



TUOLUMNE HERITAGE TRAIL

Alternatives Analysis for Phase 2 and Phase 3 Segments





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1 Executive Summary

The Tuolumne Heritage Trail (formerly the Gold Rush Path) is a planned multi-use facility connecting the historic Gold Rush communities of Sonora and Columbia in Tuolumne County. This Feasibility Study evaluates design alternatives for Phase 2, which extends along State Route 49 (SR-49) from north of Shaws Flat Road to the intersection of Parrotts Ferry Road (approximately 1.9 miles), and Phase 3, which extends along Parrotts Ferry Road from SR-49 to Columbia State Historic Park (approximately 1.5 miles). Together these phases close a critical gap in the regional active-transportation network and connect schools, neighborhoods, employment, and visitor destinations.

Two alternatives were developed and evaluated for each phase. For Phase 2, both alternatives provide a Class I multi-use path; Alternative 1 on the west side of SR-49 and Alternative 2 on the east side. For Phase 3, Alternative 1 provides Class IV protected bikeways on both sides of Parrotts Ferry Road, and Alternative 2 provides a Class I multi-use path on the east side. Each alternative was evaluated against a consistent set of quantitative criteria (safety and crash reduction, mode shift/VMT/GHG, travel time, and cost) and qualitative criteria (connectivity, Safe Routes to School, ADA/pedestrian benefit, placemaking and historic character, and public support).

For Phase 2, the evaluation indicates that Alternative 2 (east side) offers meaningful advantages: it eliminates a highway crossing at the SR-49/Parrotts Ferry Road intersection for users traveling to and from Columbia, requires substantially less earthwork and retaining-wall structure, and carries a lower estimated construction cost (approximately \$77.3 million escalated, versus \$98.3 million for Alternative 1), though it requires more right-of-way acquisition and may affect seven adjacent structures. For Phase 3, Alternative 2 (Class I path, east side) provides the strongest pedestrian accessibility, Safe Routes to School outcome, and continuity with Phase 2 Alternative 2, while Alternative 1 (Class IV, both sides) minimizes right-of-way impact and serves cyclists on both sides.

This study consolidates the project vision and goals, the design alternatives, the evaluation methodology and results, and an implementation, phasing, and funding strategy. Recommended alternatives for each phase should be confirmed by the Project Development Team in coordination with TCTC and the City of Sonora once final opinion of probable costs and community input are complete.

2 Vision and Goals

The Tuolumne Heritage Trail Phases 2 and 3 represent a critical investment in safe, multimodal connectivity for the growing communities in Sonora and Columbia. As school enrollment and regional population continue to increase, the need for accessible and reliable pedestrian and bicycle infrastructure has become more urgent. Currently, the corridor is constrained to a single travel lane in each direction, with no dedicated sidewalks or bicycle facilities. As a result, vehicles, freight traffic, cyclists, and pedestrians are forced to share a limited roadway, creating significant safety risks for students, families, older adults, and residents.

The Tuolumne Heritage Trail seeks to transform this corridor into a safe, comfortable, and connected route that supports all users while preserving the unique character of Tuolumne County. Beyond improving mobility, the project is guided by a vision that thoughtfully integrates the area's natural landscape and rich cultural history, enhancing, rather than detracting from, its identity. Rooted in the legacy of the Southern Mines, the project draws upon the rich cultural and historical context that defines Sonora, Columbia, and the surrounding region. By physically and experientially connecting these destinations, the Path creates a continuous narrative that highlights the area's Gold Rush-era origins, vibrant downtown character, and enduring sense of place.

As such, the designs for both phases incorporate a context-sensitive approach that reflects the historic built environment and natural landscape of Tuolumne County. Potential design strategies include extending the existing savannah oak landscape to reinforce the area's ecological identity, incorporating natural oak elements such as timber guardrails, and repurposing locally sourced loose rocks into gabion walls that blend with the surrounding terrain. Additional concepts may draw inspiration from traditional Mi-Wok Native American huts to respectfully acknowledge the region's Indigenous heritage, while subtle gold accents and detailing can be integrated to reference the origins and legacy of the historic Gold Rush path.

Lighting along the corridor will be thoughtfully designed to remain low in intensity and carefully directed in order to comply with local dark sky ordinances and minimize impacts on surrounding natural habitats. Similarly, opportunities may include the installation of historic plaque markers at key locations to provide interpretive information about the area's rich cultural and mining history, enhancing the educational and experiential value of the trail.

The Trail will also serve as a platform for storytelling, offering opportunities to interpret the history of the Gold Rush, the evolution of Sonora's downtown, and the cultural significance

of Columbia as a preserved historic town. Wayfinding, public art, and educational installations will reinforce these narratives, transforming the corridor into an immersive cultural experience for residents and visitors alike. By activating key nodes along the route, such as gateways, trailheads, and intersections, the project will create inviting public spaces that encourage gathering, exploration, and economic activity.

Importantly, the project's placemaking approach emphasizes community identity and inclusivity. By connecting neighborhoods, schools, and commercial areas, the Tuolumne Heritage Trail strengthens social cohesion and ensures that the benefits of enhanced mobility and public space are shared broadly. The integration of the trail into existing urban and historic contexts will be guided by a respect for local character, ensuring that improvements complement, not compete with, the distinctive qualities that make Sonora and its surrounding communities unique. Through this integrated approach, the Tuolumne Heritage Trail will function as both a mobility spine and a cultural corridor, one that honors the past while supporting a vibrant, accessible, and connected future for Tuolumne County.

Together, these elements will be thoughtfully woven into modern trail amenities to create a cohesive and immersive experience that feels authentic to the community while supporting contemporary mobility, safety, and usability needs. These elements are intended as potential placemaking features rather than prescriptive design requirements, allowing for continued collaboration with stakeholders and the community to refine and tailor improvements as the project advances. Collectively, these strategies will be thoughtfully integrated with modern trail amenities to create a cohesive, authentic experience that supports contemporary mobility, safety, and usability while honoring the unique character of the region.

The vision for the Tuolumne Heritage Trail is supported by the following goals and objectives, derived from analysis of existing conditions and community feedback, which together establish a framework for a trail that is not only functional and safe, but also reflective of Tuolumne County's distinct sense of place:

- **Goal 1: Celebrate Tuolumne County's Unique Landscape and Natural History**
 - *Objective 1A:* Feature the region's pre-European settlement native oak savannah landscape.
 - *Objective 1B:* Highlight post-1848 landscape transformations and mining-era interventions.
- **Goal 2: Connect Communities and Enhance Mobility Through Safety and Complete Streets Improvements**

- *Objective 2A:* Expand access to key destinations, including schools, community facilities, and regional transportation corridors, for all users.
- *Objective 2B:* Improve safety conditions for residents and visitors through dedicated pedestrian and bicycle infrastructure and traffic calming strategies.
- **Goal 3: Memorialize Tuolumne County’s Cultural Heritage and Mining History**
 - *Objective 3A:* Highlight the diverse communities and cultural narratives that have shaped Tuolumne County over time.

3 Phase 2 Design Alternatives

Phase 2 of the Tuolumne Heritage Trail will provide improved multimodal connectivity for bicyclists and pedestrians along SR-49 from just north of Shaws Flat Road in Sonora to the intersection of Parrotts Ferry Road. At the southern end of the alignment, Phase 2 will connect to where Phase 1 ends on the Tuolumne Heritage Trail. The Phase 2 Tuolumne Heritage Trail project will also include traffic signal and intersection upgrades at the intersection of SR-49 and Parrotts Ferry Road. This intersection will connect Phase 2 to the future Phase 3 segment of the trail. In addition to Phase 2 improvements, a roundabout is planned at the intersection of SR-49 and Shaws Flat Road/Columbia Way. This roundabout is not included in the Phase 2 or 3 alternatives analysis.

3.1 SR-49/Parrotts Ferry Road Intersection Design

The following intersection improvements are recommended at the intersection of SR-49 and Parrotts Ferry Road regardless of which alternative is selected for the Phase 2 alignment:

- New southbound left turn lane from Parrotts Ferry Road to SR-49;
- Protected left turn phase (signal modification) for the existing left-turn lane from SR-49 to northbound Parrotts Ferry Road;
- A new crosswalk across the Parrots Ferry Road approaching the intersection
- Pedestrian/bicycle ramps and landing pads;
- Concrete islands with truck aprons at the northeast and northwest corners at the intersection.

Additional design elements may be recommended or needed for the intersection depending on the Phase 2 alternative that is selected. These are discussed in Section 3.3 and Section 3.4 as part of the descriptions of Alternative 1 and Alternative 2, respectively.

3.2 Multi-Use Path Segment Designs

For the Phase 2 segment of the Tuolumne Heritage Trail, a Class I Bikeway, or multi-use path, was identified as the preferred facility type. This type of facility is a wide, two-way

paved path that is physically separated by the roadway. Both cyclists and pedestrians can use a Class I facility. Two concepts for the Class I facility have been identified and are considered as part of the alternative analysis. These concepts will each require a combination of multiple segment types and are described below. Renderings that are provided are illustrative and can be mirrored depending on whether the path is on the east or west side of the road.

At-Grade Multi-Use Path (No Retaining Walls)

On sections where the terrain is relatively level, the Class I multi-use path can be constructed at grade (street level), adjacent to the roadway. A barrier will protect the path from motor vehicle traffic on the roadway. As seen in Figure 1, the path would be 10-foot-wide with additional 2-foot shoulders on each side for a total of a 14-foot-wide paved surface. These segments will have an 11-foot motor vehicle travel lane with a 4-to-10-foot shoulder between the path and the barrier. The segments with a 10-foot shoulder will provide space for vehicles to pull over in an emergency. The other side of the road would not be changed from existing conditions.

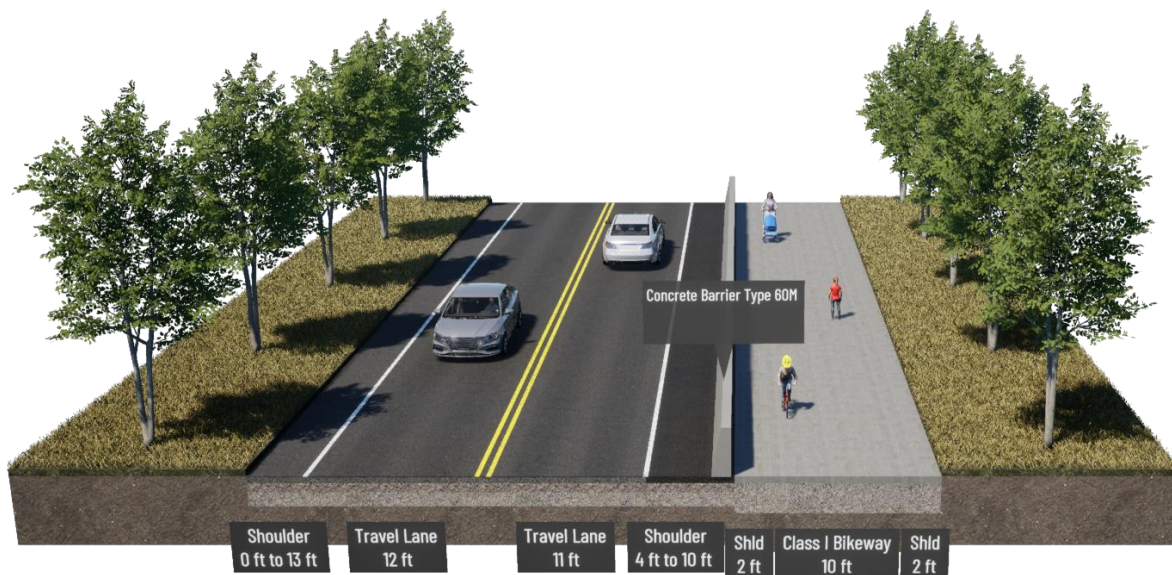


Figure 1: Cross Section of At-Grade Multi-Use Path (No Retaining Wall)

When the corridor passes through more mountainous terrain, cut and fill sections will be required. Various combinations of retaining walls can be used to accommodate the path along the roadway, depending on the slopes and specific conditions of the terrain.

At-Grade Multi-Use Path with Retaining Wall (Cut)

At locations where the terrain next to the roadway begins to slope up, the width of the multi-use path can be accommodated by cutting the hill and placing a retaining wall. The multi-use path will remain at grade and continue to include a 4-to-10-foot shoulder along SR-49. Figure 2 shows a cross section of such segments of the path.



Figure 2: Cross Section of At-Grade Multi-Use Path with Retaining Wall (Cut)

Raised Multi-Use Path with Tiered Retaining Walls

In other locations where the existing ground slopes up from the roadway, a tiered retaining wall design may be implemented. As seen in Figure 3, a wall is used to elevate and separate the multi-use path from the roadway. This concept reduces the amount of cut needed to build the multi-use path. It uses two walls: one to retain the hill, and one adjacent to the road to elevate the path. The design will include fencing on top of the wall between the path and the roadway. Similar to the other concepts, the shoulder in this concept will vary between 4 and 10 feet in width along the retaining wall. The opposite side of the road will not be modified.



Figure 3: Cross Section of Raised Multi-Use Path with Tiered Wall

Raised Multi-Use Path with Single Retaining Wall

In other locations where the existing ground slopes up from the roadway, the path will climb up to follow the existing ground at the back of the path. Like the tiered wall concept, this concept helps reduce the amount of cut needed to build the multi-use path. Like the tiered-wall segments, this typical section would have a fence on the wall between the path and the road. It would also be able to accommodate a roadway shoulder varying between 4 and 10 feet in width. A cross section of this type of segment is shown in Figure 4.



Figure 4: Cross Section of Raised Multi-Use Path with Single Retaining Wall

In some locations, the terrain adjacent to the roadway slopes downward, requiring fill sections with retaining walls. Depending on the severity of the slope and other terrain considerations, the multi-use path may be constructed at the same elevation as the adjacent roadway or may be grade-separated by lowering it below the road.

At-Grade Multi-Use Path with Retaining Wall (Fill)

Figure 5 provides a cross section of how the multi-use path can be designed next to the roadway on segments where the hill slopes down from the edge of the roadway. Here, an exterior retaining wall is used to level the ground adjacent to the roadway. A 2-foot-wide fence or barrier separates the path from the adjacent roadway shoulder, which would vary in width between 4 and 10 feet.



Figure 5: Cross Section of At-Grade Multi-Use Path with Retaining Wall (Fill)

Lowered Multi-Use Path with Tiered Retaining Walls

In other locations where the existing ground slopes down from the roadway, a tiered retaining wall design may be implemented. As seen in Figure 6, a wall is used to lower and separate the multi-use path from the roadway. This concept reduces the amount of fill needed to build the multi-use path. It uses two walls: one to retain the path, and one adjacent to the road to lower the path. The design will include fencing on top of the wall on the outside of the path. Similar to the other concepts, the shoulder in this concept will vary between 4 and 10 feet in width along the retaining wall. The opposite side of the road will not be modified.



Figure 6: Cross Section of Lowered Multi-Use Path with Tiered Retaining Walls

3.3 Phase 2 Alternative 1: Class I Multi-Use Path on West Side of SR-49

The Phase 2 Alternative 1 concept would provide the Class I multi-use path along the west side of the corridor. Much of the terrain along the west side of the corridor slopes up from the roadway, and therefore this alternative would rely heavily on the sections shown in Figures 2, 3, and 4. As seen in Figure 7, for most of the alignment, the path would be raised with tiered retaining walls or using a single retaining wall. In short segments north of the Arco gas station and just south of Gold Rush Plaza, the path would be at grade along the west side of SR-49.

At the intersection of SR-49 and Parrotts Ferry Road, Alternative 1 would also require new crosswalks crossing the east and west approaches of SR-49 to provide a connection to the future facilities planned along Parrotts Ferry Road. These crosswalks may include pedestrian and/or bicycle push-buttons and signals. An exhibit showing a possible intersection design configuration for Alternative 1 is provided below in Figure 8.



Figure 7: Phase 2 Alternative 1 - Class I Multi-Use Path on West Side of SR-49

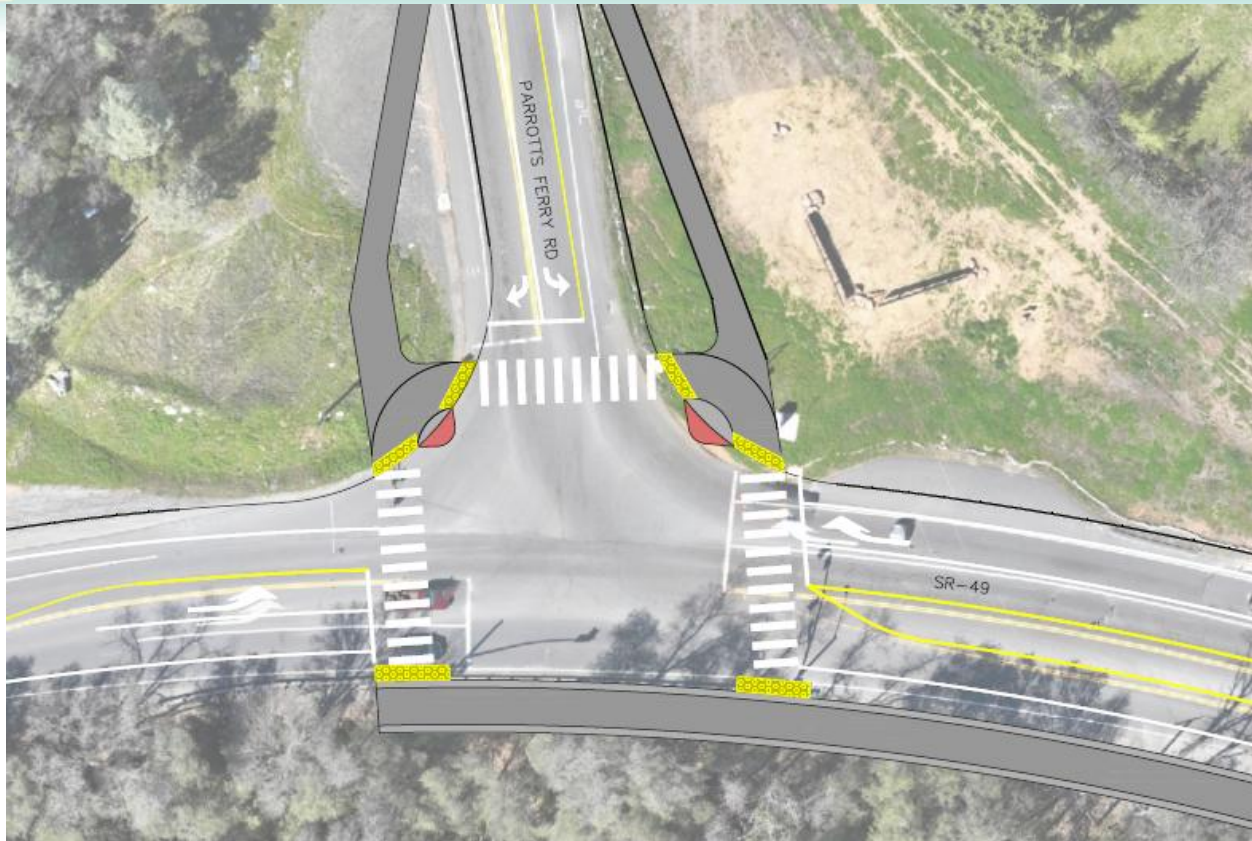


Figure 8: Phase 2 Alternative 1 - SR-49/Parrots Ferry Road Intersection Design

3.4 Phase 2 Alternative 2: Class I Multi-Use Path on East Side of SR-49

Alternative 2 would be located along the east side of SR-49, where the terrain is generally more level. As shown in Figure 9, approximately 50% of the alignment along the east side would include the path at-grade using an exterior retaining wall with fill on the downslope. Roughly 40% of the alignment would maintain the path at grade without the need for any retaining walls or only using a single exterior retaining wall for cutting into the hillside. One segment of the alignment spanning approximately 650 feet north and south of O'Hara Drive would be lowered using the tiered retaining wall design.

Because Alternative 2 is located along the east side of the roadway, no pedestrian or bicycle crossings are needed across SR-49 at the intersection with Parrots Ferry Road. A possible proposed intersection design for Alternative 2 is shown below in Figure 10.



Figure 9: Phase 2 Alternative 2 - Class I Multi-Use Path on East Side of SR-49

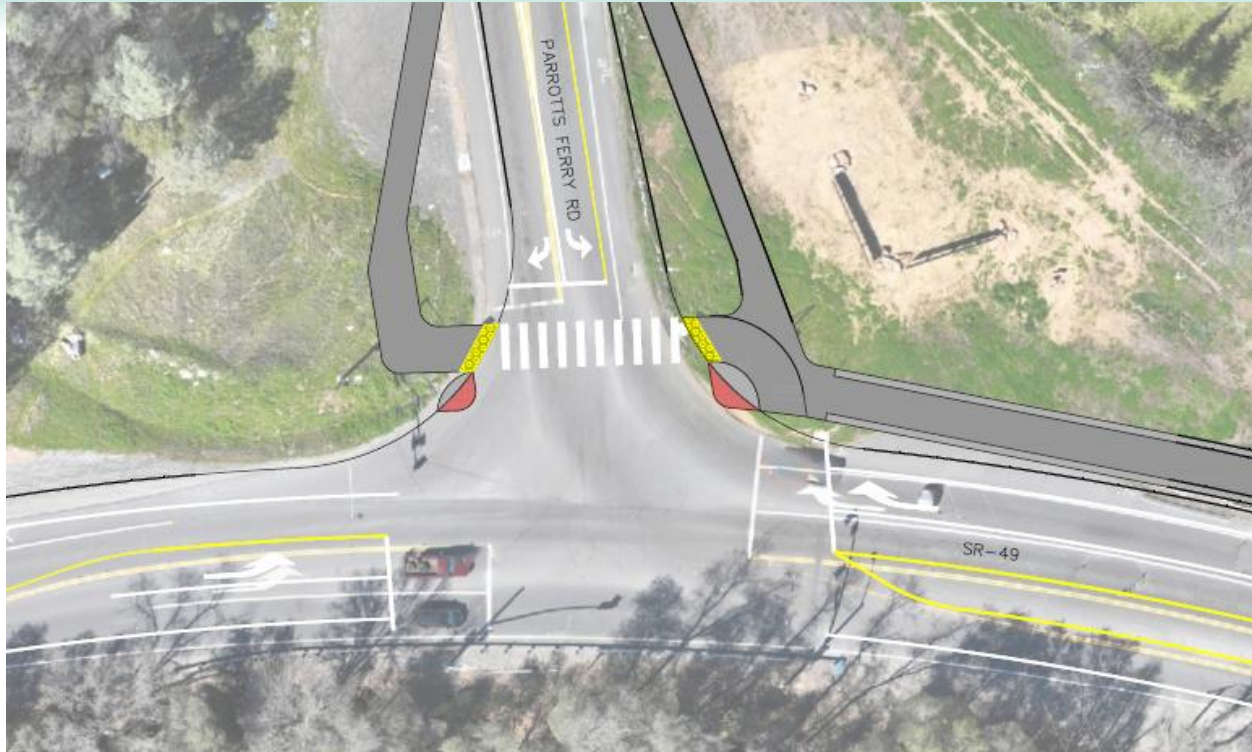


Figure 10: Phase 2 Alternative 2 - SR-49/Parrots Ferry Road Intersection Design

4 Phase 3 Design Alternatives

The Phase 3 segment of the Tuolumne Heritage Trail spans along Parrots Ferry Road from SR-49 to Columbia State Historic Park located at Columbia Street. For the Phase 3 segments of the Tuolumne Heritage Trail, alternatives considered include Alternative 1: Class IV protected bike lanes along both sides Parrots Ferry Road, and Alternative 2: a Class I multi-use path along the east side of the road. The specific designs segments of each alternative are described in their corresponding sections.

4.1 Phase 3 Alternative 1: Class IV Protected Bikeway

The Phase 3 Alternative 1 concept would provide the Class IV bikeway along both sides of the street throughout the corridor. This concept was identified for its ability to reduce the overall right-of-way impacts and associated conflicts with utility poles and trees along both sides of the corridor. The following are descriptions of typical sections that would comprise the design of Phase 3 Alternative 1. In all design sections, the design includes 11-foot travel lanes in each direction, and 8-foot-wide bicycle lanes with 3-foot buffers that include vertical delineators (bollards) to separate cyclists from moving vehicles on each side of the road.

Class IV Bikeway (No Cut or Fill)

Where the terrain is relatively flat, the Class IV bike lanes can be constructed without cut or fill requiring the use of retaining walls, as shown in Figure 11.



Figure 11: Cross Section of At-Grade Class IV Bikeway

Class IV Bikeway (Cut and Fill Wall)

On areas with steep and varying topography, cut or fill may be required to maintain the bicycle lanes at grade level. Exterior retaining walls will be used and may include fences above for additional protection for cyclists. Figure 12 through Figure 14 depict examples of cut sections on one side, fill sections on the other side, and combinations of cut and fill sections on each side. The renderings provided are for illustrative purposes and can be mirrored to match specific terrain conditions.



Figure 12: Cross Section for At-Grade Class IV Bikeway with Cut Section



Figure 13: Cross Section of At-Grade Class IV Bikeway with Fill Section

Where the terrain is sloped on both sides of the roadway, the Class IV bikeway will be cut from the larger amount of terrain is used to fill the downhill terrain area to support the other side of the bike lane. As shown in Figure 14, this will require one retaining wall on each side

to support the removal of land on one side and the newly added land on the other side. The bike lanes would be protected with a 3-foot buffer on each side, filled with a level of protective barrier, such as bollards or other similar mechanisms. Fences will also be included on top of the retaining walls next to the bike lanes.



Figure 14: Cross Section of At-Grade Class IV Bikeway with Cut and Fill Sections

Figure 15 on the following page provides a map of the Phase 3 alignment that identifies which sections of the Class IV facility would require cut, fill, or neither.

