

Central Valley Passage LONG DISTANCE ROUTE

PROPOSAL TO CREATE A LONG DISTANCE BICYCLE
ROUTE AROUND THE HIGH SPEED RAIL ROUTE IN
THE CENTRAL VALLEY



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EXECUTIVE SUMMARY

This report presents the California Bicycle Coalition and Kern Council of Government's proposal for the Central Valley Passage (CVP), a long-distance bicycle route through the Central Valley, as part of a project funded by Caltrans and the High-Speed Rail Authority. The proposal lays out a paved bike route plan between Bakersfield and Merced that will run adjacent to waterways, roads, and railroad corridors while encouraging users of all abilities through low-stress design. The route will pass through and connect 14 Central Valley cities and towns. As proposed the Central Valley Passage runs between 266.88 miles to 264.77 miles (due to alternate route options)

GOALS

The goal of this project is to build a Central Valley Passage: a long-distance, low-stress cycle route through the heart of California that will also:

- » **Enhance interconnectivity between Central Valley cities**
- » **Serve all types from local commuting, inter-city riding, and long-distance adventure cycling**

- » **Highlight and connect destinations that can increase economic productivity (employment, schools, shopping, landmarks)**
- » **Enhance the development of robust, low-stress networks within cities and towns**
- » **Enhance utilization of high-quality transit including the high-speed rail and bus rapid transit routes**

The High-Speed Rail project has committed to improving transportation and bicycle networks within cities with rail stations. The Central Valley Passage will pass through Bakersfield, Fresno, and Merced, providing access to the High-Speed Rail station in each city. This proposed low-stress and connected bikeway is an essential step towards increased active transit accessibility for residents and tourists to key destinations in the Central Valley.

The route and phasing is designed to prioritize transportation connectivity and accessibility for local commuters first and then tourism and adventure cycling second. The design and implementation of the Central Valley

Passage will facilitate inter-city travel by connecting locals to existing and planned low-stress routes. Once a regional low-stress system is complete, cyclists will be able to ride within their communities and throughout the Central Valley by bicycle.

Central Valley Passage Phase I of this project includes building the route through what CalBike has deemed “high-priority” areas, particularly those near large city centers with larger numbers of bicycle riders.

» **Phase I Cities:** Bakersfield, Shafter, Wasco, McFarland, Richgrove, and Delano in the south, and Fresno to Madera in the north

Central Valley Passage Phase II includes building in the central area of the proposed Phase I of the High-Speed Rail Projects. Because distances between services in this phase are greater than the distances between services in Phase I of the project, Phase II is more focused on developing long-distance bike tourism.

» **Phase II Cities:** Porterville, Exeter, Visalia, Hanford, and Reedly

Central Valley Passage Phase III contains segments key to completing a contiguous long-distance route. Based on the smaller population in these areas, fewer services, and lower frequency of inter-city travel, this segment is a lower priority.

» **Phase III Cities:** Richgrove, Reedly, and Merced

CENTRAL VALLEY PASSAGE BICYCLE ROUTE



Figure 1. Map of Central Valley Passage Bicycle Route



INTRODUCTION

California's formal bicycle infrastructure is lacking throughout much of the state. In large swaths of the Central Valley, the automobile is the only available transportation mode for inter-city travel. A great deal of funding and political efforts have been invested in constructing the High-Speed Rail (HSR) project through the Central Valley which will be an important alternative transportation option for residents living in relative proximity to the proposed stations.

Unlike other parts of the State, there is a service gap for a safe long-distance cycle route or series of routes that would connect Central Valley major cities of Bakersfield, Fresno, and Merced. This project is designed to augment the work of implementing the HSR work being done in the Central Valley while addressing these service gaps for active transportation in the region.

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- » **Serve all types from local commuting, inter-city riding, and long-distance adventure cycling**
- » **Highlight and connect destinations that can increase economic productivity (employment, schools, shopping, landmarks)**
- » **Enhance the development of robust, low-stress networks within cities and towns**
- » **Enhance the utilization of high-quality transit including high-speed rail and bus rapid transit**

Design and phasing of this project prioritize local commuters first, then tourism and adventure cyclists. Encouraging commuters to cycle to work or cycle to transit hubs will reduce emissions and improve quality of life. By increasing the connectivity between cities in the Central Valley, this route will encourage the ability to move through the Central Valley on a bicycle, reducing vehicle

emissions and traffic congestion. This route will encourage the flow of commuters and tourists to cycle to accessible destinations.

