



TECHNICAL MEMORANDUM

DATE: March 31, 2026

TO: Carrie Harris | City of Bend

FROM: Kayla Fleskes-Lane, Anders Hart | DKS Associates
Jessie Rykels-Wilson, Madelyn Cayton | Parametrix

SUBJECT Hawthorne Avenue and Harriman Street Connections Study – Project #24998-003
Draft Concept Evaluation

The Hawthorne Crossing will connect Hawthorne Avenue with a bridge over both the BNSF railroad and US 97 (Bend Parkway). This will create a welcoming, safer connection for people biking, walking, and rolling between east and west Bend.

This document provides an evaluation of three alternatives for street sections near the bridge: on Harriman Street between Greenwood Avenue and Franklin Avenue on the west side (including the Hawthorne Avenue/Harriman Street intersection), and from 3rd Street to 5th Street on the east side (including the Hawthorne Avenue/3rd Street intersection). These segments are currently gaps in safe connections in Bend's biking and walking network.

This document includes a discussion of:

- Design goals and technical considerations, including options dismissed based on these considerations
- Alternatives advanced for evaluation
- Project team recommendations

This memorandum is not intended to be a comprehensive evaluation but instead focuses on key standards, technical considerations and differentiators that informed the development and evaluation of alternatives. The evaluation presented here will be presented at an open house planned for April 7, 2026, which will solicit public input. That input will inform City Council discussions on the benefits and costs associated with each of the alternatives for future design and construction funding consideration. This project is not currently funded for design or construction, so this evaluation provides option of varying magnitude.

DESIGN GOALS AND CONSIDERATIONS

The project team has identified three main goals for these connections:

1. Provide a safe transition from the Hawthorne Crossing to the street network
2. Alignment with community goals
3. Meet community needs cost-effectively.

The following summarizes the key design evaluation criteria and technical opportunities and constraints that led to the development of concepts for the Harriman Street and Hawthorne Avenue street sections, in combination with the above goals.

GOALS AND EVALUATION CRITERIA

Table 1 summarizes the goals and evaluation criteria used in selecting the recommended alternatives for the study segments and intersections. The evaluation criteria are used to compare each alternative to a no-build condition, with each marked as a disadvantage, neutral, or advantage (except the *Can be implemented in a phased approach, pending funding availability* criterion, which is not assigned a value because there is not currently a design or construction budget.

TABLE 1: GOALS AND EVALUATION CRITERIA

GOAL	EVALUATION CRITERIA	MEASURE
1. PROVIDE SAFE TRANSITION FROM BRIDGE PROJECT TO STREET NETWORK	Provides clear, intuitive connectivity for road users of all ages and abilities.	Qualitative
	Design features promote safe speeds and travel behaviors.	Qualitative
	Minimizes conflict points between vulnerable roadway users and motor vehicle traffic.	Qualitative/Quantitative (crash reduction factors)
	Includes design elements that increase active modes of transportation for all users and abilities.	Qualitative
2. ALIGNS WITH COMMUNITY GOALS	Provides access to adjacent businesses.	Qualitative/Quantitative (change in on-street parking)
	Aligns with future development, City infrastructure, and City Standards	Qualitative
	Aligns traffic patterns with the Transportation System Plan's road classifications and identified low stress network and Key Walking and Biking Routes	Qualitative
	Prioritizes existing and future street trees and landscaping	Qualitative
3. MEET COMMUNITY NEEDS COST-EFFECTIVELY	Can be implemented in a phased approach, pending funding availability	Qualitative/Quantitative (Class IV Estimate Cost (\$))
	Minimizes community impacts during construction (including temporary easement) and right-of-way acquisition needs.	Qualitative
	Minimizes the costs and challenges of ongoing maintenance requirements.	Qualitative

TECHNICAL OPPORTUNITIES AND CONSTRAINTS

Harriman Street between Greenwood Avenue and Franklin Avenue and Hawthorne Avenue between 3rd Street and 5th Street are both classified as local streets. Local streets are designed primarily to provide access to individual properties and are characterized by lower speeds and traffic volumes. This helped define alternatives that were considered in the evaluation. In addition to trying to address the goals and evaluation criteria, several opportunities and constraints helped drive the development of concepts for the Hawthorne Avenue and Harriman Street connections:

- **Lower Traffic Volumes on Hawthorne Avenue and Harriman Street:** With the decision to fully close the at-grade access to US 97, traffic volumes are expected to be substantially lower on Hawthorne Avenue and potentially on Harriman Street in the future (see Table 2). Additionally, modal filters will be in place at Greenwood Avenue and Franklin Avenue on Harriman Street, further lowering traffic volumes. This provides an opportunity to consider treatments that may not be appropriate based on today's traffic volumes. For example, based on NACTO guidance, a shared street would be considered an all ages and abilities bikeway with the likely level of traffic volumes on Harriman Street in the future.
- **Fire Access Requirements:** Where vehicular travel lanes are maintained, Hawthorne Avenue and Harriman Street need to provide 20-foot wide fire access (26 feet when a building is three stories or taller), consistent with fire code.
- **Funding Considerations:** The alternatives for Harriman Street and Hawthorne Avenue each include a lower-cost option that maintains existing curb lines and would be simpler to implement compared to the other alternatives. This range of options reflects the fact that this project currently does not have a budget for design and construction and is intended to give City Council options when deciding how much to invest in these locations.
- **Traffic Control Considerations:** The Harriman Street/Hawthorne Avenue, Harriman Street/Irving Avenue, and Hawthorne Avenue/3rd Street intersection designs will be important for determining the level of comfort that people walking and biking experience in the study area. Intersections are especially important for the safety and level of comfort for these road users because they have more conflict points and greater potential for high-severity crashes. This evaluation considered the connections to these intersections to ensure none of them would become a barrier to active transportation in the study area, while balancing considerations for other modes (autos, freight/deliveries, and transit). Additionally, while the intersection of Harriman Street with Greenwood Avenue and Franklin Avenue will be critical components of the City's Low Stress Network, these intersections were not considered in detail for this analysis as there have been recent or planned improvements made at each. Where applicable, it is noted where options for this project would conflict with existing designs at these intersections.