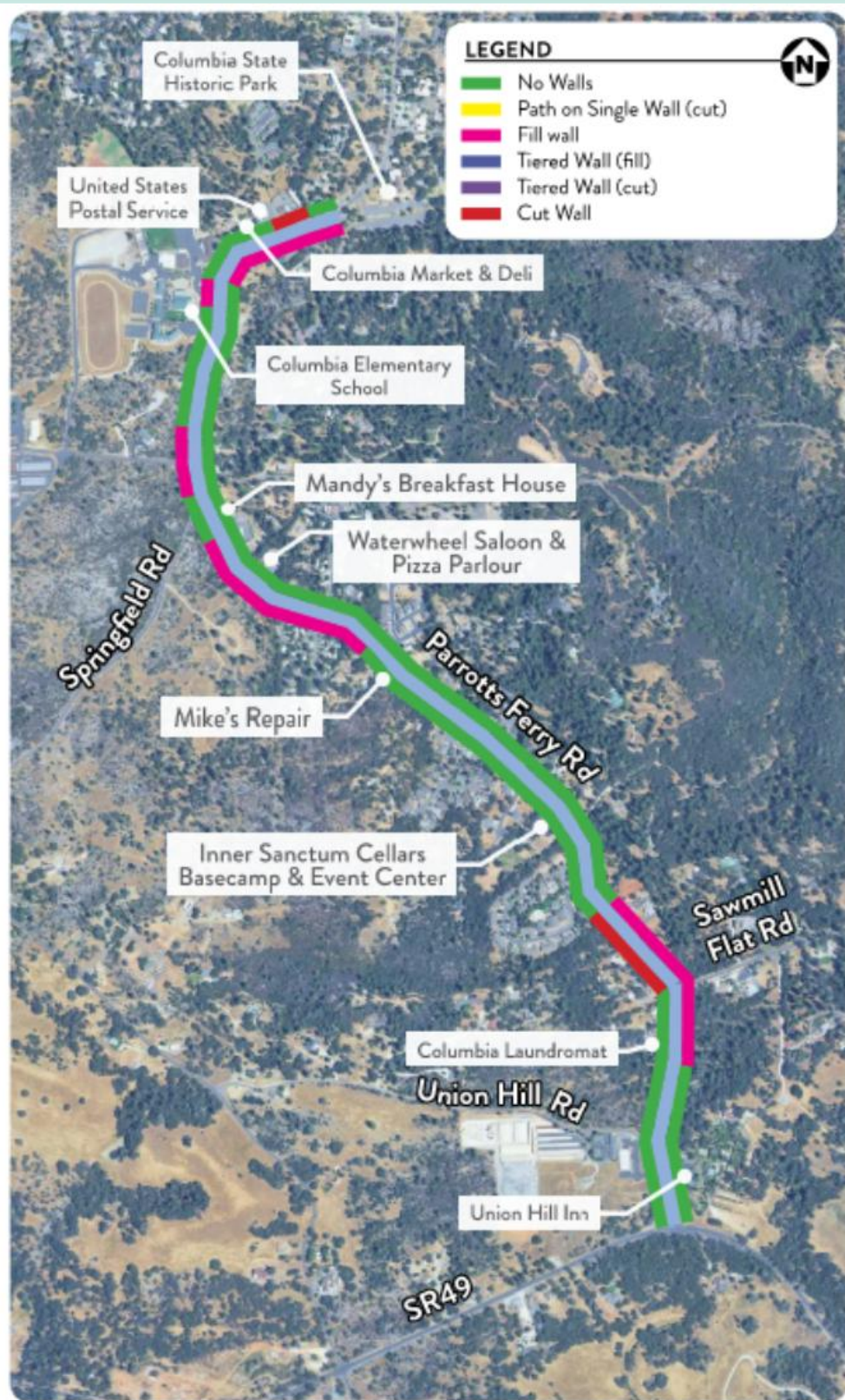


Figure 15: Phase 3 Alternative 1 - Class IV Bikeway on Both Sides of the Street

4.2 Phase 3 Alternative 2: Class I Multi-Use Path Along East Side

The Phase 3 Alternative 2 concept would provide a Class I multi-use path on the east side of the road throughout the corridor. When paired with Phase 2 Alternative 2, this would keep the multi-use path consistently on the east side, reducing potential for bicycle and pedestrian crashes with motor vehicles by eliminating the need to cross the roadway when connecting between Phase 2 and Phase 3. As shown in Figure 16, the Class I multi-use path alignment along the Phase 3 corridor generally maintain the facility at the roadway level through a combination of at-grade, cut, and fill configurations depicted in Figure 1, Figure 2, and Figure 5 and described in Section 3.2 Multi-Use Path Segment Designs.

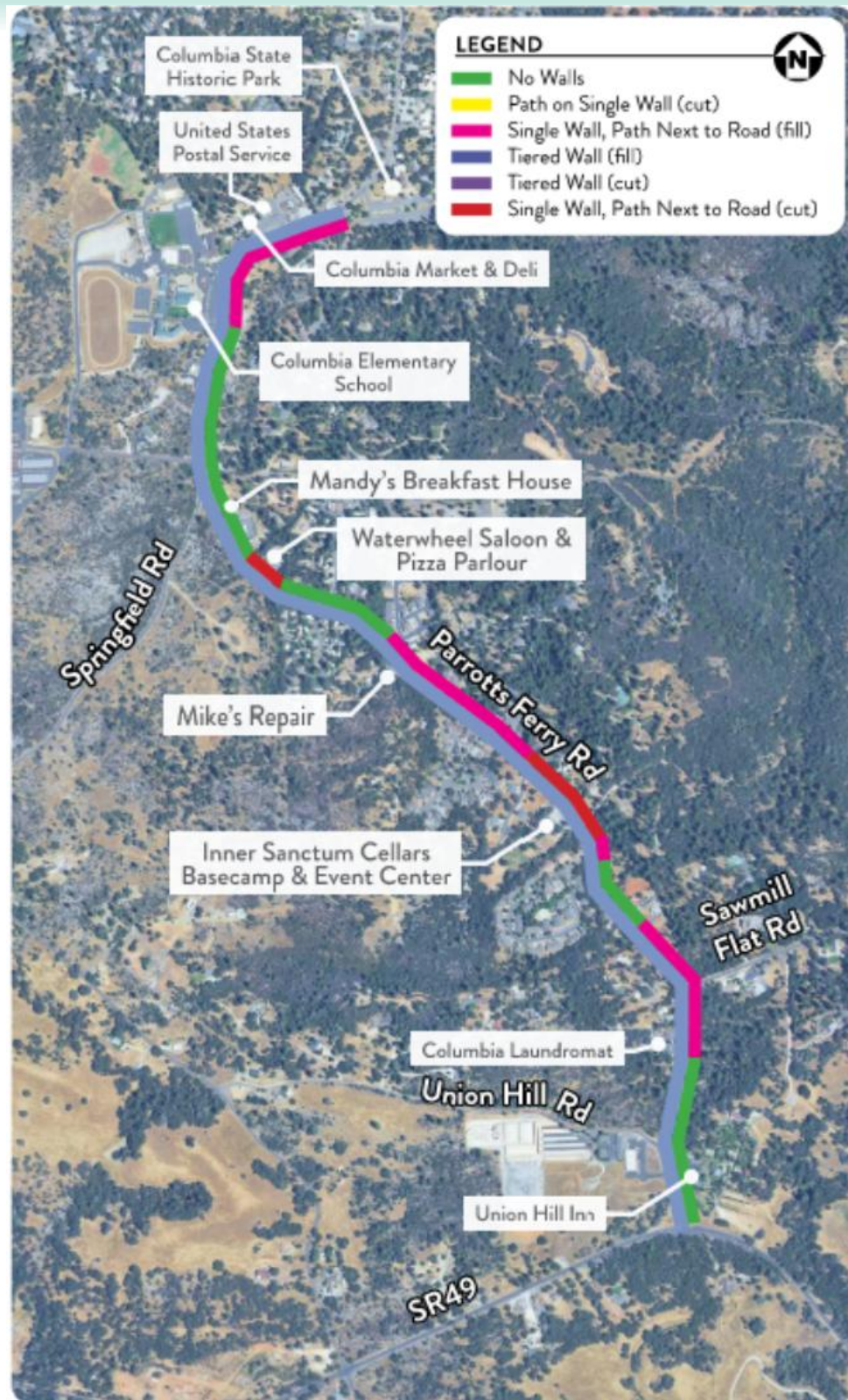


Figure 16: Phase 3 Alternative 2 - Class I Multi-Use Path on East Side of Parrots Ferry Road

5 Evaluation Criteria and Methodology

Both qualitative and quantitative criteria are used in the evaluation of the alternatives for Phase 2 and Phase 3 segments of the Tuolumne Heritage Trail. Generally, quantitative criteria are used to gauge potential benefits of the alternative from a transportation perspective, while qualitative criteria are used to identify less tangible benefits such as connectivity to nearby destinations and opportunities for placemaking and celebration of the corridor's historic character. Additionally, the alternatives are evaluated with regard to costs associated with both construction and long-term maintenance.

5.1.1 Alternative Benefits

Safety and Potential for Crash Reductions

Each alternative is evaluated with regard to its potential to provide safety benefit along the Tuolumne Heritage Trail corridors. The improvements identified as part of the alternatives will be evaluated using crash reduction factors. The Caltrans Local Roadway Safety Manual v1.7 provides specific reduction factors based on the types of improvements that are being considered both along the state roadway and at intersections along the alignment. Table 1 lists the specific improvements that are being considered for implementation as part of the Phase 2 and Phase 3 alternatives, and corresponding Crash Reduction Factors.

Table 1: Crash Reduction Factors by Improvement Type

Code (Type)	Description	Crash Reduction Factor	Expected Life	Applicability			
				Phase 2		Phase 3	
				Alt 1	Alt 2	Alt 1	Alt 2
SI05 (Signal Modification)	Install left-turn lane and add turn phase (signal has no left -turn lane or phase before)	55% (All Crashes)	20 years	X	X		
SI06 (Signal Modification)	Provide protected left turn phase (left turn lane already exists)	30% (All Crashes)	20 years	X	X		
SI19PB (Ped & Bike)	Install Pedestrian crossing (Signalized Intersection)	25% (Ped & Bike)	20 years	X	X		
R34PB (Ped & Bike)	Install Separated Bike Lanes	45% (Ped & Bike)	20 years	-	-	X	-
R35PB (Ped & Bike)	Install sidewalk/pathway (to avoid walking along roadway)	80% (Ped & Bike)	20 years	X	X	-	X
R36PB (Ped & Bike)	Install/upgrade pedestrian crossings (with enhanced safety features)	35% (Ped & Bike)	20 years	-	-	X	X

Crash reduction factors are applied to the number of applicable crashes that were recorded over the previous 5-year period, based on data from the Statewide Integrated Traffic Records System (SWITRS) to estimate the potential for crash reductions over each improvement’s expected life. The resulting number of reduced crashes can be assigned a monetary value, depending on location, as shown in Table 2 below.

Table 2: Value of Safety Benefits for Crash Reduction

Location Type	Crash Cost *
Signalized Intersection	\$2,162,000
Non-Signalized Intersection	\$3,440,000
Roadway	\$2,978,000

* Based on Table 7-1, Highway Safety Manual (HSM), First Edition, 2010. Adjusted to 2024 Dollars.

Modal Split, VMT, and GHG Reduction Impacts

Each alternative is evaluated for its potential to shift mode towards biking and walking using the Caltrans Active Transportation Benefit-Cost Tool, developed by the Active Transportation Resource Center (ATRC) at UC Davis. The tool estimates expected benefits of proposed active transportation projects in California and offers estimated mode shift, crash reduction, and impact on greenhouse gas emissions (GHG) among other benefits, and is useful for California Active Transportation Program (ATP) Grant Application.

For the purpose of this evaluation, potential benefits of Phase 2 and Phase 3 are evaluated independently. Because the tool evaluates improvements in the context of existing conditions, it is anticipated that the cumulative benefit of both phases would be greater than the sum of each individual project. The analysis for each alternative is provided in Appendix A.

It should be noted that the tool used has limitations, especially when considering potential benefit for pedestrians. This is largely due to the lack of connecting pedestrian amenities that exist today. Additionally, the Caltrans tool considers the Class IV protected bicycle facilities as bicycle-only facilities – though the design of the facility is consistent with the Federal Highway Administration (FHWA) design for a visually separated pedestrian lane for use in small towns and rural environment¹.

Connectivity Benefits and Safe Routes to Schools

Both Phase 2 and Phase 3 segments of the Tuolumne Heritage Trail have a public school at one of their termini. Each alternative is evaluated based on how it contributes to a future safe routes to school (SRTS) network. While all alternatives are anticipated to provide

¹ [Pedestrian Lane -Rural Design Guide](#)

benefit by providing an improved bicycle and pedestrian facility for accessing the Sonora High School (Phase 2) and Columbia Elementary School (Phase 3), consideration will be given to proximity of the facility to the school, and elimination of unprotected crossings for school-aged children.

In addition to providing improved access to nearby schools, the alternatives are evaluated as to their ability to serve existing trips based on the origins and destinations data collected through Replica. A qualitative evaluation of each alternative's potential for connectivity to existing origins and destinations is conducted. This analysis considers trips that originate and terminate in one of nine (9) census block groups surrounding the Phase 2 and Phase 3 corridors. Only trips that use the SR-49/Parrotts Ferry Road corridor, or parallel corridor consisting of Springfield Road/Shaws Flat Road/Saratoga Road are considered for this analysis. A map showing the roadway segments included in the Replica analysis is provided in Figure 17.

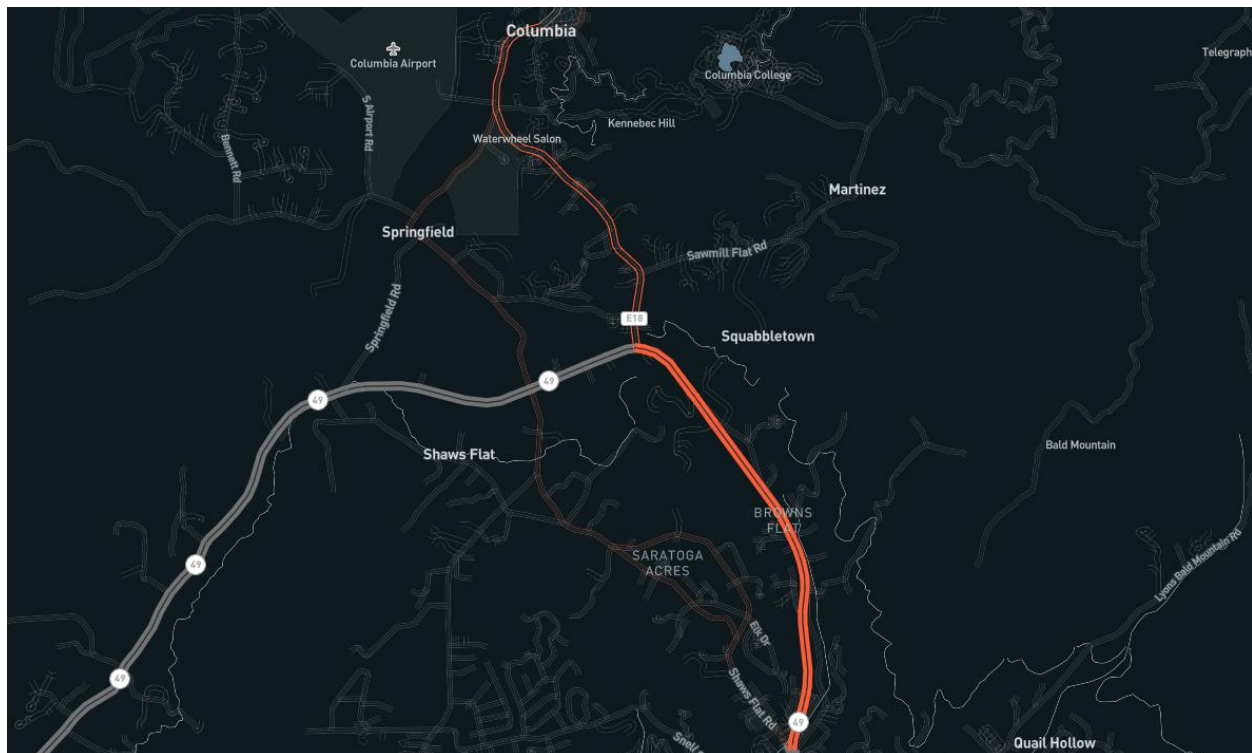


Figure 17: Phase 2 and Phase 3 Corridor Trip Volumes (Replica)

Figure 18 shows the 9 census Block Groups that were considered as part of the Mode shift evaluation.

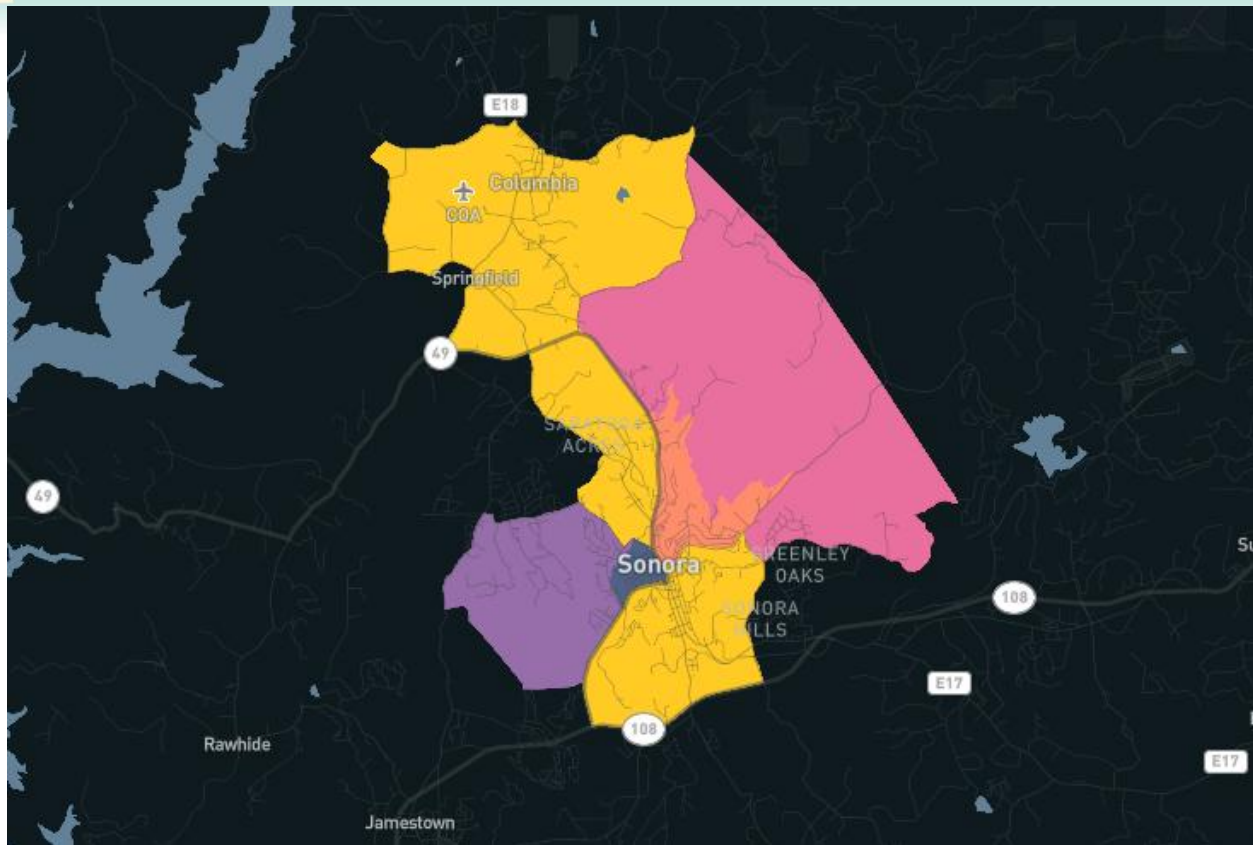


Figure 18: Phase 2 and Phase 3 Trip Origins and Destination Study Area

The corridor recorded an estimated 42,900 trips along the Phase 2 and Phase 3 segments of the alignment in a single weekday, in Fall 2025. Of these, an estimated 6,850 trips started and ended within the study area shown in Figure 18. The connectivity analysis uses trip origin and destination to identify the number of trips that would most likely benefit from the alternative's trail design. Additionally, evaluation of the alternatives considers the existing network and potential for the facility to connect new trips. A summary of vehicular trips along the Phase 2 and Phase 3 corridors is provided in Appendix B.

Pedestrian Benefits (ADA)

The alternatives considered for Phase 2 and Phase 3 of the Tuolumne Heritage Trail include various elements that improve compliance with the Americans with Disabilities Act (ADA) of 1990. Alternatives are evaluated based on the provision of linear feet of ADA-compliant sidewalks and number of new or improved ADA ramps.

Placemaking Opportunities and Historic Character

The Tuolumne Heritage Trail is intended to be more than a transportation facility, and offers the opportunity to celebrate historic identity of the region through landscaping and hardscaping elements that reflect both the mining heritage of the area and the historic Mi-

Work Native American culture that preceded it. Specific lighting, landscaping, and aesthetic elements are anticipated to be incorporated into future design stages. Renderings below provide examples of lighting, landscaping, hardscaping, and aesthetic finishes that may be considered and integrated into future design phases. However, the alternatives are evaluated based on their ability to accommodate placemaking elements, rest areas, and historic markers and totems based on available right-of-way and the specific configuration of the trail along the alignment.



Figure 19: Rendering of Aesthetic Treatment of Retaining Wall (Standard Caltrans Design)



Figure 20: Rendering of Potential Placemaking/Element Along Class I Facility

Public Support

Public feedback is an important consideration for decision-makers as the project moves forward. Strong community support for specific alternatives and design elements can improve the project's competitiveness for grant funding and help ensure long-term success during implementation. Reflecting community values in the project's design also builds trust and fosters a sense of shared ownership among residents. As such, the perspectives gathered through this engagement process will continue to inform design development and decision-making throughout the life of the project.

Public engagement was received through various meetings and channels, described below. A summary of input received through the project is provided in Appendix C.

- Initial Site Visits and stakeholder meetings were held for both Phase 2 and Phase 3 in early April 2025. Input received through these engagements helped form initial concepts for further public feedback.
- In November 2025, the project held a Visioning Days series of events served as a focused outreach effort to gather community input on initial concept designs for Phases 2 and 3 of the project. Over three days, the project team hosted eleven events including walking tours, focused meetings workshops, virtual reality headsets, and other interactive activities culminating with a well-attended open house on Saturday. Local community sponsors provided event space, food, and promotional support. The Project Team held three days Visioning days with

community members in mid-November 2025 to receive feedback and inputs for initial design concepts for Phase 2 and Phase 3 of the project.

An interactive online map (Public Coordinate) was also used to collect community feedback. The map allowed community members to submit location-specific comments within designated categories such as safety, concerns, opportunities, and bicycle or pedestrian feedback.

- Finally, the Project team presented revised concepts for both Phase 2 and Phase 3 at a Tuolumne Heritage Trail Open House event held in May 2026.

Section 6 Alternatives Evaluation discusses the overall community sentiment for each of the alternatives for consideration when selecting a preferred concept.

5.1.2 Construction Cost and Construction Feasibility

This section discusses the various costs that are considered for evaluation of the various alternatives. Costs are broken down as follows:

Construction and Right-of-Way Acquisition & Easement Costs

Cost of construction is estimated for each of the Phase 2 and Phase 3 alternatives. Costs considered include paving costs, construction of the retaining walls, earthwork (cut and fill needs), intersection improvements, and right-of-way acquisition and property impact costs. Opinion of probable costs for each alternative are provided in Appendix D.

Constructability Evaluation

In addition to construction costs, alternatives are evaluated based on additional construction considerations. These include a qualitative evaluation of severity and duration of construction impacts, environmental clearance considerations, and potential utility relocations or impacts.

A significant consideration is the line of influence of each retaining wall, which is the zone behind and below the wall, defined by the soil's angle of repose, within which excavation, shoring, drainage, and wall footings must be accommodated during construction. For a cut wall, the line of influence extends up-slope and behind the wall face. For a fill wall, it extends down-slope and in front of and beneath the proposed path. In several locations this temporary construction envelope is materially wider than the finished wall and extends beyond the existing public right-of-way, encroaching on adjacent private parcels and, in places, approaching existing buildings. The current study quantifies wall type, height, and approximate length for each alternative at a planning level, but it does not resolve the line of influence parcel-by-parcel. This study now explicitly identifies the locations where the line of influence is expected to reach private property or structures, flagging them as areas requiring additional geotechnical and structural engineering in a subsequent design phase

to confirm wall type, refine the excavation envelope, and develop measures that avoid or minimize permanent impacts to those elements. Resolving these locations early in final design is the single most effective way to reduce right-of-way risk and protect the project schedule.

Where the line of influence cannot be kept within available right-of-way by wall selection alone, the project will rely on shoring to constrain the temporary excavation. Soldier-pile, soil-nail, or comparable shoring systems allow near-vertical temporary cuts, collapsing the construction envelope so that work can proceed within a narrower corridor and limiting disturbance to adjacent private right-of-way, utilities, and buildings. As a design principle, shoring will be used to the maximum extent practicable in constrained segments to avoid permanent acquisition and to keep excavation off neighboring parcels. The trade-off is higher unit cost and added construction complexity, which should be carried forward as the project advances. Permanent acquisition or temporary construction easements would be pursued only where shoring is infeasible, and the strategy for those parcels, including coordination with affected owners, will be developed in a later phase once the wall geometry and line of influence are engineered.

6 Alternatives Evaluation

6.1 Phase 2 Alternatives Evaluation and Comparison

6.1.1 Evaluation of Benefits

Safety and Potential for Crash Reductions

Between January 1, 2021 and December 31, 2025 the Phase 2 corridor had 27 reported crashes. Of these, one crash involved a cyclist and two involved pedestrians along the SR-49 corridor. It is assumed that both alternatives would result in similar overall safety benefits through the provision of a physically separated Class I multi-use along the corridor. The Caltrans Active Transportation Benefit-Cost Tool, whose results are reported in Appendix A, does not provide any differentiation in terms of potential safety benefits between the two alternatives.

Driveways along SR-49 represent potential points of conflict between motorists and pedestrians. The east side of the Phase 2 segment is estimated to have approximately 17 driveways and roadways that would cross the Class I facility, while the west side of the roadway has an estimated 15 roadways and driveways.

A qualitative analysis indicates that Alternative 2 with the Class I facility on the east side of the roadway is assumed to offer overall improved safety by eliminating the need for bicyclists and pedestrians using the trail to cross SR-49 at the intersection of SR-49 and Parrotts Ferry Road.

Modal Split, VMT, and GHG Reduction Impacts

The Caltrans Active Transportation Benefit-Cost Tool (see Appendix A) estimates that both alternatives are anticipated to reduce the number of vehicle miles traveled (VMT) by an estimated 45,700 vehicle-miles over a 20-year period. This translates to a reduction of nearly 13 tons of CO₂ equivalent (comprising CO₂, CH₄, and N₂O emissions) over a 20-year period.

Because the two alternatives offer the same type of facility improvements, the Caltrans tool does not offer any differentiation between the east and west alternatives.

Connectivity Benefits

While the two alternatives for Phase 2 offer similar modal split, VMT, and GHG benefits, a further analysis of existing trip patterns and the existing roadway network shows that a path on the east side is expected to offer slightly more connectivity. Replica data indicates that on an average weekday in Fall 2025, an estimated 1,660 trips (29% of total trips that occurred along the Phase 2 and Phase 3 corridors) originated from census block groups located on the west side of the SR-49 corridor. Conversely, an estimated 1,300 trips (23% of total trips within the study area) originate along the east side of the Phase 2 alignment. Trip destinations mirrored a similar trend, with 29% (approx. 1,675) of total trips in the study area terminating along the west side of SR-49, and 25% (approx. 1,400) of total trips within the study area terminating along the east side of the corridor.

When considering trip origins and destinations within the Phase 2 alignment, an estimated 630 daily trips start and end on the west side of SR-49 compared to 230 trips on the east side of the corridor.

However, the east side of SR-49 has more homes and businesses connecting directly to the corridor at midpoints along the Phase 2 segment. Because SR-49 is a high-speed highway with no mid-segment crossing opportunities, a path on the east side would provide better direct access to these adjacent uses than a path on the west side. Alternative 2 would therefore better serve the larger concentration of trips originating and terminating along the corridor. Both Alternative 1 and Alternative 2 would provide a new separated facility that students could use to access Sonora High School by walking or biking. However, as discussed above, students accessing the school from the west side of the alignment are generally anticipated to connect via Shaws Flat Road and would not benefit directly from the Phase 2 trail. On the other hand, students living along the east side of the Phase 2 alignment would greatly benefit from the multi-use trail located along the east side of the

roadway (Alternative 2), but not receive the same connectivity benefit from a multi-use trail located along the west side of SR-49 (Alternative 1).

Pedestrian Benefits (ADA)

Both alternatives offer a new ADA-compliant path that spans approximately 9,900 feet from Shaws Flat Road north to Parrotts Ferry Road. Pedestrians using Alternative 1 would also need to cross SR-49 at Parrotts Ferry Road, and therefore the alternative includes ADA-compliant crosswalks and ADA ramps across the highway. Conversely, Alternative 2 does not require this additional crossing of SR-49 and therefore only provides a single crosswalk across Parrotts Ferry Road. Overall Alternative 2 offers an improved pedestrian and bicycle experience for users connecting to/from the future Phase 3 alternative by eliminating the need to cross SR-49 at Parrotts Ferry Road.

