



Chelan-Douglas Transportation Council

# South Wenatchee Bicycle Connectivity Study

June 2022



Chelan-Douglas Transportation Council

SOUTH WENATCHEE  
BICYCLE CONNECTIVITY STUDY

June 2022

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# Introduction

South Wenatchee lacks comfortable bicycle connections to the regional bicycle network due to the barriers created by Mission Street, Ferry Street, South Wenatchee Avenue, and SR 285. South Wenatchee has a high-density-grid network of low volume roads that are comfortable for bicyclists of most ages and abilities. However, there is not a comfortable and convenient crossing of Mission Street to access the Sellar Bridge spur of the Apple Loop Trail (Loop Trail), nor funded connections to the Loop Trail along the Wenatchee Riverfront via South Wenatchee Avenue and Bridge Street.

The Regional Bicycle Advisory Committee (RBAC) conducted a study of the South Wenatchee area in late 2020 with two goals:

1. Replace South Wenatchee “Needs Further Study Area” in the Bike Plan with non-prescriptive recommendations for Ferry Street, Stevens Street, Marr Street, and South Wenatchee Avenue.
2. Evaluate the advantages, disadvantages, and challenges of alternative bike route concepts connecting Bridge Street to South Wenatchee via Locomotive Park and the existing multi-use trail on the Sellar Bridge.

From the recommendations of the RBAC, a more in-depth planning and engineering study to determine the form of bike facilities, on South Wenatchee Avenue and multiple east/west corridors connecting South Wenatchee to the Loop Trail was identified as a high priority need. The South Wenatchee Bicycle Connectivity Study seeks to address the recommendations from the RBAC, and the goals of the Study are aligned with the goals and results of the 2020 RBAC study and report.

## Purpose and Need

The South Wenatchee Bicycle Connectivity Study seeks to achieve three purposes:

- Improve the safety and comfort of biking in South Wenatchee
- Provide facilities that make biking a more viable choice for South Wenatchee residents and appeal to a wide range of bike user types, ages, abilities and comfort levels
- Connect the neighborhoods to the west of Mission Street to the Loop Trail and new bridge at Bridge Street

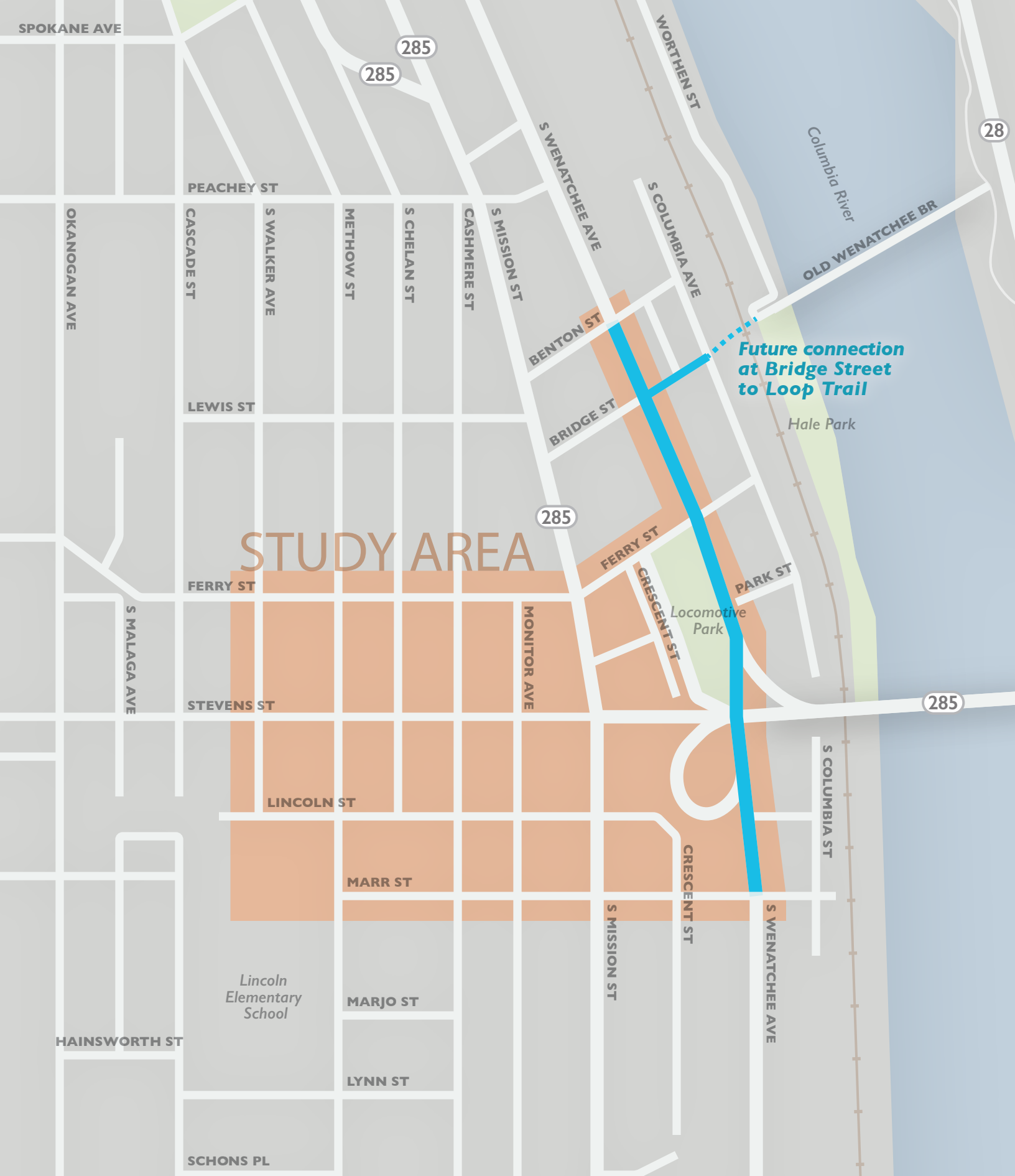
South Wenatchee is an area that has higher rates of low-income households, households in which English is not the primary language (typically Spanish-speaking). The project seeks to provide the South Wenatchee area with viable alternatives to motor vehicle transportation, connecting to recreational opportunities and employment centers. A safe, comfortable and accessible connection for bicycling is the goal of the project.

## Study Scope

The scope of the South Wenatchee study seeks to identify a specific north-south bicycle improvement between Marr Street and Benton Street. The bicycle facility should meet the project purpose and need.

Also included in the scope of the study is an assessment of the viability of east-west connections among each of the parallel streets between Benton and Marr, between South Wenatchee Avenue and the neighborhoods to the west, with the study area ending at approximately Methow Street, though its assumed improvements will continue west, pending further concept development and analysis. The crossing of Mission Street, to connect the low volume, low stress neighborhood roadways between Methow Street and Mission Street to the new facility on South Wenatchee Avenue is also included in the study scope.

A map of the study area is shown on the following page.



South Wenatchee Bicycle Connectivity Study Area

## Existing Conditions

The existing conditions in the study area are roadways that do not have specific bike facilities or improvements. Parallel to South Wenatchee Avenue, between Ferry Street and Snohomish Street, there is an off-street multi-use pathway that runs through Locomotive Park. The multi-use pathway is a high comfort facility that can serve as a connecting piece of the bike network serving the South Wenatchee neighborhood. Access to the multi-use pathway requires crossing of the loop ramps between South Wenatchee Avenue and SR 285 (southern terminus), and crossing at the signalized intersection of Ferry Street and South Wenatchee Avenue (northern terminus). Additionally, the Sellar Bridge Spur of the Loop Trail connects to the sidewalk network near Snohomish Street and South Wenatchee Avenue.

### South Wenatchee Avenue

South Wenatchee Avenue is a three to five lane wide facility within the project limits. At least two lanes in each direction are present between Benton Street and Snohomish Street, and at least one lane in each direction, with a continuous left turn lane, is present between Snohomish Street and Marr Street. On-street parking is present between Benton and Ferry Streets. Between Ferry Street and Snohomish Street, loop ramps to and from SR 285 utilize merge and diverge lanes, and wide shoulders to connect to South Wenatchee Avenue. At the signalized intersection with Ferry Street, left turn lanes are present in each direction.

### Mission Street

Mission Street is a three to five lane wide facility within the project limits. The study looked only at potential crossings of Mission Street and did not consider changes to the lane configuration. At Marr Street, Mission Street is three to four lanes wide. At Snohomish, Stevens/SR 285 and Ferry Street, Mission Street is five lanes wide.

### Neighborhood Roadways

The neighborhood roadways in the study area are typically two lanes wide with intermittent on-street parking. Most are unmarked, low volume streets. The exception is Ferry Street which is marked for two westbound lanes, one eastbound lane and a two way left turn lane between Methow Street and Mission Street and sees roughly 11,000 vehicles per day west of Mission St and 600-700 vehicles per day to the east of Mission St.

## Design Criteria

Design criteria for the South Wenatchee Avenue bike facility, as well as the east-west corridors between South Wenatchee Avenue and the neighborhoods west of Mission Avenue include the following standards and reference documents:

- Standard Plans – WSDOT
- Public works pre-approved plans and policies – City of Wenatchee
- Manual on Uniform Traffic Control Devices (MUTCD) – FHWA
- Urban Bikeway Design Guide – NACTO

In addition to the standards and reference documents, the following location-specific design criteria were used in developing the concepts that were evaluated for the study.

- Minimum lane width of 11 feet on any roadway in the study area
- Minimum of two southbound lanes on South Wenatchee Avenue between Benton and Ferry Streets, and a minimum of one northbound lane on South Wenatchee Avenue between Ferry and Benton Streets
- On-street parking shall remain available between Benton and Ferry Streets, both to serve adjacent businesses and to provide a model bike facility that can be extended north of the study limits.
- Maintain at least one lane per direction, and the same number of lanes approaching signalized intersections on east-west corridors
- Minimum bike lane width of 5' per direction, or 10' for a two-way cycle track or shared use path
- The multi-use pathway in Locomotive Park shall be considered the primary connection along South Wenatchee Avenue between Snohomish Street and Ferry Street.



Public feedback gathered at May, 2022 bike rodeo event at CAFÉ

# Public Outreach

## Public Outreach Strategy

To develop a project that is responsive to the needs of the community, a program of public outreach was developed involving in-person and online elements. The timing of in-person outreach was coordinated with other events, both related and unrelated to the project.

Public outreach printed materials were developed in both English and Spanish, with translation provided by Spanish-speaking staff on the consultant team. The CDTC and consultant team provided English and Spanish-speaking representatives for the in-person events in late 2021.

Public feedback was sought on three main subjects related to the project:

- Routes used for biking in South Wenatchee
- Comfort with facility types
- Barriers to biking

The materials that were developed for advertising events, and in-person surveys, are included in Appendix A.

## Outreach Events

Opportunities for feedback included:

- In person distribution of flyers within the neighborhood directing residents to an online survey
- In person distribution of surveys at a COVID-19 vaccination event, October, 2021
- Advertisement of surveys on NGO and government websites





*Demonstration cycle track from Bike Rodeo event, May 2022*

- In person and virtual listening sessions hosted at The Community for the Advancement of Family Education center (CAFÉ), located at 766 Mission Street in Wenatchee, near the project study area, in November, 2021
- Online open house for feedback. The online open house website is <https://www.bikesouthwenatchee.com/>.
- In-person bike rodeo, hosted at CAFÉ in May, 2022

## Listening Sessions

At the listening sessions, participants were given a map of the project corridor and a one-page survey consisting of four questions. Information was provided in English and Spanish, as requested. The four-question survey sought feedback on levels of comfort with cycling as a modal choice, perceived safety and comfort concerns on South Wenatchee Avenue and the connecting streets, and a preferred type of facility. Three-dimensional orthogonal renderings were provided to clearly describe the different potential facility types.

The information that was provided at the Listening Sessions can be found in Appendix A.

## Online Survey

At the various events and at the listening session, feedback was collected in person, and information directing people to the project website and survey was provided. The survey on the website matched that on the materials provided at the listening session. Translation of the website and survey was provided via Google Translate.

The online survey was open for feedback during November of 2021. Limited additional feedback was collected via the survey. The feedback collected matched that from the listening session.