TABLE 2. REFERENCE TRAFFIC VOLUMES

LOCATION	PEAK HOUR TRAFFIC VOLUME (VEHICLES)	DAILY TRAFFIC VOLUME (VEHICLES)
HARRIMAN STREET SOUTH OF HAWTHORNE AVENUE EXISTING (2025) COUNT	201	~1,900
HAWTHORNE AVENUE EAST OF 3 RD STREET	304	~2,600
NACTO THRESHOLD FOR ALL AGES & ABILITIES BIKEWAYS FOR A SHARED SPACE ^A	≤~120 ^{B C}	≤1,000

^A Assumes target vehicle speeds of 10mph

^B NACTO recommends 60 vehicles in the peak direction during the p.m. peak hour, which was converted to a bidirectional number for purposes of this table.

^C Vehicle volumes are likely substantially lower on Hawthorne Avenue between 4th Street and 5th Street and may meet the NACTO threshold for a shared space.

CONCEPTS DISMISSED

The following concepts were dismissed due to technical design constraints:

- **Cycle Track on Harriman Street** – The project team dismissed the option for a cycle track on the west side of Harriman Avenue (while maintaining the existing curb lines) because the existing right-of-way would not allow for desired minimum widths in alignment with NACTO recommendations.
- **Shared Use Path on both sides of Harriman Street** – The project team did not include a shared-use path on both sides of Harriman Street to reduce costs from altering the east-side curb and sidewalk. The west side was selected for the shared use path alternative (discussed in more detail below) as it would cross fewer conflicts with vehicles at driveways and intersections.

HARRIMAN STREET

This section describes the alternatives for Harriman Street between Greenwood Avenue and Franklin Avenue; it also includes an evaluation of these alternatives using the criteria described above with a rating of disadvantage, neutral, or advantage. Quantities are provided for some criteria, such as the estimated cost of each alternative.

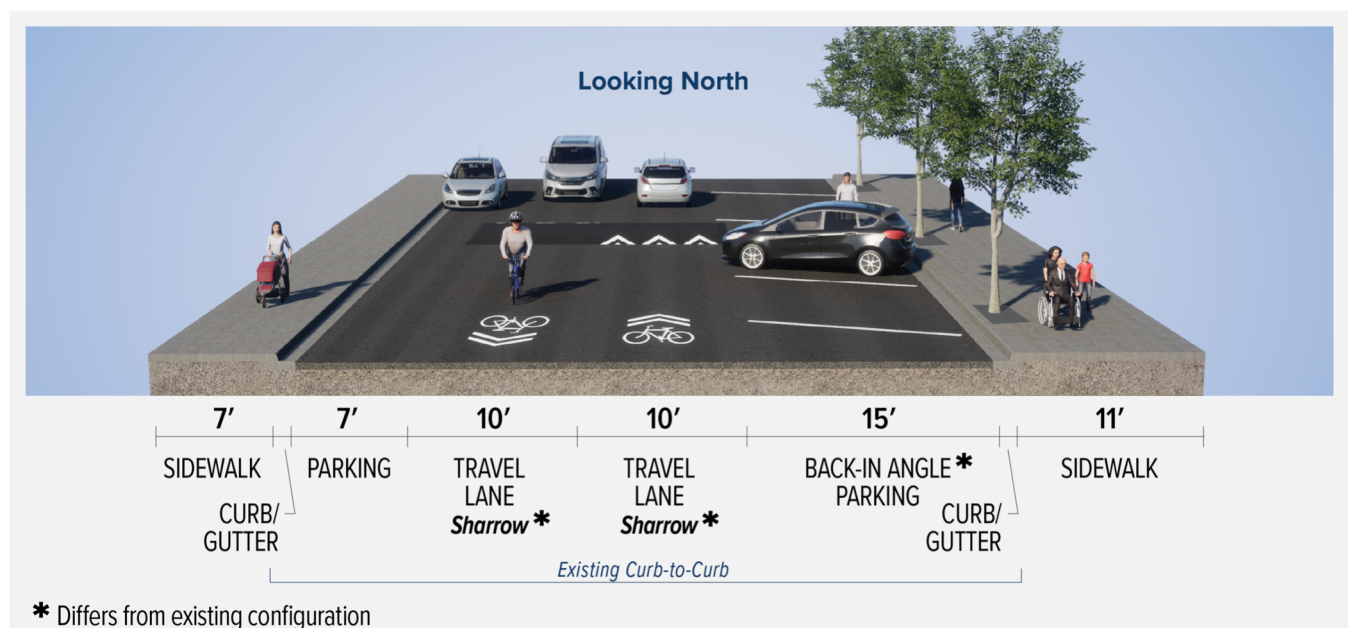
DESCRIPTION OF ALTERNATIVES

The following describes the proposed alternatives for Harriman Street. Some segments also have different options listed that can be considered at intersections, listed separately after the segment alternatives. Cross-section figures of the proposed alternatives are provided here, while the Appendix includes plan view concepts for the alternatives as well.

1. Sharrows and Speed Humps – Baseline Option

This alternative is intended to maintain existing curb lines and parking while still reducing vehicular speeds, representing a lower-cost and lower-impact option.

- North of Irving Avenue (Figure 1)
 - Sharrows, speed humps, and other traffic calming features
 - Back-in angle parking
 - Sidewalk infill
- South of Irving Avenue (Figure 2)
 - Sharrows, speed humps, and parking on alternating sides of the street



Note: Existing street trees planted within the east-side (right) sidewalk on this block would be maintained.