Placemaking Opportunities and Historic Character

Both alternatives can accommodate placemaking elements, rest areas, and historic markers consistent with the project vision. Alternative 2, located on the east side of SR-49, is considered to provide greater placemaking opportunity: the east side carries a higher concentration of adjacent destinations and offers more contiguous space for gateway treatments, interpretive markers, and seating, particularly near the southern (Sonora High School) and northern (Parrotts Ferry Road) termini. The west-side Alternative 1, which relies heavily on tiered and single retaining-wall sections through sloped terrain, offers fewer locations where the path widens enough to support gathering nodes. Final placemaking elements, including landscaping, lighting, and interpretive features that reflect the region's mining and Mi-Wok heritage, will be developed in subsequent design phases.

Public Feedback

Two public open houses were held on May 29 and May 30, 2026 to share progress and gather feedback on the Tuolumne Heritage Trail project. Events took place at Coffill Park in Downtown Sonora and at Columbia State Historic Park, attracting more than 80 attendees over the two days. Participating community members were invited to review the plans and provide input. Most feedback came through verbal conversations with members of the project team. Other comments were captured through write-in comments left on a post-it poster board or a comment card.

The feedback collected over two days was largely positive, expressing general support for the trail concept and enthusiasm for improved bicycle and pedestrian connectivity in the region. The community also expressed interest in extending connections to East Sonora

and additional major destinations, such as the Indigeny Reserve and Mother Lode Fair. Several comments reflected a desire for safer conditions along the existing Sonora and Columbia corridors, noting current conditions as hazardous for cyclists. There are concerns regarding e-bikes on the trail because they travel at much faster speeds than non-electric and non-motorized bicycles. To mitigate these concerns, community members suggested educational programming to demonstrate how trails and roads can be shared across all users.

When asked, most community members also said they thought a multi-use path on the east side, rather than the west side, of SR-49 would provide better connectivity. This was because they perceived there to be more homes and, especially, businesses, with access points on the east side.

Environmental and landscaping considerations were noted. The community expressed interest in incorporating native plants, native perennial grass, and any other plants that support local wildlife and pollinators. To support the native plantings and stormwater management, permeable surface materials are recommended.

Community priorities, including safety improvements, more connections, native landscaping, and educational programming, will inform the project team's ongoing planning efforts. Combined with technical analysis, these insights will guide decisions on alignment and design features as the project advances.

6.1.2 Evaluation of Construction Costs and Construction Feasibility

Alternatives 1 and 2 for Phase 2 differ in terms of cost of construction and right-of-way acquisition needs. High-level opinion of probable costs for each alternative are provided in Appendix D. The paving for the two alternatives costs about the same at approximately \$2.3 million for either one. However, Alternative 2 is anticipated to require significantly less earthwork (cut and fill) and rely less on structural concrete retaining walls. The total cost associated with earth work and retaining walls is anticipated to be approximately \$37 million for Alternative 1 and \$26 million for Alternative 2.

Alternative 2 also has a simpler intersection design at Parrotts Ferry Road, for a total intersection cost of approximately \$750,000 compared to \$1,500,000 estimated for Alternative 1.

Alternative 1 design overall has a lower right-of-way impact on adjacent properties, requiring approximately 42,000 square feet of property acquisition compared to 54,500

square feet required to accommodate Alternative 2. Alternative 2 is also anticipated to impact seven adjacent building structures, further resulting in an additional \$2.5 million cost not incurred by Alternative 1.

Overall, construction costs favor selection of Alternative 2, which has an estimated construction cost of \$52 million (\$77 million when escalated over 10 years) compared to \$66 million (\$98 million when escalated over 10 years) estimated for Alternative 1. When considering additional costs such as drainage, maintenance, contingency, and right-of-way acquisition, the total life-cycle cost of Alternative 2 is anticipated to remain below that of Alternative 1, even after accounting for the additional property-acquisition and building-impact costs noted above. A full comparison of capital, right-of-way, and 20-year maintenance costs for both alternatives is provided in Appendix D.

With regard to constructability, Alternative 2 requires less earthwork and fewer linear feet of retaining walls than Alternative 1, which overall indicates the potential for reduced construction impacts, lower risk, and shorter construction duration. Alternative 2 also maintains the path at grade for much of the alignment, reducing the depth and extent of structural intervention and limiting the footprint of construction relative to the more heavily walled west-side alternative. The constructability of each alternative is governed less by the paved path itself than by the retaining wall systems required to carry the path across the corridor's variable topography, and by the temporary excavation those walls demand.

For Phase 2 specifically, the east-side topography introduces a distinct constructability condition that warrants attention despite Alternative 2's overall lower earthwork. Along portions of the east side, the existing ground sits below the elevation of SR-49, so carrying the path at grade requires fill walls to build the path platform up to roadway level. Because these walls are founded below the street and must support fill placed against the roadway embankment, constructing them is expected to require partial reconstruction of the adjacent edge of SR-49. The roadway structural section over the affected length will need to be removed and rebuilt as the fill wall and path platform are constructed. This is a localized but real impact on both cost and traffic handling, as it implies staged construction, temporary lane closures or shifts, and reconstruction of pavement, edge drainage, and any affected striping along those segments. It does not change the conclusion that Alternative 2 is the less construction-intensive alternative overall, but it is a meaningful constructability factor that should be reflected in the opinion of probable cost, the construction phasing plan, and the traffic-management approach. It is also another location where shoring and careful sequencing will be used to limit the depth and duration of the roadway impact.

In summary, while Alternative 2 remains the more readily constructible option owing to its reduced earthwork and largely at-grade profile, the constructability of either alternative ultimately turns on the retaining-wall systems and their lines of influence. By identifying up front where those lines of influence reach private right-of-way and structures, where the Phase 2 east-side fill walls will require roadway reconstruction, this study isolates the locations where additional engineering, shoring, and owner coordination will be concentrated in a later design phase, giving decision-makers a clear view of where the remaining construction risk and cost lie before the project advances.

It should be noted that constructing the path along the east side of the corridor would generally require more right-of-way compared to Alternative 1 on the west side, which can lead to some uncertainty when considering overall schedule.

6.1.3 Phase 2 Evaluation Summary

Table 3 summarizes the costs and benefits that each alternative offers. Overall, Alternative 2 offers a slight to moderate advantage when considering benefits relating to safety, connectivity, opportunity for placemaking, and public support. Alternative 2 also offers a significantly reduced cost compared to Alternative 1.

Table 3: Summary of Phase 2 Alternatives Evaluation

Criteria	Alternative 1 – Path on West	Alternative 2 – Path on East
Safety		Alternative 2 eliminates need for crossing SR-49 at the intersection with Parrots Ferry Road for users going to or coming from Columbia.
Mode Split, VMT, GHGs	Alternatives 1 & 2 are anticipated to result in similar reductions in VMT and GHG.	
Connectivity and Safe Routes to Schools		While more trips occur along the west side of the alignment, Alternative 2 would fill a missing gap in the network for trips originating or terminating along the east side of SR-49 that are otherwise unserved by the existing bicycle and pedestrian network. This includes potential connection to Sonora High School, which is already well connected to residences along the west side of the corridor but generally lacks connectivity to the east side.
Pedestrian/ADA	Alternatives offer comparable ADA improvements to the pedestrian network.	

Criteria	Alternative 1 – Path on West	Alternative 2 – Path on East
Placemaking & Character		Final placemaking elements, including landscaping, lighting, and interpretive features that reflect the region's mining and Mi-Wok heritage, will be developed in subsequent design phases. However, Alternative 2 provides greater placemaking opportunity as the east side carries a higher concentration of adjacent destinations and offers more contiguous space for gateway treatments, interpretive markers, and seating.
Public Sentiment		While both alternatives were well received by the community, a slight preference was expressed for Alternative 2 due to its improved access and connectivity to intersections along the east side of the alignment.
Construction Costs		Alternative 2 is anticipated to cost \$77.32 million, offering a potential saving of \$21 million compared to Alternative 1.
Constructability Considerations	Alternative 1 requires less overall right-of-way acquisition and has reduced potential to impact buildings.	Alternative 2 requires less earthwork, and has the potential for reduced construction impacts, lower risk, and shorter construction duration.

6.2 Phase 3 Evaluation and Comparison

6.2.1 Evaluation of Benefits

Safety and Potential for Crash Reductions

Both alternatives significantly improve safety for anyone bicycling or walking along the corridor, including children on their way to school. Both alternatives provide physical separation between the bicycle/pedestrian facility and the roadway. Alternative 1 provides a curb, although this curb is mountable so that someone could drive over it in an emergency. It also uses delineator posts, which provide visual separation. Alternative 2 would have a 5-foot unpaved buffer space between the roadway and path. It would also likely use concrete barriers where available right-of-way requires the buffer space to be narrower.

As shown in Table 1: Crash Reduction Factors by Improvement Type, the Caltrans Local Roadway Safety Manual identifies a 45% crash reduction factor for provision of separated bicycle lanes, while an 80% crash reduction factor is assigned to Class I facilities that separate users from moving motor vehicles. Between 2021 and 2025, only one pedestrian crash was reported along Parrotts Ferry Road, and no bicycle crashes. This could be due to the existing conditions, which do not encourage walking and biking along the corridor, and would-be trail users may instead choose to use a parallel corridor for walking and biking. Overall, it is anticipated that the Class I facility offers the potential for a higher reduction in bicyclist and pedestrian crashes in the long term.

Modal Split, VMT, and GHG Reduction Impacts

The Caltrans Active Transportation Benefit-Cost Tool (see Appendix A) estimates that both alternatives are anticipated to reduce the number of vehicle miles traveled (VMT) by an estimated 38,300 vehicle-miles over a 20-year period. This translates to a reduction of nearly 11 tons of CO₂ equivalent (comprising CO₂, CH₄, and N₂O emissions) over a 20-year period.

Connectivity Benefits and Safe Routes to School

Replica origin-destination data for the study area indicate that Parrotts Ferry Road carries the highest concentration of bicycle and pedestrian trips along the combined Phase 2/Phase 3 corridor, with the greatest activity between downtown Sonora and Columbia. Because Alternative 1 provides a facility on both sides of Parrotts Ferry Road, it directly serves trips originating or terminating on either side without a crossing. Alternative 2 concentrates the facility on the east side; trips generated on the west side (including some residential areas) would require a crossing to reach the path.

Overall, Alternative 1 offers directional benefits for southbound trips along the west side and northbound trips along the east side of Parrotts Ferry Road. Alternative 2 better serves northbound and southbound trips along the east side of the corridor but requires crossing of Parrotts Ferry Road for any trips originating or terminating in the neighborhoods to the west. Additionally, Alternative 2 generally offers greater connectivity to the Phase 2 segment of the trail by eliminating the need to cross Parrotts Ferry Road, particularly for those traveling south between Columbia and Sonora.

Both alternatives connect the corridor's principal destinations; Columbia College, Columbia State Historic Park, and Columbia Elementary School.

Pedestrian Benefits (ADA)

Both alternatives improve compliance with the Americans with Disabilities Act. Alternative 2 (Class I multi-use path) provides a continuous ADA-compliant pathway along the east side of Parrotts Ferry Road, with new ADA ramps and a crossing at the SR-49 terminus. Alternative 1 (Class IV bikeway) is a bicycle facility and does not by itself provide an ADA pedestrian path along the corridor. Pedestrian accessibility under Alternative 1 would depend on adjacent sidewalk provision, which is limited along much of Parrotts Ferry Road. On the basis of dedicated pedestrian accessibility, Alternative 2 provides the greater ADA benefit.

Placemaking Opportunities and Historic Character

Both alternatives can accommodate placemaking and interpretive elements consistent with the project vision, including historic markers, rest areas, and gateway treatments. Alternative 2 offers greater placemaking potential: the continuous east-side multi-use path supports a mobility-hub terminus at the Columbia Street parking lot and provides a contiguous edge for landscaping, seating, and interpretive installations. Alternative 1's two-sided configuration distributes the limited right-of-way across both sides of the roadway, leaving less contiguous space for gathering nodes. Community feedback (see below) expressed a preference for preserving the natural landscape and limiting large land cuts, which favors the alternative that minimizes earthwork.

Public Feedback

Public feedback on the Phase 3 alternatives was gathered through the November 13-15, 2025, Visioning Days, the PublicCoordinate online map, and the May 29-30, 2026 open houses at Coffill Park and Columbia State Historic Park. These engagement events yielded diverse feedback that provides helpful insight into the community's vision for the Tuolumne Heritage Trail

Community members highlighted preservation of the natural landscape, avoidance of large land cuts, and replacement of any removed trees. This sentiment generally favors the alternative that minimizes earthwork and tree removal along the corridor.

The Class IV bikeway, in Alternative 1, was generally seen as an enhancement for users, providing much more protection and separation from motor-vehicles than the existing condition. However, one resident believed that Alternative 2 would be much safer for children because offers more physical protection from traffic than Alternative 1. Both alternatives offer a dedicated and buffered design which is a substantial safety

improvement from existing conditions. A full summary of input received is provided in Appendix C.

Residents expressed financial concerns about the cost of large art installations. Small-scale art installations could be a viable compromise.

To remain consistent with feedback received during community engagement, efforts should be made to preserve the natural landscape, large land cuts should be avoided and any removed trees replaced.

6.2.2 Evaluation of Construction Costs and Construction Feasibility

Alternatives 1 and 2 for Phase 3 vary in cost of construction and right-of-way acquisition needs. High-level opinion of probable costs for each alternative are provided in Appendix D. Paving for the two alternatives costs \$1.6 and \$1.7 million for Alternative 1 and Alternative 2, respectively. Alternative 2 is expected to require more earthwork and retaining walls. The total cost of earthwork and retaining walls is anticipated to be approximately \$9.8 million for Alternative 1 and \$12 million for Alternative 2.

Alternative 1 also has a lower right-of-way impact on adjacent properties, requiring approximately 78,000 square feet of property acquisition compared to 104,000 square feet required to accommodate Alternative 2. Both alternatives also has the potential impact existing buildings, with Alternative 1 impacting five buildings and Alternative 2 impacting 10 buildings. Many of these building impacts, however, could likely be avoided as the design is developed further.

Construction costs favor selection of Alternative 1, which has an estimated construction cost of \$25 million (\$37 million when escalated over 10 years) compared to \$32 million (\$47 million when escalated over 10 years) estimated for Alternative 2.

With regard to constructability, Alternative 1 requires less earthwork, which overall indicates the potential for reduced construction impacts and construction duration. It also impacts less right of way and has fewer building impacts. This means it is likely to go through fewer issues with property acquisition, which also would make it more favorable for the project schedule.

For Phase 3, the Parrotts Ferry Road corridor includes seasonal drainage swales that convey stormwater across and along portions of the alignment during wet-weather events. These features must be preserved or replaced in kind so that the trail does not impede existing drainage or create new flooding or erosion. The path and any associated walls in Phase 3 will be designed around these swales, maintaining their conveyance capacity

through measures such as realigned or extended culverts, regraded swale sections, or short structures that carry the path over the drainage course. Accommodating these crossings is a known design and cost item, and identifying them now allows the hydraulic design and any required drainage permits to be scoped in the next phase rather than discovered during construction. In both Phase 3 alternative opinion of probable costs, the cost of new drainage structure was increased from 10% to 20% of the subtotal of other construction costs to account for costs associated with this location.

For both alternatives, accommodating these seasonal swales is the primary remaining drainage risk to be resolved in final design. Both alternatives pass through a segment of road that is surrounded by swales on both sides that fill with water seasonally. Alternative 1 would have less impact on the swales on the east side, but it would also impact the west side. Alternative 2 would only impact the swale on the east side of the roadway, but it would impact it more than Alternative 1 would.

6.2.3 Phase 3 Evaluation Summary

Table 4 provides an overall summary of the various benefits and construction cost and constructability considerations for Phase 3 Alternatives 1 and 2. Overall, Alternative 2 offers improved safety, connectivity, pedestrian facilities, opportunities for placemaking, and generally received more public support. Alternative 1 is anticipated to provide a reduced overall construction cost.

Table 4: Summary of Phase 3 Alternatives Evaluation

Criteria	Alternative 1 – Class IV	Alternative 2 – Class I
Safety		Alternative 2 offers greater separation for trail users and therefore is generally considered to provide greater safety benefit.
Mode Split, VMT, GHGs	Alternatives 1 & 2 are anticipated to result in similar reductions in VMT and GHG.	
Connectivity and Safe Routes to Schools		Alternative 2 offers greater connectivity to the Phase 2 segment of the Tuolumne Heritage Trail for both bicyclists and pedestrians, and therefore better connection between Columbia and Sonora.
Pedestrian/ADA		Alternative 2 offers a more complete ADA facility by providing a Class I facility.

Criteria	Alternative 1 – Class IV	Alternative 2 – Class I
Placemaking & Character		The Class I facility of Alternative 2 offers greater opportunity for aesthetic treatment of paving. The Class I facility type also lends itself to improved placemaking by providing greater separation of the trail from the roadway.
Public Sentiment		While both alternatives were well received by the community, a slight preference was expressed for Alternative 2 due to its greater level of separation between trail users and adjacent motorists.
Construction Costs	Alternative 1 is anticipated to cost \$37 million, offering a \$10 million saving over Alternative 2.	
Constructability Considerations	Alternative 1 requires less overall right-of-way acquisition, reduced earthwork.	Alternative 2 construction impacts would be limited to the east side of Parrotts Ferry Road, while construction of Alternative 1 would occur along both sides of the roadway.

7 Implementation Plan

7.1 Phasing and funding strategy

Phases 2 and 3 of the Tuolumne Heritage Trail are being advanced through a coordinated, phased implementation strategy that reflects the varying physical conditions, jurisdictional requirements, and funding opportunities along the corridor. As the central and northern extensions of the overall alignment, these phases are critical to closing key connectivity gaps between Sonora, Columbia, and surrounding destinations, while delivering near-term safety and mobility benefits.

Phasing within these segments will be guided by constructability, right-of-way constraints, environmental considerations, and proximity to high-demand destinations such as schools, residential neighborhoods, and community facilities. The phasing approach will allow Phase 2 and Phase 3 improvements to be implemented segments to ensure that each segment functions independently and contributes to the overall corridor vision.

The delivery approach for each phase reflects differing regulatory and jurisdictional conditions. Phase II is within Caltrans right-of-way, requiring coordination with the State

and potentially utilizing a streamlined delivery process such as the Design Engineering Evaluation Report (DEER) under the Quality Management Assessment Process. In contrast, Phase III is expected to occur outside of state right-of-way and advance through a local assistance delivery model. These distinct pathways allow each phase to proceed under the most appropriate process, improving delivery efficiency and aligning with project complexity.

Funding for Phases 2 and 3 will rely on a strategic and diversified approach, leveraging a combination of local, regional, state, and federal sources. While specific funding sources are still being identified and developed, Phase 2 is anticipated to pursue competitive grant programs and coordinated funding strategies through the Tuolumne County Transportation Council (TCTC). Both phases are well-positioned to compete for California Transportation Commission (CTC)-administered programs, such as the Active Transportation Program (ATP) and other multimodal funding initiatives, given the project's strong alignment with statewide priorities related to safety, connectivity, and active transportation.

Additional funding opportunities may include federal programs such as the Transportation Alternatives Program (TAP) and Congestion Mitigation and Air Quality (CMAQ) program, as well as regional and local contributions. The project may also explore partnerships with local jurisdictions, tribal entities, and community stakeholders to support implementation and match funding requirements. Packaging Phase 2 and Phase 3 segments to align with specific grant criteria, such as safety improvements, school access, and equity outcomes, will be an important component of the funding strategy.

Overall, the phased implementation and diversified funding approach for Phases 2 and 3 enables the project to advance in a flexible and opportunistic manner while continuing to build toward a cohesive, continuous Gold Rush Path. By prioritizing high-impact segments and aligning project delivery with available funding programs, these phases can deliver early, visible benefits and establish momentum for full corridor realization.

7.2 Additional Considerations

7.2.1 Environmental Clearance

Both phases will require environmental review prior to construction. Because Phase 2 lies within Caltrans right-of-way along SR-49, it will require an encroachment permit and coordination with Caltrans, and is anticipated to be cleared under the California Environmental Quality Act (CEQA); if federal funding is pursued, National Environmental Policy Act (NEPA) clearance will also be required and Caltrans will act as the assigned lead under its NEPA assignment.

Phase 3, expected to occur largely outside state right-of-way, would advance through a local-assistance delivery model. Anticipated environmental considerations along both corridors include biological resources (oak woodland and savanna habitat and protected trees), cultural and tribal resources requiring consultation with the Tuolumne Band of Me-Wuk Indians and the Chicken Ranch Rancheria, drainage and water-quality/floodplain concerns, and the airport influence zone near the Columbia Airport. The relative ease of environmental clearance (particularly the extent of tree removal and earthwork) should be reflected in the constructability comparison, consistent with community feedback favoring minimal land cuts and tree replacement.

7.2.2 Ongoing Public Engagement

Public engagement should continue through final design and into construction. The two alternatives per phase should be carried into continued outreach through the project website, the PublicCoordinate online forum, and future workshops or pop-up events for subsequent design phases, with targeted engagement of disadvantaged communities, the homeowners' associations along Parrotts Ferry Road, and tribal partners. Sustained community involvement supports grant competitiveness, builds trust and shared ownership, and helps refine placemaking and design elements as the project advances. Feedback received should be documented and incorporated into the selection of preferred alternatives and subsequent design phases.

Tuolumne Heritage Trail Phase 2 and Phase 3

Appendix A: Caltrans Active Transportation Project Cost-Benefit Tool

Project Details

Project ID: 6a3dd99af189392b6b5cf6b8

Project Created: 2026-06-26T01:44:58.048Z

Project Name: Tuolumne Heritage Trail Phase 2 - Alternative 1

Project Developer: Kimley-Horn

Project Cost: \$93,000,000

Project Time Frame: 20 years

Project Type: Infrastructure

Active Travel Type: Pedestrian and Bicyclist

Transit Type: Connections to transit stops

Project Reach:

Number of Intersections: 1

Length: 9,977 ft (2 mi)

Project-Level Active Travel

Estimated Average Daily Bike Miles Traveled (BMT)

		Daily Bike Miles Travelled (BMT)	Daily BMT / Capita	Daily BMT / Jobs
Existing		60	0.017	0.027
Increase in Active Travel	Car Shift	10	0.003	0.004
	Route Shift	34	0.009	0.015
	Induced Travel	7	0.002	0.003
	Shift from Other Modes	7	0.002	0.003
	Total	58	0.016	0.025
Projected (Existing + Increase)		118	0.032	0.052

Estimated Average Daily Walk Miles Traveled (WMT)

		Daily Walk Miles Traveled (WMT)	Daily WMT / Capita	Daily WMT / Jobs
Existing		7	0.002	0.008
Increase in Active Travel	Car Shift	0	0	0
	Route Shift	0	0	0
	Induced Travel	0	0	0
	Shift from Other Modes	0	0	0
	Total	0	0	0
Projected (Existing + Increase)		7	0.002	0.008

Project-Level Quantitative Benefits

Safety

Mode	Outcome	20 Year Benefit	20 Year Benefit / Capita	20 Year Benefit / Jobs
Bike	Crashes	3	0.103	0.181
	Injuries	3	0.1	0.175
	Deaths	0.095	0.003	0.006
Pedestrian	Crashes	0.042	0.001	0.003
	Injuries	-0.079	-0.003	-0.005
	Deaths	-0.012	0	-0.001
Combined	Crashes	50	0.319	0.492
	Injuries	35	0.264	0.404
	Deaths	15	0.032	0.044

Mode	Outcome		Benefit	Benefit / Capita	Benefit / Jobs
Bike	Crashes	Current Rate per 1000 volume	55	8,491	3,259
		Estimated After-project Rate per 1000 volume	56	8,594	3,298
	Injuries	Current Rate per 1000 volume	54	8,221	3,155
		Estimated After-project Rate per 1000 volume	54	8,321	3,193
	Deaths	Current Rate per 1000 volume	2	270	104
		Estimated After-project Rate per 1000 volume	2	274	105
Pedestrian	Crashes	Current Rate per 1000 volume	5	669	255
		Estimated After-project Rate per 1000 volume	5	688	263
	Injuries	Current Rate per 1000 volume	4	621	237
		Estimated After-project Rate per 1000 volume	4	585	223
	Deaths	Current Rate per 1000 volume	0.407	48	19
		Estimated After-project Rate per 1000 volume	0.371	43	16
Combined	Crashes	Current Rate per 1000 volume	11	1,549	599
		Estimated After-project Rate per 1000 volume	21	2,859	1,106
	Injuries	Current Rate per 1000 volume	10	1,474	569
		Estimated After-project Rate per 1000 volume	18	2,495	964
	Deaths	Current Rate per 1000 volume	0.919	76	30
		Estimated After-project Rate per 1000 volume	2	121	49

VMT and Emissions

20 Year Vehicle Miles Traveled (VMT) Reductions	20 Year VMT Reductions / Capita	20 Year VMT Reductions / Jobs
45,705	13	20

	20 Year Emission Reductions (Grams)	20 Year Emission Reductions (Grams) / Capita	20 Year Emission Reductions (Grams) / Jobs
Greenhouse Gasses			
CO2	12,903,547	3,553	5,694
CH4	146	0.04	0.064
N2O	265	0.073	0.117
Total C02 Equivalent	12,977,778	3,574	5,727
Air Toxins			
NOx	2,625	0.723	1
PM 2.5	69	0.019	0.03
PM 10	75	0.021	0.033
NH3	1,617	0.445	0.713
CO	40,392	11	18
SOx	128	0.035	0.056

Physical Activity

	20 Year Marginal Metabolic Equivalent of Task (MMET) Increase	20 Year MMET Increase / Capita	20 Year MMET Increase / Jobs
Bicyling	58,882	16	26
Walking	0	0	0
TOTAL	58,882	16	26

General Benefits

Theme	Description
Safety	Elements from this project are likely to increase safety for walking and bicycling by directly reducing crashes, injuries, deaths, or by other factors like reducing car speeds that in turn will increase safety.
Increasing Active Travel	The elements for this project may or may not increase walking and bicycling. Consider including other elements in your project that have known effects of increasing active travel. Increasing active travel is an important way to achieve social benefits and the reason why many of the quantitative benefit categories below are unknown.
Encouragement and Education	Consider including non-infrastructure elements to increase the potential for social benefits from the project. Although the benefits from non-infrastructure elements cannot be quantified at the project level at this time, benefits are likely.
Context	The project context is very important for describing the expected benefits of active transportation projects. The quantitative calculations below consider the estimated existing miles of walking and bicycling through the project reach, but do not consider how a project's context might modify the calculations.
Economic Activity	Evidence suggests that generally active transportation projects are likely to have slightly positive or non-significant economic impacts on nearby businesses and slightly positive effects on housing prices. However, because economic impacts are difficult to quantify and are likely more context dependent than other benefits, this tool does not report quantitative estimates.
Other Costs and Benefits	A number of other costs and benefits are likely to accrue from active transportation projects that are not reported below because there is either a lack of evidence or the evidence is inconclusive. Please see the supporting literature review for details about other potential costs and benefits.
Physical Activity	The elements for this project may or may not increase physical activity. Consider including other elements in your project that have known effects of increasing active travel.
VMT Reductions (and emissions)	The elements for this project may or may not reduce car use. Consider including other elements in your project that have known effects of increasing active travel or reducing car use.