EXISTING CONDITIONS IN THE CENTRAL VALLEY

Currently, the cycle infrastructure between cities in the area is lacking, and single-occupancy vehicles are the preferred means of transportation. State and regional transportation policies for the Central Valley region primarily focus on automotive mobility. Local decision-makers allocate federal, state, and local dollars to expand or restructure freeways and high-speed streets.

For those unable to afford a vehicle, movement through the Central Valley is challenging. Commuting by bicycle between and within cities in the Central Valley is also a challenge due to the area's land expanse and the lack of large multi-city metropolitan regions like that of the Bay Area and the Los Angeles Metro Region.

With over 15 state and federal funding sources available for active transportation projects, Central Valley governments and councils of government certainly have opportunities and made great strides in improving and expanding active transportation within their respective regions. Small incremental changes to the active transportation network's quality and availability have encouraged growth in cycling and active transportation.

RELATIONSHIP TO THE CALTRANS AND THE HIGH-SPEED RAIL PROJECT

The project's ties to the High-Speed Rail project mean the Central Valley Passage will connect through each of the three Central Valley HSR station areas (Bakersfield, Fresno, and Merced). In these cities, the High-Speed Rail Authority has guaranteed high-quality transit to be accessible from the high-speed rail stations. Therefore, cyclists on the Central Valley Passage will be able to access high-speed rail and the local, high-quality transit available in the city. This proposal is funded by a Caltrans grant

in collaboration with the California Bicycle Coalition, with the task to design and determine the approximate cost to build the CVP. [Caltrans' California High-Speed Rail project](#) will extend through the Central Valley of California and provide a transit option between northern and southern California. Phase 1 of the California High-Speed Rail will run from San Francisco to Los Angeles beginning with Central Valley station connections, with Phase 2 between Sacramento and San Diego. The completed High-Speed Rail project will have over 800 miles of rail and 24 stations. This long-distance cycle route's relationship with the High-Speed Rail will focus on Phase 1, particularly the stations and rail lines between Bakersfield in the south and Merced in the north.

VISION: A REGIONAL LOW-STRESS NETWORK

The project is designed to be a low-stress network, as defined by People for Bikes and Mineta Transportation Institute as a route where most adults would feel comfortable. A route of this stature and nature will be the first within the Central Valley and connect to several existing cycle routes throughout the area, thus invigorating the Central Valley economy. Caltrans proposes the High-Speed Rail run west of Highway 99 due to fewer land constraints. While the ease of constructing the long-distance path entirely along the Caltrans right-of-way is tempting, this plan and low-stress design guidance shows the importance of locating the Central Valley Passage along a more populated route for safety and ease of cycling. (See Appendix A for a review of best practices for designing and implementing a bike route based on weather, cyclist needs, and the planned route location)

This Central Valley Passage's foremost goal is to create a low-stress facility that would serve as a central corridor or spine connecting active transportation facilities for cyclists. Therefore this route will use the [Bike Network Analysis](#) guidelines for developing on-street facilities. Developed by People For Bikes, this tool uses inputs such as speed limit, lane width, and



Figure 2. Map of the Proposed High-Speed Rail Route



Figure 3. Example of grade separation near a heavily-trafficked street

intersection frequency to decide whether an on-street bicycle facility is low- or high-stress. This binary decision will easily allow for planners to classify routes and determine the lowest stress options for the long-distance route. While on-street facilities are often the least expensive option in terms of construction and land acquisition cost, they can often still be high-stress routes for cyclists. Where construction near heavily trafficked roads is necessary, grade separation should be considered an option for the cycle route. [Grade separation](#) is a raised path, likened to a sidewalk, provides an extra degree of separation between the cyclist and the road. The best candidates for these types of paths are high-speed streets with few interruptions (driveways/intersections), winding roads where cars can drift into bicycle lanes, and finally that the path has high volumes of bicycle traffic. Where the route needs to cross or follow a high-volume traffic road, grade separation could be the most useful.