FIGURE 1: ALTERNATIVE 1 - BETWEEN IRVING AVENUE AND GREENWOOD AVENUE (MAINTAINS EXISTING CURB LINES)

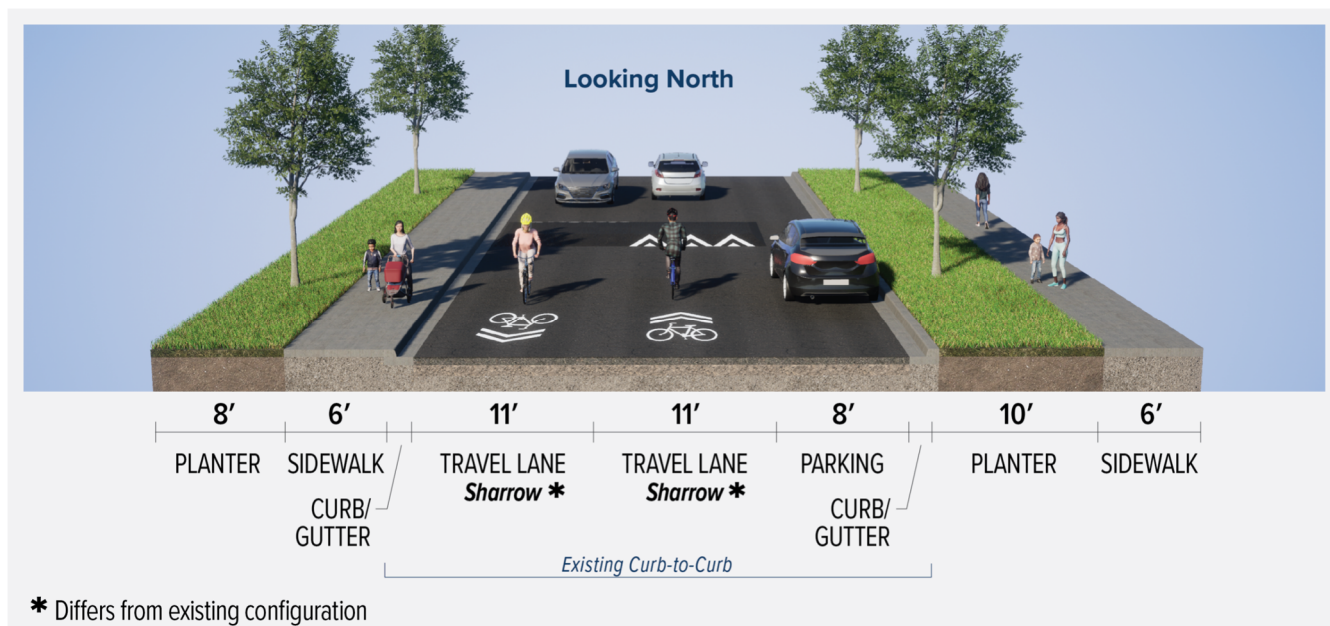


FIGURE 2: ALTERNATIVE 1 - BETWEEN IRVING AVENUE AND FRANKLIN AVENUE (MAINTAINS EXISTING LANE CONFIGURATION AND CURB LINES)

2. Shared-Use Path

This alternative provides greater separation between people biking and vehicle traffic with a continuous west-side shared-use path¹ and creates an extension of the promenade planned with the Hawthorne Crossing. The width of shared use path (13 feet) may be narrow for people walking in addition to two-way bicycle traffic between Irving Avenue and Greenwood Avenue, especially so close to business entrances on Harriman Street². However, this width balances cost savings (by maintaining the east-side curblines and sidewalk on the entire segment between Greenwood Avenue and Franklin Avenue) and on-street parking in an area with higher lane utilization.

- North of Irving Avenue (Figure 3)
 - West side shared-use path with parallel parking on both sides of the street, maintaining two-way traffic
- South of Irving Avenue (Figure 4)
 - West-side shared-use path with no on-street parking, maintaining two-way traffic

¹ Building a shared-use path in a commercial area like Harriman Street may require updating Bend's code not to allow sidewalk cafes where they would narrow the facility to five feet or less.

² NACTO recommends 15 feet of width for shared-use paths that see between 50 and 400 cyclists per hour, with a minimum width of 11 feet, in addition to 2 feet of lateral clearance on either side. See NACTO Urban Design Guide, <https://nacto.org/publication/urban-bikeway-design-guide/designing-bikeways-for-all-ages-and-abilities/paths/>

Intersection Options

To help address barriers created by intersections and to further reduce vehicle volumes and speeds, the alternatives were paired with one or more intersection treatment listed below, based on feasibility and consistency with the broader cross section:

- Greenwood Avenue/Harriman Street
 - Crosswalk across the alley and potential traffic calming to slow turning vehicles while maintaining pilot project crossing improvements or
 - Raised/contrasting color pavement across the alley, modified raised median for wide shared-use path crossing and widen for shared-use path on north leg of intersection before transitioning back to street (Alternative 2 only). Note: this would require changing the current configuration of this intersection, which includes a right-in/right-out median and pedestrian and bicycle cuts.
- Irving Avenue/Harriman Street
 - Curb extensions with two-way stop control or
 - Raised crossing on west leg (Alternative 2 only)
- Hawthorne Avenue/Harriman Street
 - Raised intersection, all-way stop control, or
 - Raised crosswalks, all-way stop control
- Franklin Avenue/Harriman Street
 - No change from planned NE Franklin Avenue Corridor Project design, or
 - Modify raised median for wide shared-use path crossing and widen for shared-use path on south leg of intersection before transitioning back to street (Alternative 2 only). Note: this would require changing the current design for this intersection, which includes a right-in/right-out median and pedestrian and bicycle cuts.

EVALUATION OF ALTERNATIVES

Both alternatives for Harriman Street have trade-offs that should be considered carefully, as shown in Table 3. Key differentiators between the alternatives are:

- Alternative 1 would not change the placement of people biking at the Greenwood Avenue and Franklin Avenue intersections. Alternative 2 would have biking facilities on the west side of Harriman Street, and this configuration could pose challenges for bicycle traffic moving between Harriman Street and Hawthorne Avenue and would require more changes at the intersections with Franklin Avenue and Greenwood Avenue to ensure pedestrian and bicycle paths are intuitive.
- Alternative 1 would maintain most of the existing on-street parking, while Alternative 2 would reduce on-street parking north of Irving Street and eliminates on-street parking south of it.
 - Approximate on-street parking spaces between Franklin Avenue and Greenwood Avenue:
 - > Existing: 78; Alternative 1: 70; Alternative 2: 33
- Alternative 2 would be much more costly than Alternative 1.