## Bike Rodeo

A bike rodeo event was held in May, 2022 at the CAFÉ offices, near the project study area. The event garnered a high turnout and significant feedback was received. The public expressed a strong preference for buffered bike lanes on South Wenatchee Avenue and was strongly not in favor of marked bike lanes. For the east-west corridors, the public favored Stevens Street as the route to South Wenatchee Avenue, with minor support for Ferry Street.

Information on the project was provided at a booth at the event, and feedback was gathered via a “dot exercise” where participants placed a colored sticker on their favored (green) and least favored (red) options on large format boards. CDTC staff, and Spanish-speaking translators were present to provide accessibility for participants who preferred communication not in English. The resulting feedback boards are included in Appendix A.

## Summary of Public Feedback

At the listening sessions, on paper surveys returned to the CDTC, and among the feedback collected on the website and online survey, several consistent themes were raised prior to the team’s technical assessment of alternatives.

At the bike rodeo after the assessment of alternatives, clear preferences were expressed by the public for some of the alternatives.

### Pre-Alternatives Analysis Feedback

- Crossings, both existing and not existing at high volume roads are a concern
- Lighting is a concern for safety, both from crashes and public safety concerns
- Physical separation from moving and parked vehicles is desired for a bike facility to be high comfort
- Elements to increase driver awareness of bike facilities and presence of bikes are highly desired to increase the range of potential users
- There was no definite preference on an east-west route or Mission Street crossing location among the survey respondents
- Sidewalk gaps are barriers to safe and comfortable active mode connections in the area, either on foot or by bicycle
- The public provided positive feedback on the cycle track and shared use path sections as their highest preference for a high comfort bike facility

### Post-Alternatives Analysis Feedback

- Strong preference for buffered bike lanes on South Wenatchee Avenue
- Strong dislike of unbuffered, painted bike lanes on South Wenatchee Avenue
- Strong preference for the use of Stevens Street as the east-west corridor connecting residential areas between Mission Street and Methow Street to South Wenatchee Avenue
- Parking utilization in the project area is typically less than 50% of the available spaces



# Bike Facility Concepts

Bike facilities were evaluated in two distinct areas of the project study area. On South Wenatchee Avenue, in the north-south direction, a more detailed investigation of specific bike treatments was completed. In the wider study area, a conceptual routing study with a section-focused investigation of potential improvements on the east-west routes connecting the South Wenatchee neighborhood across Mission Street and to the South Wenatchee Avenue facility was completed.

# South Wenatchee Avenue Corridor

The South Wenatchee Bicycle Connectivity Study area includes the signalized intersection at Benton Street and South Wenatchee Avenue, south to the unsignalized intersection with Marr Street. The RBAC’s 2020 study of the corridor identified the need for a high comfort facility for cyclists of a wide range of abilities. The design team for the South Wenatchee Bicycle Connectivity Study was tasked with developing a range of feasible options and identifying a preferred alternative. The preferred alternative would be presented to the City of Wenatchee for future implementation.

## Roadside Frontage

The South Wenatchee Avenue frontage, within the study limits, has three different characters. Between Benton and Ferry Streets, businesses and storefronts are located at the back of wide sidewalks. On-street parking is present between Benton and Ferry street, and there is an anticipated future connection to the Loop Trail at Bridge Street.

Between Ferry Street and Snohomish Street, the frontage of South Wenatchee Avenue is dedicated to Locomotive Park, and the loop ramps to and from SR 285.

Between Snohomish Street and Marr Street, industrial uses, with more open lots and no on-street parking are present.

## On Street Parking

The reduction and/or removal of on-street parking is frequently necessary to provide bicycle facilities without widening right of ways and roadway footprints. Other similar corridors in urban settings have demonstrated that with continuous on-street parking, parking utilization is between 40 and 50%. Bike projects that reduce parking by less than 50% are unlikely to have an impact on parking which creates scarcity of spaces. Parking after the installation of bike facilities may not be as convenient to certain parcels, storefronts and locations as in the existing condition, but the parking would still be available within a short walking distance (within the block).

## Locomotive Park Path

The design team, early in the study process, investigated several alternatives to using the Locomotive Park multi-use path as the primary facility between Snohomish Street and Ferry Street. Each of the alternatives to the path were not desirable as facilities that would appeal to a wide range of rider comfort levels, and therefore did not meet the project goals. The options that were evaluated, but not recommended included shifting bike lanes and a center bike lane. The rationales for each are as follows:

*Table 1 Bike Facilities Toolbox*

Description	Required Width	Capital Investment	Physical Separation	Rider Stress and Comfort Benefit	Intersection Complexity	On-Street Parking Impact
Shared Use Path	High	High	High	High	High	Low
Buffered Bike Lanes	Medium	Medium	Medium	Medium	Low	High
Protected Bike Lanes	Medium	High	High	High	Medium	Medium
Striped Bike Lanes	Low	Low	Low	Low	Low	Medium
Two Way Cycle Track	Medium	Medium	Medium	Medium	High	Medium



*Bike Facilities Toolbox Sample Photos*

- **Shifting Bike Lanes** Adding bike lanes to the existing South Wenatchee Avenue, parallel to the path, would have required shifting the bike lanes to accommodate the on- and off-ramps from SR 285, and resulted in lanes that were located between vehicle lanes, with only a striped buffer separation, for at least some of the length of South Wenatchee Avenue. It was determined that the potential for conflict, and the high stress level and low rider comfort of the shifting bike lanes made it not a viable alternative to the path.
- **Center Bike Lanes** Reallocating existing shoulder and lane space on South Wenatchee Avenue parallel to the path to create a center bike lane was investigated by the design team. While an irregular treatment, center bike lanes did offer the opportunity to provide physical barriers and buffers to traffic, while not restricting traffic access to and from the ramps to SR 285. But, the transition in and out of the center bike lanes at either end, as well as the stress of riding between opposing directions of traffic, compared to the off-street path, made center bike lanes not a viable alternative to the path.

- Required roadway width
- Capital investment to construct
- Physical separation width and type
- Rider stress/comfort level
- Intersection complexity
- Compatibility with on-street parking

Table 1 and the toolbox above show the range of facilities considered and an overall assessment of each of the listed factors using a high-medium-low scale.

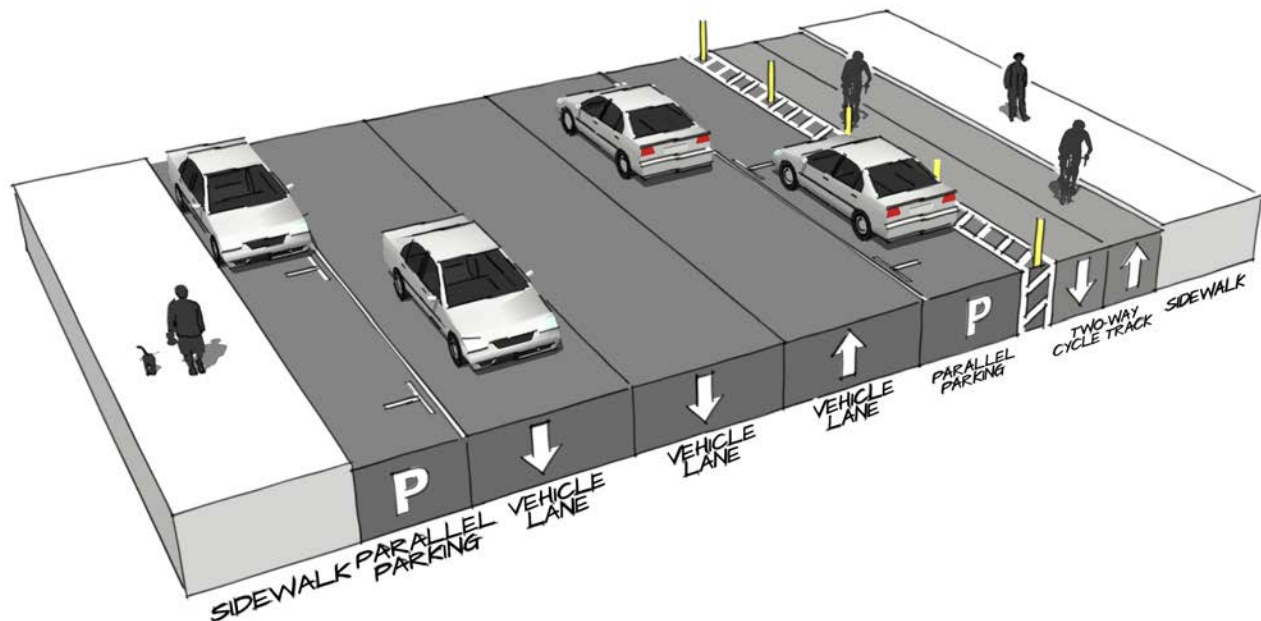
## Evaluated Alternatives

The design team evaluated alternative linear bike facility types in two segments of South Wenatchee Avenue. The northern segment is between Benton Street and Ferry Street. The southern segment is between Snohomish Street and Marr Street.

The off-street path through Locomotive Park is the preferred high comfort facility between Ferry Street and Snohomish Street. The use of the off-street path is compatible with any of the alternatives discussed in the north or south segment. A intersection treatment at Ferry Street that involves painted bike and pedestrian crossings and potentially bike signals and phases is recommended regardless of alternative selected in the north corridor. Additional pushbutton activated signage in advance of the loop ramp rectangular rapid flash beacon (RRFB) existing at the south-to-east loop ramp between South Wenatchee Avenue and SR 285 is recommended with any of the alternatives shown below. The advanced warning beacon will increase visibility and comfort for active mode users entering or exiting the multi-use path at the southern terminus.

## Linear Bike Facilities Toolbox

The design team approached the identification of feasible bike facilities with a toolbox of different treatments, including striped, signed, barrier protected and physically separated bike facilities. Each bike facility type represents a balance between several factors such as:



## North Segment: Two-Way Cycle Track (E1)

The two-way cycle track concept, titled “E1” removes one of the northbound lanes, and the wide existing shoulders and places a two-way bicycle facility on the east curb line of the existing South Wenatchee Avenue. The concept retains two southbound lanes and a southbound left turn lane at Ferry Street. On-street parking is retained on both sides of the street between Bridge and Benton Streets, although the parking lane is not at the curb line on the east shoulder. The on-street parking on the east shoulder is between the two-way cycle track and the northbound travel lane.

A two-way cycle track is one of the highest levels of separation and protection for cyclists, other than an off-street multi-use path. The section of the two-way cycle track that was evaluated by the design team was at street-grade, meaning there would be no modification to the existing curbs. But, the cycle track could be elevated, by either 3 or 6 inches for additional physical protection from vehicles with a “cold joint” to the existing curb.

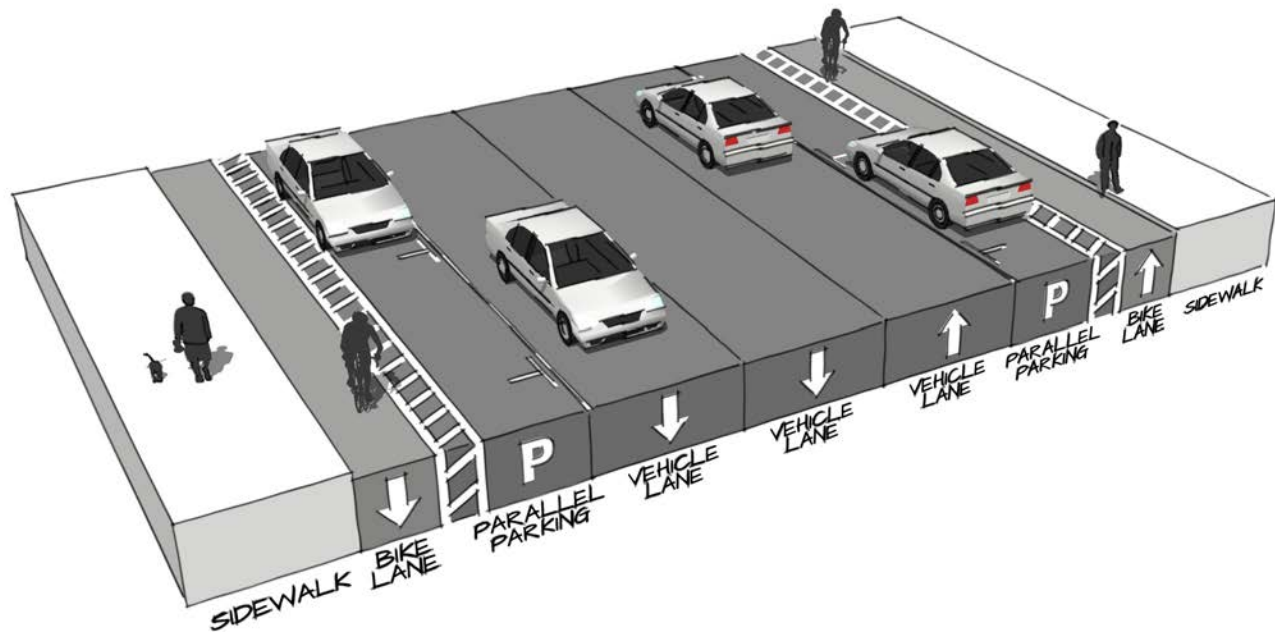
Two-way cycle tracks do require more complex intersections. Since the track would be present between two signalized intersections, each signal could be reconfigured to provide a dedicated bicycle phase that may simplify some access to and from the cycle track, but there would be an impact on vehicle operations.