Element Specific General Benefits

Infrastructure Element	Benefits	Sources
Off-street multiuse or bike path (sidepaths included, Class I)	Multi-use or off-street paths are generally preferred over all other bike infrastructure. Living near paths may increase physical activity and raise residential property values. Conflicting evidence of safety of multi-use paths indicates that general safety outcomes are uncertain, and context (especially about intersections with roads) is likely to determine crash reduction.	Kaczynski et. al. (2007, 2009); Broach et al. (2012); Fitch & Handy (2020)
Crosswalk	While marked crosswalks alone have not been directly associated with safety benefits, they can result in safety improvements when combined with other interventions including signals or flashing beacons. Marked crosswalks have been showed to increase pedestrian channeling which reduces variation in crossing behavior.	Zegeer et. al. (2001); Sisiopiku & Akin (2003); Poswayo et al. (2019)
Curb Extension	Curb extensions have been associated with reductions in pedestrian injuries from 4 to 40% with an average reduction of 24%. They also reduce car turning speeds and crossing distances for pedestrians (reducing exposure and crash risk).	Fitzpatrick & Schneider (2005); Schneider et al. (2010, 2017); Stipancic, J. et. al. (2020)
Signal Phasing	Different signal phasing schemes are associated with different benefits. Full-red signal phasing schemes have resulted in 24% reductions in injuries while half-red signal phasing schemes have resulted in 19% reductions. Protected left turns has also resulted in safety benefits for cyclists and pedestrians.	Harkey et al. (2008); Monsere et al. (2019); Stipancic et al. (2020)

Project Level Benefit Uncertainty
Project-Level Active Travel
Estimated Average Daily Bike Miles Traveled (BMT)

		Daily Bike Miles Travelled (BMT)			Daily BMT / Capita			Daily BMT / Jobs		
		Lower	Mean	Upper	Lower	Mean	Upper	Lower	Mean	Upper
Existing		60	60	60	0.017	0.017	0.017	0.027	0.027	0.027
Increase in Active Travel	Car Shift	2	10	18	0.001	0.003	0.005	0.001	0.004	0.008
	Route Shift	7	34	60	0.002	0.009	0.017	0.003	0.015	0.027
	Induced Travel	1	7	12	0	0.002	0.003	0.001	0.003	0.005
	Shift from Other Modes	1	7	12	0	0.002	0.003	0.001	0.003	0.005
	Total	13	58	103	0.003	0.016	0.028	0.006	0.025	0.045
Projected (Existing + Increase)		73	118	163	0.02	0.032	0.045	0.032	0.052	0.072

Estimated Average Daily Walk Miles Traveled (WMT)

		Daily Walk Miles Traveled (WMT)			Daily WMT / Capita			Daily WMT / Jobs		
		Lower	Mean	Upper	Lower	Mean	Upper	Lower	Mean	Upper
Existing		7	7	7	0.002	0.002	0.002	0.008	0.008	0.008
Increase in Active Travel	Car Shift	0	0	0	0	0	0	0	0	0
	Route Shift	0	0	0	0	0	0	0	0	0
	Induced Travel	0	0	0	0	0	0	0	0	0
	Shift from Other Modes	0	0	0	0	0	0	0	0	0
	Total	0	0	0	0	0	0	0	0	0
Projected (Existing + Increase)		7	7	7	0.002	0.002	0.002	0.008	0.008	0.008

Project-Level Quantitative Benefits

Safety

			Benefit			Benefit / Capita			Benefit / Jobs		
Mode	Outcome		Lower	Mean	Upper	Lower	Mean	Upper	Lower	Mean	Upper
Bike	Crashes	Change in Crashes	2	3	4	0.056	0.103	0.13	0.099	0.181	0.228
		Current Rate per 1000 volume	55	55	55	8,491	8,491	8,491	3,259	3,259	3,259
		Estimated After-project Rate per 1000 volume	70	56	46	10,777	8,594	7,017	4,136	3,298	2,693
	Injuries	Change in Injuries	2	3	4	0.054	0.1	0.126	0.095	0.175	0.221
		Current Rate per 1000 volume	54	54	54	8,221	8,221	8,221	3,155	3,155	3,155
		Estimated After-project Rate per 1000 volume	68	54	44	10,434	8,321	6,793	4,004	3,193	2,607
	Deaths	Change in Deaths	0.052	0.095	0.12	0.002	0.003	0.004	0.003	0.006	0.007
		Current Rate per 1000 volume	2	2	2	270	270	270	104	104	104
		Estimated After-project Rate per 1000 volume	2	2	1	343	274	223	132	105	86

Mode	Outcome		Benefit			Benefit / Capita			Benefit / Jobs		
			Lower	Mean	Upper	Lower	Mean	Upper	Lower	Mean	Upper
Pedestrian	Crashes	Change in Crashes	0.127	0.042	-0.042	0.004	0.001	-0.001	0.008	0.003	-0.003
		Current Rate per 1000 volume	5	5	5	669	669	669	255	255	255
		Estimated After-project Rate per 1000 volume	5	5	4	726	688	650	277	263	248
	Injuries	Change in Injuries	-0.051	-0.079	-0.126	-0.002	-0.003	-0.004	-0.003	-0.005	-0.008
		Current Rate per 1000 volume	4	4	4	621	621	621	237	237	237
		Estimated After-project Rate per 1000 volume	4	4	4	598	585	564	228	223	215
	Deaths	Change in Deaths	-0.011	-0.012	-0.015	0	0	-0.001	-0.001	-0.001	-0.001
		Current Rate per 1000 volume	0.407	0.407	0.407	48	48	48	19	19	19
		Estimated After-project Rate per 1000 volume	0.375	0.371	0.363	44	43	42	17	16	16

Mode	Outcome		Benefit			Benefit / Capita			Benefit / Jobs		
			Lower	Mean	Upper	Lower	Mean	Upper	Lower	Mean	Upper
Combined	Crashes	Change in Crashes	28	50	63	0.187	0.319	0.384	0.294	0.492	0.586
		Current Rate per 1000 volume	11	11	11	1,549	1,549	1,549	599	599	599
		Estimated After-project Rate per 1000 volume	18	21	21	2,522	2,859	2,838	974	1,106	1,099
	Injuries	Change in Injuries	19	35	44	0.144	0.264	0.325	0.221	0.404	0.494
		Current Rate per 1000 volume	10	10	10	1,474	1,474	1,474	569	569	569
		Estimated After-project Rate per 1000 volume	15	18	18	2,131	2,495	2,527	823	964	978
	Deaths	Change in Deaths	8	15	18	0.017	0.032	0.04	0.024	0.044	0.055
		Current Rate per 1000 volume	0.919	0.919	0.919	76	76	76	30	30	30
		Estimated After-project Rate per 1000 volume	1	2	2	103	121	124	41	49	50

VMT and Emissions

20 Year Vehicle Miles Traveled (VMT) Reductions			20 Year VMT Reductions / Capita			20 Year VMT Reductions / Jobs		
Lower	Mean	Upper	Lower	Mean	Upper	Lower	Mean	Upper
9,998	45,705	81,413	3	13	22	4	20	36

	20 Year Emission Reductions (Grams)			20 Year Emission Reductions (Grams) / Capita			20 Year Emission Reductions (Grams) / Jobs		
	Lower	Mean	Upper	Lower	Mean	Upper	Lower	Mean	Upper
Greenhouse Gasses									
CO2	2,822,651	12,903,547	22,984,443	777	3,553	6,329	1,246	5,694	10,142
CH4	32	146	259	0.009	0.04	0.071	0.014	0.064	0.114
N2O	58	265	472	0.016	0.073	0.13	0.026	0.117	0.208
Total CO2 Equivalent	2,838,889	12,977,778	23,116,666	782	3,574	6,366	1,253	5,727	10,200
Air Toxins									
NOx	574	2,625	4,676	0.158	0.723	1	0.253	1	2
PM 2.5	15	69	123	0.004	0.019	0.034	0.007	0.03	0.054
PM 10	16	75	133	0.005	0.021	0.037	0.007	0.033	0.059
NH3	354	1,617	2,880	0.097	0.445	0.793	0.156	0.713	1
CO	8,836	40,392	71,949	2	11	20	4	18	32
SOx	28	128	227	0.008	0.035	0.063	0.012	0.056	0.1

Physical Activity

	Marginal Metabolic Equivalent of Task (MMET) Increase			MMET Increase / Capita			MMET Increase / Jobs		
	Lower	Mean	Upper	Lower	Mean	Upper	Lower	Mean	Upper
Bicycling	12,197	58,882	131,105	3	16	36	5	26	58
Walking	0	0	0	0	0	0	0	0	0
TOTAL	12,197	58,882	131,105	3	16	36	5	26	58

Project Details

Project ID: 6a3dda41f189392b6b5cf6b9

Project Created: 2026-06-26T01:47:45.448Z

Project Name: Tuolumne Heritage Trail Phase 2 - Alternative 2

Project Developer: Kimley-Horn

Project Cost: \$69,000,000

Project Time Frame: 20 years

Project Type: Infrastructure

Active Travel Type: Pedestrian and Bicyclist

Transit Type: Connections to transit stops

Project Reach:

Number of Intersections: 1

Length: 9,977 ft (2 mi)

Project-Level Active Travel

Estimated Average Daily Bike Miles Traveled (BMT)

		Daily Bike Miles Travelled (BMT)	Daily BMT / Capita	Daily BMT / Jobs
Existing		60	0.017	0.027
Increase in Active Travel	Car Shift	10	0.003	0.004
	Route Shift	34	0.009	0.015
	Induced Travel	7	0.002	0.003
	Shift from Other Modes	7	0.002	0.003
	Total	58	0.016	0.025
Projected (Existing + Increase)		118	0.032	0.052

Estimated Average Daily Walk Miles Traveled (WMT)

		Daily Walk Miles Traveled (WMT)	Daily WMT / Capita	Daily WMT / Jobs
Existing		7	0.002	0.008
Increase in Active Travel	Car Shift	0	0	0
	Route Shift	0	0	0
	Induced Travel	0	0	0
	Shift from Other Modes	0	0	0
	Total	0	0	0
Projected (Existing + Increase)		7	0.002	0.008

Project-Level Quantitative Benefits

Safety

Mode	Outcome	20 Year Benefit	20 Year Benefit / Capita	20 Year Benefit / Jobs
Bike	Crashes	3	0.103	0.181
	Injuries	3	0.1	0.175
	Deaths	0.095	0.003	0.006
Pedestrian	Crashes	0.042	0.001	0.003
	Injuries	-0.079	-0.003	-0.005
	Deaths	-0.012	0	-0.001
Combined	Crashes	50	0.319	0.492
	Injuries	35	0.264	0.404
	Deaths	15	0.032	0.044

Mode	Outcome		Benefit	Benefit / Capita	Benefit / Jobs
Bike	Crashes	Current Rate per 1000 volume	55	8,491	3,259
		Estimated After-project Rate per 1000 volume	56	8,594	3,298
	Injuries	Current Rate per 1000 volume	54	8,221	3,155
		Estimated After-project Rate per 1000 volume	54	8,321	3,193
	Deaths	Current Rate per 1000 volume	2	270	104
		Estimated After-project Rate per 1000 volume	2	274	105
Pedestrian	Crashes	Current Rate per 1000 volume	5	669	255
		Estimated After-project Rate per 1000 volume	5	688	263
	Injuries	Current Rate per 1000 volume	4	621	237
		Estimated After-project Rate per 1000 volume	4	585	223
	Deaths	Current Rate per 1000 volume	0.407	48	19
		Estimated After-project Rate per 1000 volume	0.371	43	16
Combined	Crashes	Current Rate per 1000 volume	11	1,549	599
		Estimated After-project Rate per 1000 volume	21	2,859	1,106
	Injuries	Current Rate per 1000 volume	10	1,474	569
		Estimated After-project Rate per 1000 volume	18	2,495	964
	Deaths	Current Rate per 1000 volume	0.919	76	30
		Estimated After-project Rate per 1000 volume	2	121	49

VMT and Emissions

20 Year Vehicle Miles Traveled (VMT) Reductions	20 Year VMT Reductions / Capita	20 Year VMT Reductions / Jobs
45,705	13	20

	20 Year Emission Reductions (Grams)	20 Year Emission Reductions (Grams) / Capita	20 Year Emission Reductions (Grams) / Jobs
Greenhouse Gasses			
CO2	12,903,547	3,553	5,694
CH4	146	0.04	0.064
N2O	265	0.073	0.117
Total C02 Equivalent	12,977,778	3,574	5,727
Air Toxins			
NOx	2,625	0.723	1
PM 2.5	69	0.019	0.03
PM 10	75	0.021	0.033
NH3	1,617	0.445	0.713
CO	40,392	11	18
SOx	128	0.035	0.056

Physical Activity

	20 Year Marginal Metabolic Equivalent of Task (MMET) Increase	20 Year MMET Increase / Capita	20 Year MMET Increase / Jobs
Bicyling	58,882	16	26
Walking	0	0	0
TOTAL	58,882	16	26

General Benefits

Theme	Description
Safety	Elements from this project are likely to increase safety for walking and bicycling by directly reducing crashes, injuries, deaths, or by other factors like reducing car speeds that in turn will increase safety.
Increasing Active Travel	The elements for this project may or may not increase walking and bicycling. Consider including other elements in your project that have known effects of increasing active travel. Increasing active travel is an important way to achieve social benefits and the reason why many of the quantitative benefit categories below are unknown.
Encouragement and Education	Consider including non-infrastructure elements to increase the potential for social benefits from the project. Although the benefits from non-infrastructure elements cannot be quantified at the project level at this time, benefits are likely.
Context	The project context is very important for describing the expected benefits of active transportation projects. The quantitative calculations below consider the estimated existing miles of walking and bicycling through the project reach, but do not consider how a project's context might modify the calculations.
Economic Activity	Evidence suggests that generally active transportation projects are likely to have slightly positive or non-significant economic impacts on nearby businesses and slightly positive effects on housing prices. However, because economic impacts are difficult to quantify and are likely more context dependent than other benefits, this tool does not report quantitative estimates.
Other Costs and Benefits	A number of other costs and benefits are likely to accrue from active transportation projects that are not reported below because there is either a lack of evidence or the evidence is inconclusive. Please see the supporting literature review for details about other potential costs and benefits.
Physical Activity	The elements for this project may or may not increase physical activity. Consider including other elements in your project that have known effects of increasing active travel.
VMT Reductions (and emissions)	The elements for this project may or may not reduce car use. Consider including other elements in your project that have known effects of increasing active travel or reducing car use.

Element Specific General Benefits

Infrastructure Element	Benefits	Sources
Off-street multiuse or bike path (sidepaths included, Class I)	Multi-use or off-street paths are generally preferred over all other bike infrastructure. Living near paths may increase physical activity and raise residential property values. Conflicting evidence of safety of multi-use paths indicates that general safety outcomes are uncertain, and context (especially about intersections with roads) is likely to determine crash reduction.	Kaczynski et. al. (2007, 2009); Broach et al. (2012); Fitch & Handy (2020)
Crosswalk	While marked crosswalks alone have not been directly associated with safety benefits, they can result in safety improvements when combined with other interventions including signals or flashing beacons. Marked crosswalks have been showed to increase pedestrian channeling which reduces variation in crossing behavior.	Zegeer et. al. (2001); Sisiopiku & Akin (2003); Poswayo et al. (2019)
Curb Extension	Curb extensions have been associated with reductions in pedestrian injuries from 4 to 40% with an average reduction of 24%. They also reduce car turning speeds and crossing distances for pedestrians (reducing exposure and crash risk).	Fitzpatrick & Schneider (2005); Schneider et al. (2010, 2017); Stipancic, J. et. al. (2020)
Signal Phasing	Different signal phasing schemes are associated with different benefits. Full-red signal phasing schemes have resulted in 24% reductions in injuries while half-red signal phasing schemes have resulted in 19% reductions. Protected left turns has also resulted in safety benefits for cyclists and pedestrians.	Harkey et al. (2008); Monsere et al. (2019); Stipancic et al. (2020)

Project Level Benefit Uncertainty
Project-Level Active Travel
Estimated Average Daily Bike Miles Traveled (BMT)

		Daily Bike Miles Travelled (BMT)			Daily BMT / Capita			Daily BMT / Jobs		
		Lower	Mean	Upper	Lower	Mean	Upper	Lower	Mean	Upper
Existing		60	60	60	0.017	0.017	0.017	0.027	0.027	0.027
Increase in Active Travel	Car Shift	2	10	18	0.001	0.003	0.005	0.001	0.004	0.008
	Route Shift	7	34	60	0.002	0.009	0.017	0.003	0.015	0.027
	Induced Travel	1	7	12	0	0.002	0.003	0.001	0.003	0.005
	Shift from Other Modes	1	7	12	0	0.002	0.003	0.001	0.003	0.005
	Total	13	58	103	0.003	0.016	0.028	0.006	0.025	0.045
Projected (Existing + Increase)		73	118	163	0.02	0.032	0.045	0.032	0.052	0.072

Estimated Average Daily Walk Miles Traveled (WMT)

		Daily Walk Miles Traveled (WMT)			Daily WMT / Capita			Daily WMT / Jobs		
		Lower	Mean	Upper	Lower	Mean	Upper	Lower	Mean	Upper
Existing		7	7	7	0.002	0.002	0.002	0.008	0.008	0.008
Increase in Active Travel	Car Shift	0	0	0	0	0	0	0	0	0
	Route Shift	0	0	0	0	0	0	0	0	0
	Induced Travel	0	0	0	0	0	0	0	0	0
	Shift from Other Modes	0	0	0	0	0	0	0	0	0
	Total	0	0	0	0	0	0	0	0	0
Projected (Existing + Increase)		7	7	7	0.002	0.002	0.002	0.008	0.008	0.008

Project-Level Quantitative Benefits

Safety

			Benefit			Benefit / Capita			Benefit / Jobs		
Mode	Outcome		Lower	Mean	Upper	Lower	Mean	Upper	Lower	Mean	Upper
Bike	Crashes	Change in Crashes	2	3	4	0.056	0.103	0.13	0.099	0.181	0.228
		Current Rate per 1000 volume	55	55	55	8,491	8,491	8,491	3,259	3,259	3,259
		Estimated After-project Rate per 1000 volume	70	56	46	10,777	8,594	7,017	4,136	3,298	2,693
	Injuries	Change in Injuries	2	3	4	0.054	0.1	0.126	0.095	0.175	0.221
		Current Rate per 1000 volume	54	54	54	8,221	8,221	8,221	3,155	3,155	3,155
		Estimated After-project Rate per 1000 volume	68	54	44	10,434	8,321	6,793	4,004	3,193	2,607
	Deaths	Change in Deaths	0.052	0.095	0.12	0.002	0.003	0.004	0.003	0.006	0.007
		Current Rate per 1000 volume	2	2	2	270	270	270	104	104	104
		Estimated After-project Rate per 1000 volume	2	2	1	343	274	223	132	105	86

Mode	Outcome		Benefit			Benefit / Capita			Benefit / Jobs		
			Lower	Mean	Upper	Lower	Mean	Upper	Lower	Mean	Upper
Pedestrian	Crashes	Change in Crashes	0.127	0.042	-0.042	0.004	0.001	-0.001	0.008	0.003	-0.003
		Current Rate per 1000 volume	5	5	5	669	669	669	255	255	255
		Estimated After-project Rate per 1000 volume	5	5	4	726	688	650	277	263	248
	Injuries	Change in Injuries	-0.051	-0.079	-0.126	-0.002	-0.003	-0.004	-0.003	-0.005	-0.008
		Current Rate per 1000 volume	4	4	4	621	621	621	237	237	237
		Estimated After-project Rate per 1000 volume	4	4	4	598	585	564	228	223	215
	Deaths	Change in Deaths	-0.011	-0.012	-0.015	0	0	-0.001	-0.001	-0.001	-0.001
		Current Rate per 1000 volume	0.407	0.407	0.407	48	48	48	19	19	19
		Estimated After-project Rate per 1000 volume	0.375	0.371	0.363	44	43	42	17	16	16

Mode	Outcome		Benefit			Benefit / Capita			Benefit / Jobs		
			Lower	Mean	Upper	Lower	Mean	Upper	Lower	Mean	Upper
Combined	Crashes	Change in Crashes	28	50	63	0.187	0.319	0.384	0.294	0.492	0.586
		Current Rate per 1000 volume	11	11	11	1,549	1,549	1,549	599	599	599
		Estimated After-project Rate per 1000 volume	18	21	21	2,522	2,859	2,838	974	1,106	1,099
	Injuries	Change in Injuries	19	35	44	0.144	0.264	0.325	0.221	0.404	0.494
		Current Rate per 1000 volume	10	10	10	1,474	1,474	1,474	569	569	569
		Estimated After-project Rate per 1000 volume	15	18	18	2,131	2,495	2,527	823	964	978
	Deaths	Change in Deaths	8	15	18	0.017	0.032	0.04	0.024	0.044	0.055
		Current Rate per 1000 volume	0.919	0.919	0.919	76	76	76	30	30	30
		Estimated After-project Rate per 1000 volume	1	2	2	103	121	124	41	49	50

VMT and Emissions

20 Year Vehicle Miles Traveled (VMT) Reductions			20 Year VMT Reductions / Capita			20 Year VMT Reductions / Jobs		
Lower	Mean	Upper	Lower	Mean	Upper	Lower	Mean	Upper
9,998	45,705	81,413	3	13	22	4	20	36

	20 Year Emission Reductions (Grams)			20 Year Emission Reductions (Grams) / Capita			20 Year Emission Reductions (Grams) / Jobs		
	Lower	Mean	Upper	Lower	Mean	Upper	Lower	Mean	Upper
Greenhouse Gasses									
CO2	2,822,651	12,903,547	22,984,443	777	3,553	6,329	1,246	5,694	10,142
CH4	32	146	259	0.009	0.04	0.071	0.014	0.064	0.114
N2O	58	265	472	0.016	0.073	0.13	0.026	0.117	0.208
Total CO2 Equivalent	2,838,889	12,977,778	23,116,666	782	3,574	6,366	1,253	5,727	10,200
Air Toxins									
NOx	574	2,625	4,676	0.158	0.723	1	0.253	1	2
PM 2.5	15	69	123	0.004	0.019	0.034	0.007	0.03	0.054
PM 10	16	75	133	0.005	0.021	0.037	0.007	0.033	0.059
NH3	354	1,617	2,880	0.097	0.445	0.793	0.156	0.713	1
CO	8,836	40,392	71,949	2	11	20	4	18	32
SOx	28	128	227	0.008	0.035	0.063	0.012	0.056	0.1

Physical Activity

	Marginal Metabolic Equivalent of Task (MMET) Increase			MMET Increase / Capita			MMET Increase / Jobs		
	Lower	Mean	Upper	Lower	Mean	Upper	Lower	Mean	Upper
Bicycling	12,197	58,882	131,105	3	16	36	5	26	58
Walking	0	0	0	0	0	0	0	0	0
TOTAL	12,197	58,882	131,105	3	16	36	5	26	58

Project Details

Project ID: 6a3ebcc6f189392b6b5cf6bc

Project Created: 2026-06-26T17:54:14.917Z

Project Name: Tuolumne Heritage Trail Phase 3 - Alternative 1

Project Developer: Kimley-Horn

Project Cost: \$28,700,000

Project Time Frame: 20 years

Project Type: Infrastructure

Active Travel Type: Pedestrian and Bicyclist

Transit Type: Connections to transit stops

Project Reach:

Number of Intersections: 0

Length: 8,797 ft (2 mi)

Project-Level Active Travel

Estimated Average Daily Bike Miles Traveled (BMT)

		Daily Bike Miles Travelled (BMT)	Daily BMT / Capita	Daily BMT / Jobs
Existing		50	0.012	0.047
Increase in Active Travel	Car Shift	9	0.002	0.008
	Route Shift	28	0.007	0.027
	Induced Travel	6	0.001	0.005
	Shift from Other Modes	6	0.001	0.005
	Total	48	0.012	0.045
Projected (Existing + Increase)		99	0.024	0.092

Estimated Average Daily Walk Miles Traveled (WMT)

		Daily Walk Miles Traveled (WMT)	Daily WMT / Capita	Daily WMT / Jobs
Existing		0	0	0
Increase in Active Travel	Car Shift	0	0	0
	Route Shift	0	0	0
	Induced Travel	0	0	0
	Shift from Other Modes	0	0	0
	Total	0	0	0
Projected (Existing + Increase)		0	0	0

Project-Level Quantitative Benefits

Safety

Mode	Outcome	20 Year Benefit	20 Year Benefit / Capita	20 Year Benefit / Jobs
Bike	Crashes	-0.084	-0.003	-0.005
	Injuries	-0.156	-0.006	-0.01
	Deaths	-0.005	0	0
Pedestrian	Crashes	0	0	0
	Injuries	0	0	0
	Deaths	0	0	0
Combined	Crashes	-3	-0.011	-0.021
	Injuries	-6	-0.02	-0.038
	Deaths	-0.03	-0.001	-0.002

Mode	Outcome		Benefit	Benefit / Capita	Benefit / Jobs
Bike	Crashes	Current Rate per 1000 volume	0.146	21	10
		Estimated After-project Rate per 1000 volume	0.059	9	4
	Injuries	Current Rate per 1000 volume	0.141	21	9
		Estimated After-project Rate per 1000 volume	0.043	6	3
	Deaths	Current Rate per 1000 volume	0.005	0.68	0.302
		Estimated After-project Rate per 1000 volume	0.001	0.207	0.092
Pedestrian	Crashes	Current Rate per 1000 volume	0.077	0.076	0.067
		Estimated After-project Rate per 1000 volume	0.077	0.076	0.067
	Injuries	Current Rate per 1000 volume	0.077	0.076	0.067
		Estimated After-project Rate per 1000 volume	0.077	0.076	0.067
	Deaths	Current Rate per 1000 volume	0	0	0
		Estimated After-project Rate per 1000 volume	0	0	0
Combined	Crashes	Current Rate per 1000 volume	0.396	6	3
		Estimated After-project Rate per 1000 volume	0.293	4	2
	Injuries	Current Rate per 1000 volume	0.394	5	2
		Estimated After-project Rate per 1000 volume	0.22	3	1
	Deaths	Current Rate per 1000 volume	0.002	0.281	0.116
		Estimated After-project Rate per 1000 volume	0.001	0.157	0.065

VMT and Emissions

20 Year Vehicle Miles Traveled (VMT) Reductions	20 Year VMT Reductions / Capita	20 Year VMT Reductions / Jobs
38,344	9	36

	20 Year Emission Reductions (Grams)	20 Year Emission Reductions (Grams) / Capita	20 Year Emission Reductions (Grams) / Jobs
Greenhouse Gasses			
CO2	10,825,346	2,619	10,097
CH4	122	0.03	0.114
N2O	222	0.054	0.207
Total C02 Equivalent	10,887,621	2,634	10,155
Air Toxins			
NOx	2,202	0.533	2
PM 2.5	58	0.014	0.054
PM 10	63	0.015	0.059
NH3	1,356	0.328	1
CO	33,887	8	32
SOx	107	0.026	0.1

Physical Activity

	20 Year Marginal Metabolic Equivalent of Task (MMET) Increase	20 Year MMET Increase / Capita	20 Year MMET Increase / Jobs
Bicyling	49,399	12	46
Walking	0	0	0
TOTAL	49,399	12	46

General Benefits

Theme	Description
Safety	Elements from this project are likely to increase safety for walking and bicycling by directly reducing crashes, injuries, deaths, or by other factors like reducing car speeds that in turn will increase safety.
Increasing Active Travel	Elements from this project are likely to increase walking or bicycling or both. Increasing walking and bicycling is a key way to achieve social benefits from increasing physical activity and reducing vehicle miles traveled. Additionally, increasing walking and bicycling is known to increase safety (the phenomenon known as "safety in numbers").
Encouragement and Education	Consider including non-infrastructure elements to increase the potential for social benefits from the project. Although the benefits from non-infrastructure elements cannot be quantified at the project level at this time, benefits are likely.
Context	The project context is very important for describing the expected benefits of active transportation projects. The quantitative calculations below consider the estimated existing miles of walking and bicycling through the project reach, but do not consider how a project's context might modify the calculations.
Economic Activity	Evidence suggests that generally active transportation projects are likely to have slightly positive or non-significant economic impacts on nearby businesses and slightly positive effects on housing prices. However, because economic impacts are difficult to quantify and are likely more context dependent than other benefits, this tool does not report quantitative estimates.
Other Costs and Benefits	A number of other costs and benefits are likely to accrue from active transportation projects that are not reported below because there is either a lack of evidence or the evidence is inconclusive. Please see the supporting literature review for details about other potential costs and benefits.
Physical Activity	Some of the increase in active travel expected from your project is likely to be associated with new active travel (where people shift from other modes of travel). This increase in physical activity reduces the risk of several prevalent diseases.
VMT Reductions (and emissions)	A small fraction of the increase in active travel expected from your project is likely to be associated with reduced car use and reduced emissions. Reducing car use has downstream benefits of reducing air pollutants and greenhouse gas emissions. Note: the change in air pollutant exposure from shifting from non-active travel modes to active travel modes is uncertain with some evidence suggesting increases and some suggesting decreases. We have intentionally ignored this factor.