TABLE 3: HARRIMAN STREET ALTERNATIVES EVALUATION

GOAL	EVALUATION CRITERIA	ALTERNATIVE 1: SHARROWS AND SPEED HUMPS	ALTERNATIVE 2: SHARED-USE PATH
PROVIDE SAFE TRANSITION FROM BRIDGE PROJECT TO STREET NETWORK	Provides clear, intuitive connectivity for road users of all ages and abilities.	Sharrows provide clear circulation for bikes but less separation from vehicle traffic.	Shared use path provides a separate space for vulnerable road users, but intersection crossings may not be as intuitive. Mixes bicycle and pedestrian traffic.
	Design features promote safe speeds and travel behaviors.	Includes speed humps and could include intersection treatments to calm traffic.	Narrows street width and could include intersection treatments to calm traffic.
	Minimizes conflicts between vulnerable roadway users and motor vehicle traffic.	Modal filters reduce traffic volumes but sharrows provide minimal separation on Harriman Street.	Separates vulnerable road users from vehicle traffic.
ALIGNS WITH COMMUNITY GOALS	Includes design elements that increase active modes of transportation for all users and abilities.	Modal filters will reduce volumes and creates an all-ages-and-abilities street for biking, although angle parking may be less comfortable.	Modal filters will reduce volumes and shared use path creates an all-ages-and-abilities street for biking.
	Provides access to adjacent businesses.	Maintains most of the existing on-street parking (reduced by approximately 8 spaces) and does not substantially improve walking/biking access.	Reduces on-street parking north of Irving Street and eliminates on-street parking south of it (reduced by approximately 45 spaces) but enhances walking/biking access to businesses on west side of street.
	Aligns with future development, City infrastructure, and City standards.	Will not create major changes for these considerations.	Will reduce curb-to-curb width but maintains the 20 feet required for fire access ³ .
	Aligns traffic patterns with the Transportation System Plan’s road classifications and identified low stress network and Key Walking and Biking Routes.	Traffic patterns will be consistent with local streets.	Traffic patterns will be consistent with local streets.
	Prioritizes existing and future street trees and landscaping	Maintains all existing street trees	May remove existing street trees on west side
MEET COMMUNITY NEEDS COST-EFFECTIVELY	Can be implemented in a phased approach pending funding availability.	Cost:\$173K to \$264K* Changes can be done incrementally	Cost: \$1.6M to \$2.4M* Not easily completed in phases.
	Minimizes community impacts during construction (including temporary easement) and right-of-way acquisition needs.	Low impact – Minimal changes to curb lines.	High impact – Requires curb reconstruction.
	Minimizes the costs and challenges of ongoing maintenance requirements.	Minimizes added maintenance.	West-side shared-use path may create minimal additional maintenance needs.

Gray = Neutral, Orange = Disadvantage, Teal= Advantage

* These cost estimates do not include intersection options. Intersection option cost estimates are included in the appendix.

³ 26-feet is needed for three story buildings or taller. Additional refinement may be needed to ensure cross section does not limit future developments.

HAWTHORNE AVENUE

This section describes the alternatives for Hawthorne Avenue between 3rd Street and 5th Street; it also includes an evaluation of the alternatives using the criteria described above with a rating of disadvantage, neutral, or advantage. Quantities are provided for some criteria, such as the estimated costs for each alternative.

DESCRIPTION OF ALTERNATIVES

1. Sharrows and Speed Humps – Baseline Option

This alternative would minimize impacts by maintain two-way traffic and implementing traffic calming measures like speed humps between 3rd Street and 5th Street.

- 3rd Street to 4th Street (Figure 5)
 - Sharrows and speed humps
 - No parking on south side of street
- 4th Street to 5th Street (Figure 6)
- Sharrows and speed humps
 - Parking on both sides of the street