The two-way cycle track on the east curb would provide direct access to the future Bridge Street connection to the Loop Trail. There would be a required crossing of

South Wenatchee Avenue at Ferry Street to connect to the Locomotive Park path. A two-way cycle track between Ferry and Benton Streets could present additional complexities when trying to connect with future long-term planned bike facilities to the north of the study area. While a cycle track has benefits in the current study area, connecting directly to the Bridge Street connection to the Loop Trail and having limited interactions with driveways, parking lots or side streets in the segment, future extensions of a cycle track may be more difficult to integrate with existing development. For example, a road diet with bike lanes would require a transition between the one-way bike lanes and the two-way cycle track in the area of Benton Street. The transition is like to be of a lower comfort level for a wide range of users and could reduce be seen as a barrier to the utility of the bike facilities.

The two-way cycle track would require a raised transit island for northbound stops in the study area to maintain access for bus boardings and alights. The raised island is a comfort improvement for pedestrians, dedicating space to waiting for and boarding transit, but is a higher cost for implementation. The transit island and the single lane northbound with the two-way cycle track concept would also require an in-lane stop for transit buses at Bridge Street.

A conceptual rendering of alternative E1 is shown in Appendix B, Figure 1. More detailed sections and a 10% design level conceptual striping and curbing layout for alternative E1 are included in Figure 8, Appendix C.



## North Segment: Buffered Bike Lanes (E2)

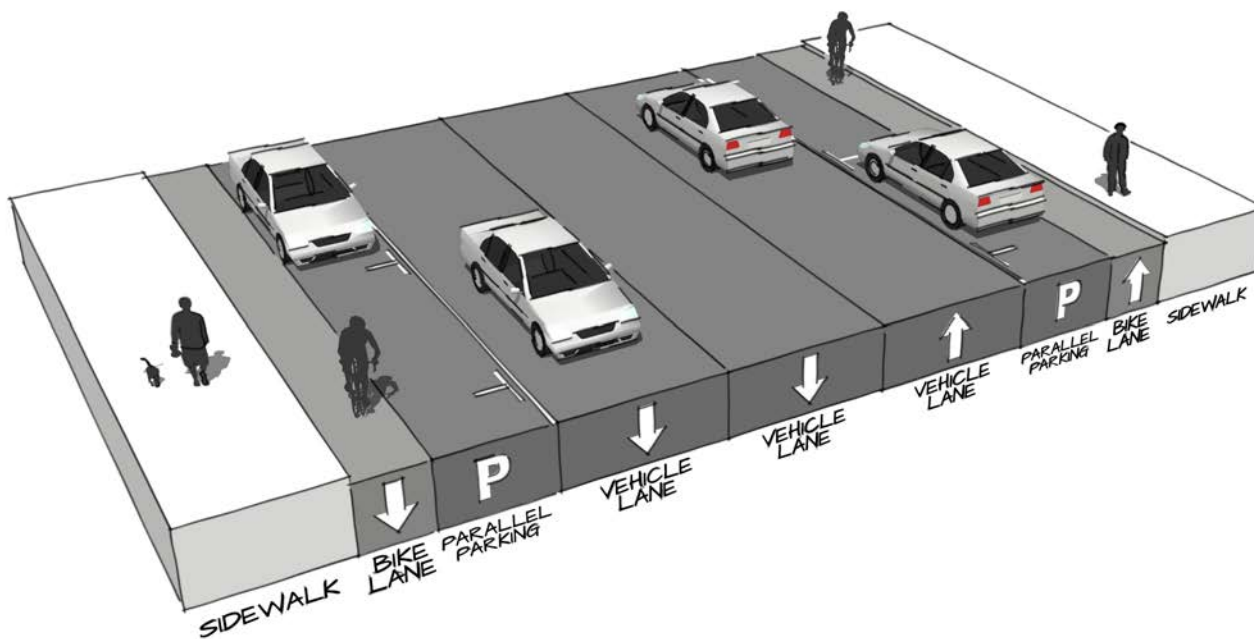
A buffered bike lane concept, titled “E2”, removes one of the northbound lanes and the existing wide shoulders and places a one-way bike lane (with the direction of traffic) along each existing curb line with a wide painted buffer to each bike lane. The concept retains two southbound lanes and a southbound left turn lane at Ferry Street. On-street parking is retained on both sides of the street between Bridge and Benton Streets, although the parking lane is not at the curb line. In both directions, the on-street parking lane is between the travel lane and the bike lane buffer. The bike lane buffer meets minimum guidance in NACTO for dooring protection width.

A buffered bike lane concept would require minimal changes to the existing intersections on South Wenatchee Avenue. The intersection at Ferry Street could be painted with green and white crosswalks, indicating the presence of cyclists and pedestrians crossing to and from the Locomotive Park multi-use path. At Benton Street, the bike lanes could temporarily end until the future road diet and extension of bike lanes to the north of the study area is implemented by the City of Wenatchee.

The northbound buffered bike lane would provide direct access to the future Bridge Street connection to the Loop Trail, but southbound traffic would be required to cross South Wenatchee Avenue at Bridge Street. An enhanced crossing, with controls such as rectangular rapid flashing beacons (RRFBs), or another form of pedestrian and/or cyclist actuated signal system is recommended at Bridge Street for alternative E2.

In order to maintain access to the existing Link Transit stops in both directions on South Wenatchee Avenue with concept E2, raised transit islands would need to be constructed in the bike lane buffers in both directions at Bridge Street. The northbound bus stop would need to be in-lane. The transit islands require narrowing of all lanes to minimums in order to not affect the existing curb line.

A conceptual rendering of alternative E2 is shown in Figure 2, Appendix B. More detailed sections and a 10% design level conceptual striping and curbing layout for alternative E2 are included in Figure 9, Appendix C.



## North Segment: Striped Bike Lanes (E3)

A striped bike lane concept, titled “E3”, removes one northbound lane between Bridge and Benton Streets, and the existing wide shoulders, and places a bike lane at the curb line in both directions of South Wenatchee Avenue. The bike lanes do not have a designated buffer, physical separation, or dooring buffer to on-street parking. The concept retains two southbound lanes and a southbound left turn lane at Ferry Street. On-street parking is retained on both sides of the street between Bridge and Benton Streets, although the parking lane is not at the curb line. In both directions, the on-street parking lane is between the travel lane and the bike lane.

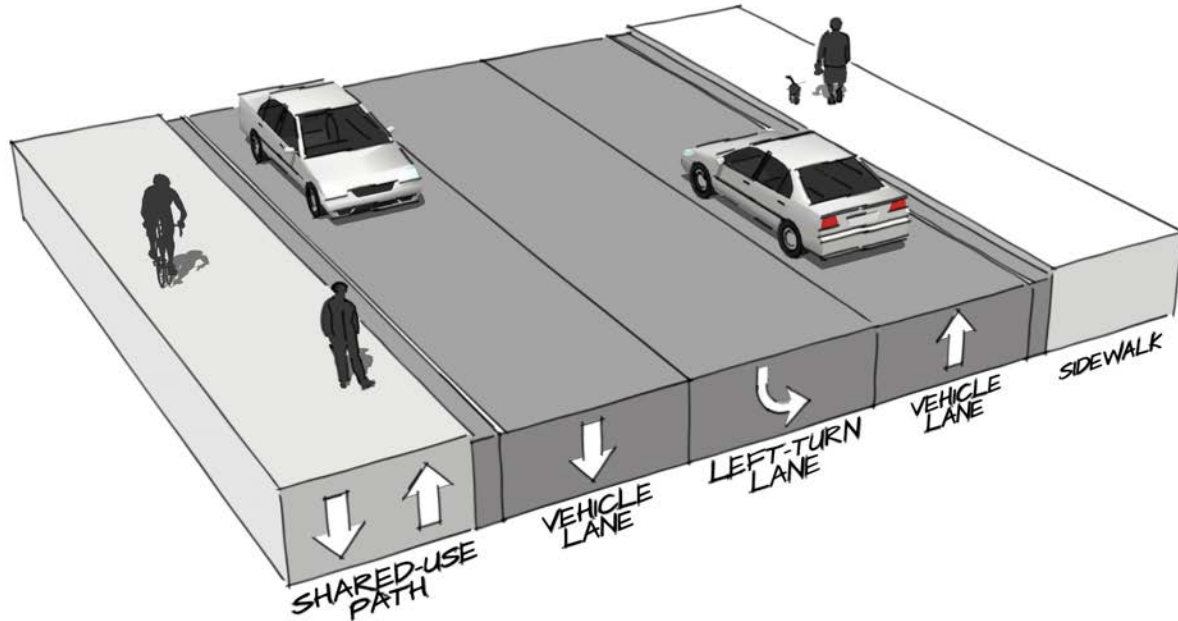
The impacts of bike lanes at the intersections would be very similar to concept E2. Access

to the future Bridge Street connection would be very similar to concept E2. An enhanced crossing, with controls such as rectangular rapid flashing beacons (RRFBs), or another form of pedestrian and/or cyclist actuated signal system is recommended at Bridge Street for alternative E3.

Transit stops are not affected by the E3 concept, and new transit islands are not required. In both directions, transit stops would not be in-line, and vehicles would be able to legally pass stopped transit vehicles.

A conceptual rendering of alternative E3 is shown in Figure 3, Appendix B. More detailed sections and a 10% design level conceptual striping and curbing layout for alternative E3 are included in Figure 10, Appendix C.





## South Segment: Off Street Shared Use Path (E4)

In the South segment of South Wenatchee Avenue, the design team considered bike lane options that would require minimal changes to the existing roadway. The required crossings of South Wenatchee Avenue at Snohomish Street and then again at Marr Street, a distance along South Wenatchee Avenue of only 220 feet, was determined to be an undesirable risk of conflict and a high stress element of an overall bike route between the neighborhoods and the South Wenatchee Avenue facility.

The only recommended alternative for a low stress facility that meets the project goal in the south segment is an extension of the multi-use path from Locomotive Park to the intersection

with Marr Street, along the west curb of South Wenatchee Avenue. The existing curb line facing South Wenatchee Avenue would not need to change to implement the wider path. There is existing right of way available, and no development has occurred within the right of way that would need to be removed. A path with a minimum width of 10 feet would provide a high comfort connection from the northwest corner of Marr Street and South Wenatchee Avenue to the loop ramp RRFB and multi-use path through Locomotive Park.

A conceptual rendering of alternative E4 is shown in Figure 4, Appendix B. Conceptual layouts of curbing for alternative E4 are included in Figure 6, Appendix C.

# South Wenatchee Avenue Corridor Alternatives Evaluation

The South Wenatchee Avenue alternatives were evaluated in more detail to identify the preferred set of bicycle facility treatments to improve the safety and comfort of biking along the corridor.

## Evaluation Approach

The approach to the alternatives evaluation included the development of criteria that addressed elements of the project objectives. The following were key principles utilized in developing the criteria:

- Supported the purpose of the study
- Both quantitative and qualitative
- Are multimodal and safety focused
- Accounts for readily available data
- Helps to differentiate between the alternatives

Each of the resulting criteria and the supporting performance measures are described in Table 2 and are further defined in the paragraphs that follow.