In a recent survey conducted by the California Bicycle Coalition, the second most common

element of a bike ride considered stressful was the lack of tree shade along the route. While planners have occasionally neglected to include this aspect of stress in analyses, tree cover should be included along the long-distance route to mitigate the stress of riding in inclement weather. The concept of cyclists being attracted to shaded routes is being observed in journalistic and academic circles, with the consensus being trees are an essential part of active transportation planning. According to a [2011 study by the Federal University of São Carlos in Brazil](#), cyclists cited tree cover as “one of the five most important attributes to foster cycling” in cities. If the route hopes to draw commuters and touring cyclists, it must include tree planting as part of our budget.

With a growing population and an increase in planned public transportation improvements, the area between Bakersfield and Merced is a prime location for a long-distance cycle route. With its flat terrain and access to services, the physical strain of this route will be minimal, and therefore it is accessible to a variety of cyclists. By adding proper infrastructure like

shade, drinking water, and safe crossings, this route can be made highly accessible. It has the potential to be a popular and well-used route for residents of the Central Valley and visitors from other areas.

For cycling and active transportation use in the Central Valley to have a transformative impact on greenhouse gas emissions and quality of life for this sprawling and rural area, investment in regional connectivity projects must focus on active transportation between Central Valley cities.

Regional connectivity projects will not only decrease greenhouse gas emissions but also spur the utilization of the high-speed rail network, local economies and small businesses in the Central Valley, and grow tourism for central and inland parts of the state. It is vital for a state agency, and not merely local agencies, to invest in the quality of life and economic viability of the entire region. Investment in public and active transportation is a proven way to support community development while also eliminating greenhouse gas emissions from single-occupancy vehicles.

For disadvantaged communities surrounding the Central Valley's major cities, the Central Valley Passage will be easy to access. Both Kern Transit and Golden Empire Transit allow bicycles on their vehicles. Those who live too far away from the route or do not have access to a low-stress connection route will have multi-modal access to the CVP.

TOURISM AND ADVENTURE CYCLING

Central Valley is home to over fifty wineries and breweries, a myriad of food and culture festivals, arts districts, historical towns, and landmarks throughout the region. These are economic drivers that can be enhanced by promoting regional bike travel through the Central Valley.

To make the Central Valley Passage appealing to adventure cyclists, it should be registered with the [Adventure Cycling Route Network](#), a cycle advocacy organization working with

government agencies to map and design the United States Bicycle Route System (USBR). With over 50,000 miles of documented cycle routes to "iconic destinations across the county," it is notable that Adventure Cycling lists only one long-distance cycleway in California. [USBR 50's new 233-mile stretch](#) between South Lake Tahoe and San Francisco is a new low-stress cycling route that will serve as a template for our future recommendations.

The dearth of cycling routes means large swaths of California's natural and historic sites are difficult to access via active transportation. The CVP through the Central Valley could become part of the [USBR 87 route](#), which is currently planned to extend from the northern border of Washington into Oregon's central valley. It is essential to connect to low-stress existing plans and infrastructure to ensure that residents can use these facilities.

The coast of California receives the most bicycle traffic and recognition as a premier biking route. However, the Central Valley has the potential to grant more equitable access to residents looking to commute by bicycle and to draw adventure cyclists who want to travel this route in its entirety or piece by piece. The Central Valley Passage provides an option to explore inland California in a new and exciting way.

Cities within the Central Valley serve as the gateway to many of California's eastern sights and destinations. Building a cycle route through this area means cyclists can participate in a multimodal adventure by cycling to cities with transit to specific eastern locations.

Transit connection points on the CVP between places like Yosemite and other national parks, vineyards and historic landmarks will encourage an increase in tourism throughout the Central Valley. For example, the YARTS bus to Yosemite leaves from both Fresno and Merced, and the public transportation to Sequoia National Park leaves from Visalia. All three cities are along the proposed cycle route, and some transport options allow cyclists to bring their bikes onboard.



Figure 4. Yosemite Area Regional Transportation System

COMMUNITY ENGAGEMENT

This document is designed to be used in conjunction with community engagement efforts to determine the best possible path for the Central Valley Passage. The current recommendations will lay the groundwork for a proposed route. The route maps in this planning document are intended as a starting point to get feedback from community members and local stakeholders.