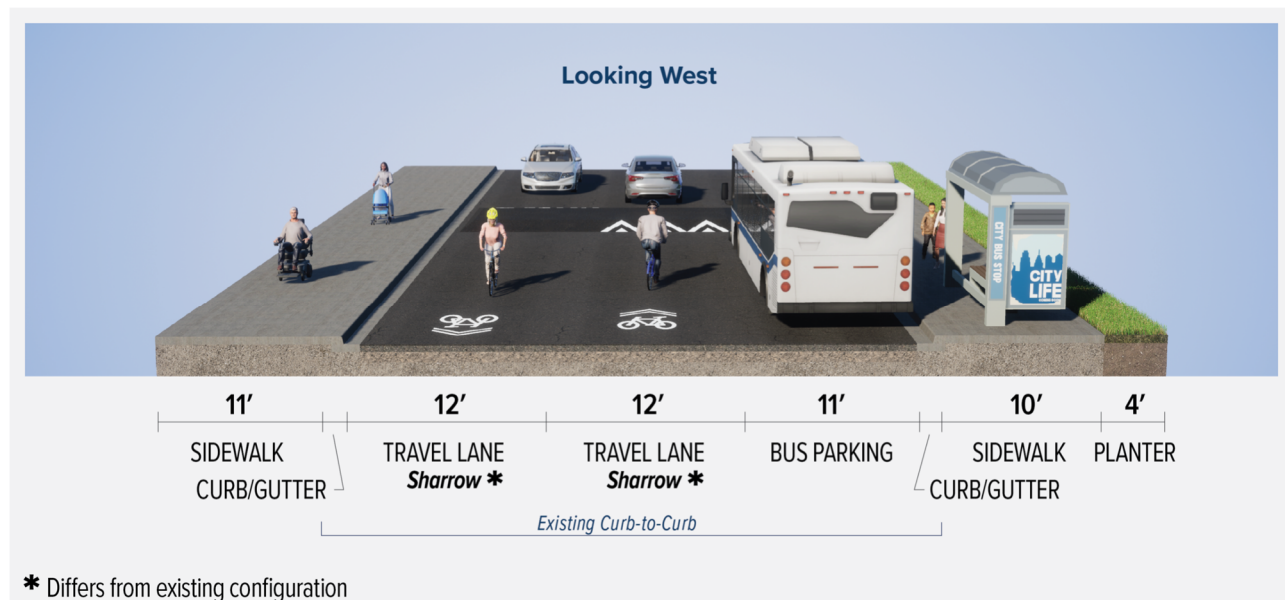


FIGURE 5: ALTERNATIVE 1 BETWEEN 3RD STREET AND 4TH STREET

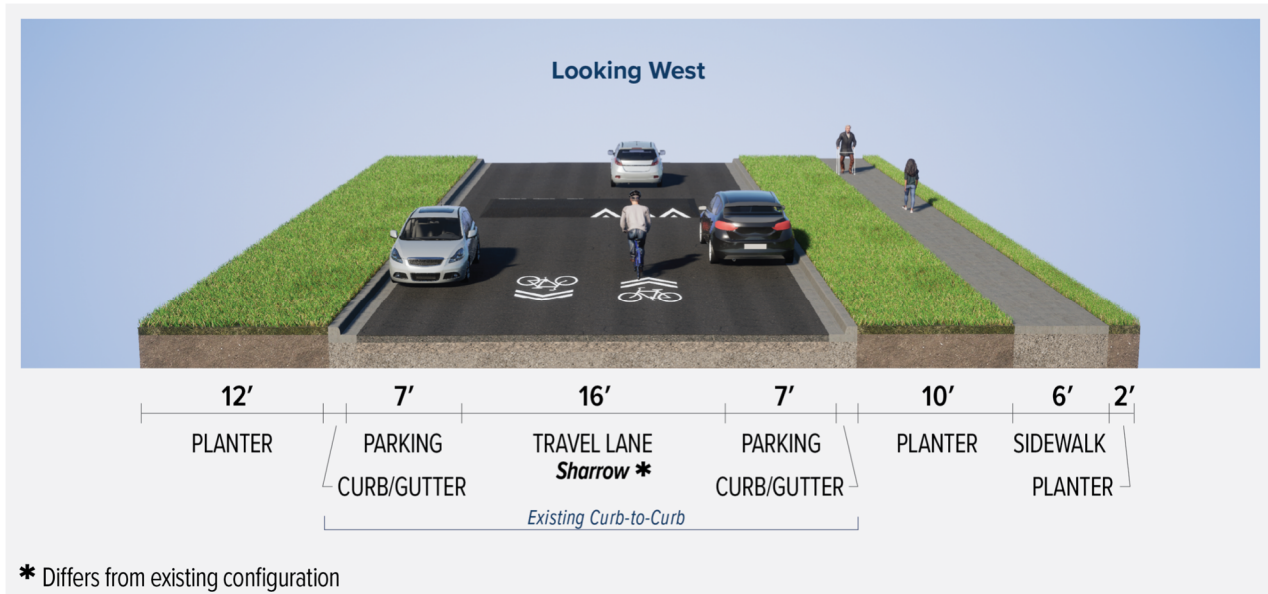


FIGURE 6: ALTERNATIVE 1 BETWEEN 4TH STREET AND 5TH STREET

2. Cycle Track

This alternative provides a medium-impact option. It would create separation between people biking and walking while maintaining both curb lines.

- 3rd Street to 4th Street (Figure 7)
 - > 14-foot cycle track on south side of the street, maintaining both existing curb lines
 - > One-way westbound vehicle traffic
 - > Sidewalk infill on north side with parallel parking pockets
 - > Works well with a traffic signal at intersection with 3rd Street (see concepts attached in the Appendix)
- 4th Street to 5th Street (Figure 8)
 - > 15-foot cycle track on south side and removing on-street parking from both sides to allow one-way westbound vehicle traffic.