### Safety Criteria

While each of the alternatives improves safety over existing conditions, bike lanes, cycle tracks and raised cycle tracks/shared use paths each have other safety benefits or considerations. In the context of South Wenatchee Avenue, the safety of the facility will be tied to the interaction with driveways and parking, modified lane configurations from existing conditions, and intersection treatments.

Each of the alternatives shortens the exposure of pedestrians to vehicle travel lanes at existing marked crossings of South Wenatchee Avenue over existing conditions. Some alternatives provide

additional pedestrian safety benefit with hardscaped islands. The safety of pedestrians crossing a two-way bicycle facility should be considered for the cycle track and shared use path alternatives.

### Facility Comfort Criteria

The comfort of the facility is directly tied to safety and the appeal to a wider range of ages and abilities of cyclists. The separation distance from vehicle traffic and installation of physical barriers increase comfort and reduces the “traffic stress” for an average cyclist. Buffer widths and other protections to prevent dooring of a cyclist was also a consideration in comparing the alternatives.

Striped bike facilities are vulnerable to incursion by vehicles. Incursions can be caused by accessing parallel parking, unintentional or intentional driving in bike lanes, using a bike facility as a turn lane or to get around turning or stopped vehicles, or by errant parked vehicles not within the marked parking lanes. The susceptibility of each alternative to lane incursion and potential conflict with cyclists was compared.

### Transit Criteria

S Wenatchee Avenue is a corridor with well used transit routes. There are two bus stops within the project area, just south of Bridge Street. The impact on the location of bus stops, and how accessible the stops are to pedestrians, including ADA considerations, is one measure. Another measure assesses the impact of changes to the bus stops on through traffic that may require buses to stop in-lane creating situations where vehicles are blocked while the bus loads and unloads riders.

<i>Table 2 Evaluation Criteria</i>		
Criteria	Measure	Description of the Measure
<b>Safety</b>	Cyclists	What are the safety benefits for cyclists based on the interaction with driveways, on-street parking, modified lane configurations, and intersection treatments?
	Pedestrians	Are there safety impacts to pedestrians such as crossing a two-way bicycle facility or sharing a multi-use pathway with cyclists?
<b>Facility Comfort</b>	Separation from Travel Lane	To what degree does the alternative provide improved separation from vehicle traffic, both in distance and by physical barriers?
	Potential Lane Incursion	Is there potential for incursion in the bicycle facility by vehicles to access parallel parking, unintentional or intentional driving in bike lanes, using a bike facility as a turn lane or to get around turning or stopped vehicles, or by errant parked vehicles not within the marked parking lanes?
<b>Transit</b>	Impacts to Traffic Flow	Are there bus pull-outs or stops that are in-lane and impact through traffic progression?
	Access to Bus Stop	Is access to existing bus stops improved or impacted based on ADA considerations and nearest crossing location?
<b>Traffic Operations</b>	Intersection & Corridor Capacity	Are the number of travel lanes reduced, to what degree, and are there any impacts on intersection LOS and corridor delay?
<b>Implementation</b>	Compatibility with Other Projects	How compatible is the alternative with existing and planned active transportation facilities and connections?
	Cost & Complexity	Does the alternative minimize costs and stay within existing curb-to-curb width of the corridor to reduce overall complexity?
	Public Input	Is there general support of the alternative noted through various community and stakeholder outreach processes?

## Traffic Operations Criteria

Modifications to the number of vehicle lanes and intersection operations are accounted for as part of the traffic operations criteria. Each alternative requires the reduction of northbound South Wenatchee Avenue to a single lane, but retains two lanes southbound. Additionally, some intersections require traffic control or channelization changes depending on the alternative. A traffic operations analysis was performed to assess impacts on corridor and intersection operations. The Traffic Operations section of the report, and Table 6, include documentation of the impact to level of service from the modifications to South Wenatchee Avenue, reducing to a single lane northbound, and incorporating bike facilities.

## Implementation Criteria

The South Wenatchee Avenue project is limited in scope. Future bicycle infrastructure projects are anticipated north of Benton Street. The extension of the pedestrian and bicycle facilities at Bridge Street to include a new Apple Loop Trail crossing of the Columbia River will increase the demand for bicycle facilities on South Wenatchee Avenue. Compatibility of each alternative with known future projects has been considered.

**Table 3 Evaluation Results for South Wenatchee Avenue**

Criteria	Measure	E1: Two-Way Cycle Track	E2: Buffered Bike Lane	E3: Striped Bike Lane
Safety	Cyclist Conflict Points	▲	▲▲	▲
	Pedestrian Conflict Points	—	—	—
Facility Comfort	Separation from Travel Lane	▲▲	▲▲	—
	Potential Lane Incursion	▲	▲	▼
Transit	Impacts to Traffic Flow	▼	▼▼	—
	Access to Bus Stop	▼	▼	—
Traffic Operations	Intersection & Corridor Capacity	▼	—	—
Implementation	Compatibility with Other Projects	▼	▲	▲
	Cost & Complexity	▲	▲▲	▲▲
	Public Input	▲	▲▲	▼
		<b>Overall Score</b>		
		▲2	▲7	▲2

**Scoring Methodology:**

▲▲ Significant Advantage    ▲ Advantage    — Neutral    ▼ Disadvantage    ▼▼ Significant Disadvantage

### Project cost and Complexity

The alternatives are each intended to minimize reconstruction of the corridor and stay within the existing curb-to-curb width of South Wenatchee Avenue. There are differences in the amount of re-striping, signing and hardscape required for each alternative. The complexity of intersection modifications will also affect the installation cost for each alternative, along with seeking WSDOT approval for improvements that impact facilities along their system.

Finally, public support was also accounted for by incorporating the results of feedback obtained through multiple outreach events where the alternatives were presented.

### Evaluation Results

A summary of the evaluation results is presented in Table 3 based on the approach outlined previously. The evaluation process scored each criteria and performance measure based on whether there was likely to be a high or low benefit or a high or low impact. In some cases there was no benefit or impact, and that was also noted. The scores were determined using both qualitative and quantitative information, depending upon the criteria and availability of data. A more detailed summary table has been included in Appendix D and provides more information on how each score was determined.

Based on the evaluation process, the Buffered Bike Lane treatment (E2) scored the highest, and the other two alternatives scored slightly lower. The Buffered Bike Lane was shown to provide the greatest safety and comfort for cyclists, and will be one of the least costly and complex treatments to implement, while also receiving strong public support.

# Summary of Recommended Alternative Treatments

After evaluation of a range of alternatives, scoring the alternatives by a range of criteria and considering the public feedback received by the CDTC, the recommended treatments for South Wenatchee Avenue include:

- Removal of one northbound lane between Ferry Street and Benton Street
- Installation of buffered single-direction bike lanes on either side of South Wenatchee Avenue between Ferry Street and Benton Street
- Retention of on-street parking between the bike lanes and vehicle lanes on South Wenatchee Avenue between Bridge Street and Benton Street
- Addition of green striping and protected corners at the signalized intersection of Ferry Street and South Wenatchee Avenue to facilitate crossing of bike traffic between the Locomotive Park multi-use path and the buffered bike lanes
- Installation of advanced RRFB signage at the existing loop ramp crossing to increase visibility of crossing active mode traffic exiting the Locomotive Park multi-use path
- Widening to the west of the existing west side sidewalk between Snohomish Street and Marr Street to provide a multi-use path connection to the Marr Street and South Wenatchee Avenue intersection.

For all of the recommended treatments, the existing curb lines will remain in place. No right of way acquisition is anticipated, as the only widening outside of the existing pavement is in the segment between Snohomish Street and Marr Street where sufficient right of way exists to widen the sidewalk. Re-striping of the entire South Wenatchee Avenue will be required between Ferry Street and Benton Street, and a plane and overlay is recommended to allow the clearest visibility of markings of the new lane configuration for all modes.

# East-West Connecting Corridors

The east-west routes in the study area connect the South Wenatchee neighborhood, bordered for the study by Methow Street, Benton Street, Marr Street and South Wenatchee Avenue, to the north-south bike route on South Wenatchee Avenue. The scope of the study on the east-west routes focused on the feasibility and identification of a program of potential improvements on one or more routes and a potential section that could be used to increase the comfort of biking on the neighborhood streets.

Four distinct corridors were selected for evaluation, with a new or enhanced crossing of Mission Street. The corridors are:

- **Ferry Street**, with an enhanced crossing and signal timing to allow for additional crossing time at the existing signalized intersection with Mission Street.
- **Stevens Street**, with a new active mode connection to the existing signal and installation of a crossing of Mission Street on the south side of the intersection.

- **Lincoln Street**, with a new pedestrian activated signal across Mission Street to Snohomish Street.
- **Marr Street**, with an enhancement of the existing marked crossing of Mission Street.

Except for Ferry Street, each of the other streets are low volume, low speed roadways which can function comfortably as mixed use facilities, without dedicated bike lanes or buffers. Ferry Street will require a dedicated bike facility because of the higher vehicle volumes.

Each of the corridors was evaluated for potential cross sections, the benefits and considerations of the associated crossing of Mission Street and the type of connection for each corridor between Mission Street and South Wenatchee Avenue. A traffic analysis of the impact on Mission Street was conducted for each east-west corridor as a factor in the identification of a preferred alternative.

*Table 4 Bike Crossings Toolbox*

Description	Comfort Increase <sup>1</sup>	Roadway Impact <sup>2</sup>	Resources <sup>3</sup>
New marked crosswalks & ramps	High	Medium	Low
Green and white marked crosswalks	Medium	Low	Low
Medians and refuge islands	Medium	Medium	Medium
Crosswalk with RRFB	High	Medium	Medium
Crosswalk with Pedestrian Hybrid Beacon (HAWK) signal	High	High	Very High
Protected intersection	High	Medium/High	Medium/High

1. Elements that appeal to riders of all ages, abilities and comfort levels

2. Operational impacts and impacts to facilities such as reduced lane widths, number of lanes, etc.

3. Cost, design time, installation time, etc.



*Bike Crossings Toolbox Photos*

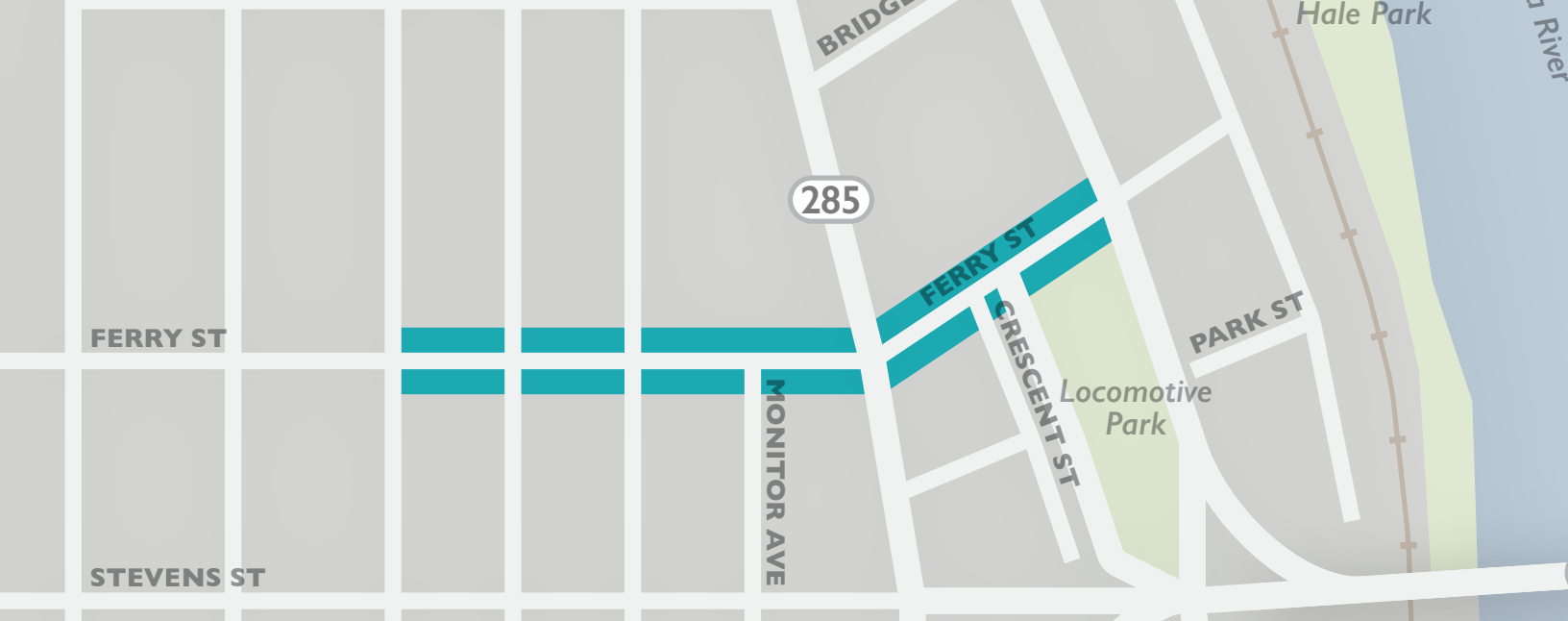
## Bike Crossings Toolbox

The design team approached the crossing of Mission Street with a toolbox of different treatments, similar to the toolbox approach to linear facilities on South Wenatchee Avenue. The toolbox includes treatments to raise awareness of mixed mode (pedestrian and bike) crossing, beacons to increase yielding rates, and physical protections.