The route passes through 14 major cities and towns within the Central Valley. The community engagement process should include meetings in each of these communities and using the following recommendations:

- » Suggested community engagement process:
- » Use physical drawing exercises for equitable engagement.
- » Email or mail individual city maps to community stakeholders. Maps are in the appendix to this document. Ask stakeholders to mark barriers and issues and return the maps.
- » When and where possible, hold community meetings in person. A list of bicycle advocacy contacts to assist with this process is included in the appendix.

Partial funding for the route and community engagement should come from Caltrans, as a state agency can provide continuity and consistent funding. While there is an abundance of funding types, as noted later in this document, Caltrans should serve as the agency responsible for securing these types of alternate funds. With land acquisition often proving difficult, the proposed route will be built partially on a right-of-way already owned by Caltrans, including highway projects and the proposed High-Speed Rail corridor.



ROUTES + NODES

To plan the best route for the Central Valley Passage (CVP), the project team determined which cities and towns are best equipped to provide services for both commuter and long-distance cyclists. Lodging, food, water, and bicycle maintenance services are imperative, therefore based on population and access to lodging, the route will pass through the following cities and towns disclosed below. The proposal is broken down by route segments, with specific plans and implementation recommendations for each portion of the long-distance route between Bakersfield and Merced. The overall route will run near Highway 99 because of the highway's passage through more populated areas and proximity to potential spur destinations to the east near the Sierra Nevada Mountains. The CVP will combine existing and planned routes, with these planned routes along waterways, in railroad corridors. It will also follow streets that provide a low-stress cycling environment. A Class I or Class II route is recommended for most inter-city travel, with separation from the street and without frequent intersections or high volumes of adjacent traffic.



Figure 5. Central Valley Passage Bicycle Route Map

BAKERSFIELD TO MCFARLAND (32 MILES)

The Central Valley Passage will begin at the Bakersfield High-Speed Rail Station and follow the rail line until the Kern River. The path will turn west and follow the existing Kern River Bike Path for 5 miles as represented in the 2019 Bakersfield Active Transportation Plan. Signage and directions along this portion of the route will be the only recommended expense. After this, the path will turn north onto the Friant-Kern Canal for just under 27 miles. The federal government has approved the construction of a multi-use path along the southern 6 miles of the Friant-Kern Canal. Kern County has yet to begin construction on this project. The remaining miles of the route along the Friant-Kern Canal must be subject to the same federal approval process. Most of this portion of the path is situated west of Highway 99 until just south of McFarland, when it crosses underneath the highway but continues along the canal.

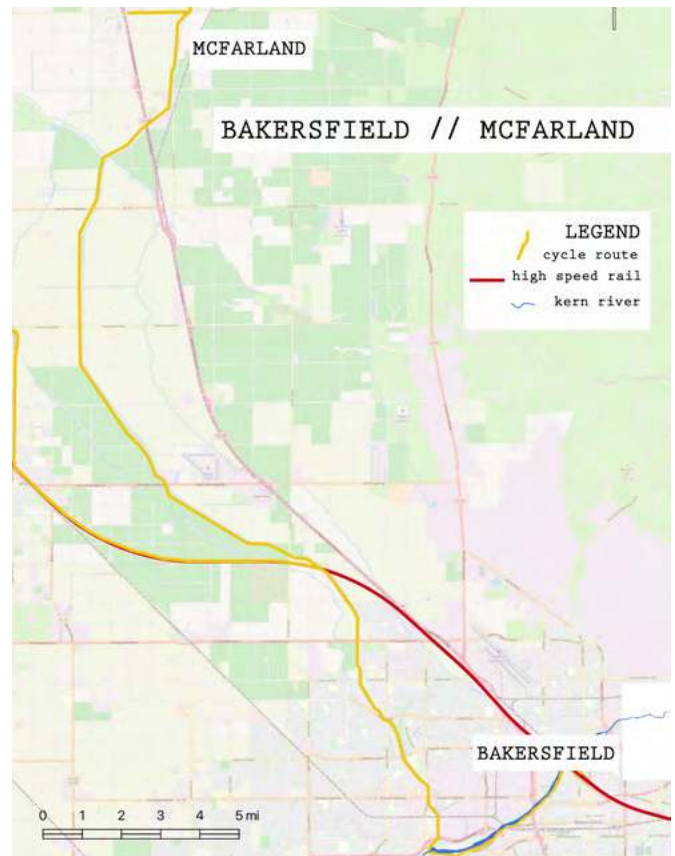


Figure 6. Bakersfield to McFarland Map

SHAFTER/WASCO NODE (17.5 MILES)