Element Specific General Benefits

Infrastructure Element	Benefits	Sources
Crosswalk	While marked crosswalks alone have not been directly associated with safety benefits, they can result in safety improvements when combined with other interventions including signals or flashing beacons. Marked crosswalks have been showed to increase pedestrian channeling which reduces variation in crossing behavior.	Zegeer et. al. (2001); Sisiopiku & Akin (2003); Poswayo et al. (2019)
Flashing Beacon	Flashing beacons at pedestrian crossings have been associated with a 70-90% increase in yield compliance (for bicyclists and pedestrians) and a 35-50% reduction in pedestrian crashes. The higher end of this range is more likely to be achieved with more intense flashing.	Vanwagner et al., (2011); Fitzpatrick et. al. (2011, 2015); Dougald, (2016); Zegeer et al. (2017)
Protected Bike Lane (Class IV)	Protected bike lanes are preferred by bicyclists, result in increases in perceived safety, and have resulted in a 41-99% reduction in crash-related bicycling injuries. They have also been associated with increases in bicycle volume between 21 and 171% with some cases observing much greater increases (e.g., 500%) with sustained increases year after year (e.g., 100%).	Teschke et al. (2012); Goodno et. al. (2013); Harris et al. (2013); Monsere et. al. (2014); Fitch & Handy (2020)

Project-Level Quantitative Benefits

Safety

Mode	Outcome		Benefit			Benefit / Capita			Benefit / Jobs		
			Lower	Mean	Upper	Lower	Mean	Upper	Lower	Mean	Upper
Bike	Crashes	Change in Crashes	0.027	-0.084	-0.308	0.001	-0.003	-0.011	0.002	-0.005	-0.019
		Current Rate per 1000 volume	0.146	0.146	0.146	21	21	21	10	10	10
		Estimated After-project Rate per 1000 volume	0.129	0.059	0.012	19	9	2	8	4	0.798
	Injuries	Change in Injuries	-0.036	-0.156	-0.377	-0.001	-0.006	-0.013	-0.002	-0.01	-0.023
		Current Rate per 1000 volume	0.141	0.141	0.141	21	21	21	9	9	9
		Estimated After-project Rate per 1000 volume	0.106	0.043	0.001	16	6	0.172	7	3	0.076
	Deaths	Change in Deaths	0	-0.005	-0.012	0	0	0	0	0	-0.001
		Current Rate per 1000 volume	0.005	0.005	0.005	0.68	0.68	0.68	0.302	0.302	0.302
		Estimated After-project Rate per 1000 volume	0.004	0.001	0	0.555	0.207	0.006	0.246	0.092	0.002

Mode	Outcome		Benefit			Benefit / Capita			Benefit / Jobs		
			Lower	Mean	Upper	Lower	Mean	Upper	Lower	Mean	Upper
Combined	Crashes	Change in Crashes	1	-3	-12	0.004	-0.011	-0.041	0.007	-0.021	-0.076
		Current Rate per 1000 volume	0.396	0.396	0.396	6	6	6	3	3	3
		Estimated After-project Rate per 1000 volume	0.417	0.293	0.08	6	4	1	3	2	0.51
	Injuries	Change in Injuries	-1	-6	-15	-0.005	-0.02	-0.049	-0.009	-0.038	-0.092
		Current Rate per 1000 volume	0.394	0.394	0.394	5	5	5	2	2	2
		Estimated After-project Rate per 1000 volume	0.352	0.22	0.008	5	3	0.108	2	1	0.048
	Deaths	Change in Deaths	-0.001	-0.03	-0.072	0	-0.001	-0.003	0	-0.002	-0.004
		Current Rate per 1000 volume	0.002	0.002	0.002	0.281	0.281	0.281	0.116	0.116	0.116
		Estimated After-project Rate per 1000 volume	0.002	0.001	0	0.274	0.157	0.006	0.113	0.065	0.002

VMT and Emissions

20 Year Vehicle Miles Traveled (VMT) Reductions			20 Year VMT Reductions / Capita			20 Year VMT Reductions / Jobs		
Lower	Mean	Upper	Lower	Mean	Upper	Lower	Mean	Upper
8,388	38,344	68,301	2	9	17	8	36	64

	20 Year Emission Reductions (Grams)			20 Year Emission Reductions (Grams) / Capita			20 Year Emission Reductions (Grams) / Jobs		
	Lower	Mean	Upper	Lower	Mean	Upper	Lower	Mean	Upper
Greenhouse Gasses									
CO2	2,368,044	10,825,346	19,282,647	573	2,619	4,666	2,209	10,097	17,986
CH4	27	122	218	0.006	0.03	0.053	0.025	0.114	0.203
N2O	49	222	396	0.012	0.054	0.096	0.045	0.207	0.369
Total C02 Equivalent	2,381,667	10,887,621	19,393,575	576	2,634	4,693	2,221	10,155	18,089
Air Toxins									
NOx	482	2,202	3,923	0.117	0.533	0.949	0.449	2	4
PM 2.5	13	58	103	0.003	0.014	0.025	0.012	0.054	0.096
PM 10	14	63	112	0.003	0.015	0.027	0.013	0.059	0.104
NH3	297	1,356	2,416	0.072	0.328	0.585	0.277	1	2
CO	7,413	33,887	60,361	2	8	15	7	32	56
SOx	23	107	191	0.006	0.026	0.046	0.022	0.1	0.178

Physical Activity

	Marginal Metabolic Equivalent of Task (MMET) Increase			MMET Increase / Capita			MMET Increase / Jobs		
	Lower	Mean	Upper	Lower	Mean	Upper	Lower	Mean	Upper
Bicycling	10,233	49,399	109,989	2	12	27	10	46	103
Walking	0	0	0	0	0	0	0	0	0
TOTAL	10,233	49,399	109,989	2	12	27	10	46	103

Project Details

Project ID: 6a3ebc7ef189392b6b5cf6bb

Project Created: 2026-06-26T17:53:02.755Z

Project Name: Tuolumne Heritage Trail Phase 3 - Alternative 2

Project Developer: Kimley-Horn

Project Cost: \$33,850,000

Project Time Frame: 20 years

Project Type: Infrastructure

Active Travel Type: Pedestrian and Bicyclist

Transit Type: Connections to transit stops

Project Reach:

Number of Intersections: 0

Length: 8,797 ft (2 mi)

Project-Level Active Travel

Estimated Average Daily Bike Miles Traveled (BMT)

		Daily Bike Miles Travelled (BMT)	Daily BMT / Capita	Daily BMT / Jobs
Existing		50	0.012	0.047
Increase in Active Travel	Car Shift	9	0.002	0.008
	Route Shift	28	0.007	0.027
	Induced Travel	6	0.001	0.005
	Shift from Other Modes	6	0.001	0.005
	Total	48	0.012	0.045
Projected (Existing + Increase)		99	0.024	0.092

Estimated Average Daily Walk Miles Traveled (WMT)

		Daily Walk Miles Traveled (WMT)	Daily WMT / Capita	Daily WMT / Jobs
Existing		0	0	0
Increase in Active Travel	Car Shift	0	0	0
	Route Shift	0	0	0
	Induced Travel	0	0	0
	Shift from Other Modes	0	0	0
	Total	0	0	0
Projected (Existing + Increase)		0	0	0

Project-Level Quantitative Benefits

Safety

Mode	Outcome	20 Year Benefit	20 Year Benefit / Capita	20 Year Benefit / Jobs
Bike	Crashes	0.392	0.014	0.024
	Injuries	0.379	0.013	0.023
	Deaths	0.012	0	0.001
Pedestrian	Crashes	0	0	0
	Injuries	0	0	0
	Deaths	0	0	0
Combined	Crashes	15	0.052	0.097
	Injuries	15	0.049	0.092
	Deaths	0.073	0.003	0.004

Mode	Outcome		Benefit	Benefit / Capita	Benefit / Jobs
Bike	Crashes	Current Rate per 1000 volume	0.146	21	10
		Estimated After-project Rate per 1000 volume	0.148	22	10
	Injuries	Current Rate per 1000 volume	0.141	21	9
		Estimated After-project Rate per 1000 volume	0.143	21	9
	Deaths	Current Rate per 1000 volume	0.005	0.68	0.302
		Estimated After-project Rate per 1000 volume	0.005	0.688	0.306
Pedestrian	Crashes	Current Rate per 1000 volume	0.077	0.076	0.067
		Estimated After-project Rate per 1000 volume	0.077	0.076	0.067
	Injuries	Current Rate per 1000 volume	0.077	0.076	0.067
		Estimated After-project Rate per 1000 volume	0.077	0.076	0.067
	Deaths	Current Rate per 1000 volume	0	0	0
		Estimated After-project Rate per 1000 volume	0	0	0
Combined	Crashes	Current Rate per 1000 volume	0.396	6	3
		Estimated After-project Rate per 1000 volume	0.736	11	5
	Injuries	Current Rate per 1000 volume	0.394	5	2
		Estimated After-project Rate per 1000 volume	0.733	10	4
	Deaths	Current Rate per 1000 volume	0.002	0.281	0.116
		Estimated After-project Rate per 1000 volume	0.003	0.523	0.217

VMT and Emissions

20 Year Vehicle Miles Traveled (VMT) Reductions	20 Year VMT Reductions / Capita	20 Year VMT Reductions / Jobs
38,344	9	36

	20 Year Emission Reductions (Grams)	20 Year Emission Reductions (Grams) / Capita	20 Year Emission Reductions (Grams) / Jobs
Greenhouse Gasses			
CO2	10,825,346	2,619	10,097
CH4	122	0.03	0.114
N2O	222	0.054	0.207
Total C02 Equivalent	10,887,621	2,634	10,155
Air Toxins			
NOx	2,202	0.533	2
PM 2.5	58	0.014	0.054
PM 10	63	0.015	0.059
NH3	1,356	0.328	1
CO	33,887	8	32
SOx	107	0.026	0.1

Physical Activity

	20 Year Marginal Metabolic Equivalent of Task (MMET) Increase	20 Year MMET Increase / Capita	20 Year MMET Increase / Jobs
Bicyling	49,399	12	46
Walking	0	0	0
TOTAL	49,399	12	46

General Benefits

Theme	Description
Safety	Elements from this project are likely to increase safety for walking and bicycling by directly reducing crashes, injuries, deaths, or by other factors like reducing car speeds that in turn will increase safety.
Increasing Active Travel	The elements for this project may or may not increase walking and bicycling. Consider including other elements in your project that have known effects of increasing active travel. Increasing active travel is an important way to achieve social benefits and the reason why many of the quantitative benefit categories below are unknown.
Encouragement and Education	Consider including non-infrastructure elements to increase the potential for social benefits from the project. Although the benefits from non-infrastructure elements cannot be quantified at the project level at this time, benefits are likely.
Context	The project context is very important for describing the expected benefits of active transportation projects. The quantitative calculations below consider the estimated existing miles of walking and bicycling through the project reach, but do not consider how a project's context might modify the calculations.
Economic Activity	Evidence suggests that generally active transportation projects are likely to have slightly positive or non-significant economic impacts on nearby businesses and slightly positive effects on housing prices. However, because economic impacts are difficult to quantify and are likely more context dependent than other benefits, this tool does not report quantitative estimates.
Other Costs and Benefits	A number of other costs and benefits are likely to accrue from active transportation projects that are not reported below because there is either a lack of evidence or the evidence is inconclusive. Please see the supporting literature review for details about other potential costs and benefits.
Physical Activity	The elements for this project may or may not increase physical activity. Consider including other elements in your project that have known effects of increasing active travel.
VMT Reductions (and emissions)	The elements for this project may or may not reduce car use. Consider including other elements in your project that have known effects of increasing active travel or reducing car use.

Element Specific General Benefits

Infrastructure Element	Benefits	Sources
Crosswalk	While marked crosswalks alone have not been directly associated with safety benefits, they can result in safety improvements when combined with other interventions including signals or flashing beacons. Marked crosswalks have been showed to increase pedestrian channeling which reduces variation in crossing behavior.	Zegeer et. al. (2001); Sisiopiku & Akin (2003); Poswayo et al. (2019)
Flashing Beacon	Flashing beacons at pedestrian crossings have been associated with a 70-90% increase in yield compliance (for bicyclists and pedestrians) and a 35-50% reduction in pedestrian crashes. The higher end of this range is more likely to be achieved with more intense flashing.	Vanwagner et al., (2011); Fitzpatrick et. al. (2011, 2015); Dougald, (2016); Zegeer et al. (2017)
Off-street multiuse or bike path (sidepaths included, Class I)	Multi-use or off-street paths are generally preferred over all other bike infrastructure. Living near paths may increase physical activity and raise residential property values. Conflicting evidence of safety of multi-use paths indicates that general safety outcomes are uncertain, and context (especially about intersections with roads) is likely to determine crash reduction.	Kaczynski et. al. (2007, 2009); Broach et al. (2012); Fitch & Handy (2020)

Project-Level Quantitative Benefits

Safety

Mode	Outcome		Benefit			Benefit / Capita			Benefit / Jobs		
			Lower	Mean	Upper	Lower	Mean	Upper	Lower	Mean	Upper
Bike	Crashes	Change in Crashes	0.213	0.392	0.493	0.008	0.014	0.018	0.013	0.024	0.03
		Current Rate per 1000 volume	0.146	0.146	0.146	21	21	21	10	10	10
		Estimated After-project Rate per 1000 volume	0.185	0.148	0.121	27	22	18	12	10	8
	Injuries	Change in Injuries	0.206	0.379	0.478	0.007	0.013	0.017	0.013	0.023	0.029
		Current Rate per 1000 volume	0.141	0.141	0.141	21	21	21	9	9	9
		Estimated After-project Rate per 1000 volume	0.18	0.143	0.117	26	21	17	12	9	8
	Deaths	Change in Deaths	0.007	0.012	0.016	0	0	0.001	0	0.001	0.001
		Current Rate per 1000 volume	0.005	0.005	0.005	0.68	0.68	0.68	0.302	0.302	0.302
		Estimated After-project Rate per 1000 volume	0.006	0.005	0.004	0.863	0.688	0.562	0.383	0.306	0.25

Mode	Outcome		Benefit			Benefit / Capita			Benefit / Jobs		
			Lower	Mean	Upper	Lower	Mean	Upper	Lower	Mean	Upper
Combined	Crashes	Change in Crashes	8	15	19	0.028	0.052	0.065	0.053	0.097	0.122
		Current Rate per 1000 volume	0.396	0.396	0.396	6	6	6	3	3	3
		Estimated After-project Rate per 1000 volume	0.599	0.736	0.792	9	11	11	4	5	5
	Injuries	Change in Injuries	8	15	19	0.027	0.049	0.062	0.05	0.092	0.116
		Current Rate per 1000 volume	0.394	0.394	0.394	5	5	5	2	2	2
		Estimated After-project Rate per 1000 volume	0.596	0.733	0.789	8	10	11	4	4	5
	Deaths	Change in Deaths	0.04	0.073	0.091	0.001	0.003	0.003	0.002	0.004	0.006
		Current Rate per 1000 volume	0.002	0.002	0.002	0.281	0.281	0.281	0.116	0.116	0.116
		Estimated After-project Rate per 1000 volume	0.003	0.003	0.004	0.426	0.523	0.562	0.176	0.217	0.234

VMT and Emissions

20 Year Vehicle Miles Traveled (VMT) Reductions			20 Year VMT Reductions / Capita			20 Year VMT Reductions / Jobs		
Lower	Mean	Upper	Lower	Mean	Upper	Lower	Mean	Upper
8,388	38,344	68,301	2	9	17	8	36	64

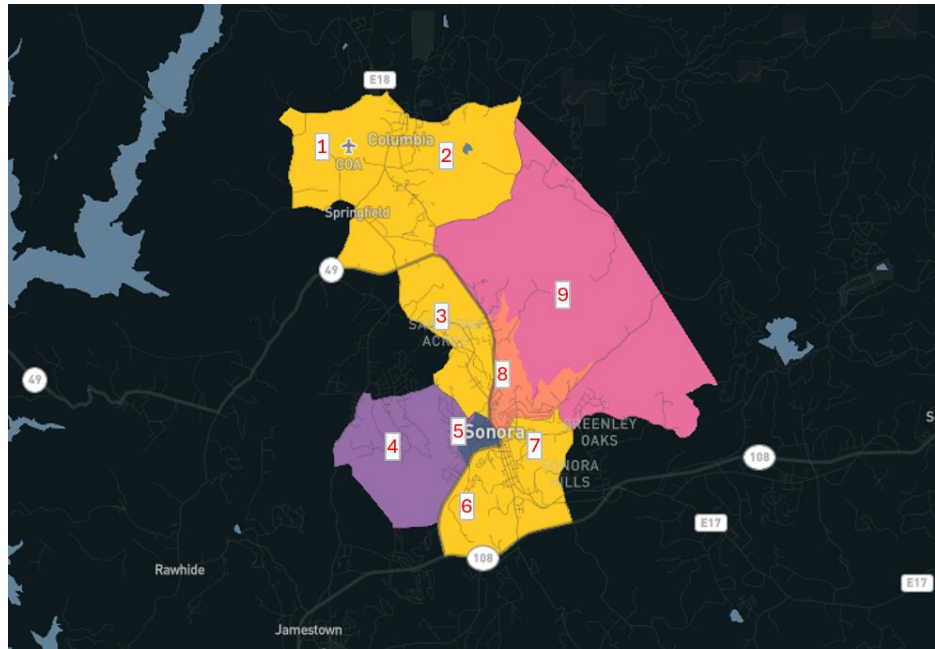
	20 Year Emission Reductions (Grams)			20 Year Emission Reductions (Grams) / Capita			20 Year Emission Reductions (Grams) / Jobs		
	Lower	Mean	Upper	Lower	Mean	Upper	Lower	Mean	Upper
Greenhouse Gasses									
CO2	2,368,044	10,825,346	19,282,647	573	2,619	4,666	2,209	10,097	17,986
CH4	27	122	218	0.006	0.03	0.053	0.025	0.114	0.203
N2O	49	222	396	0.012	0.054	0.096	0.045	0.207	0.369
Total C02 Equivalent	2,381,667	10,887,621	19,393,575	576	2,634	4,693	2,221	10,155	18,089
Air Toxins									
NOx	482	2,202	3,923	0.117	0.533	0.949	0.449	2	4
PM 2.5	13	58	103	0.003	0.014	0.025	0.012	0.054	0.096
PM 10	14	63	112	0.003	0.015	0.027	0.013	0.059	0.104
NH3	297	1,356	2,416	0.072	0.328	0.585	0.277	1	2
CO	7,413	33,887	60,361	2	8	15	7	32	56
SOx	23	107	191	0.006	0.026	0.046	0.022	0.1	0.178

Physical Activity

	Marginal Metabolic Equivalent of Task (MMET) Increase			MMET Increase / Capita			MMET Increase / Jobs		
	Lower	Mean	Upper	Lower	Mean	Upper	Lower	Mean	Upper
Bicycling	10,233	49,399	109,989	2	12	27	10	46	103
Walking	0	0	0	0	0	0	0	0	0
TOTAL	10,233	49,399	109,989	2	12	27	10	46	103

Appendix B: Origin and Destination Trip Matrix

Destination		Origin									Total
		1	2	3	4	5	6	7	8	9	
		BG 3 (Tract 21.01)	BG 2 (Tract 21.01)	BG 2 (Tract 11)	BG 3 (Tract 11)	BG 4 (Tract 11)	BG 4 (Tract 12)	BG 3 (Tract 12)	BG 2 (Tract 12)	BG 1 (Tract 12)	
BG 3 (Tract 21.01)	1	307	171	112	91	78	94	232	58	40	1183
BG 2 (Tract 21.01)	2	189	139	128	107	93	100	232	112	33	1133
BG 2 (Tract 11)	3	126	131	386	78	49	74	209	36	35	1124
BG 3 (Tract 11)	4	93	109	69	0	0	0	0	11	13	295
BG 4 (Tract 11)	5	87	101	47	0	0	0	0	7	15	257
BG 4 (Tract 12)	6	98	108	71	0	0	0	0	13	30	320
BG 3 (Tract 12)	7	229	267	231	0	0	0	0	26	66	819
BG 2 (Tract 12)	8	73	94	33	15	7	22	18	11	9	282
BG 1 (Tract 12)	9	63	27	37	19	12	37	50	14	37	296
Total		1265	1147	1114	310	239	327	741	288	278	5709



Tuolumne Heritage Trail Phase 2 and Phase 3

Appendix C: Summary of Public Engagement



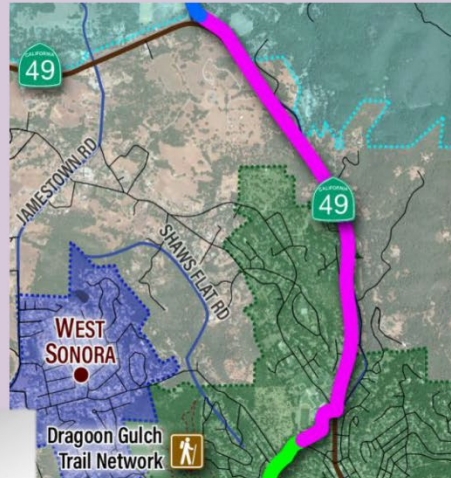
Phase 2 Stakeholder Meeting

April 3, 2025

Funded Project Title	SR 49 / Gold Rush Multi-Use Path Phase 2 Feasibility and Complete Streets Study
Total Cost	\$278,000
Funding Source	Sustainable Transportation Planning Grant and Local Match
Amount Funded	Only Planning
Length	2.1 Miles
Location	From Sonora High School to Parrots Ferry Road
Overall Project	• Part of the Gold Rush Shared Use Path Project • Estimated total cost of \$9.5-\$20 million • Stretches over 14 miles through Tuolumne County to continuously connect the Chicken Ranch Rancheria of Me-Wuk Indians Tribal Lands, Jamestown, the City of Sonora, Columbia, and Columbia College • Project is a partnership between Tuolumne County, City of Sonora, Chicken Ranch Rancheria, and Blue Zones – Tuolumne County • Intended to serve as the “Non-Motorized Highway” or the backbone of active transportation travel in Tuolumne County • Connector Paths will attach to the Gold Rush Path over time to provide a complete, easily accessible way for residents and visitors to get around the county on foot or travel by bike
Phase 2 Planned Improvements	• Separated Class 1 Multi-Modal facility from Sonora High School to Parrots Ferry Road • Exploration of possible alignments • Planning for similar complete streets improvements to Phase 1 • Collection of Lidar Data for segment • Intersection Control Evaluation (ICE) for SR 49 / Shaws Flat / School St / Columbia Way intersection



PHASE 2 GRAPHIC



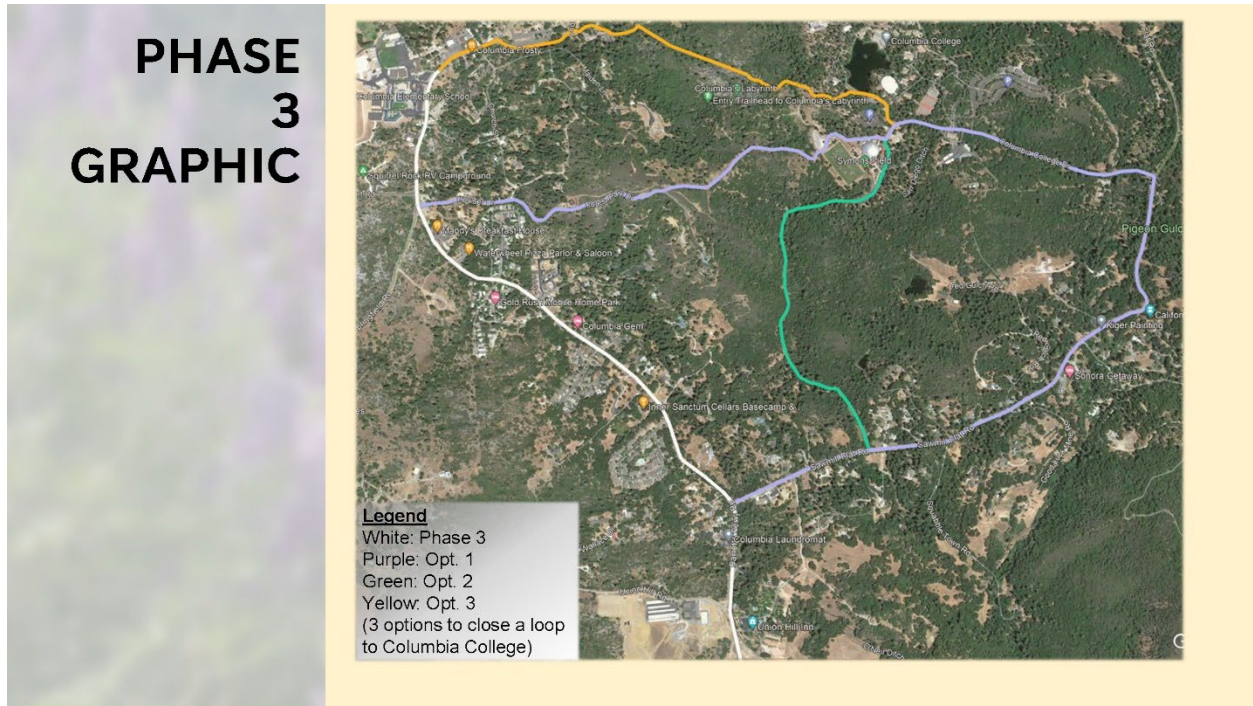
Legend
Purple: Phase 2
Green: Phase 1
Blue: Phase 3



Phase 3 Stakeholder Meeting

April 4, 2025

Funded Project Title	SR 49 / Gold Rush Multi-Use Path Phase 3 Feasibility and Complete Streets Study
Total Cost	TBD
Funding Source	Carbon Reduction Program
Amount Funded	Only Planning
Length	TBD
Location	Several options from Parrots Ferry Road to Columbia College, the Community of Columbia, and possibly connecting up to create a full Columbia Loop
Overall Project	• Part of the Gold Rush Shared Use Path Project • Estimated total cost of \$9.5-\$20 million • Stretches over 14 miles through Tuolumne County to continuously connect the Chicken Ranch Rancheria of Me-Wuk Indians Tribal Lands, Jamestown, the City of Sonora, Columbia, and Columbia College • Project is a partnership between Tuolumne County, City of Sonora, Chicken Ranch Rancheria, and Blue Zones – Tuolumne County • Intended to serve as the “Non-Motorized Highway” or the backbone of active transportation travel in Tuolumne County • Connector Paths will attach to the Gold Rush Path over time to provide a complete, easily accessible way for residents and visitors to get around the county on foot or travel by bike
Phase 3 Planned Improvements	• Similar scope of improvements to Phase 2 along with the same types of complete streets improvements as in Phase 1 • Separated Class 1 Multi-Modal facility • Explore Pathing options with the goal of creating a full loop in the area of Columbia





April Site Visit Meeting Notes

- **Project Phases**

- Phase 1, led by City, is fully funded through the design and environmental stages.
 - This phase is progressing alongside the Phase 2 Design.
 - Construction for Phase 1 is anticipated to be completed by 2028.
 - Notably, this phase addresses ongoing pedestrian safety concerns near the fairgrounds.
- Phases 4, 5, 6 are fully funded by Caltrans
 - These phases include a bridge replacement and are part of the \$65 million Caltrans Complete Streets project, extending to the Arco gas station.
 - Implementation of these projects is scheduled over the next 6-8 years.