The toolbox includes:

- New marked crossings and curb ramp modifications
- Split green and white crossings with increased width to accommodate both modes
- Medians at midblock crossings
- Rectangular rapid flash beacons (RRFBs)
- Pedestrian hybrid beacons (HAWK signal)
- Protected intersections with dedicated bicycle space and physical barriers

Table 4 and the toolbox above show the range of facilities considered and guidance on the potential comfort increase for active modes, the impact on the existing roadway and the resource requirements.



## Ferry Street: North Cycle Track Concept (A1)

Ferry Street provides a direct connection to South Wenatchee Avenue at an existing signalized intersection. A Ferry Street east-west connection would also provide access to the future connection at Bridge Street to the Loop Trail with minimal use of South Wenatchee Avenue. Because Ferry Street is a higher volume facility than the other east-west routes, two concepts for delineated and separated bike facilities were developed for analysis. The first concept, designated A1, is a two-way cycle track, with a narrow buffer that would accommodate vertical posts as a physical separation, on the north curb line of Ferry Street. The concept would require the removal of one of the two westbound lanes on Ferry Street, from South Wenatchee Avenue to Methow Street.

The existing north crosswalk at the signalized intersection at Mission Street would be reconfigured with a wide crossing and two-color striping, as well as curb ramp improvements and signal timing adjustments to provide a bike crossing phase and accommodate the two-way cycle track. The A1 concept would require a crossing at Ferry Street and South Wenatchee Avenue to access connecting bike facilities either north or southbound on South Wenatchee Avenue. The existing signalized intersection at South Wenatchee Avenue would receive similar treatments to the Mission Street signal for concept A1.

A conceptual rendering of alternative A1 is shown in Figure 5, Appendix B. Sections and a 10% design level conceptual alignment for concept A1 are included in Figure 2, Appendix C.

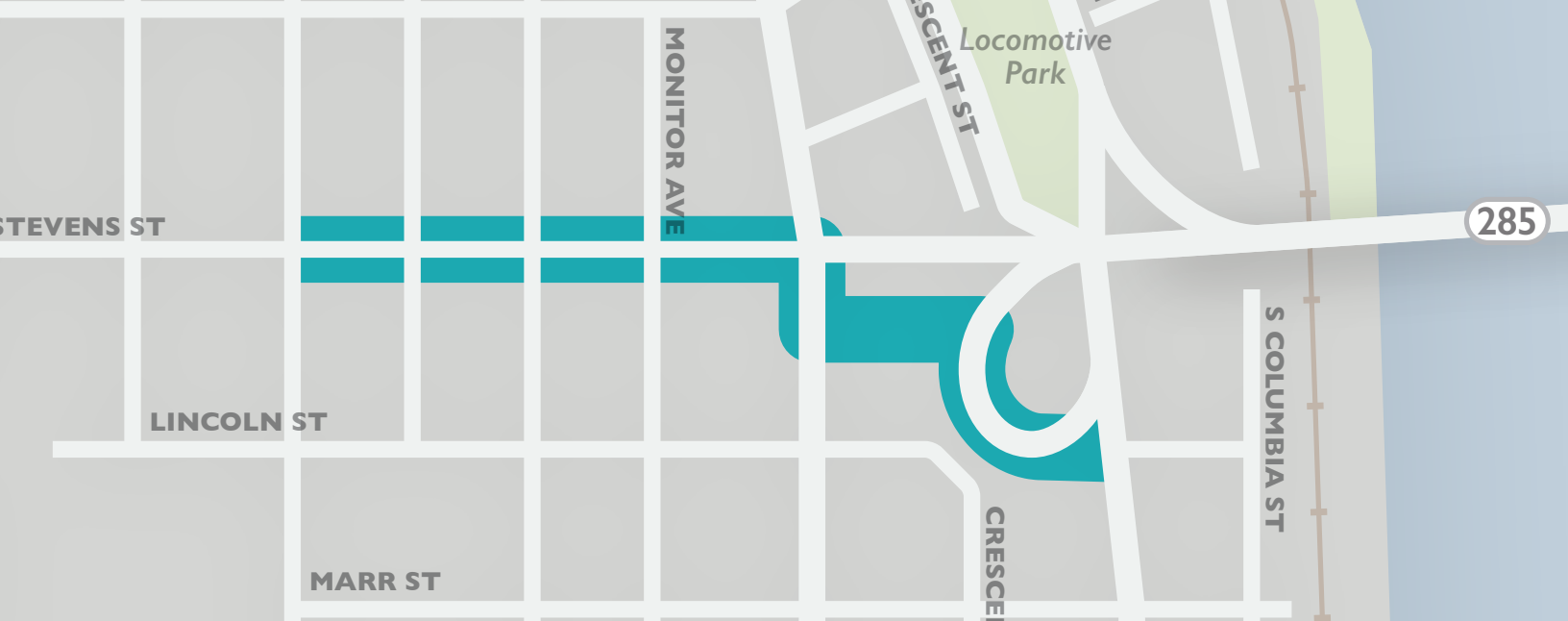
## Ferry Street: South Cycle Track Concept (A2)

The second east-west concept that uses Ferry Street places the two-way cycle track on the south curb line of the existing Ferry Street. Similar intersection treatments would be required at Mission Street and South Wenatchee Avenue to accommodate the two-way facility and connections to bike facilities on South Wenatchee Avenue. Concept A2 would have a direct connection to the multiuse path in Locomotive Park at South Wenatchee Avenue.

Concept A2 would require the removal of one eastbound lane between Methow Street and Crescent Street. Between Crescent Street and South Wenatchee Avenue, concept A2 would be in an off-street multi-use path configuration along the frontage of Locomotive park.

A conceptual rendering of alternative A2 is shown in Figure 6, Appendix B. Sections and a 10% design level conceptual alignment for concept A2 are included in Figure 3, Appendix C.





## Stevens Street Concept (B)

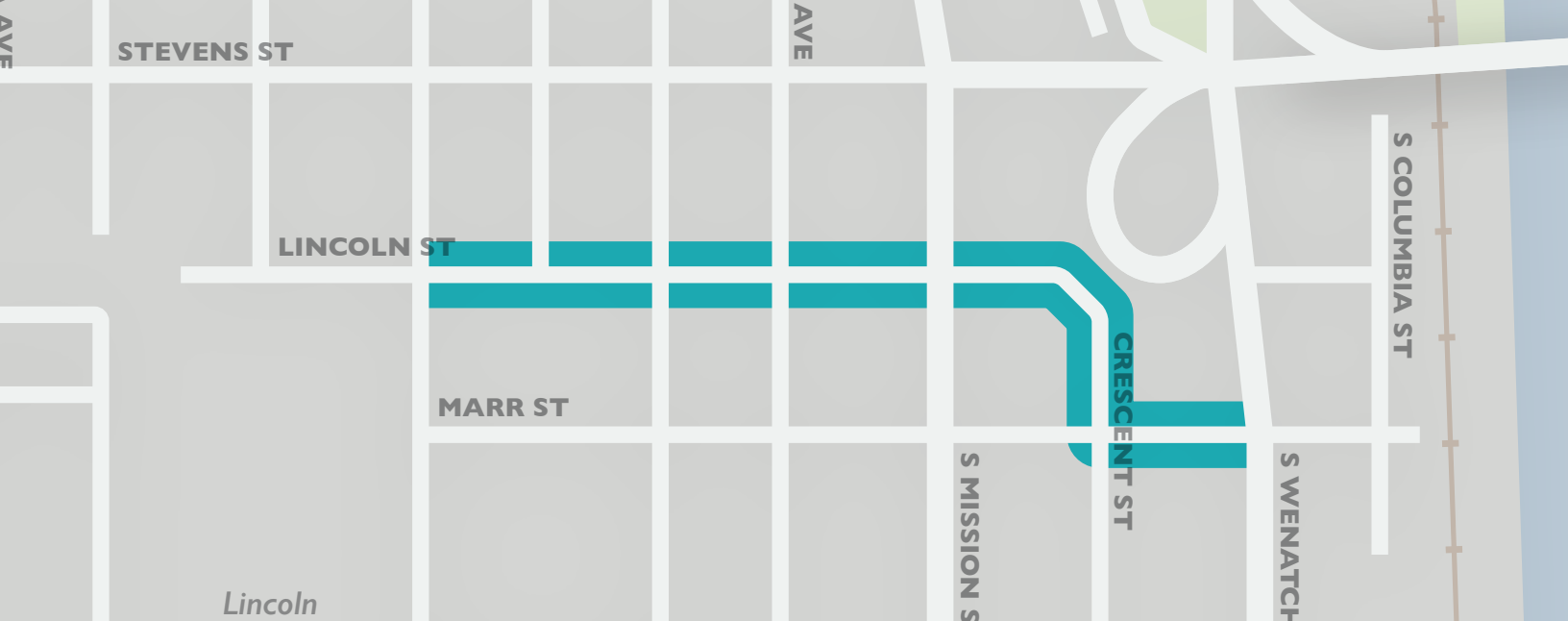
Using Stevens Street as the east-west connection, concept B, will require the highest capital cost and construction of new facilities of the four east-west routes. Changes at the Stevens Street and Mission Street intersection in 2013 removed Stevens Street from the intersection west of Mission Street, and removed the crosswalks from the intersection. Using Stevens as the east-west active mode connection will require construction of a new segment of multi-use path between the existing cul-de-sac bulb in Stevens Street and the signalized intersection with Mission Street. West of Mission Street, Stevens would be a mixed use facility with shared lanes.

At Mission Street, a marked crossing would be restored on the south side of the signalized intersection. A new active mode phase would be required to accommodate the crossing. Once across Mission Street, two alternatives can connect a Stevens Street crossing with the South Wenatchee Avenue bike facility. Widening the existing sidewalks

on the east side of Mission Street, south to the intersection with Snohomish Street would then allow the low volume Snohomish Street to serve as a mixed use connection to Marr Street and then the South Wenatchee Avenue facility. Because of the additional  $\frac{1}{4}$  mile distance, and the need to add facilities to Marr Street as well, a more direct connection through the existing loop ramp infield was chosen as the route for concept B.

The direct connection assumes that WSDOT will allow additional use of loop ramp property for extension of multiuse pathway. The path would follow the outside of the existing loop ramp, terminating at the west side of the intersection of South Wenatchee Avenue and Snohomish Street.

A conceptual rendering of alternative B is shown in Figure 7, Appendix B. Sections and a 10% design level conceptual alignment for concept B are included in Figure 4, Appendix C.