It is essential to include some towns along Highway 99 on the route, but considering cycling conditions along that corridor are occasionally hostile, the bulk of the CVP avoids the highway. Shafter and Wasco are both large towns with existing facilities and bicycle services, so there are potential nodes passing through both Shafter and Wasco along the High-Speed Rail corridor for 11.2 miles and on existing road facilities for 6.3 miles. This node will end in Wasco, but eventually it could be possible, based on route usage, to extend the node to form a loop to McFarland and back onto the primary segment of the CVP.

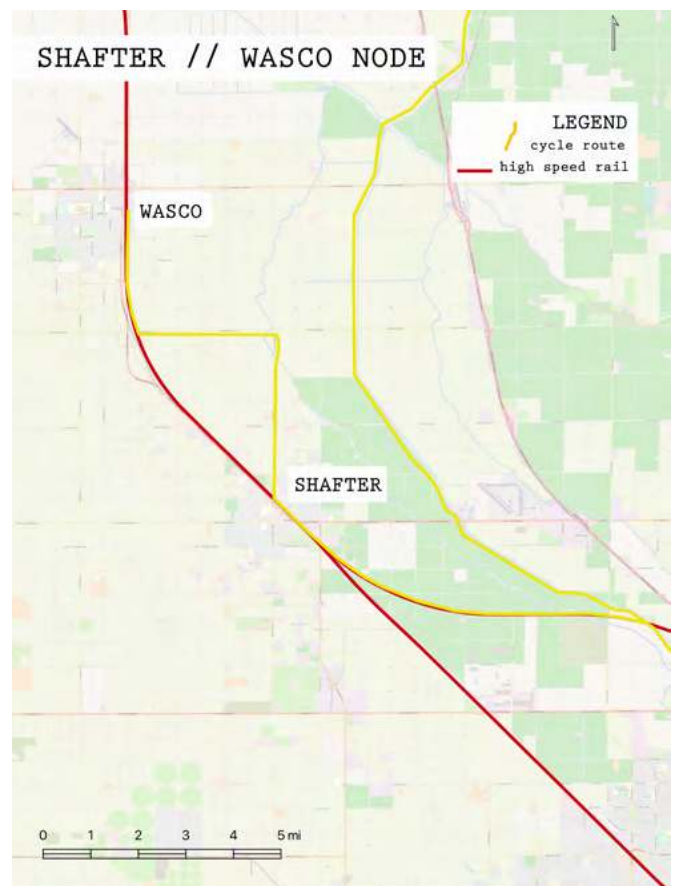


Figure 7. Shafter/Wasco Node Map

MCFARLAND NODE (1.5 MILES)

Instead of situating the route next to Highway 99, which may create a high-stress environment for cyclists, the CVP will be located along low-traffic streets, waterways, and railroad corridors. The city of McFarland is included as an optional node where cyclists can stop for services, lodging, and connections to other transportation modes. To access McFarland, a node will extend from the intersection of Sherwood Avenue and the Friant-Kern Canal and head west on Sherwood Avenue for 1.6 miles until it abuts the railroad corridor downtown and then turns north along the corridor for .4 miles.

MCFARLAND TO RICHGROVE (12.8 MILES)

The CVP continues along the Friant-Kern Canal for 3.8 miles until Avenue 4, where the route will head east for 3.8 miles until it reaches downtown Richgrove. While the CVP could have possibly continued along the Friant-Kern Canal until Exeter, there were not enough accommodations for cyclists along this route.

DELANO NODE (5.0 MILES)

The Delano node will extend west from the primary route at Basset Avenue and continue onto an existing bicycle route. The path will pass by multiple parks and end downtown Delano on High Street adjacent to the existing railroad tracks.