- **Sonora High School**

- Includes Complete Streets enhancements to improve accessibility and safety for all users.
- In alignment with the High School's guidance, it is recommended that the second community outreach meeting be held after September 15, once the school year has begun.
- Opportunities will be explored to enhance vehicular and bus circulation around the school campus.
- Consideration will be given to repurposing the former pool area for alternative uses.
- The project team held a meeting with the Sonora High School principal on Thursday, April 3, 2025.
 - During the meeting, both the school and the project team emphasized the importance of community pride for the high school.



- It was agreed that incorporating a distinctive Sonora High School theme would be valuable.
 - Potential ideas include featuring artwork or highlighting notable alumni from the school.
- ICE analysis and potential roundabout designs will be incorporated into the Caltrans project.
- There have been several pedestrian collisions in the areas surrounding the High School.
- **Parrotts Ferry Road**
 - Constrained corridor with limited space.
 - Planned 5-lane roadway widening project for the future.
- **Union Hill Inn**
 - Bed & Breakfast and wedding venue on the property.
 - There is an opportunity to create a meandering path through property.
 - The owner has been supportive of this design in past discussions.
 - Given the elevation challenges and the limited right of way along Parrotts Ferry Road, a meandering path through Union Hill Road presents a unique opportunity to offer a scenic route and better access to the property.
- **Dollar General**
 - An e-commerce facility for the last mile has been approved next to the property.
 - The path could also provide access not only for tourism but also for work-related purposes.
 - Vehicle turning movements should be considered, with the smaller vans expected.
 - An adjacent 50-unit luxury apartment complex has been approved, designed for Adventist staff.
- **Columbia College**
 - Columbia College is a key destination within the community.
 - For decades, it has been the top desired destination for the local bicycling community.
 - The college faces challenges in securing faculty housing due to the shortage.



- It currently offers 190 dorms for 3800 students.
- Columbia College operates its own Fire Department.
- **Woods Creek Rotary Park**
 - Pickleball courts will be constructed in the future near the baseball fields.
- **Sonora Community Estate**
 - The senior community has expressed a desire for safe, walkable paths free from tripping hazards.
- **Habitat for Humanity**
 - Consider adding sidewalks on each side with 4-foot bike lanes due to the limited right of way.
 - In grant applications, we have the opportunity to highlight the connection to Habitat for Humanity community and school access for the disadvantaged community.
 - During site visit, the team observed several children riding their bikes and scooters.
- **Columbia Airport**
 - Explore a potential route to Columbia Airport or a connection to nearby nature trails.
 - Columbia Airport is a regional hub known for having the most affordable fuel in the area and a grass runway, an essential training feature for pilots—making it a frequently used facility.
 - The airport sees regular traffic from campground visitors arriving by air.
 - It also hosts a variety of aviation events throughout the year.
 - Columbia Airport has a comprehensive Impact Plan in place.
 - A Cal Fire Station is located adjacent to the airport.
 - There is an existing public transit route that serves the airport.
 - The airport owns the land between Airport Road and Springfield, presenting potential opportunities for access or development.
- **Dondero Trail**
 - An unofficial nature trail runs through rock formations.
 - The trail is rough and not maintained.
 - It has flooded during recent rain events.
 - The trail is owned by Sonora High School and provides a path to Columbia Elementary School.



- **Columbia Elementary**
 - Columbia Elementary is focal point in the community and also serves as a meeting place for City Council meetings and events.
 - There is currently no safe route available to the school from the Habitat for Humanity community.
 - Parrots Ferry Road, located in front of the elementary school, serves as a major collector roadway.
- **State Historic Park**
 - There is an opportunity at the State Park for a mobility hub, providing access to public amenities
 - There is an existing stagecoach trail through the State Park which is adjacent to rock formations
 - The State Park will likely be unwilling to share the stagecoach trail with bicycles
 - National Parks recently completed a project with the State Park.
 - Future plans for the State Park involve adding lodging and concessions, with the ultimate goal of expanding toward Springfield.
- **Design Considerations**
 - TCTC: Consider using a K-rail barrier within Caltrans right of way.
 - Ensure a comprehensive and cohesive design across all phases, while transitioning themes through communities such as Jamestown, Sonora, Sonora High School, and Columbia Way.
 - During the Sonora High School Stakeholder Coordination meeting, the question of authorizing e-bikes or horses on the path was raised.
 - Phase 1 Project has not yet discussed authorized but horses will most likely not be allowed.
 - Evaluate concerns regarding the different speeds of bikes and scooters.
 - Consider delineating areas for walking and cycling.
 - During the Sonora High School Stakeholder Coordination meeting, the question of whether e-bikes or horses will be authorized along path.
 - Explore opportunities for wayfinding signs, amenities, and education signs about pre-settlement/native vegetation and local history.



- Amenities may include lighting, benches, bike rentals or bike racks.
- Consider using QR codes on education signs to provide translations into multiple languages.
- Consider multilingual or bilingual signs (a request from Con Amor).
- Collaborate with businesses along the path to integrate communities.
- Consider offering businesses or organizations the opportunity to adopt a segment of the path (e.g. “Friends of the Gold Rush”).
- Consider providing a shuttle connection to higher elevation locations.
- Assess long-term maintenance costs for feasible routes.
- At the Stakeholder Coordination Meeting on 4/4/25, the question arose on how to best connect key locations and economic generators.
- Potential alternatives:
 - Consider Sawmill Flat alternative connecting to main entrance of Columbia College
 - Consider Yankee Hill Road to main entrance of Columbia College from north via Sawmill Flat.
 - Consider connecting Columbia College to Columbia SHP via Marble Quarry RV park
 - Consider utilizing water line easement north of Union Hill Inn to connect to south side of Columbia College
 - Consider improving the Dondero Connection to provide direct access to the airport.
 - Continue along Parrott’s Ferry north of Sawmill Flat to connect to Columbia SHP, potential Class II condition given ROW constraints
- Evaluate order-of-magnitude cost estimates and funding opportunities for route alternatives.
- Build upon Vision Sonora’s placemaking and gateway opportunities.
- A Tuolumne County Supervisor requested a specific Columbia Way gateway theme and an emphasis that historical areas should maintain historical aesthetic (Stakeholder Meeting 4/4/25)
 - Consider using split rail fencing.
 - Explore using decomposed granite in some areas.



- Consider whether a path can connect to lodging on Howser/Forest Park Drive.
 - Proposed routing options will consider right of way, slope constraints, ADA compliance, drainage and utility constraints and opportunities.
- **Relevant Future Projects**
 - Greenley Road extension project.
 - Options to connect to highway along Columbia Way.
 - Parrots Ferry Road is one of the busiest corridors in the City and includes a future project to widen the corridor to 5 lanes.
 - Mark Thomas is completing a PID around Columbia.
 - Chicken Ranch Rails to Trails RFP.
- **Additional Stakeholder Coordination**
 - Motherload Bike Coalitions is one of the two main bike coalitions in the area
 - Kristin Fulton (has in-depth knowledge of the trails)
 - Chamber of Commerce
 - Columbia Council (Teresa Torbitt)
 - HOAs and Mobile Park
- **Future Community Event Options**
 - Consider the Armory, Columbia College, Elementary School or Opera House to hold future events and workshops.
 - Consider physical model to display by opera house or utilize virtual reality.
 - Xpan Interactive is a Canadian Augmented reality platform that was used for the hydrogen bus tutorials.
 - Consider a full map layout with the future routes / improvements, key destinations, Columbia College Campus Trail map, and historical sites.
 - Website and landing page are currently live and will be a central location for announcements.
 - *Visit Tuolumne* can help spread the work and include the project link on their website.
 - Consider handing out flyers at the community centers.
 - Explore potential themes, placemaking, historical facts and stories that can be integrated into the trail.



- Columbia Post Office and Sonora Post Office can distribute flyers at 25 cents/home.

- **Action Items**

Kimley-Horn		TCTC	
Item	Status	Item	Status
Tamera to work with Darren and Tyler on recording institutional project knowledge videos at key project locations.	①	KHA to investigate whether audio stories are possible on Public Coordinate for story mapping.	①
Existing Jamestown corridor accident history	①	KHA will investigate available right of way and utility data	①
Request Caltrans Incident History	①	KHA to analyze safety at crossings due to existing incident data	①
TCTC to provide Regional Transportation Plan	①	KHA to explore corridor placemaking themes	①
TCTC to provide information regarding water easement	①	KHA to identify corridor constraints and opportunities, generate cross sections	①
TCTC to provide Phase 1 Preliminary Plans for continuity across phases	①		
TCTC to request Caltrans due diligence and applicable information for Phases 4, 5, and 6	①		



TCTC to provide relevant information regarding PID for the Columbia Area, which is being completed by Mark Thomas	①		
TCTC to provide the Columbia Community Plan and standard guidelines	●		
Consider amending contract to explore alternatives in and around the college, including: • Consider Sawmill Flat alternative connecting to main entrance of Columbia College • Consider Yankee Hill Road to main entrance of Columbia College from north via Sawmill Flat. • Consider connecting Columbia College to Columbia SHP via Marble Quarry RV park • Consider utilizing water line easement north of Union Hill Inn to connect to south side of Columbia College • Consider improving the Dondero Connection to	①		



provide direct access to the airport. • Continue along Parrott's Ferry north of Sawmill Flat to connect to Columbia SHP, potential Class II condition given ROW constraints			
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Gold Rush Path Visioning Days

Community Outreach Summary | November 13-15, 2025



Intro Workshop at the Armory, Thursday, Nov. 13



Introduction

The Sonora Gold Rush Shared-Use Path Project aims to create a multi-modal corridor for bicyclists and pedestrians, improving connectivity between Columbia, Sonora, Jamestown, and the Chicken Ranch Rancheria of Me-Wuk Indians Tribal Lands. This initiative is a collaboration between the Tuolumne County Transportation Council (TCTC), Tuolumne County, the City of Sonora, the Chicken Ranch Rancheria of Me-Wuk Indians, and Caltrans. Together, these partners seek to enhance safety, expand transportation options, and provide alternatives to automobile travel for residents and visitors.

The Gold Rush Path Visioning Days series of events served as a focused outreach effort to gather community input on initial concept designs for Phases 2 and 3 of the project. Over three days in mid-November 2025, the project team hosted **eleven** events including walking tours, focused meetings workshops, virtual reality headsets, and other interactive activities culminating with a well-attended open house on Saturday. Local community sponsors provided event space, food, and promotional support. Although the week was focused on Phases 2 and 3, design teams for Phases 1 and 6 also participated in several events, listening to community input and sharing insights into the broader Gold Rush Path design. A full schedule of events is provided in the Appendix.



List of project sponsors

Public outreach and awareness for the project began weeks in advance and included presentations at public meetings, newsletters, social media posts, printed flyers, a press release, and radio announcements. More than 160 individual community members and other stakeholders participated in the Visioning Days events. The feedback related to safety and desired design features will guide the development of the next set of more detailed design alternatives.

Community input was gathered in several ways at each event. Presentations and group discussions were held throughout, allowing verbal comments and feedback to be recorded as key sources of public sentiment, ideas, and concerns. At events with space for easels, community members were also invited to write comments directly on project concept boards, providing input on specific design ideas shown. Comment cards were also available, giving attendees an additional method to share their thoughts or concerns.

An interactive online map (Public Coordinate) was available on the project website to provide an additional format for collecting feedback. It allowed community members to submit location-specific comments within designated categories such as safety, concerns, opportunities, and bicycle or pedestrian feedback. Community members could select their comment type and place it at the exact location in the project area to which their comment applied. This tool enabled the project team to gather detailed, site-specific input.

The following summary outlines the events held each day and highlights the key themes and direct comments gathered throughout the Visioning Days.



Stories of the Gold Rush Path at the Opera Hall, Saturday, Nov. 14

Community Engagement

Event / Description	Date	Location
Community Walking Workshop #1: Group walk focused on providing information and updates on Phase 1 of the Path	11/13/25	Woods Creek Park
TCTC Open Doors: Drop-in opportunity to meet the project team, provide input, ask questions, or check in on the design ideas currently being explored	11/13/25	TCTC Office
HOA/Neighborhood Meeting: Focused discussion for community members who live near the path alignment	11/13/25	Eagle Cottage, Columbia State Historic Park
Introductory Workshop: Presentation providing a comprehensive overview of the Gold Rush Path project and opportunity to collect feedback on design concepts for Phases 2 and 3	11/13/25	Armory
Community Walking Workshop #2: Group walk including a project overview and a discussion of potential path features, alignment and amenities	11/14/25	Washington & Stockton Rd
Walk With a Doc: Group walk presented by Sonora Adventist Health to share how the Path will improve access to local health centers and local resources	11/14/25	Adventist Health Office



High School Student Activity: Hands-on activity at the High School for students to try the VR (virtual reality) headset and submit their feedback through the online interactive map	11/14/25	Sonora High School
TCTC Open Doors: Drop-in opportunity to meet the project team, provide input, ask questions, or check in on the design ideas currently being explored	11/14/25	TCTC Office
Pop-up Event: Downtown tabling event focused on providing information and updates on Phase 6 of the Path	11/14/25	Linoberg Alley
Stories of the Gold Rush Path: Storytelling event with local guest speakers, Mercedes Tune and Kim Baker, providing perspective on history and geology followed by a group brainstorming on placemaking opportunities	11/14/25	Opera Hall
Community Open House Festival: Project capstone event including a presentation on the project background with up-to-date community feedback, concept exhibits for Path phases 1, 2, 3, and 6 and VR activity	11/15/25	Angelo's Hall, Columbia State Historic Park



Introductory Workshop at the Armory, Thursday, Nov. 13



Summary

Community members broadly support the Gold Rush Path goals of improving safety, walkability, and connectivity, but they strongly emphasized the need to preserve natural habitat, reduce noise, and maintain the historic character of the area. Some comments highlighted concerns about trail alignment, right-of-way constraints, private property impacts, and the desire to avoid concrete in favor of more natural materials.

There appeared to be widespread interest in native landscaping, wildlife protection, wayfinding, and opportunities for art, education, and community involvement. Several residents raised safety, equity, and maintenance questions, as well as the need for clearer communication about funding, phasing, and design details such as which side of the road the path follows.



Community Open House Festival at Columbia State Historic Park, Saturday, Nov. 15



Key Takeaways

General Community Themes

- Strong support emerged for safer walking and biking, particularly near schools, senior housing, and dangerous segments like Parrotts Ferry, Woods Creek, and Yankee Hill Rd.
- There was an overall strong desire to preserve natural, historic, and scenic character; avoiding designs that feel “sterile.”
- Some of the concerns that arose pertained to noise, lighting, construction impacts, and maintaining dark skies.
- There was an interest in art, interpretive features, cultural storytelling, and wayfinding to enhance the user experience.
- There was some confusion about where exactly the path will run and how road crossings will be prioritized.

Landscaping & Design Preferences

- An overall preference emerged for native landscaping and preservation of existing natural features, especially oak woodlands, rock outcroppings, and historic landscapes while avoiding large land cuts and replacing any removed trees.
- Placemaking should reflect local character, including historic-style signage, native materials, use of local artists, and maintaining Gold Rush–era aesthetics.
- There was an emphasis on native plants and use of local seed stock for planting.
- Material preferences include decomposed granite in certain segments and historic-consistent finishes rather than overly modern design elements such as loose gravel, planted buffers, use of local boulders, and minimizing wall installations.
- Preferences emerged for using asphalt or decomposed granite instead of concrete, especially near historic Columbia.
- If walls are necessary, residents prefer natural rock aesthetics – some dislike was expressed for gabion walls.
- Community members tended to prefer a natural trail character with plantings, plaques, natural habitat preservation, and minimal structures.
- It was mentioned that lighting should be low-scale, solar, and dark-sky compliant. Bollard lighting was favored over tall fixtures.
- It was noted that equestrian access may be most feasible in Phase 6.



Walk with a Doc, Friday, Nov. 14

Trail Functionality & User Experience

- The Path received overall support as a social, outdoors-oriented transportation option.
- Mixed support was received for intersection treatments, with roundabouts earning the most “likes,” while HAWK signals and protected intersections received more varied feedback.
- The community expressed a desire for safe access points, shorter crossing distances, and multiple entry points.
- Suggestions included keeping the Path away from the road where possible to preserve nature and to create an inspiring, quiet environment.
- Connectivity was seen to be important, with calls for links to Columbia College, nearby neighborhoods, existing trails, and community destinations.
- Interest emerged for exercise stations, mountain bike features, skateboard-friendly design, and youth-friendly elements.
- A few of the amenities requested include: drinking fountains with chargers, benches, murals, “old-time” lighting, and Wi-Fi in some areas.
- A suggestion included the potential for pop-up vendors and small event spaces along widened pull-out areas.
- There is a need for integration with bus stops, wayfinding maps, and educational features about history, culture and ecology.



- There is a recognized need for noise control along Stockton Avenue, Woods Creek, and McCoy's Tire to Woods Creek Bridge.

Safety Concerns

- Safety, visibility, and clear routing are top priorities, including safe crossings, better wayfinding, and clearer path alignment to prevent users from getting lost.
- Community members favor protected, separated multi-use path designs, especially decked or tiered options that offer more safety than simple pavement extensions.
- Concerns emerged for bike and pedestrian safety due to past collisions – sections with constrained right-of-way may still not be safe (e.g. Phase 2).
- Questions emerged about the possibility of separating e-bikes, scooters, and skateboards from pedestrians.
- Community members expressed the desire for safer school routes, better crossing infrastructure, and showed support for roundabouts where appropriate.
- Desire to widen the Path in specific bottleneck areas to improve safety.
- Needs emerged for a strategy for homeless encampments and drug-use in remote sections.

Alignment & Property Issues

- Many questions were received as to which side of the road the Path will follow and expressed a desire to minimize switching sides.
- Concerns emerged about private property impacts, right-of-way limitations, and avoidance of eminent domain.
- Access to Columbia College was debated: most support a campus connection – residents on Kennebec Lane strongly oppose linkage through the San Diego Ditch.
- Interest was expressed in using railroad corridors if feasible.
- Some mentioned keeping the Path on east side of Parrott's Ferry to keep the duck pond area protected.
- Potential crosswalks were desired for State Parks connections.
- Suggestions made to consider alternative routes like Columbia Way and Shaws Flat, and to explore creative ADA solutions.



Community Open House Festival at the Columbia State Historic Park, Saturday, Nov. 15

Wildlife, Habitat & Ecological Concerns

- Environmental considerations emerged to be considered, including night-sky-friendly lighting, wildlife crossings, and biodiversity beyond trees and grass.
- Community members mentioned landmark trees to Tuolumne such as Cherry Trees, Chinese Maples, and Foothill Pines.
- Requests were received for marshland, amphibian habitat, and creek restoration to be integrated with the Path.
- There was concern that concrete causes harm to native plants. Mulch was suggested to reduce invasive species after disturbance.
- Need for a wildlife management plan.
- Concern emerged about developing the natural landscape by the creek (in Phase 1).
- Identified desire for wildlife crossings (deer, turtles), creek protection, and addressing drainage.

Historic & Cultural Considerations

- Community members would like to preserve Columbia's historic integrity and values (e.g., avoid HAWK signals near the historic district and overly modern or "posh" designs).
- There was a desire to incorporate stories from local historical societies to preserve the feeling of "settling in a wild area."



- Community members would like to celebrate arts and culture using local art displays, native landscape competitions, interpretive signs, historic-style wayfinding.
- Create inclusive, non-mainstream storytelling that highlights diverse local history, cultures, landscapes, and artists.
- Incorporate path designs that reflect the local natural environment, highlighting the beauty of fall seasons, wildflowers, plants, trees and animals.
- Strengthen connections between existing trails and viewpoints, adding interpretive features like signage, self-guided tours, and educational elements.
- Incorporate historic, cultural, and natural points of interest, such as mining sites, Miwok heritage areas, cemeteries, and notable landscapes into the trail experience.
- Enhance visitor engagement with family-friendly installations, children's activities, local art, and interactive features.
- Support accessibility and comfort with rest areas and drinking fountains for people and dogs.



Community Walking Workshops & TCTC Open Doors, Thursday & Friday, Nov. 13 & 14

Funding, Phasing & Project Delivery

- Questions emerged about who is funding each phase and the timing for completion.
- Community members expressed concerns about future funding gaps and whether local bonds or grants will be needed.
- Some wanted to know about maintenance responsibilities
- Concern that construction will worsen congestion on an already busy road.



- There was desire for local contractors to be invited to participate in design and construction phases.

Online Mapping Input

Comments from the Public Coordinate interactive map showed an overall emphasis on safety concerns. Community members identified specific roads and intersections they consider unsafe and important for the project team to address. Additional feedback focused on where the Path would connect with other trails or nearby businesses, offering insights into what may or may not be feasible. Suggestions were also provided regarding bike parking and opportunities to improve access for bicyclists. Community members further expressed interest in understanding how the Path may affect automobile traffic and bus routes.



Public Coordinate Map as of Wednesday, Nov. 26, 2025

The following direct comments from the online site were captured during Visioning Days:



COLUMBIA

Area North of Columbia State Historic Park by the Old Columbia Schoolhouse

- **Pedestrian Access:** The Karen Bakerville Smith trail (loop) is here, from the old school parking area.

Area East of Columbia Street and South of Yankee Hill Road

- **Safety:** RV park. Pedestrians (whole families) walking on road to and from park

Area after the split of Parrott's Ferry Road & Columbia Street

- **Cyclist Access:** Would be great to have bike parking here.
 - **Cyclist Access:** Completely agree.

Area South of Parrott's Ferry Road between Maiden Lane & Columbia Street

- **Pedestrian Access:** There is a trail here from the CSHP parking lot to St Anne's church, which is used by a lot of people.

Parrott's Ferry Road around Columbia Elementary School

- **Safety:** There's a bunch of cars and a busy street lots of Columbia kids walk on to get home

Parrott's Ferry at Airport Road

- **Opportunities:** Your existing conditions report fails to list this trailhead that leads along the southern edge of the elementary to the airport. it is an important existing resource to tie into.

Perrott's Ferry Road at Springfield Road & Howser Lane

Opportunities: Good access road to Columbia College for bicyclists.

Perrott's Ferry Road at Sawmill Flat Road

- **Safety:** This is a dangerous and busy intersection, often crowded by student vehicles leaving or heading toward Columbia College. Safest to stay on the west side of the street.



SONORA

North Washington Street at West School Street

- **Safety:** This is a dangerous intersection for cars and kids
- **Safety:** Hard for cars coming up the hill to see pedestrians crossing
- **Concern:** I feel like pulling out of school street is hard at times

Area East of SR49 at Elk Drive and North of the Catholic Cemetery

- **Safety:** Walking to AM/PM is not safe
- **Opportunities:** Electric scooters or bikes to get to places faster

JAMESTOWN

SR49 at Lemon Drop Lane

- **Business and Property Ownership Concern:** In Jamestown Lemon Drop Lane does not go to the highway. It dead ends to my property that is near the Indian Red Feather clinic.

SR49 at Main Street

- **Safety:** It looks very scary

[To be added]

- **Safety:** Very close to cars
- **Safety:** A student was hit here in the crosswalk on their bike by an oncoming car. This area is always a mess in the mornings.
- **Concerns:** Will this affect people trying to get to school by car? Will this also affect bus routes?



Appendix

- I. Activity Schedule pdf

DRAFT

Progress In Motion: Tuolumne Heritage Trail Community Open House Summary

Overview

Two public open houses were held on May 29 and May 30, 2026 to share progress and gather feedback on the Tuolumne Heritage Trail project. Events took place at Coffill Park in Downtown Sonora and at Columbia State Historic Park, attracting more than 80 attendees over the two days. Exhibits highlighted the overall vision for Phases 1–6, with detailed information provided for the alignment and design of Phases 2 and 3 from Sonora to Columbia. Community members were invited to review the plans and provide input. Most feedback came through verbal conversation with members of the project team and was overwhelmingly positive. There appeared to be strong support for the project and enthusiasm about the trail concept.

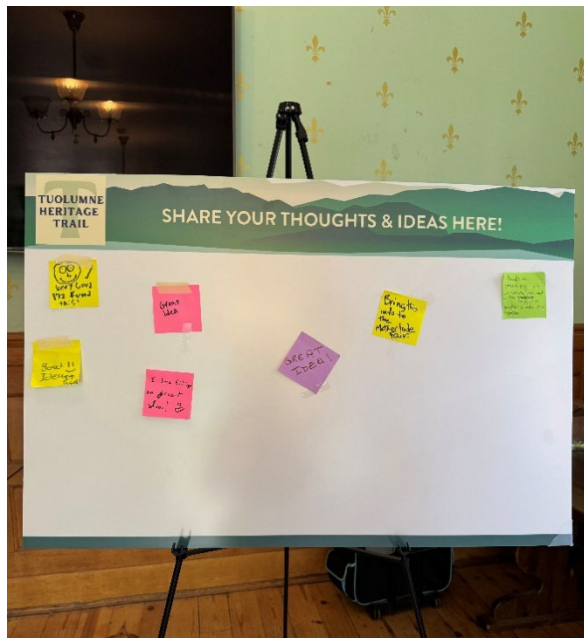
These community open houses were follow-up events to the multi-day public visioning activities focused on the trail project held in November 2025.