## Lincoln Street Concept (C)

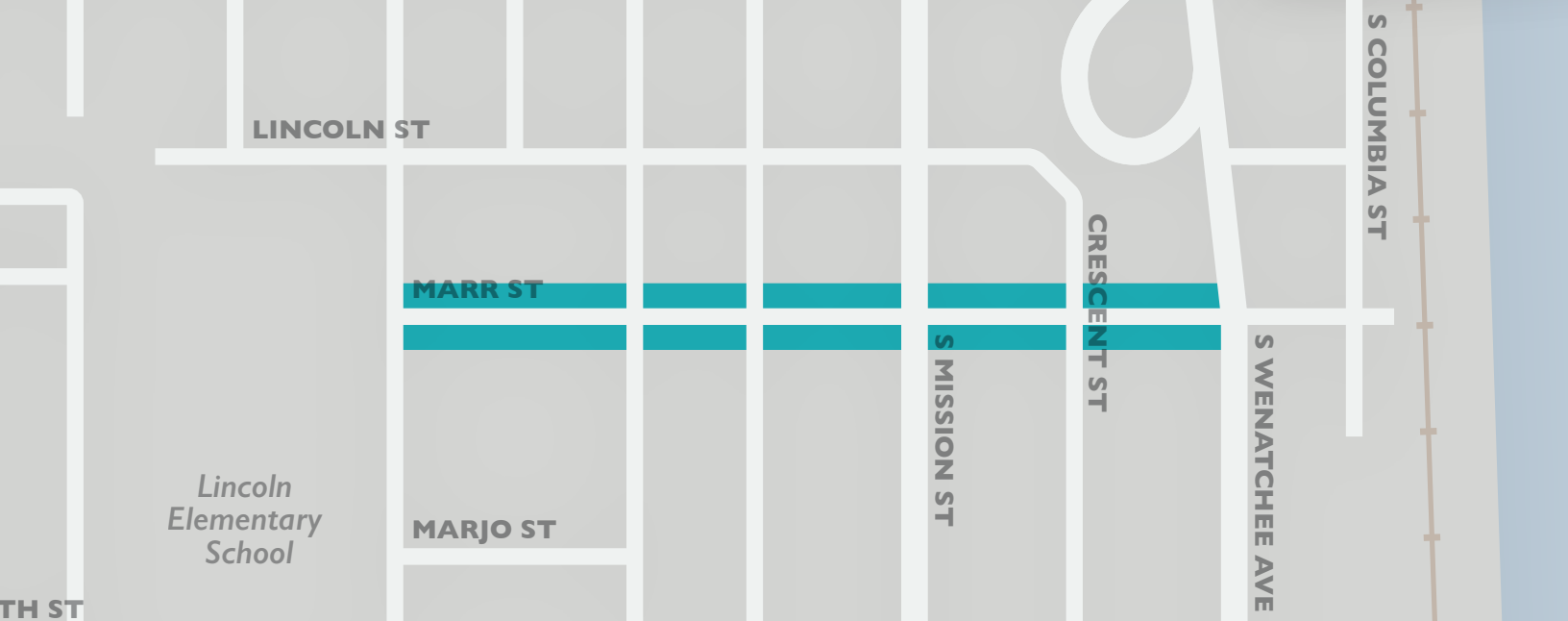
Lincoln Street, south of Stevens Street, is a low volume roadway and used for concept C to connect to South Wenatchee Avenue. Lincoln Street between Methow Street and Mission Street would be a shared facility with no separated bike space. At Mission Street, a new pedestrian signal would be installed that would also allow for controlled and protected crossing by cyclists. The signal would likely be a HAWK, based on FHWA guidance, and would need to be coordinated with the signal at Mission Street and Stevens/SR 285.

The new crossing location would put bikes on Snohomish Street, which is also a low volume street that would be a shared space as it turns south and changes to Crescent Street. At Crescent Street and Marr Street, the existing lanes would be narrowed and pushed to the south curb of

Marr Street, creating room for a two-way cycle track on the north curb. The two-way track would be protected by a buffer wide enough for vertical markers as a physical separator. The two-way track between Crescent and South Wenatchee Avenue would connect directly to the recommended multi-use path along the west curb of South Wenatchee Avenue between Marr Street and Snohomish Street.

Concept C involves significant lengths of shared street compared to other alternatives, but requires the least amount of crossings between the South Wenatchee neighborhood streets and the bike facility on South Wenatchee Avenue.

A conceptual rendering of alternative C is shown in Figure 8, Appendix B. Sections and a 10% design level conceptual alignment for concept C are included in Figure 5, Appendix C.



## Marr Street Concept (D)

The furthest south east-west connection in the study area is Marr Street. Marr is, like the other streets, low volume west of Mission Street, and therefore would be a mixed use facility. The existing crossing at Marr Street and Mission Street, on the south side of the intersection would be upgraded to include additional markings for cyclists and possibly a median island and third RRFB flasher and crossing sign for added visibility.

Between Mission Street and South Wenatchee Avenue, the existing lanes of Marr Street would be narrowed and pushed to the north curb in concept D. The resulting space on the south curb would allow for a buffered two-way cycle track. The buffer

space would be sufficient for vertical markers as a physical barrier near to Mission Street and widen out to be able to accommodate a curbed median near the South Wenatchee Avenue intersection. At the stop-controlled intersection with Marr Street and South Wenatchee Avenue, concept D would require enhancement of the crossing of Marr Street to increase visibility of cyclists accessing the multi-use path to the north along South Wenatchee Avenue.

A conceptual rendering of alternative D is shown in Figure 9, Appendix B. Sections and a 10% design level conceptual alignment for concept D are included in Figure 6, Appendix C.

# East-West Corridors Alternatives Evaluation

The East-West alternatives were evaluated in more detail to determine feasibility and identify a set of bicycle facility treatments to improve the safety, comfort, and connectivity between South Wenatchee Avenue and the residential areas to the west of Mission Street.

## Evaluation Approach

The alternatives evaluation was similar to the South Wenatchee Avenue approach, but there were a few changes to the criteria and measures to better reflect the differences in the analysis and context of the corridors. The following are the key changes:

- **Facility Comfort** The “Potential for Lane Incursion” measure was replaced with a “Route Directness & Network Connectivity” measure. Route Directness & Network Connectivity considers how direct the connection is to active transportation facilities and other generators. The factor also reflects the level of connectivity outside of the study area. It accounts for whether cyclists have to go out of their way to cross Mission Street. Since there were few instances of on-street parking or lane incursions like there were on South Wenatchee Avenue, the route directness measure helped in evaluating the location and directness of the routes that were being considered.
- **Transit** The transit criteria was removed since few of the east-west routes served transit.
- **Traffic Operations** The criteria was expanded to include two separate measures. One measure considered “Corridor Capacity and Delay” and the other measures accounted for “Intersection Operations.” Previously the two measures were combined together, but given the need to consider both corridors and intersection separately, the measures were separated out for the east-west evaluation.

**Table 5 Evaluation Results for the East-West Alternatives**

Criteria	Measure	A1 Ferry Street	A2 Ferry Street	B Stevens Street	C Lincoln Street	D Marr Street
Safety	Cyclist Conflict Points	▲▲	▲	—	▲	▲
	Pedestrian Conflict Points	—	—	▲	▲	▲
Facility Comfort	Separation from Travel Lane	▲	▲	▲▲	—	▲
	Route Directness/Network Connectivity	▲▲	▲▲	▲	▼	▲
Traffic Operations	Corridor Capacity & Delay	▼	▼	▼	▼	▼
	Intersection Operation	—	▼	▼	—	—
Implementation	Compatibility with Other Projects	▲	▲	▲	▲	▲
	Cost & Complexity	▼	▼▼	▼▼	▼	—
	Public Input	▲	—	▲▲	—	▼▼
<b>Overall Score</b>		▲ 5	▲ 1	▲ 3	0	▲ 2

**Scoring Methodology:**

▲▲ Significant Advantage    ▲ Advantage    — Neutral    ▼ Disadvantage    ▼▼ Significant Disadvantage

## Evaluation Results

A summary of the evaluation results is presented in Table 5 based on the approach and updated evaluation criteria. The evaluation process scored each criteria and performance measure consistent with how the South Wenatchee Avenue alternatives were scored. A more detailed summary table has been included in the Appendix and provides more information on how each score was determined.

Based on the evaluation process, the Ferry Street route (A2) scored the highest, which would include a cycle-track on the north side of the corridor. The next highest scoring alternative was the Stevens Street (B) route which would include a new crosswalk on the south side of the Mission Street / Stevens Street intersection. The Ferry Street cycle-track was shown to provide the greatest safety, comfort, and route directness for cyclists, but did not receive as strong public support at the Stevens Street alternative. More information on the public feedback on the east-west routes is included in the Public Outreach section and in Appendix A.

# Summary of Treatments and Considerations for Prioritization

After evaluation of several east-west corridor alternatives, scoring the alternatives and considering the public feedback received by the CDTC, it was determined that multiple corridors are feasible, but require further consideration for prioritization. Feasible treatments on east-west corridors to connect to South Wenatchee Avenue bike facilities and section treatments include:

- A two-way cycle track on Ferry Street, along the northern curb (Alternative A1) would tie directly into the recommended improvements on South Wenatchee Avenue and has some public support. Crossing of Mission Street would be at the existing Ferry/Mission signalized intersection, with modifications to phasing and crosswalk striping for bikes.
- A shared facility on Stevens Street (Alternative B), with an extended shared use path between the end of Stevens Street, a new crossing at the Mission Street signal (south leg) and a shared use path through the SR 285 ramp area, connecting near the intersection of South Wenatchee Avenue and Snohomish Street.

- A shared facility on Marr Street (Alternative D), combined with a two-way cycle track on the south curb of Marr addresses the connectivity to South Wenatchee Avenue and potential utility to the residential areas west of South Wenatchee Avenue. The Marr Street connection also provides direct access to Lincoln Elementary School. Crossing of Mission Street would be at the existing rectangular rapid flashing beacon (RRFB) which could be modified to increase median refuge space and add bike markings.

Treatments on the east-west corridors that are technically feasible, but not recommended for further consideration include:

- A two-way cycle track on Ferry Street on the southern curb (Alternative A2). The south side cycle track is more complex to design and install, has additional crossings that may present safety conflicts and is more complex at the intersection with Mission Street.
- Lincoln Street (Alternative C), based on its proximity to the Mission Street/SR 285 intersection and poor evaluation results compared to other corridors.

# Traffic Operations Analysis

An analysis of traffic operations was performed to support the findings of the South Wenatchee Bicycle Connectivity Study. Traffic forecasting methodology and traffic operations results are summarized below. Additional traffic analysis conducted during the Study, looking at potential impacts to other intersections and concepts outside of the main scope of the Study, can be found in Appendix E and F.

## Traffic Volumes

The traffic analysis focuses on the weekday PM peak hour when traffic conditions would be at the highest volumes. Weekday AM peak hour volumes were compiled for review but are not included as the analysis confirmed that PM conditions had significantly higher volumes. New and historical intersection turning movement counts were provided by CDTC staff for the Study. Counts were adjusted to reflect 2020 conditions assuming no pandemic related volume reductions.

The 2045 volume forecast was developed based on the Official 2045 Full Build CDTC Travel Demand Model. Model growth between 2020 and 2045 was added to study intersections to forecast future volumes. Consistent with any forecasting methodology, minor adjustments to the volumes were made for reasonableness. The post-processed 2045 traffic volumes were used in the traffic operations analysis for the previously discussed alternatives on South Wenatchee Avenue and the east-west corridors.

## Traffic Operations Analysis

PM peak hour traffic operations were evaluated at the study intersections based on level of service (LOS). The LOS analysis method was based on procedures identified in the Highway Capacity Manual (6th Edition) and evaluated using Synchro version 11.

At signalized intersections, LOS is measured in average control delay per vehicle and is typically reported using the intersection delay. At stop-sign-controlled intersections, LOS is measured in delay per vehicle. Traffic operations for an intersection can be described alphabetically with a range of levels of service (LOS A through F), with LOS A indicating free-flowing traffic and LOS F indicating extreme congestion and long vehicle delays. Table 6 summarizes the weekday PM peak hour LOS at study intersections. In general, the different bike facility scenarios do not dramatically change traffic operations at study intersections in most cases.

For detailed descriptions of each alternative, please see the earlier sections for South Wenatchee Avenue and the East-West corridors.

No operational analysis was performed for Alternative D as the Marr Street improvements do not change existing lane configurations, crossing types or intersection control. Therefore, there is no impact to level of service from the conceptual design for Alternative D described in earlier sections.

While there are no operations metrics for Alternative D, it is expected that lane markings and signage in the area would be improved at the Mission Street/Marr Street intersection to simplify driver and bicycle operations at the crossing.

