
14	PROJECT TEMPORARY TRAFFIC CONTROL	L.S.	1	1	$25,000	$25,000	$ 25,000	$ 25,000
	OTHER ITEMS							
15	SHORING OR EXTRA EXCAVATION	L.S.	1	1	$25,000	$25,000	$ 25,000	$ 25,000
16	ROADWAY SURVEYING	L.S.	1	1	$20,000	$20,000	$ 20,000	$ 20,000
17	CEMENT CONC. SIDEWALK	S.Y.	170	120	$50	$50	$ 8,500	$ 6,000
18	CEMENT CONC. DRIVEWAY ENTRANCE TYPE 1	S.Y.	10	0	$100	$100	$ 1,000	$ -
19	SIDEWALK RAMPS	Each	4	1	$2,000	$2,000	$ 8,000	$ 2,000
20	UNKNOWN UTILITY REPAIR	EST.	25000	25000	$1	$1	$ 25,000	$ 25,000
21	SPCC PLAN	L.S.	1	1	$5,000	$5,000	$ 5,000	$ 5,000
22	LANDSCAPING	L.S.	1	1	$20,000	$20,000	$ 20,000	$ 20,000
23	AS CONSTRUCTED DRAWINGS	L.S.	1	1	$5,000	$5,000	$ 5,000	$ 5,000
	Right of Way, BNSF Permits, and PUD Relocations						TBD	TBD
	Weathering Steel Truss Construction Subtotal						$ 2,290,000	$ 2,480,000
	20% Contingency						$ 458,000	$ 496,000
	Engineering						$ 824,400	$ 892,800
	Construction Total						**$ 3,572,400**	**$ 3,868,800**

Upgrade Options			
High Strength Weathering Steel Truss	**+/-**	**+$ 139,580**	**+$ 116,907**
Tunable Truss	**+/-**	**+$ 807,780**	**+$ 623,451**