Written Comments

Notecards & Post-it Board:

- Very good! Plz fund this!
- Great idea
- Good idea
- Great idea!
- I love biking so great idea!
- Bring this into the Mother Lode Fair
- Hands-on teaching how to share the road with bicycles – (maybe a radio story)
- Connect East Sonora to downtown.
- My brother bikes from Sonora to Columbia – it's very dangerous! This is needed!
- Concerned about e-bikes
- A walkable/bike path to (Indigeny?)
- I love the idea! It is progressive and (scenic/serenity?).
- Great idea! I'll use the trail.
- Native plants
- Plants that support caterpillars for songbirds.
- Native perennial grasses.
- Sink the water into the gravel where possible.
- Let's do it

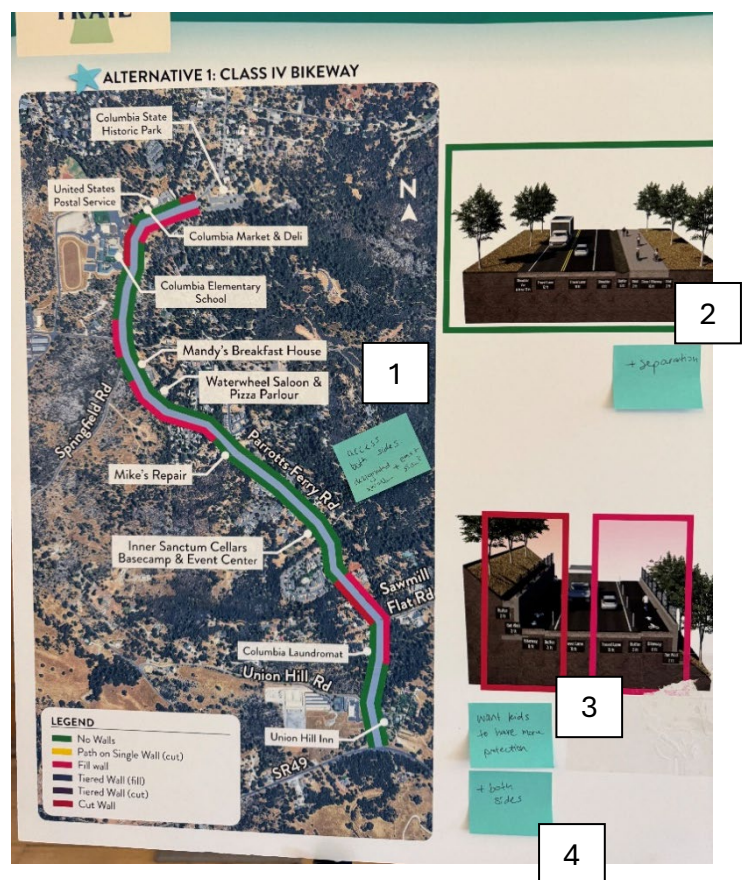
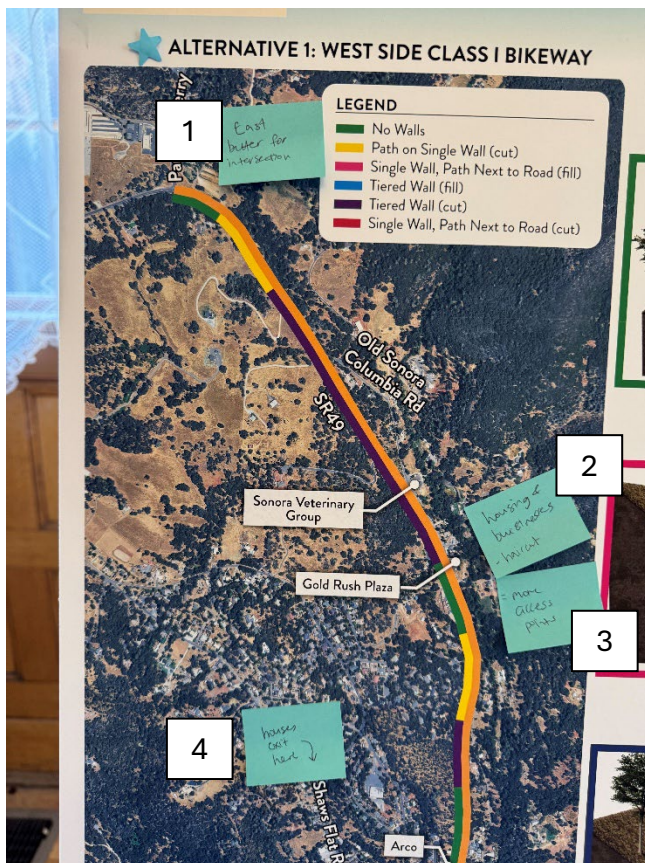


Alternative 1 Board: West Side Class I Bikeway

1. East better for intersection
2. Housing & businesses; haircut
3. More access points
4. Houses exist here

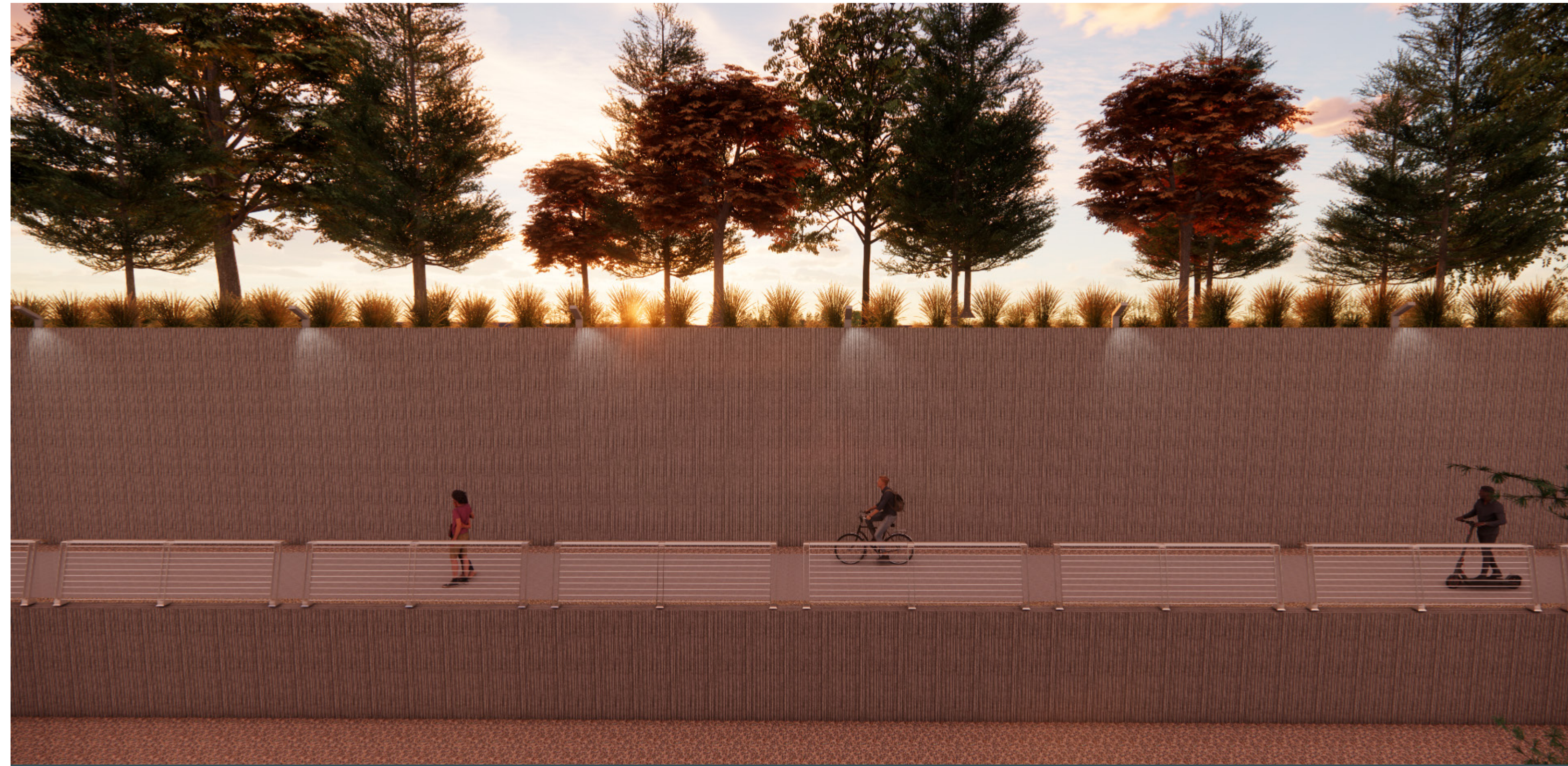
Alternative 2 Board: East Side Class IV Bikeway

1. Access both sides; designated crosswalks + east side?
2. + separation
3. Want kids to have more protection
4. + both sides





CONCEPTUAL RENDERINGS



Side View of Trail



Tiered Wall



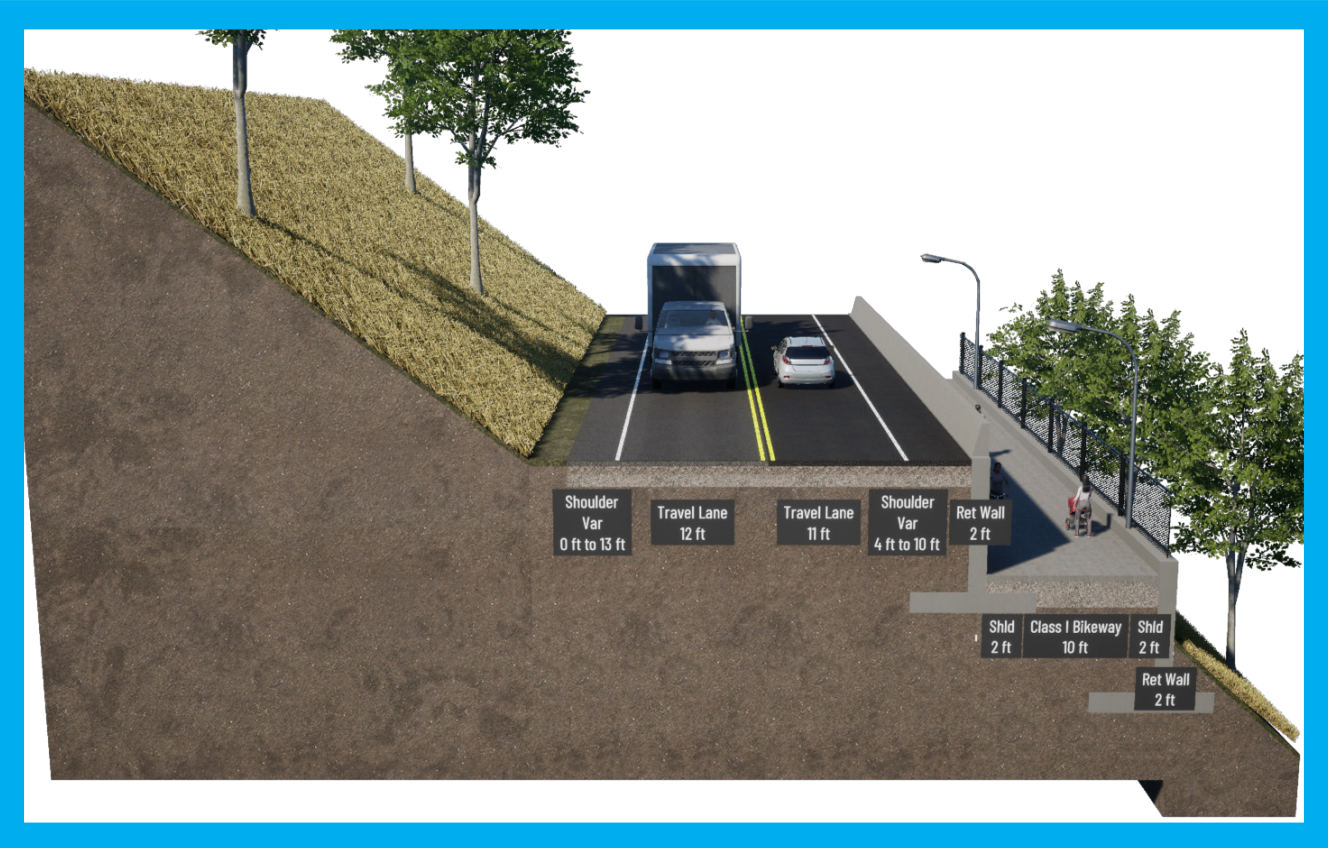
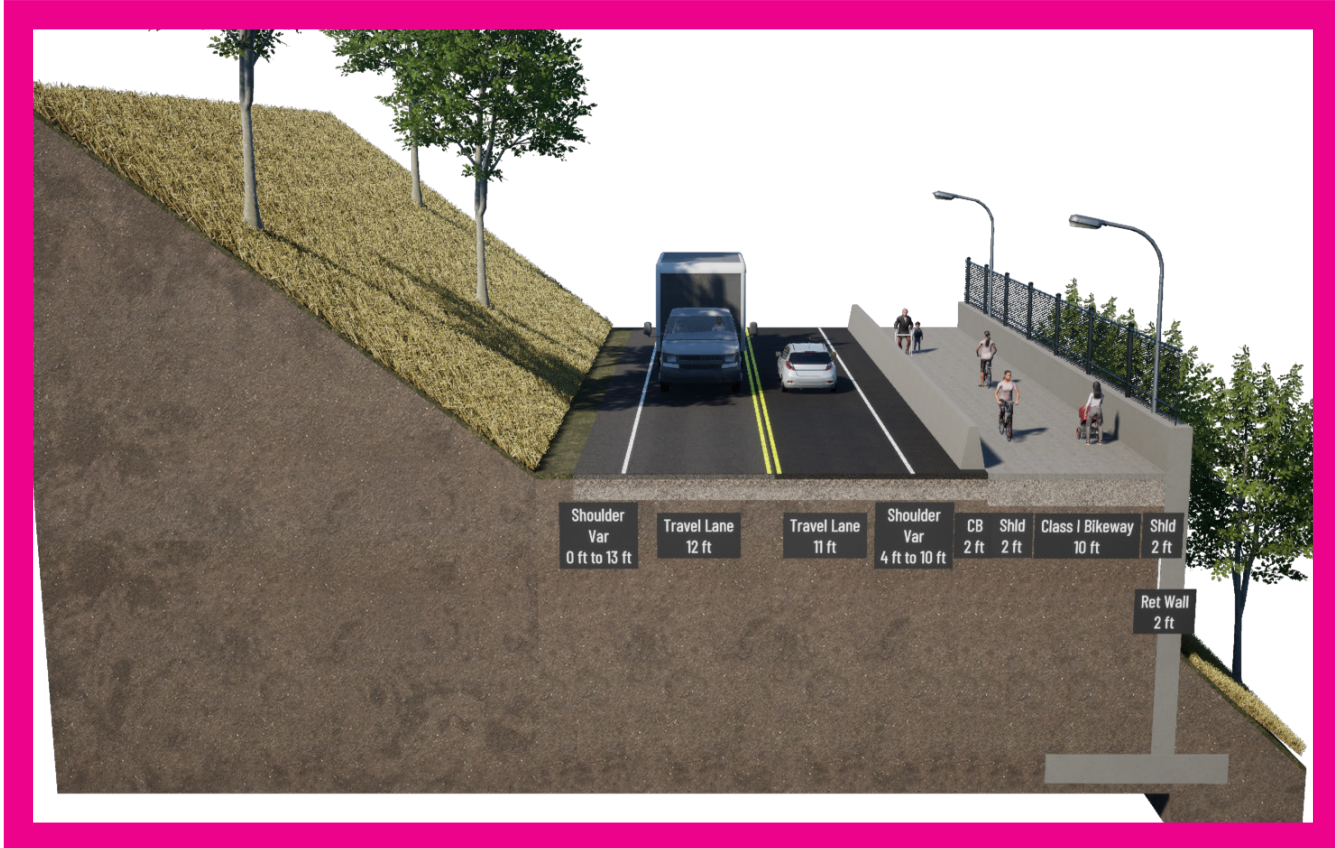
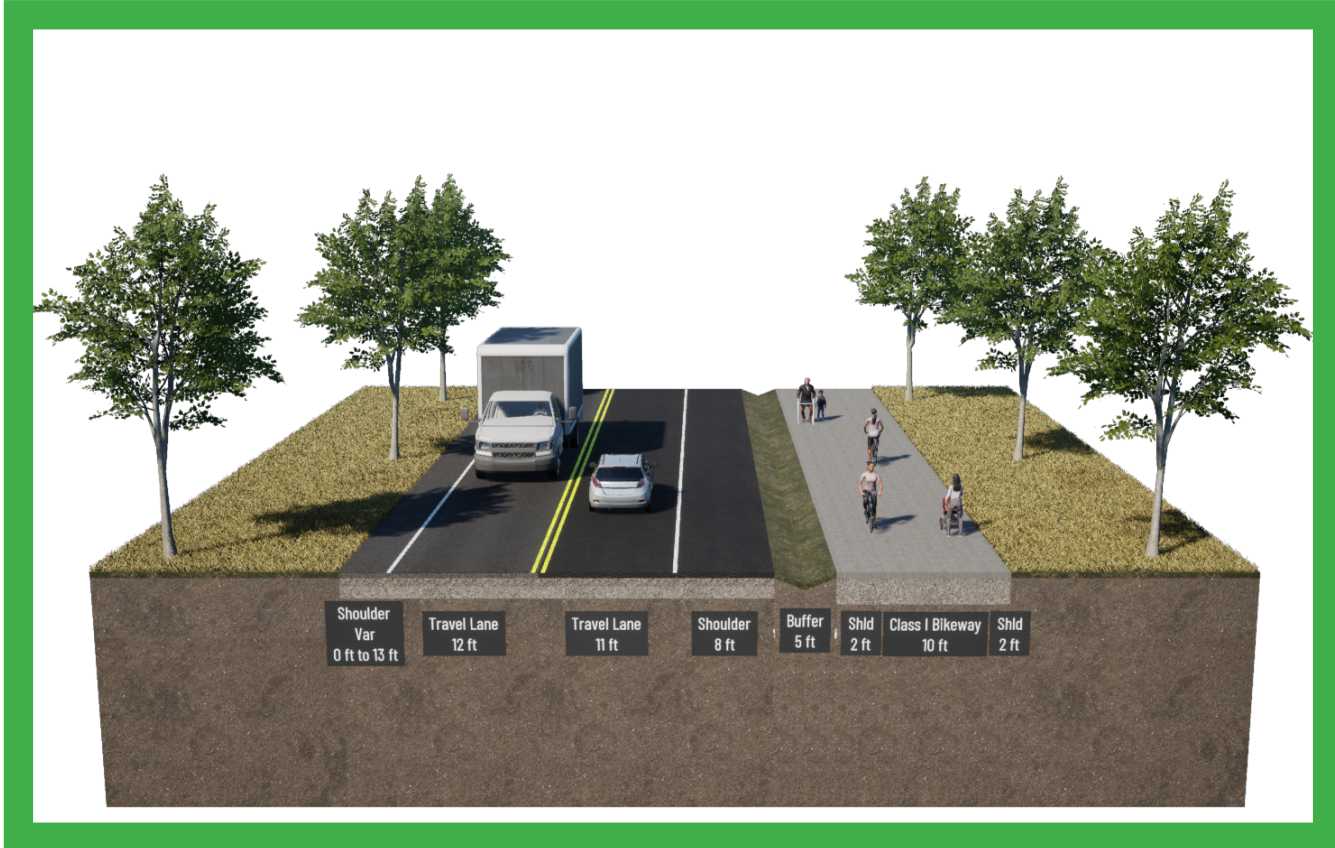
Potential Openings for Placemaking



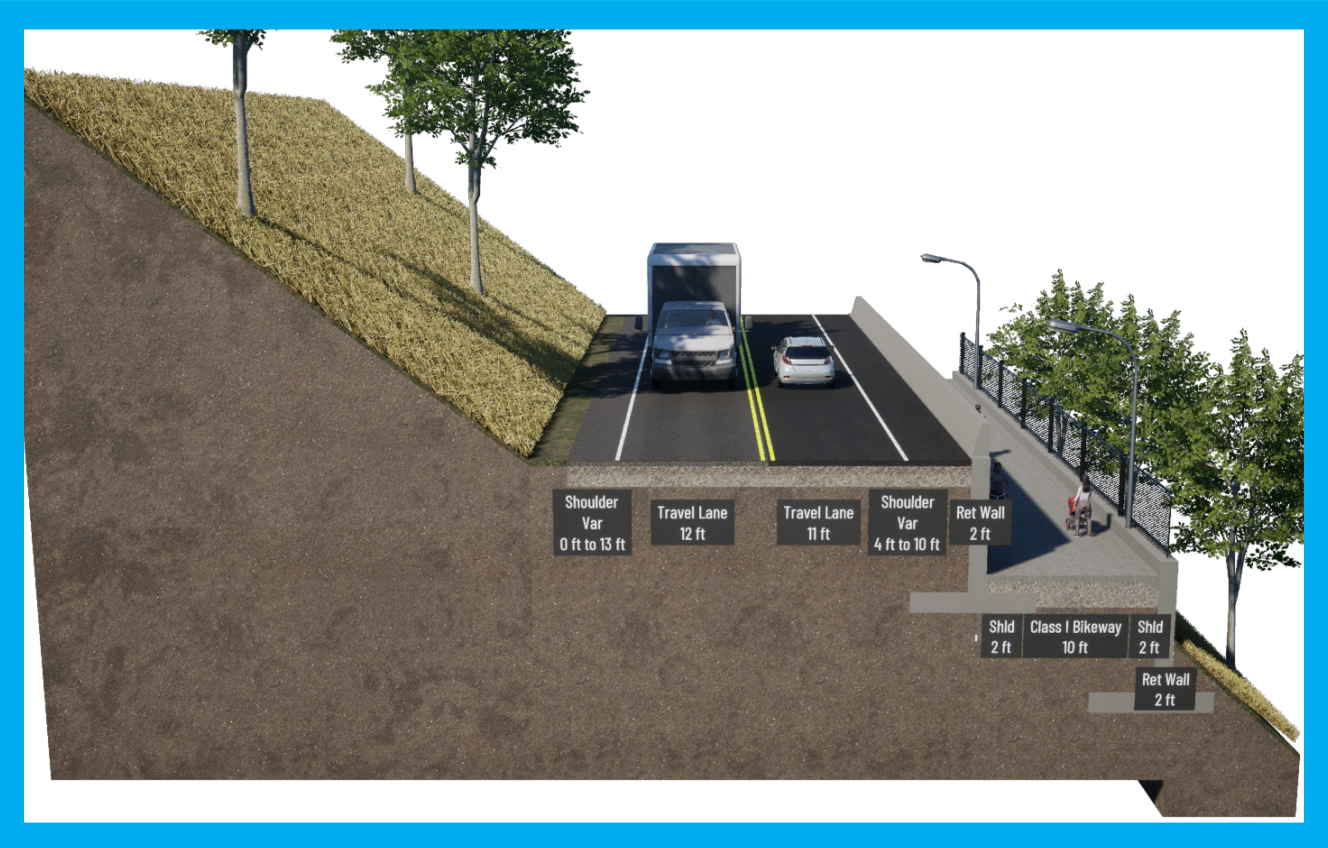
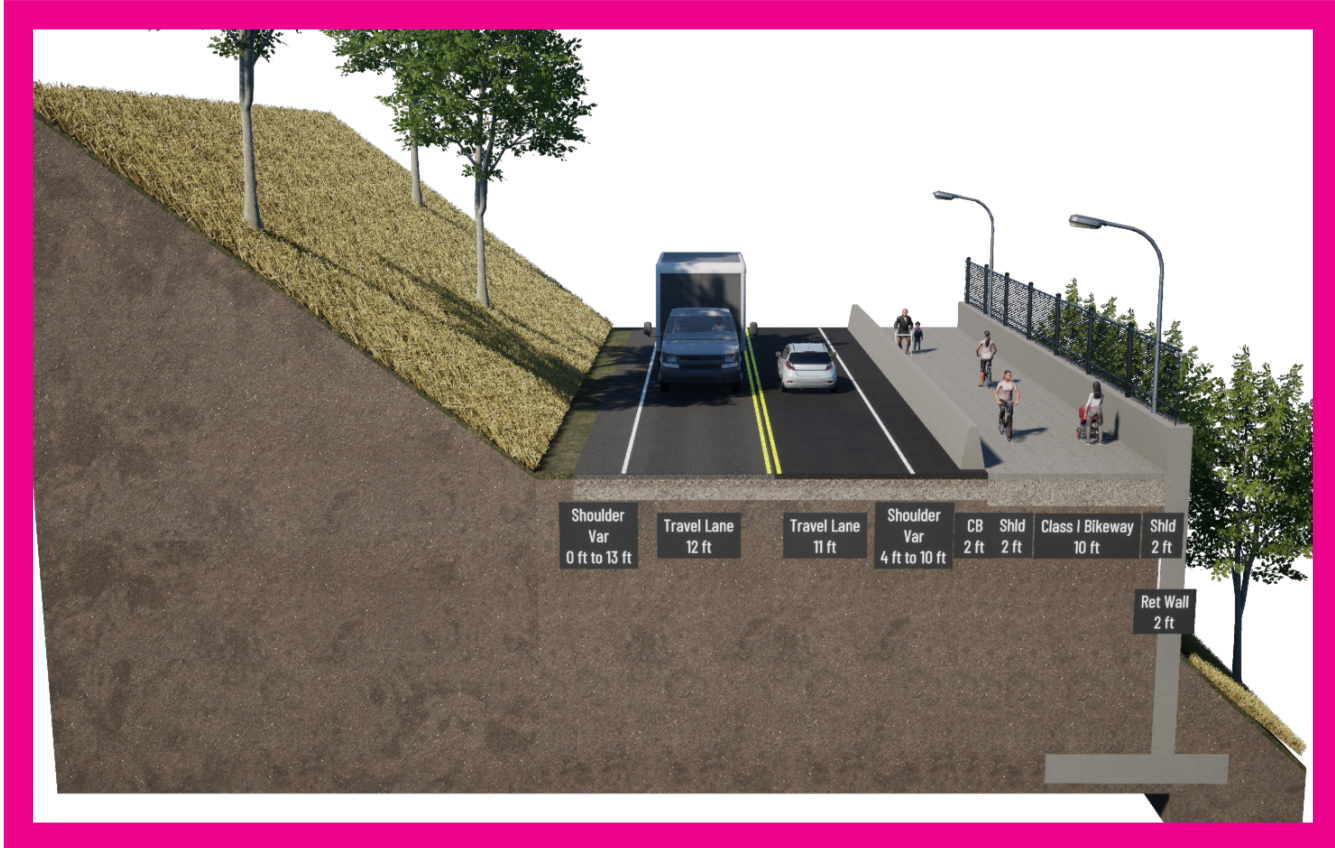
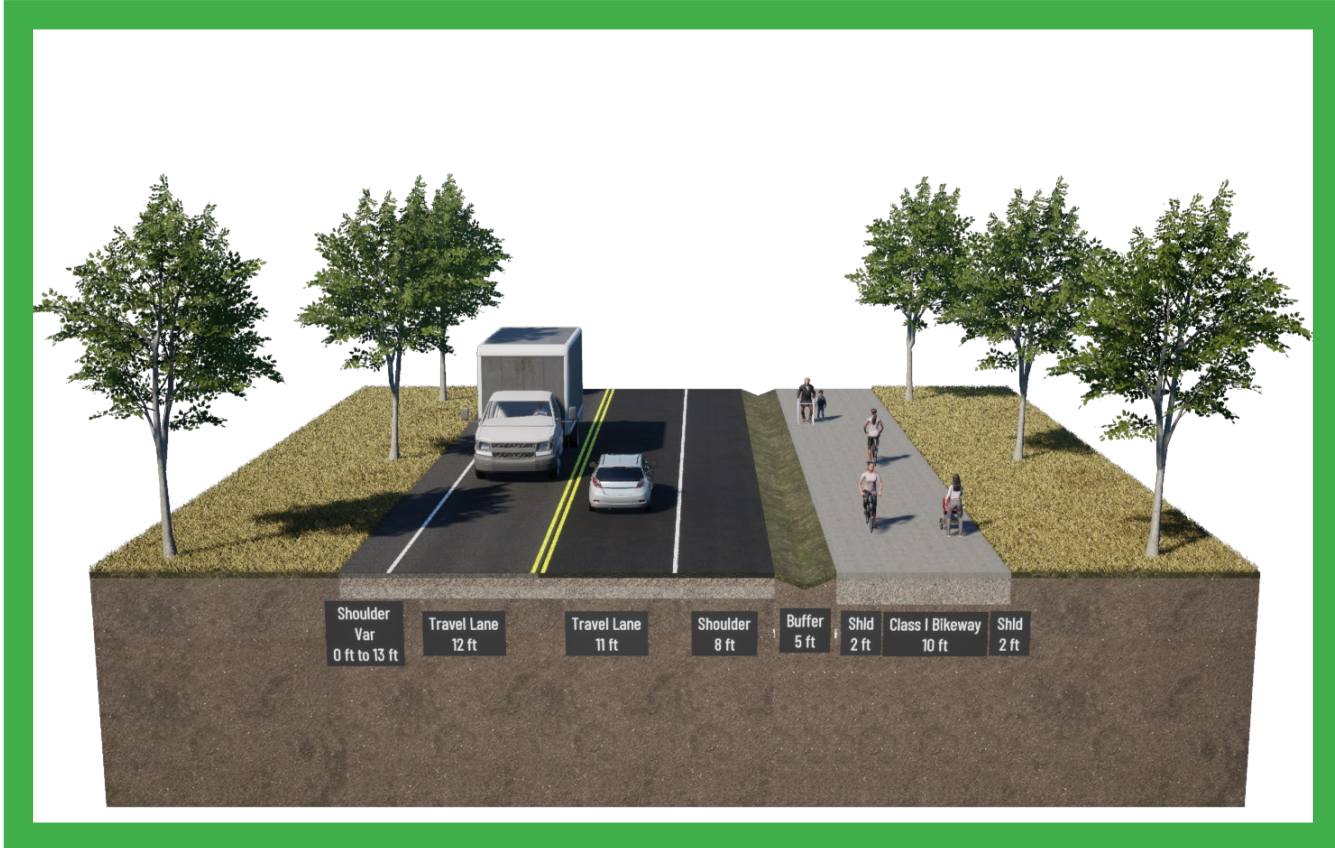
Trail on Retaining Wall