A single traffic analysis was performed for all Alternative E modifications to South Wenatchee Avenue. The changes in number of vehicle lanes, crossings and intersection operational changes along South Wenatchee Avenue are the same for Alternatives E1 and E2. Alternative E3 on South Wenatchee Avenue will have no operational differences from the existing conditions.

**Table 6 Future 2045 Weekday PM Peak Hour Level of Service**

Intersection	Baseline		Ferry Street (Alt A1)		Ferry Street (Alt A2)		Stevens Street (Alt B)		Lincoln Street (Alt C)		South Wenatchee (Alt E)	
	LOS	Delay (W/M)	LOS	Delay (W/M)	LOS	Delay (W/M)	LOS	Delay (W/M)	LOS	Delay (W/M)	LOS	Delay (W/M)
Mission St/ Ferry St	B	18.8	C	23.6	C	22.3	B	18.7	B	18.8	B	18.7
Mission St/SR 285	D	43.7	D	43.5	D	43.5	D	50.2	D	43.8	D	43.7
Mission St/Marr St	E	42.9 (WBL)	E	42.9 (WBL)	E	42.9 (WBL)	E	42.9 (WBL)	E	42.9 (WBL)	E	42.9 (WBL)
Crescent St/ Ferry St	D	36.2	C	32.3	D	36.9	D	36.2	D	36.2	D	36.2
Wenatchee Ave/Ferry St	C	31.6	C	31.6	C	31.6	C	31.6	C	31.6	C	28.3
Wenatchee Ave/Marr St	D	27.0 (EB)	D	27.0	D	27.0 (EB)	D	27.0 (EB)	D	27.0 (EB)	D	27.0 (EB)
Mission St/ Crawford Ave	C	23.0	C	23.0	C	23.0	C	23.0	C	23.0	C	23.0
Mission St/ Snohomish St <sup>3</sup>	-	-	-	-	-	-	-	-	C	22.9	-	-

Source: *Transpo Group, 2022*  
 1. Level of service (LOS), based on Highway Capacity Manual (6th Edition) methodology.  
 2. Average delay in seconds per vehicle. For traffic signals reported as intersection average. For TWSC, reported for worst movement (WM).  
 3. Values not shown mean analysis not applicable.

## Future Extension of Bike Facilities

Traffic analysis was conducted to better understand the overall sensitivity and volume shifts associated with extending the bike improvements described in previous sections to Wenatchee Avenue north of Benton Street. The extension of bike facilities would extend the reduction of northbound Wenatchee Avenue to a single lane, with no anticipated changes to the operation of Wenatchee Avenue beyond what is shown in Table 6. Northbound traffic operations would operate adequately with a single lane. Extending the bike facilities would likely shift more traffic to the Mission Street corridor. The reduction of vehicle traffic along Wenatchee Avenue could improve overall bike comfort levels along the corridor. The shift in traffic to Mission Street is not enough to significantly affect traffic operations on Mission Street.



# Implementation Strategies and Next Steps

The CDTC Regional Bicycle Plan assigns each candidate corridor in the region a prioritization score to aid local agencies in developing Transportation Improvement Plans to implement bikeways in their jurisdictions. In the South Wenatchee area, the prioritization scores for corridors in the study area are:

- South Wenatchee Avenue (priority score 10 out of 10)
- Marr and Stevens Streets (priority score 9 out of 10)
- Ferry Street (priority score 7 out of 10)

The City of Wenatchee is encouraged by the Regional Bicycle Plan to prioritize the three listed corridors. All three corridors are described in the South Wenatchee Bicycle Connectivity Study. To aid in implementation, the following discussion of strategies and next steps are presented for consideration by the City of Wenatchee.

## South Wenatchee Avenue

Many of the elements listed in the recommended treatments for South Wenatchee Avenue can be developed as independent mini-projects and retain utility and realize safety and comfort benefits for users. Improvements south of the underpass of SR 285, specifically, are good candidates for “quick win” type projects while funding is identified for changes between Ferry Street and Benton Street.

The striping modifications between Ferry Street and Benton Street will have increased utility and use if combined with either the improvements at Bridge Street to connect South Wenatchee Avenue to the Loop Trail or extensions of the bike facilities north of Benton

Street. Because of the reliance for connectivity on other projects, the striping of buffered bike lanes between Ferry and Benton Streets should be considered a mid- to long-range project.

Projects already in the City of Wenatchee’s Transportation Improvement Plans which may lead to renewal of the paved surface and new striping, such as overlays or major utility work, would be opportunities to implement the recommended treatments with minimal added cost. The City should conduct direct outreach to businesses between Ferry and Benton Streets to make them aware of the intended multimodal connections, the modifications to the existing parking configuration, and the research-backed benefits of bike facilities in retail corridors.

The recommended alternative treatments for South Wenatchee Avenue are also compatible with long-term City plans to extend the South Wenatchee Avenue bike improvements beyond the limits of the study. Buffered bike lanes are comparatively easier to install in most urbanized roadways, compared to a two-way cycle track.

## East-West Corridors

The east-west corridors are a critical part of the success of improvements on South Wenatchee Avenue in providing connectivity and modal choice for the neighborhoods of South Wenatchee. The use of Ferry, Stevens and Marr Streets as connections are all feasible. Although the study area for the South Wenatchee Bicycle Connectivity Study terminates at Methow Street, Stevens Street and Ferry Street provides connectivity to destinations further west as the road extends to Miller Street, while Marr Street terminates at Methow Street and the Lincoln Elementary School campus.

Stevens Street (Alternative B) could be a single project that connects the neighborhood to South Wenatchee Avenue, while Ferry (Alternative A1) and Marr (Alternative D) Streets would both need to be implemented to provide the same level of connectivity as Stevens Street. The use of a single corridor or multiple corridor connections will depend on future available funding through grants and local resources, as well as coordination with WSDOT regarding the Mission Street/SR 285 intersection and the use of the SR 285 loop ramp right of way.

While the Stevens Street connection had strong public support, and provides good connections as a single project, it is likely the most expensive and complex to construct of the east-west corridors. The increased cost, complexity, and potential project delays working with WSDOT to permit additional active mode facilities within the WSDOT controlled access area for SR 285 may make Stevens Street a less attractive alternative for making needed connections as other facilities on South Wenatchee Avenue come online, compared to the combination of Ferry and Marr Streets. The Marr Street corridor improvements are likely the lowest cost and impact of the east-west corridors to implement. Ferry Street improvements would fall, in terms of cost and complexity, in between Stevens and Marr Streets.

Combined with the independent utility, low cost and complexity and re-use of existing facilities, the Marr Street corridor likely represents the best near term “quick win” east-west improvement. When combined with elements of the recommended treatments on South Wenatchee Avenue south of the SR 285 underpass (Alternative E4), the Marr Street east-west corridor could help to provide a short-term multimodal connection to the South Wenatchee Avenue area while funding is identified for the Ferry Street and/or Stevens Street corridors. Stevens Street is likely the longest term improvement, considering the agency coordination required, and the higher cost of new location facilities.

## Grant Funding

Several grant programs in the state of Washington provide state and federal funds on an annual or biennial basis for projects with similar characteristics the concepts on South Wenatchee Avenue or the east-west corridors. A brief summary of the most likely funding sources and the application periods is as follows.

- **Safe Routes to School (WSDOT)** The safe routes to school (SRTS) program is either state or federal funding, with applications due in odd-numbered years, and funding available as of the following year’s third quarter. Improvements must be near to and benefit a school, so the Marr Street corridor would be the best candidate for SRTS funding. The program is very competitive, but the Marr Street project, if built to connect to an existing South Wenatchee Avenue facility, could be a strong candidate for funding.
- **Bike/Ped Program (WSDOT)** The bike/ped program is either state or federal funding, with applications due in odd-numbered years, and funding available as of the following year’s third quarter. The program is highly competitive but provides design and construction funds for project types similar to all of the options on South Wenatchee Avenue and the east-west corridors described in this report. The ped/bike program is very competitive. Lower cost elements of the projects may be more competitive than larger, high cost projects.
- **Transportation Improvement Board (TIB)** State funding offered yearly with funds available just after the first of the year following award. TIB provides funds through direct application programs and a Complete Streets program that could be used to install certain portions of the recommended improvements, including striping modifications and crossings.
- **Surface Transportation Block Grant (STBG)** Federal funding programs are administered by the local Metropolitan Planning Organization (MPO). Funding is typically awarded in even numbered years. Improvements that involve additional shared use paths may be candidates for these programs, as federal funding carries additional reporting requirements which make low-cost improvements like re-striping less of an attractive funding option.

Grant programs that focus on safety, such as WSDOT’s Highway Safety Improvement Program (HSIP) and FHWA’s new in 2022 Safe Streets and Roads for All (SS4A) are less likely candidates for funding the identified projects. Both programs are focused on a more systemic safety-based strategy, rather than single capital projects. The City of Wenatchee was awarded HSIP funding in 2018, but not in 2020. If data-based analysis of crash trends in the City of Wenatchee identify bike-involved crashes in corridors lacking facilities as a high priority risk factor, the identified projects could be included as part of a citywide program of bike improvements. The citywide program could be eligible for funding through HSIP or SS4A. HSIP typically calls for projects in spring of even numbered years. SS4A’s first deadline will be in September of 2022. Future calls for projects through SS4A are not known at the time of this report.



# Next Steps

The next steps for the projects described in the South Wenatchee Bicycle Connectivity Study, on South Wenatchee Avenue and on the east-west connecting corridors, will require further engineering design. The concepts described in the report, and included in Appendix B and C as renderings and 10% design plans, need further refinement to be converted into design plans used for constructing improvements that connect the South Wenatchee neighborhoods to the Loop Trail and other areas of the City.

The next steps for creating multimodal connections and offering greater modal choice to the South Wenatchee neighborhood is;

1. Confirm and advance recommended alternatives to preliminary engineering design
2. Program funding in the City of Wenatchee's Transportation Improvement Plan
3. Apply for grant funding to supplement local funding
4. Finalize engineering design
5. Construct bicycle improvements

It is strongly recommended that the 4th and 5th steps be aligned with the construction of the City's improvements at Bridge Street and connections to the Loop Trail.

# **Appendix A: Study Outreach Materials**



## DO YOU BIKE on or around S. Wenatchee Ave?

The Chelan-Douglas Transportation Council (CDTC)  
is conducting a Bicycle Connectivity Study and

**we want to hear from you!**

**JOIN US** at one of these local events to share  
your stories and concerns, and provide  
feedback on how we can improve bicycle  
safety along S. Wenatchee Avenue.

**Tuesday, Nov 16, 2021**  
**LISTENING SESSION**  
*The Orange House*  
802 S Mission St  
5:30 – 6:30 PM



**Thursday, Nov 18, 2021**  
**VIRTUAL LISTENING SESSION**  
[www.facebook.com/wenatcheecafe](http://www.facebook.com/wenatcheecafe)  
5:30 - 6:30 PM

scan here to  
take our survey!

**FOR MORE INFORMATION**  
please contact Riley Shewak  
at [riley@chelan-douglas.org](mailto:riley@chelan-douglas.org)



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## ¿ANDAS EN BICICLETA Por S. Wenatchee Ave o en sus alrededores?

El Consejo de Transporte de Chelan-Douglas (CDTC) está  
llevando a cabo un Estudio de conectividad de bicicletas

**y queremos saber de usted!**

**ÚNASE CON NOSOTROS** en uno de estos eventos locales  
para compartir sus historias e inquietudes, y brindar  
comentarios sobre cómo podemos mejorar la seguridad  
de las bicicletas a lo largo de S. Wenatchee Avenue.

**Martes, 16 de Nov, 2021**  
**LISTENING SESSION**  
*La Casa Naraja*  
802 S Mission St  
5:30 – 6:30 PM



**Jueves, 18 de Nov, 2021**  
**SESIÓN DE ESCUCHA VIRTUAL**  
[www.facebook.com/wenatcheecafe](http://www.facebook.com/wenatcheecafe)  
5:30 - 6:30 PM

escanee aquí para  
realizar nuestra  
encuesta!