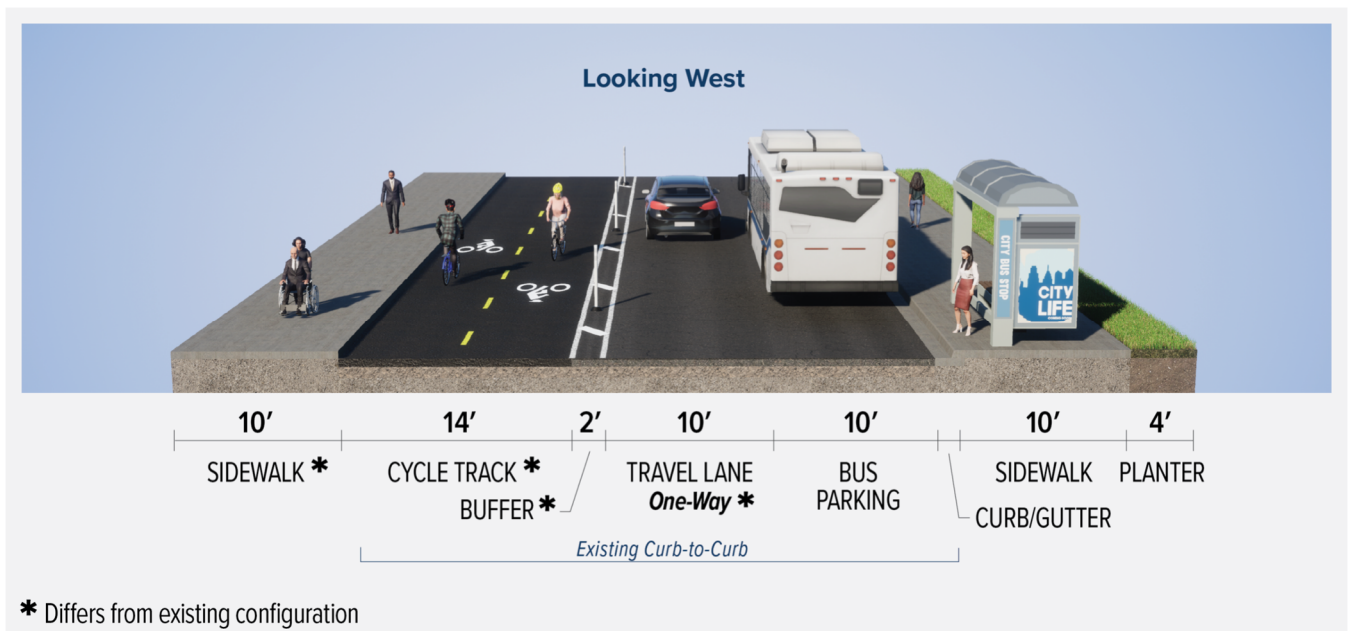


FIGURE 7: ALTERNATIVE 2 BETWEEN 3RD STREET AND 4TH STREET

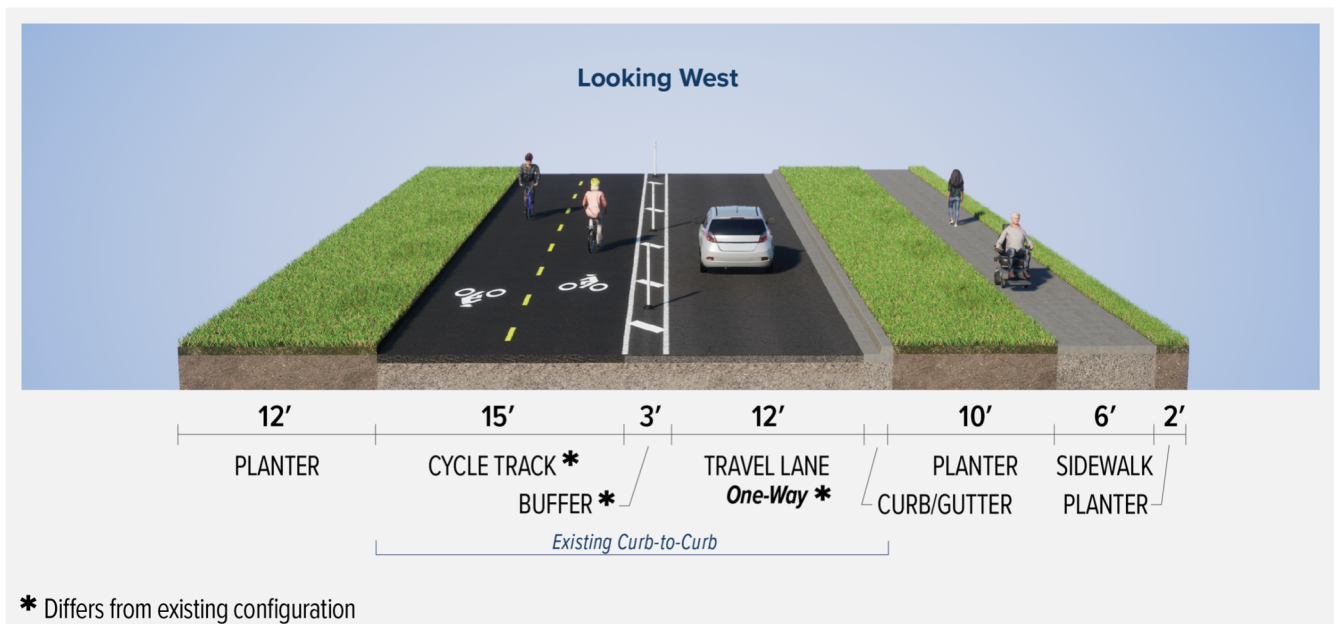


FIGURE 8: ALTERNATIVE 2 BETWEEN 4TH STREET AND 5TH STREET

3. Shared-Use Path – Enhanced Option

This alternative provides separation between people walking or biking and vehicle traffic with a continuous south-side shared-use path, in a way that is consistent with the planned cross-section west of 3rd Street.

- 3rd Street to 4th Street (Figure 9)
 - Shared-use path on south side of street, maintaining the existing north curb line
 - One-way westbound vehicle traffic
 - Sidewalk infill on north side with parallel parking pockets
 - Works well with a traffic signal at intersection with 3rd Street (see concepts attached in the Appendix)
- 4th Street to 5th Street (Figure 10)
 - Shared-use path on south side of street, maintaining the existing north curb line
 - One-way westbound vehicle traffic and on-street parking/bus layover on the north curb