PHASE 2 - ALIGNMENT ALTERNATIVES

ALTERNATIVE 1: WEST SIDE CLASS I BIKEWAY

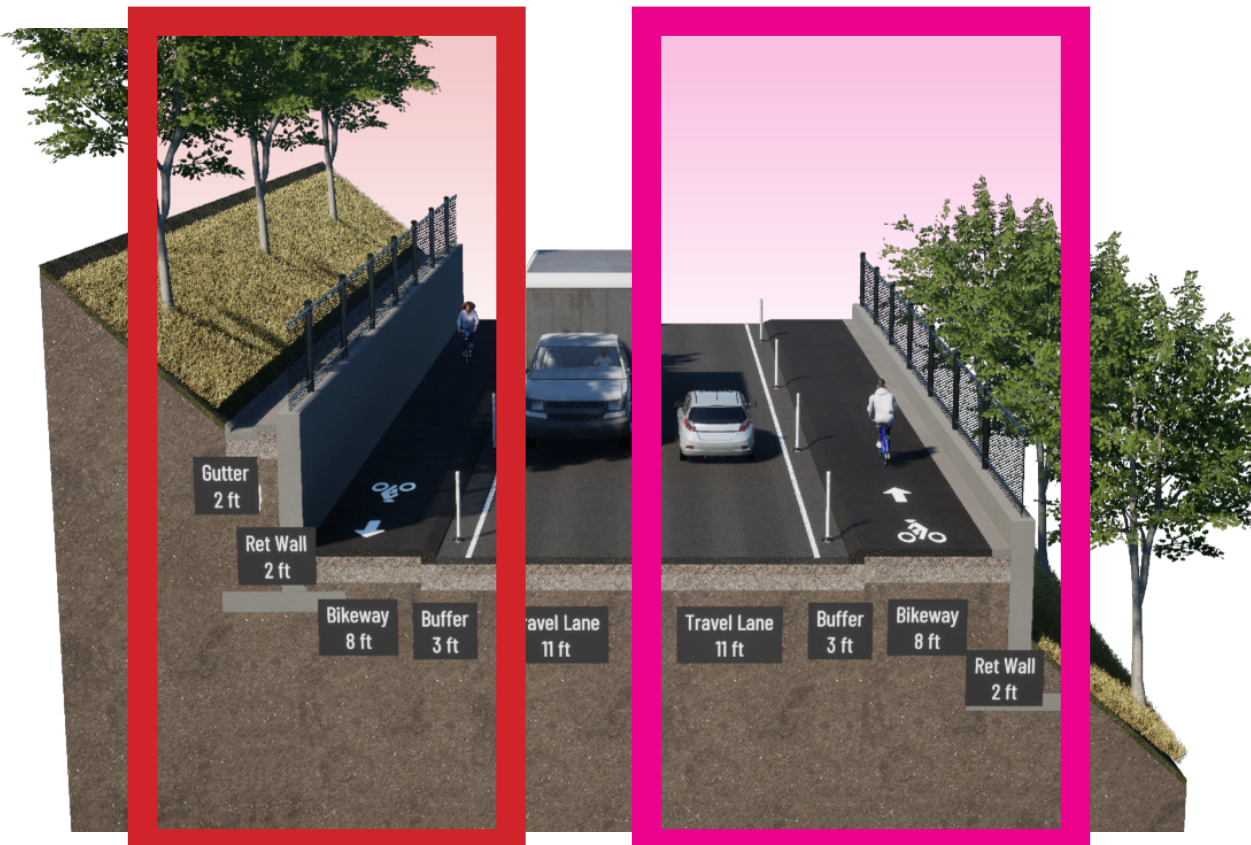
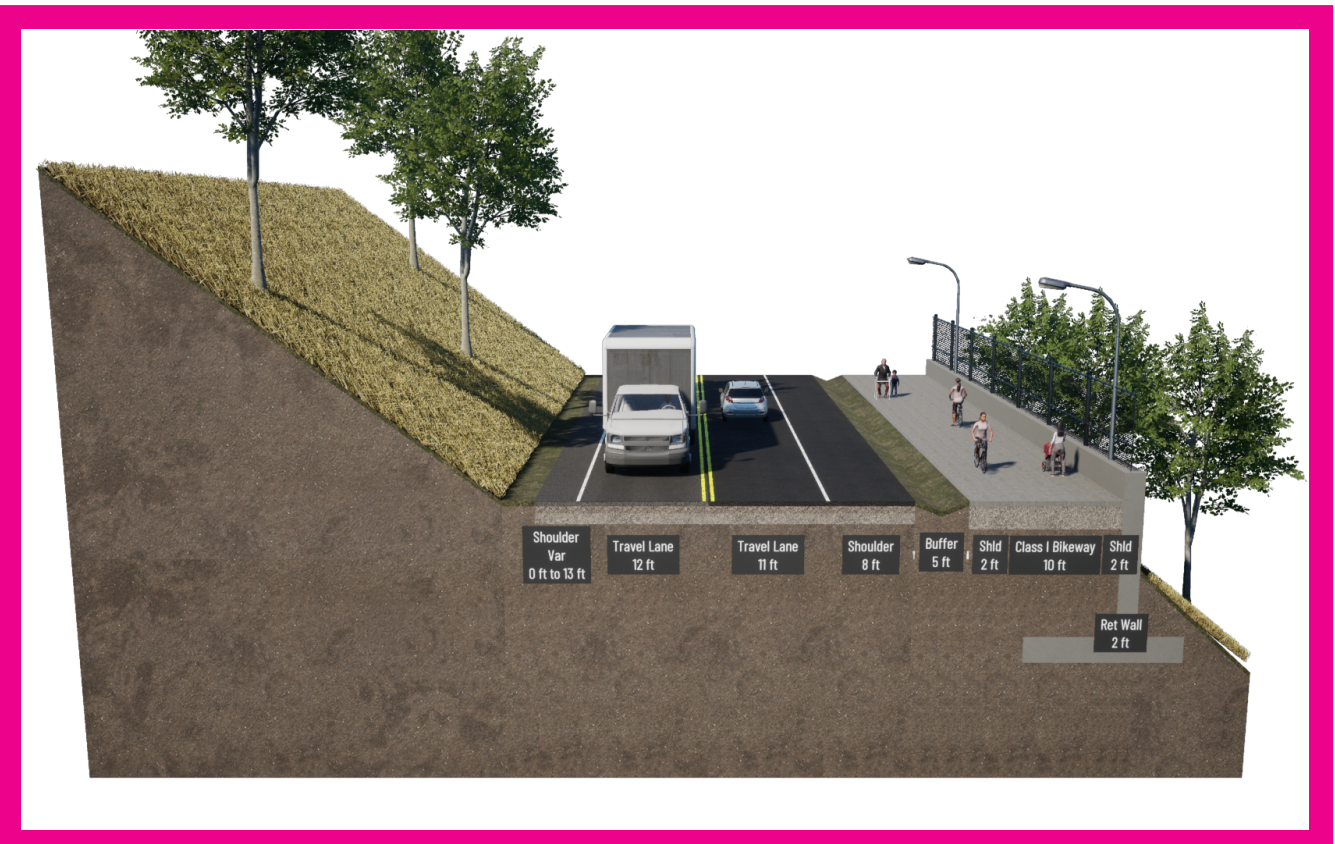
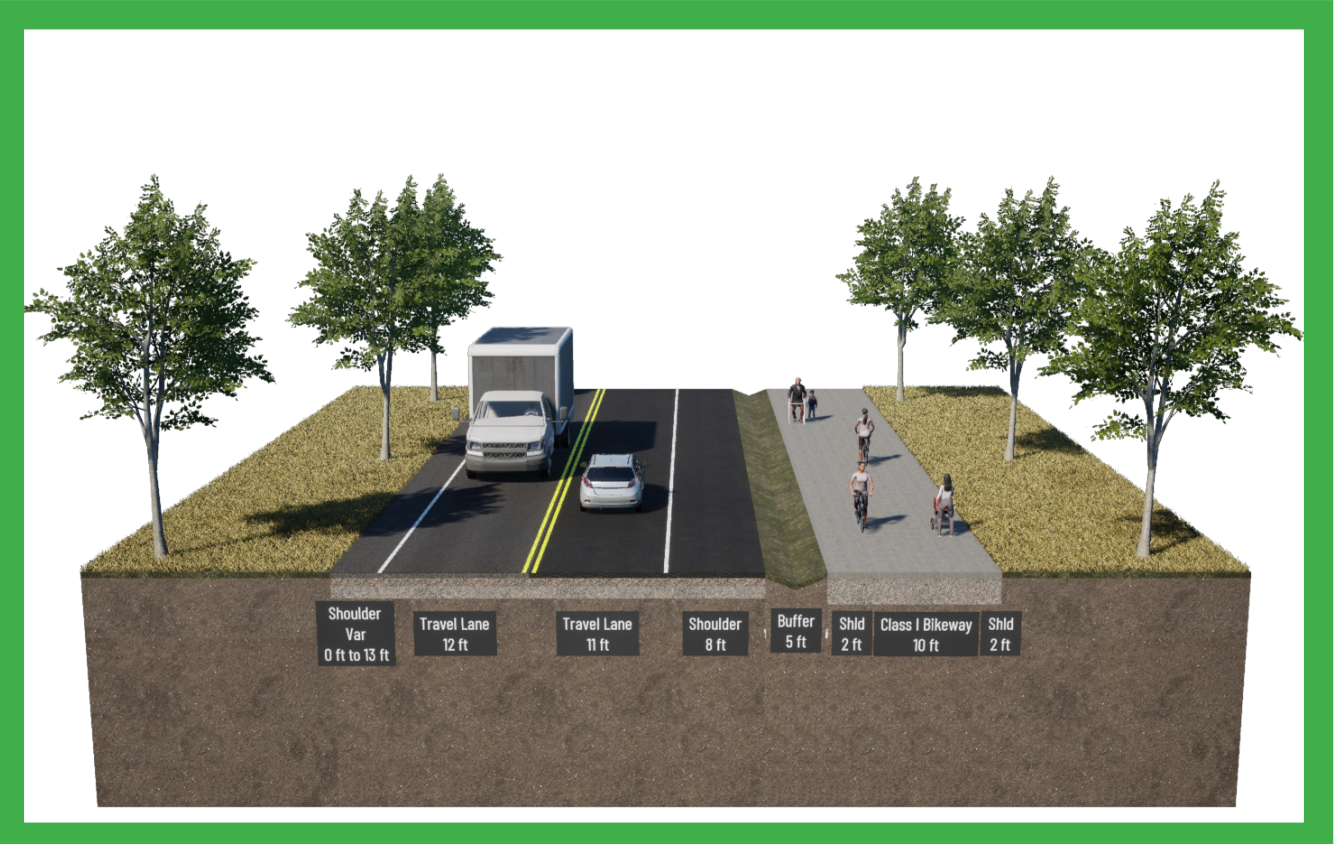
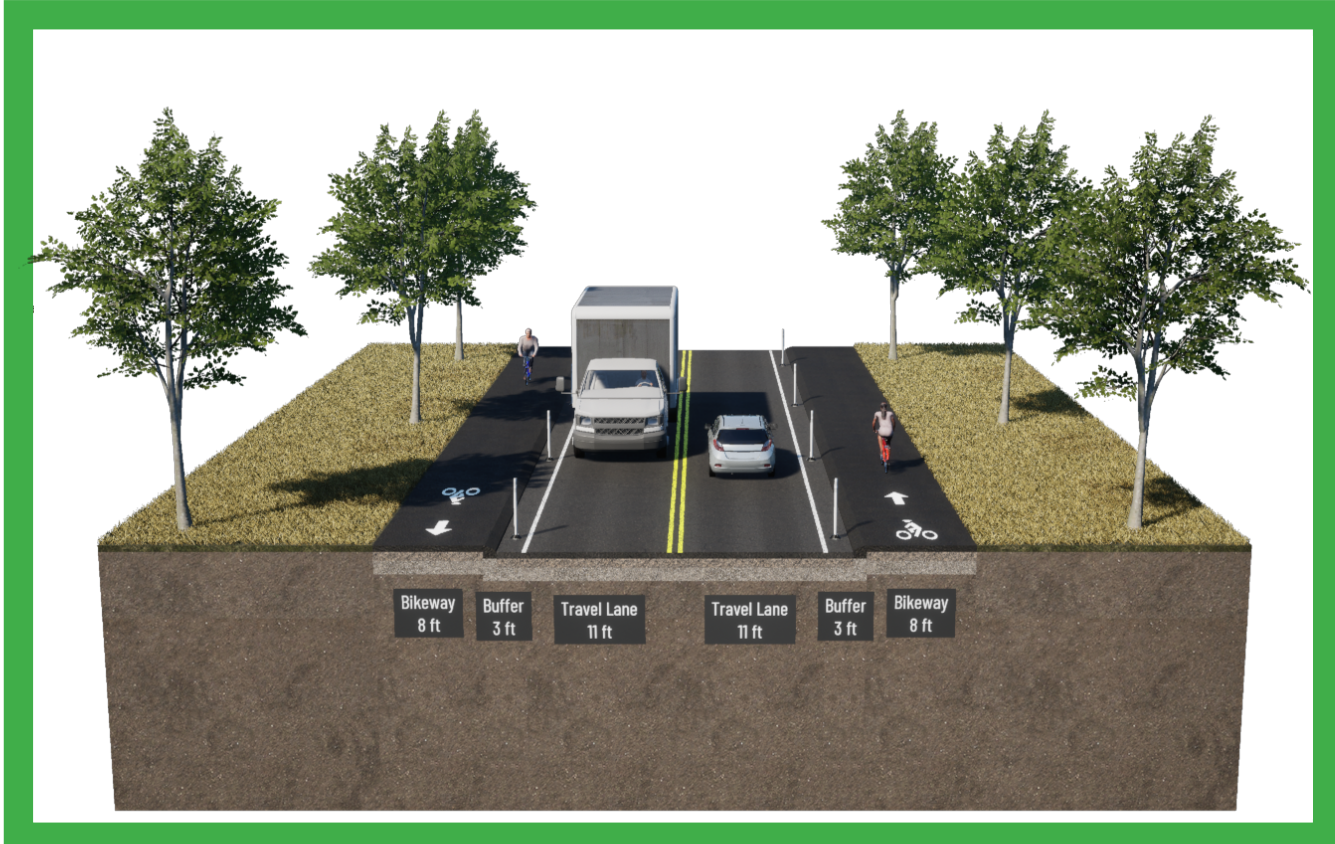
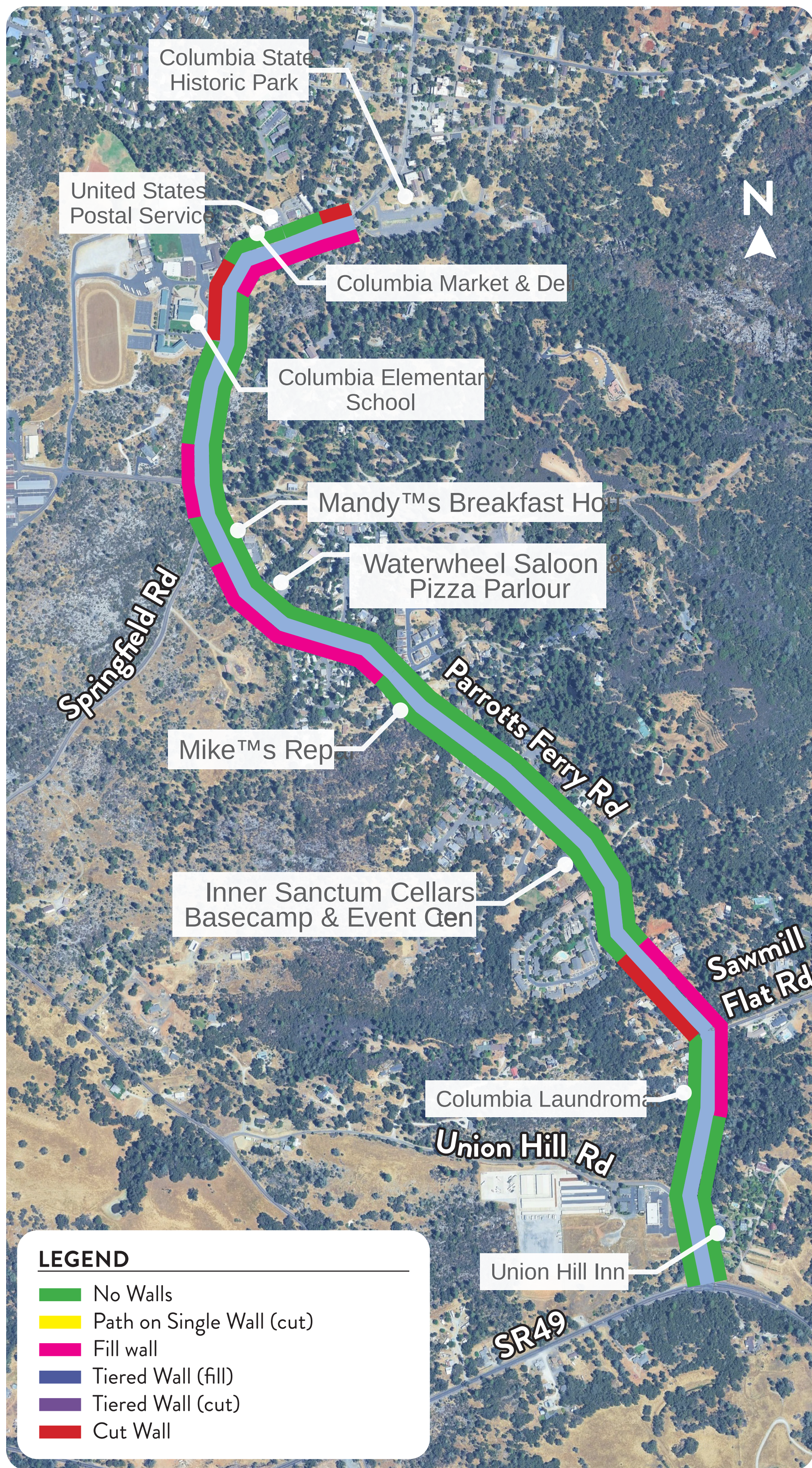


ALTERNATIVE 2: EAST SIDE CLASS I BIKEWAY

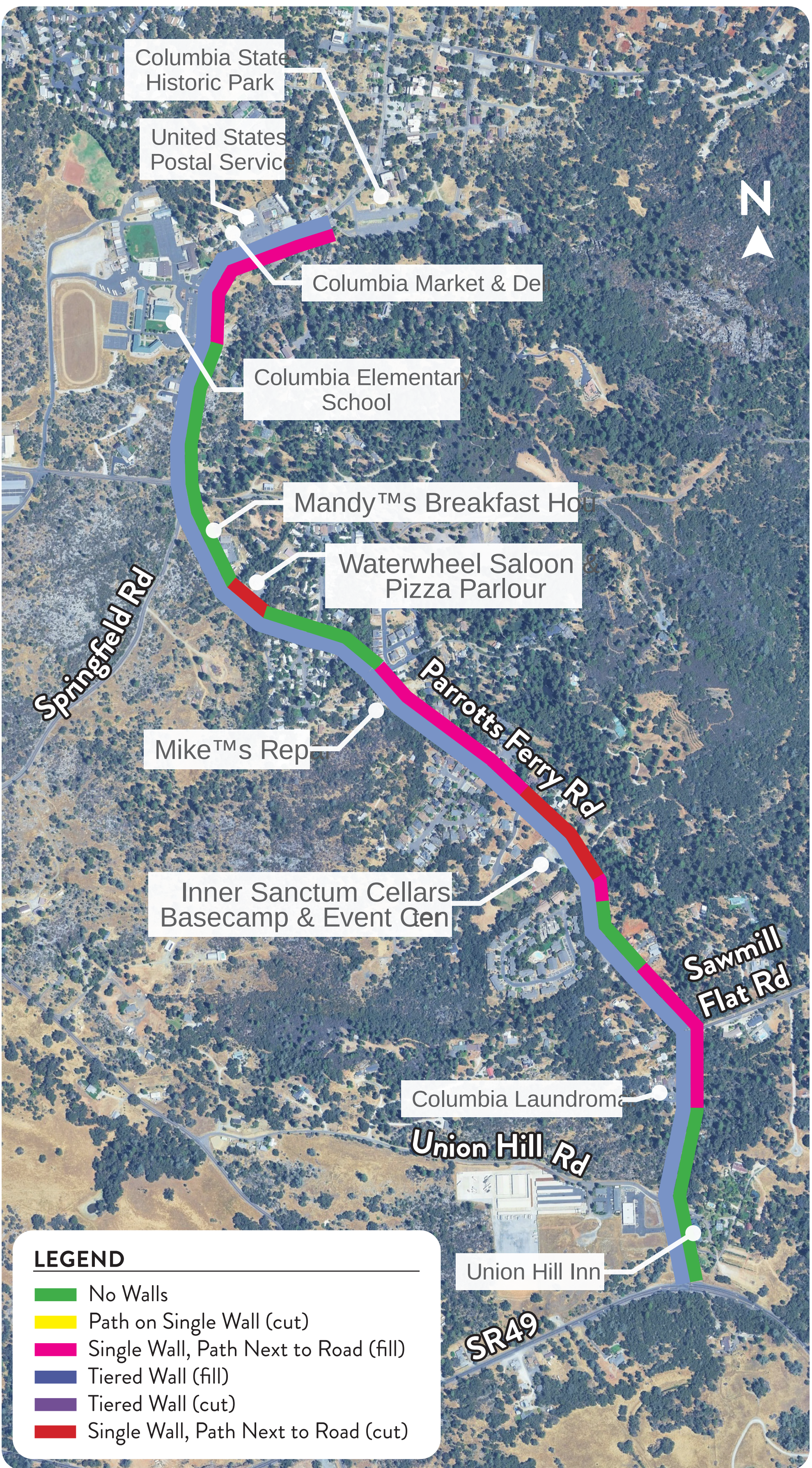


PHASE 3 - ALIGNMENT ALTERNATIVES

ALTERNATIVE 1: CLASS IV BIKEWAY



ALTERNATIVE 2: EAST SIDE CLASS I BIKEWAY





PHASE 2 PLAN





PHASE 3 PLAN



Phase 2 Alternative 1 - Opinion of Probable Cost				
Item	Unit	Quantity	Unit Cost (\$)	Total Cost (\$)
Paving (Roadway Shoulder)	SF	109110	12.96	\$ 1,414,389
Paving (Class I Bikeway)	SF	138556	6.17	\$ 855,284
Retaining walls: Structural Concrete	CY	8007	2100	\$ 16,814,622
Earthwork: Excavation	CY	35889	250	\$ 8,972,222
Earthwork: Fill	CY	31500	350	\$ 11,025,000
Signal modifications	LS	1	1500000	\$ 1,500,000
Right of Way	SF	42000	10	\$ 420,000
Building Impacts	EA	0	350000	\$ -
Subtotal				\$ 41,001,517
New drainage infrastructure (10%)				\$ 4,100,152
Maintenance (10%)				\$ 4,100,152
Contingency (35%)				\$ 17,220,637
Total Construction Cost (no escalation)				\$ 66,400,000
Total Construction Cost, With escalation (10 years, 4% per year)				\$ 98,300,000
Permitting and Design (25%)				\$ 24,600,000

Phase 2 Alternative 2 - Opinion of Probable Cost				
Phase 3 Alternative 2 - Opinion of Probable Cost	Unit	Quantity	Unit Cost (\$)	Total Cost (\$)
Paving (Roadway Shoulder)	SF	109707	12.96296296	\$ 1,422,128
Paving (Class I Bikeway)	SF	139937	6.172839506	\$ 863,809
Retaining walls: Structural Concrete	CY	6113	2100	\$ 12,836,444
Earthwork: Excavation	CY	17419	250	\$ 4,354,815
Earthwork: Fill	CY	25778.55	350	\$ 9,022,493
Signal modifications	LS	1	750000	\$ 750,000
Right of Way	SF	54500	10	\$ 545,000
Building Impacts	EA	7	350000	\$ 2,450,000
Subtotal				\$ 32,244,688
New drainage infrastructure (10%)				\$ 3,224,469
Maintenance (10%)				\$ 3,224,469
Contingency (35%)				\$ 13,542,769
Total Construction Cost (no escalation)				\$ 52,200,000
Total Construction Cost, With escalation (10 years, 4% per year)				\$ 77,300,000
Permitting and Design (25%)				\$ 19,300,000

Phase 2 Alternative 1 - Opinion of Probable Cost				
Item	Unit	Quantity	Unit Cost (\$)	Total Cost (\$)
Paving (Roadway Shoulder)	SF	52801	12.96	\$ 684,457
Paving (Class IV Bikeway)	SF	140807	6.17	\$ 869,179
Retaining walls: Structural Concrete	CY	3231	2100	\$ 6,784,244
Earthwork: Excavation	CY	6502	250	\$ 1,625,399
Earthwork: Fill	CY	3990	350	\$ 1,396,500
Delineators	EA	1767.5	60	\$ 106,050
Asphalt Dike	LF	17675	7	\$ 123,725
Right of Way	SF	77900	10	\$ 779,000
Building Impacts	EA	5	350000	\$ 1,750,000
Subtotal				\$ 14,118,554
New drainage infrastructure (20%)				\$ 2,823,711
Maintenance (10%)				\$ 1,411,855
Contingency (35%)				\$ 6,423,942
Total Construction Cost (no escalation)				\$ 24,800,000
Total Construction Cost, With escalation (10 years, 4% per year)				\$ 36,700,000
Permitting and Design (25%)				\$ 9,200,000

Phase 2 Alternative 2 - Opinion of Probable Cost

Phase 3 Alternative 2 - Opinion of Probable Cost				
Item	Unit	Quantity	Unit Cost (\$)	Total Cost (\$)
Paving (Roadway Shoulder)	SF	70292	12.96296296	\$ 911,193
Paving (Class I Bikeway)	SF	122814	6.172839506	\$ 758,111
Retaining walls: Structural Concrete	CY	3111	2100	\$ 6,533,333
Earthwork: Excavation	CY	6590	250	\$ 1,647,500
Earthwork: Fill	CY	10972.5	350	\$ 3,840,375
Right of Way	SF	103500	10	\$ 1,035,000
Building Impacts	EA	10	350000	\$ 3,500,000
Subtotal				\$ 18,225,512
New drainage infrastructure (20%)				\$ 3,645,102
Maintenance (10%)				\$ 1,822,551
Contingency (35%)				\$ 8,292,608
Total Construction Cost (no escalation)				\$ 32,000,000
Total Construction Cost, With escalation (10 years, 4% per year)				\$ 47,400,000
Permitting and Design (25%)				\$ 11,900,000