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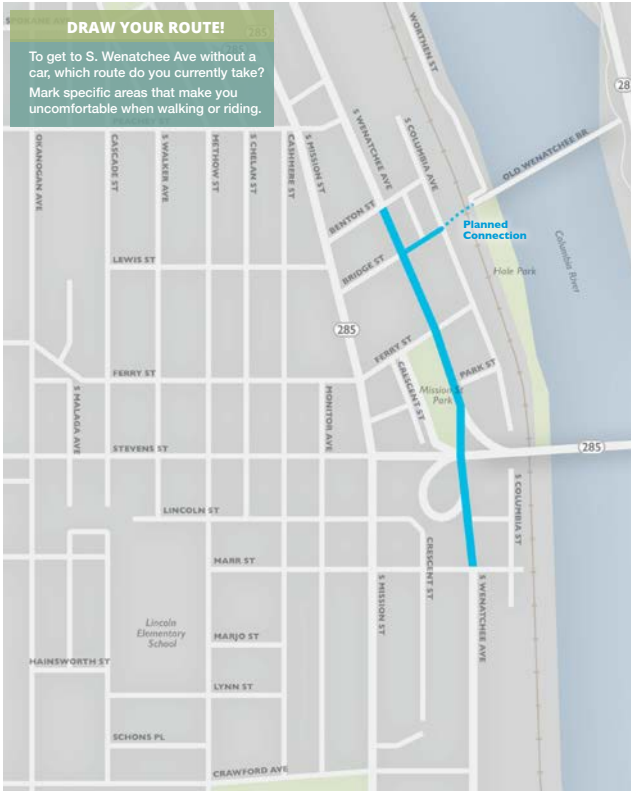
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**DRAW YOUR ROUTE!**

To get to S. Wenatchee Ave without a car, which route do you currently take? Mark specific areas that make you uncomfortable when walking or riding.



FOR MORE INFORMATION, CONTACT: Riley Shewak  
Chelan-Douglas Transportation Council  
riley@chelan-douglas.org

**S WENATCHEE AVE BICYCLE SURVEY**

You can also complete this survey online at [www.bikesouthwenatchee.com](http://www.bikesouthwenatchee.com).

- Do you ever use a bike for transportation?
  - Yes
    - If Yes, what would make you use your bike more often?
  - No
    - If no, what would make you feel comfortable using a bike?
- How often do you walk or ride your bike on the Apple Capital Recreation Loop Trail?
  - Daily
  - 2-3x per week
  - Weekly
  - Monthly
  - Less than Monthly
  - Never (skip to #3d)
- Where are you coming from/to?
  - Home
  - Work
  - Other (Please specify) \_\_\_\_\_
- How do you get from home to the trail?
  - Car
  - Bike
  - Walk
  - Link Bus
  - Other (Please specify) \_\_\_\_\_
- Are there transportation changes that would make you use the trail more?
  - Protected Bike Lane
  - Buffered Bike Lane
  - Cycle Track
  - Shared Use Path
  - None of these (please explain why)
- What transportation challenges make you most uncomfortable when riding a bike around S. Wenatchee Ave?
 

*Be specific with your answer i.e. difficult intersections to cross, not comfortable with cars on road in a specific area, etc. Use the map provided to mark any specific locations.*

Do you want to stay informed on the latest news about this project? (optional)  
Name: \_\_\_\_\_ Email: \_\_\_\_\_

### Protected Bike Lanes

Protected bike lanes create space for cyclists at the curb, moving on-street parking away from the curb. On street parking spaces and parked vehicles, in addition to a striped buffer, separate the bike lanes from moving traffic. Vehicles do not cross the bike lanes to park, but pedestrians accessing parked cars do cross the bike lane. Bike lanes are one-way, biking with the direction of traffic.

### Buffered Bike Lanes

Buffered bike lanes create space for cyclists on the road between on-street parking and vehicle travel lanes. A striped buffer to traffic and/or to parked vehicles can provide additional protection from moving traffic and doors of parking vehicles. Vehicles must cross the bike lane to enter or exit parking spaces. Bike lanes are one-way, biking with the direction of traffic.

### Cycle Track

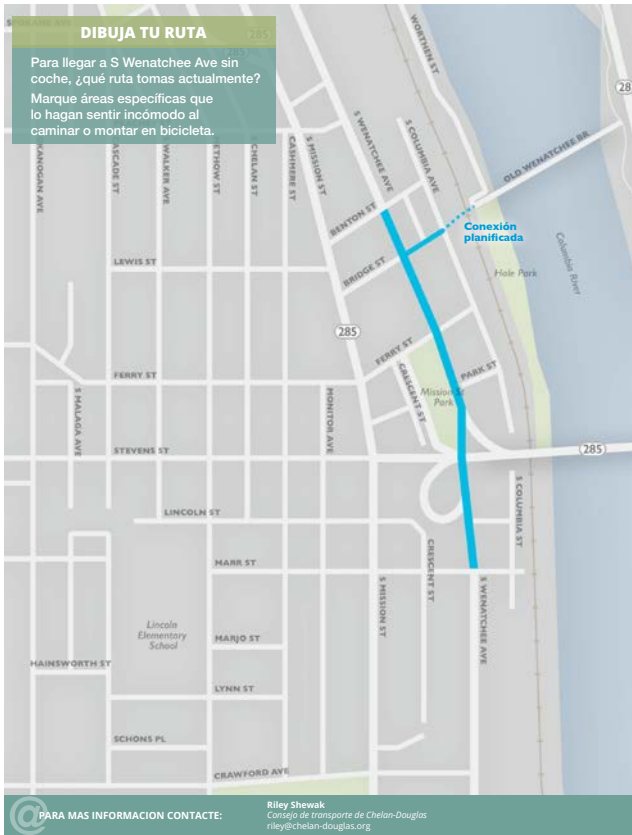
A protected two-way bicycle 'roadway' is created within the existing roadway. The cycle track is located at the curb, with on-street parking away from the curb. On street parking spaces and parked vehicles, in addition to a striped buffer and physical markers, separate the two-way bike facility from moving traffic. Vehicles do not cross the bike lanes to park. Cycle tracks are two-way, and intersections require additional improvements to maintain a safe crossing for bikes, pedestrians and vehicles.

### Shared Use Path

A shared use path is a space physically separated from the roadway, usually by a curb, dedicated for use by cyclists and/or pedestrians. The shared use path requires modification of existing curbs and/or acquisition of additional right of way to construct.

**DIBUJA TU RUTA**

Para llegar a S Wenatchee Ave sin coche, ¿qué ruta tomas actualmente? Marque áreas específicas que lo hagan sentir incómodo al caminar o montar en bicicleta.



PARA MAS INFORMACION CONTACTE: Riley Shewak  
Consejo de transporte de Chelan-Douglas  
riley@chelan-douglas.org

**ENCUESTA SOBRE BICICLETAS DE S. WENATCHEE AVE**

También puede completar esta encuesta en línea en [www.bikesouthwenatchee.com](http://www.bikesouthwenatchee.com).

- ¿Alguna vez usas una bicicleta para transportarte?
  - Sí  
En caso afirmativo, ¿qué le haría usar su bicicleta con más frecuencia?
    - Diario
    - 2-3 veces por semana
    - Semanalmente
    - Mensual
    - Menos que mensual
    - Nunca (pase a # 3d)
  - No  
Si no, ¿qué te haría sentir cómodo usando una bicicleta?
- Mire las 4 opciones presentadas en las páginas interiores. ¿Con cuál de estos se sentiría cómodo montando una bicicleta solo o con su familia? (Niños, familiares mayores, etc.)  
Seleccione todo lo que corresponda y luego encierre en un círculo su favorito.
  - Carril para bicicletas protegido
  - Carriles para bicicletas con amortiguación
  - Pista para bicicletas
  - Ruta de uso compartido
  - Ninguno de esos (por favor explica por qué)
- 3a. ¿Con qué frecuencia caminas o montas en bicicleta en el Apple Capital Recreation Loop Trail?
  - Diario
  - 2-3 veces por semana
  - Semanalmente
  - Mensual
  - Menos que mensual
  - Nunca (pase a # 3d)
- 3b. ¿De dónde vienes o a dónde vas?
  - Al Hogar
  - Al Trabajo
  - Otro (por favor especifique) \_\_\_\_\_
- 3c. ¿Qué método de viaje utilizas para ir al Apple Capital Recreation Loop Trail de sus casa?
  - Coche
  - Bicicleta
  - Caminando
  - Link Autobús
  - Otro (por favor especifique) \_\_\_\_\_
- 3d. ¿Hay cambios de transporte que le harían usar el sendero más?
  - Sí
  - No
4. ¿Cuáles son los desafíos del transporte que le harían sentir más incómodo cuando andas en bicicleta por S. Wenatchee Ave?  
Sea específico con su respuesta, es decir, intersecciones son difíciles de cruzar, no se siente cómodo con los automóviles en la carretera en un área específica, etc. Utilice el mapa proporcionado para marcar cualquier ubicación específica.

¿Quieres estar informado de las últimas novedades de este proyecto? (opcional)  
Nombre: \_\_\_\_\_ Correo electrónico: \_\_\_\_\_

**Carril para bicicletas protegido**

Los carriles para bicicletas protegidos crean espacio para los ciclistas en la acera, alejando el estacionamiento en la calle de la acera. En los espacios de estacionamiento en la calle y los vehículos estacionados, además de un amortiguador rayado, separe los carriles para bicicletas del tráfico en movimiento. Los vehículos no cruzan los carriles para bicicletas para estacionar, pero los peatones que acceden a los autos estacionados sí cruzan el carril para bicicletas. Los carriles para bicicletas son unidireccionales, para bicicletas con la dirección del tráfico.

**Carriles para bicicletas con amortiguación**

Los carriles para bicicletas con amortiguación crean espacio para los ciclistas en la carretera entre el estacionamiento en la calle y los carriles de circulación de vehículos. Un amortiguador rayado para el tráfico y / o los vehículos estacionados puede proporcionar protección adicional contra el tráfico en movimiento y las puertas de los vehículos de estacionamiento. Los vehículos deben cruzar el carril para bicicletas para entrar o salir de los espacios de estacionamiento. Los carriles para bicicletas son unidireccionales, para bicicletas con la dirección del tráfico.

**Pista para bicicletas**

Se crea una "calzada" protegida de dos vías para bicicletas dentro de la calzada existente. La pista para bicicletas está ubicada en la acera, con estacionamiento en la calle lejos de la acera. En los espacios de estacionamiento en la calle y los vehículos estacionados, además de un amortiguador rayado y marcadores físicos, separe la instalación de bicicletas de dos vías del tráfico en movimiento. Los vehículos no cruzan los carriles para bicicletas para estacionar. Las pistas para bicicletas son de dos vías y las intersecciones requieren mejoras adicionales para mantener un cruce seguro para bicicletas, peatones y vehículos.

**Ruta de uso compartido**

Un camino de uso compartido es un espacio separado físicamente de la calzada, generalmente por un bordeillo, dedicado para uso de ciclistas y / o peatones. El camino de uso compartido requiere la modificación de los bordeillos existentes y / o la adquisición de un derecho de paso adicional para construir.

¿En qué camino te sentirías más cómodo andando en bicicleta??



Which would you feel most and least comfortable bicycling?

### Carril de Bicicletas

### Bike Lanes

Ferry Street to Bridge Street  
Bike Lanes / Carril de Bicicletas  
Mirando al Norte

Bridge Street to Benton Street  
Bike Lanes / Carril de Bicicletas  
Mirando al Norte

Dot exercise: A grid of red dots with a red circle in the center.

### Carril de Bicicletas Separadas

### Buffered Bike Lanes

Ferry Street to Bridge Street  
Buffered Bike Lanes / Carril De Bicicletas  
Looking North / Mirando al Norte

Bridge Street to Benton Street  
Buffered Bike Lanes / Carril De Bicicletas  
Looking North / Mirando al Norte

Dot exercise: A grid of green dots with a yellow dot in the center.

### Pista de Bicicletas

### Cycle Track

Ferry Street to Bridge Street  
Cycle Track / Pista de Bicicletas  
Looking North / Mirando al Norte

Bridge Street to Benton Street  
Cycle Track / Pista de Bicicletas  
Looking North / Mirando al Norte

Dot exercise: A grid of green dots with a yellow dot in the center.

Feedback collected via dot exercise at Bike Rodeo, May 2022 (1/2)



¿En qué camino te sentirías más cómodo andando en bicicleta?



Which road would you feel most and least comfortable bicycling?

### Ferry St



### Stevens St



### Marr St