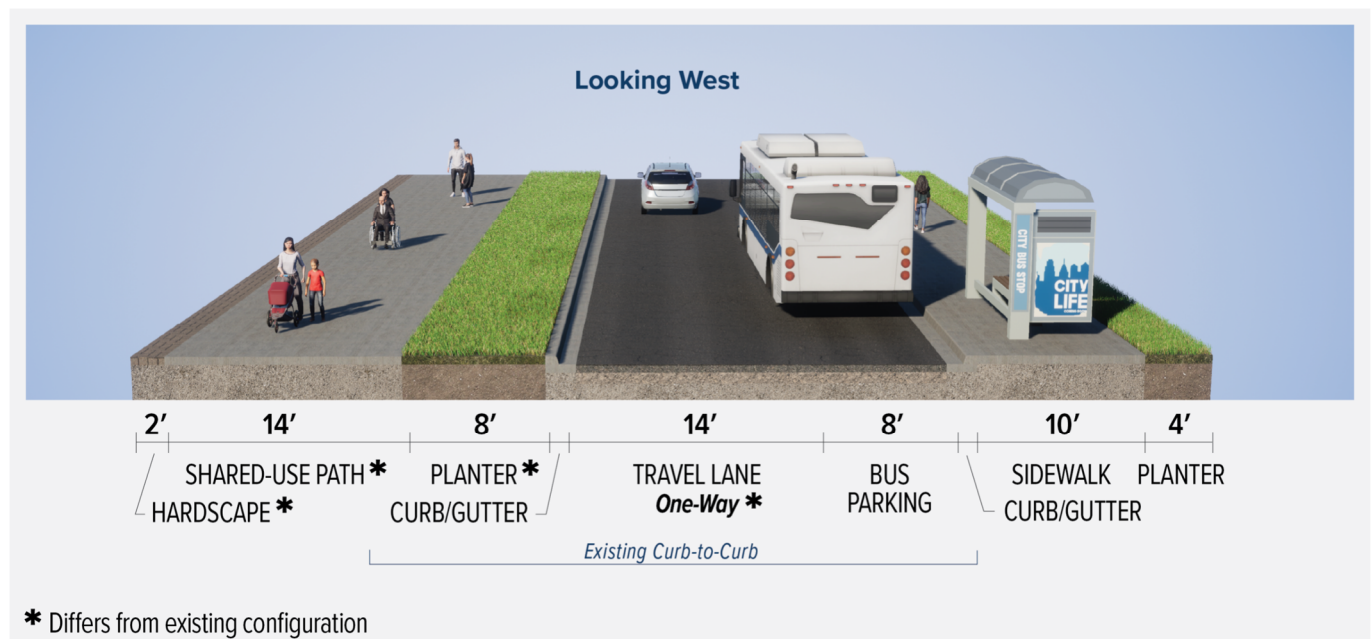


FIGURE 9: SHARED-USE PATH BETWEEN 3RD STREET AND 4TH STREET

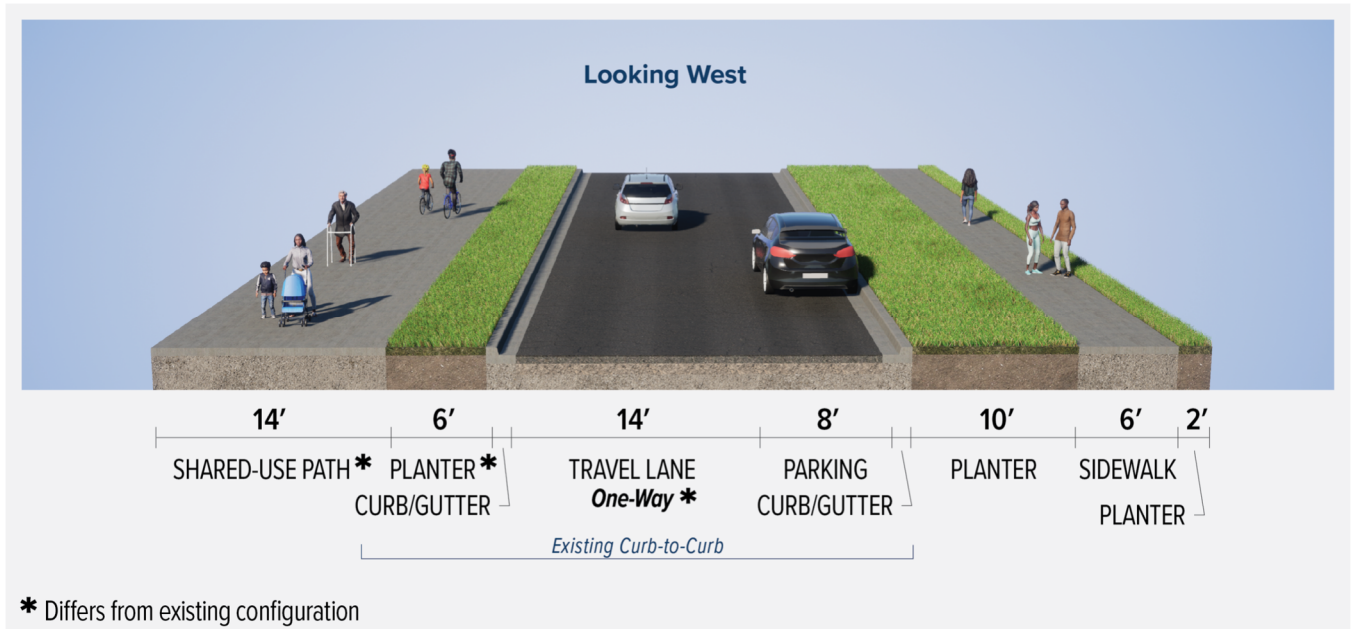


FIGURE 10: SHARED-USE PATH BETWEEN 4TH STREET AND 5TH STREET

Intersection Options

To help address barriers created by intersections and to further reduce vehicle volumes and speeds, the alternatives could include one or more intersection treatment listed below, based on feasibility and consistency with the broader cross section (see concepts attached in Appendix):

- Hawthorne Avenue/3rd Street intersection⁴
 - Existing configuration: rectangular rapid flashing beacon (RRFB)
 - Traffic signal with no median
 - Traffic signal with full median through intersection, restricting vehicle turns to right-in, right-out only (see Figure 11)
- Hawthorne Avenue/4th Street intersection
 - Curb extensions
- Hawthorne Avenue/5th Street intersection
 - Curb extensions and striping to guide users to the trail on the east side of 5th Street

The Hawthorne Avenue/3rd Street intersection is a unique location because it is a key route crossing of a five-lane street (3rd Street). This crossing presents a significant barrier to people walking or biking and necessitates additional treatment to create a safe and comfortable crossing. The RRFB option does not offer as many safety benefits for people on foot or bicycles crossing 3rd Street compared to a traffic signal. An RRFB increases the risk of driver noncompliance, especially in the scenario where a pedestrian crosses the intersection and then a person biking reaches the intersection while the RRFB is still flashing. The benefits of a signal also include the opportunity for timing coordination with the Greenwood Avenue and Franklin Avenue intersections. Additional collaboration will be needed with the Oregon Department of Transportation (ODOT) to confirm a traffic signal as the appropriate treatment, given the proximity to ODOT's traffic signal at Greenwood Avenue.

⁴ Note that all intersection options assume the promenade treatment and westbound traffic only on the west leg of the intersection, consistent with the Hawthorne Crossing of US 97.



FIGURE 11: EXAMPLE OF A TRAFFIC SIGNAL AND MEDIAN

EVALUATION OF ALTERNATIVES

The alternatives for this segment of Hawthorne Avenue will have varying impacts on vehicle access and the location of bicycle traffic in relation to the intersection with 3rd Street. Key differentiators among the alternatives are:

- Alternative 1 would maintain two-way traffic on both blocks while Alternatives 2 and 3 would only allow one-way westbound vehicle traffic.
- Alternatives 2 and 3 would keep people biking on the south side of the street, resulting in them using the south leg of the intersection with 3rd Street. This configuration would align well with the promenade planned on the south side of Hawthorne Avenue between 2nd Street and 3rd Street.
- Alternatives 2 and 3 would introduce potential conflict points between 4th Street and 5th Street at residential driveways along the protected facilities, though the conversion to one-way traffic will eliminate some potential conflict points. The protected facilities may increase the perception of comfort for people walking and biking but may also reduce the awareness of vehicles exiting through the driveways. Additionally, drivers may have limited visibility of cyclists approaching in both directions.
- Alternative 3 has additional constructability considerations between 4th Street and 5th Street, as the properties along the south side of the street are higher than the street grade. Installing the shared-use path with accessible grades would require cutting the grade, installing slopes between the shared-use path and right of way or short walls to retain the fill and steep connections to the existing driveways.
- Alternative 1 would have the lowest cost and impact to existing traffic patterns. While it would calm traffic, it would offer less separation between vulnerable road users and vehicle traffic.

TABLE 4: HAWTHORNE AVENUE ALTERNATIVES EVALUATION

GOAL	EVALUATION CRITERIA	ALTERNATIVE 1: SHARROWS AND SPEED HUMPS	ALTERNATIVE 2: CYCLE TRACK	ALTERNATIVE 3: SHARED-USE PATH
1. PROVIDE SAFE TRANSITION FROM BRIDGE PROJECT TO STREET NETWORK	Provides clear, intuitive connectivity for road users of all ages and abilities.	Mixes people walking or biking with vehicle traffic but includes traffic calming. Works well with traffic signal at 3rd Street but does not align as well with planned promenade west of 3rd Street.	Provides clear circulation for people walking and biking. Works well with traffic signal at 3rd Street.	Provides clear circulation, but mixes bicycle and pedestrian traffic. Works well with traffic signal at 3rd Street.
	Design features promote safe speeds and travel behaviors.	Provides traffic calming features.	One-way vehicle traffic will reduce volumes. Creates potential conflicts with south side driveways between 4th and 5th Street.	One-way vehicle traffic will reduce volumes. Creates potential conflicts with south side driveways between 4th and 5th Street.
	Minimizes conflicts between vulnerable roadway users and motor vehicle traffic.	Mixes vulnerable road users with vehicle traffic.	Separates pedestrians, bicyclists, and vehicle traffic.	Separates vulnerable road users from vehicle traffic, but mixes bicycle and pedestrian traffic.
2. ALIGNS WITH COMMUNITY GOALS	Includes design elements that increase active modes of transportation for all users and abilities.	Provides a low-stress facility for vulnerable road users but with less separation from vehicle traffic.	Provides a continuous, separated path along a low-stress facility.	Provides a continuous, separated path along a low-stress facility.
	Provides access to adjacent businesses.	Maintains on-street parking on both blocks and does not change vehicle access. Reduces parking in front of the north-side businesses near 3rd Street from 8 to 5 spaces and does not substantially improve walking/biking access.	Provides on-street parking on one side of the street between 3rd and 4th Street but no on-street parking between 4th and 5th Street. Reduces parking in front of the north-side businesses near 3rd Street from 8 to 7 spaces and improves walking/biking access.	Provides on-street parking on one side of the street. Reduces parking in front of the north-side businesses near 3rd Street from 8 to 7 spaces and improves walking/biking access.
	Aligns with future development, City infrastructure, and City standards.	Maintains two-way vehicle traffic	Requires changes to transit circulation. Opportunity to reconfigure Safeway driveways to reduce conflicts.	Requires changes to transit circulation. Opportunity to reconfigure Safeway driveways to reduce conflicts.
	Aligns traffic patterns with the Transportation System Plan's road classifications and identified low stress network and Key Walking and Biking Routes.	Will not create major changes for these considerations.	Requires one-way vehicle traffic, which is acceptable for a local street.	Requires one-way vehicle traffic, which is acceptable for a local street.
	Prioritizes existing and future street trees and landscaping	Will not remove street trees	May remove street trees	May remove street trees
3. MEET COMMUNITY NEEDS COST-EFFECTIVELY	Can be implemented in a phased approach pending funding availability.	Cost: \$515K to \$787K* Can be built in phases	Cost: \$662K to \$1.0M* Difficult to implement in phases.	Cost: \$1.6M to \$2.5M* Difficult to implement in phases.
	Minimizes community impacts during construction (including temporary easement) and right-of-way acquisition needs.	Low impact - Sharrows can be implemented with relatively little investment.	Low impact – Requires minimal changes to curbs lines.	High impact – May require extra work due to grades between 4th and 5th Street.
	Minimizes the costs and challenges of ongoing maintenance requirements.	Minimizes added maintenance.	Cycle track with temporary materials may require additional maintenance.	Shared-use path may require minimal additional maintenance.

Gray = Neutral, Orange = Disadvantage, Teal = Advantage

* These cost estimates do not include intersection options. Intersection option cost estimates are included in the appendix.

SUMMARY

Table 5 summarizes the expected cost range and approximate right-of-way impact associated with each alternative on Harriman Street and Hawthorne Avenue. On Harriman Street, Alternative 1 would be less costly and have a lower impact than Alternative 2, which would require changing curb lines with a longer and more impactful construction duration.

On Hawthorne Avenue, Alternative 1 would be the least impactful and costly option but would offer less separation between vulnerable road users and vehicle traffic. Alternatives 2 and 3 both prioritize separation between people walking and biking from vehicle traffic. Alternative 3 provides a continuous south-side walking route, but has higher cost and constructability challenges, particularly between 4th Street and 5th Street. Alternative 2 maintains the existing curb lines and reduces overall cost but may have higher maintenance costs.

TABLE 5: COST AND IMPACT SUMMARY OF ALTERNATIVES

ALTERNATIVE	COST RANGE*	CONSTRUCTABILITY IMPACT
HARRIMAN STREET		
ALTERNATIVE 1	\$173K to \$264K	Low Impact
ALTERNATIVE 2	\$1.6M to \$2.4M	High Impact
HAWTHORNE AVENUE		
ALTERNATIVE 1	\$515K to \$787K	Low Impact
ALTERNATIVE 2	\$662K to \$1.0M	Low Impact
ALTERNATIVE 3	\$1.6M to \$2.5M	High Impact
*These cost estimates do not include intersection options. Intersection option cost estimates are included in the appendix.		