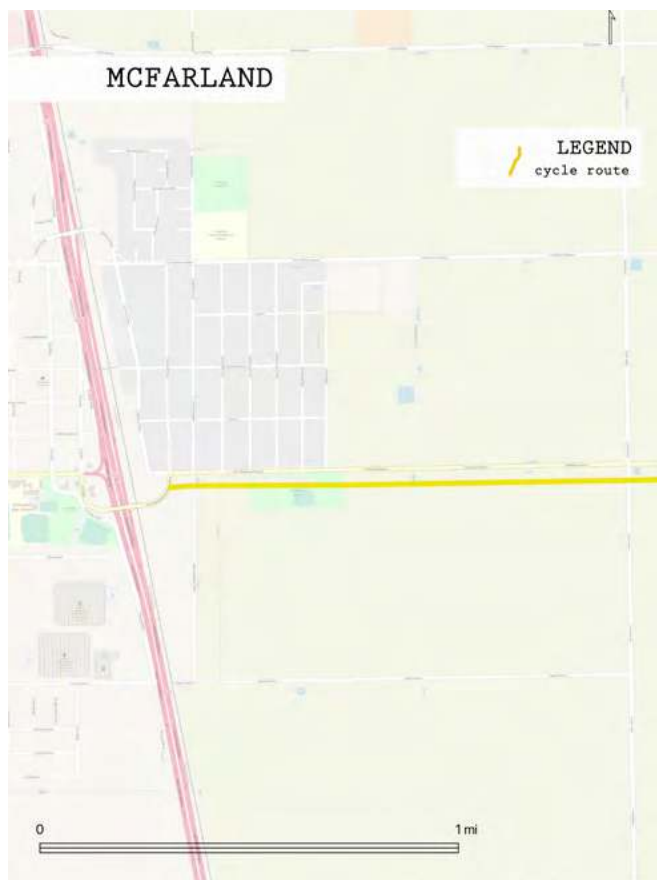


Figure 8. McFarland Node Map

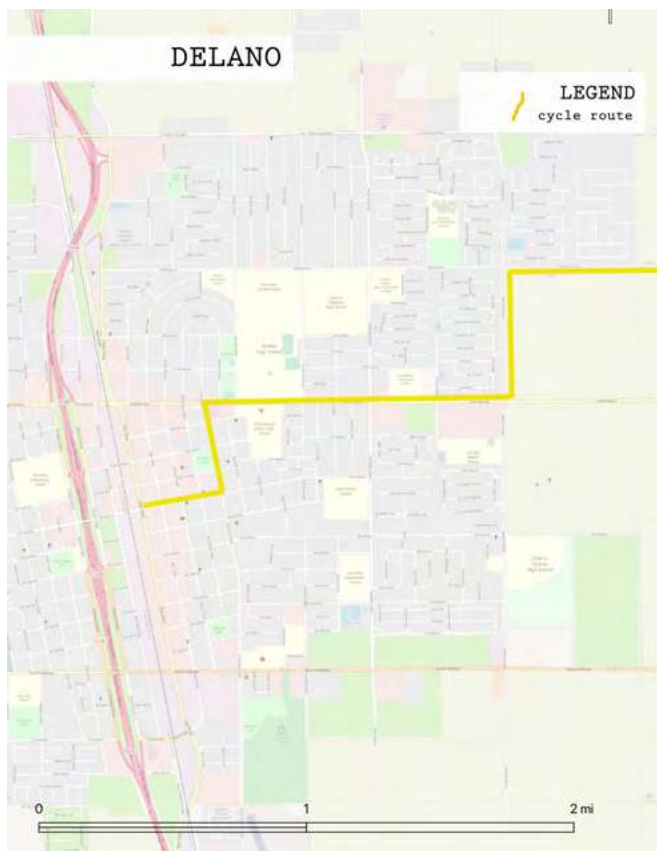


Figure 9. Delano Node Map

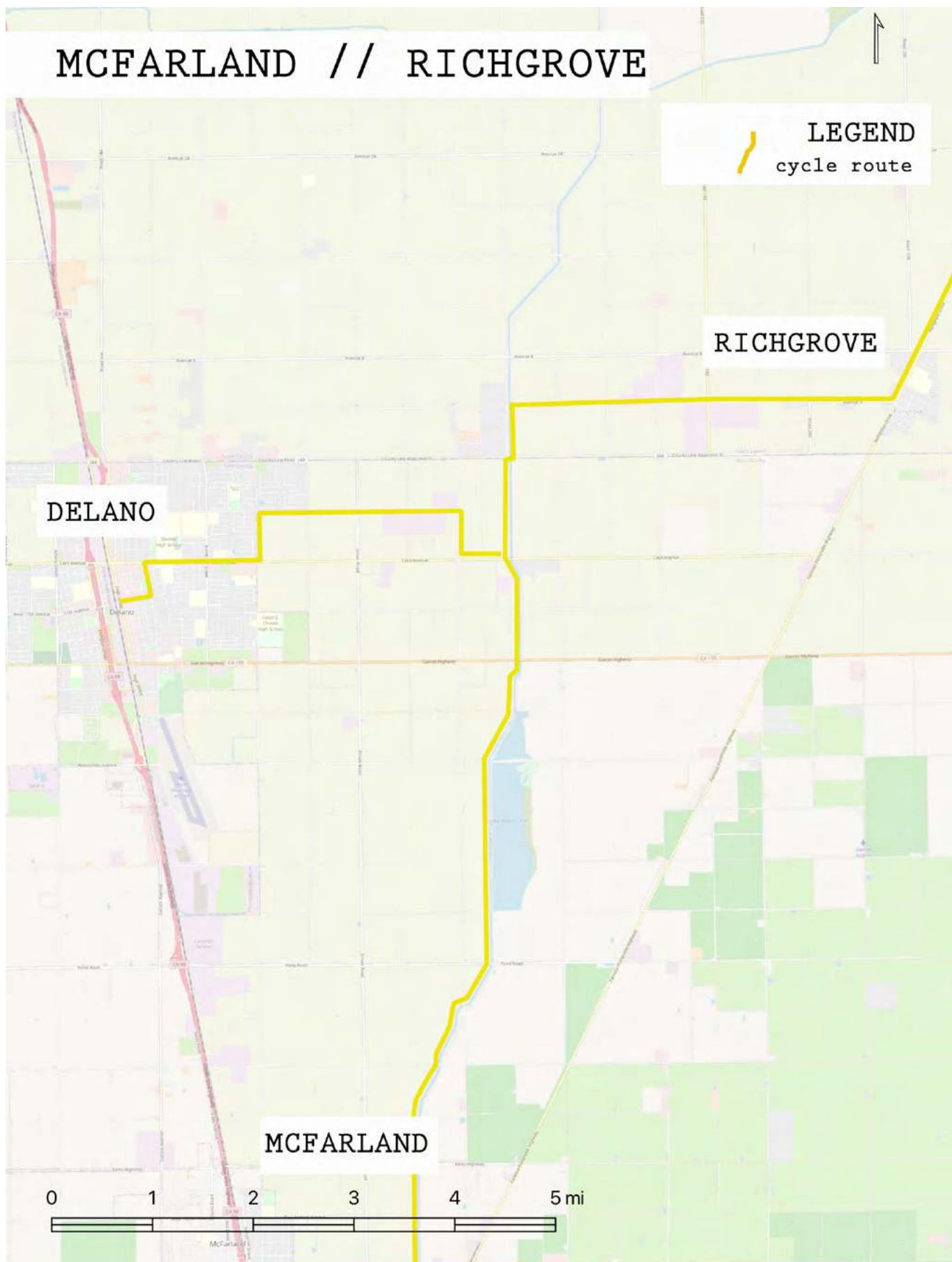


Figure 10. McFarland to Richgrove Map

RICHGROVE TO PORTERVILLE (23.6 MILES)

This portion of the CVP covers the most diverse route type, but because of its distance and abundance of route options, this route is the best option to continue the CVP. From Richgrove, the route will be built adjacent to the San Joaquin Valley Railroad for 2.7 miles until Avenue 4, where it will turn to the north and follow Road 216 for 1.7 miles. An eastward turn along the White River for 2.3 miles will bring the route adjacent to the SJVR for another 8.2 miles. After this, a 3.2-mile ride along Deer Creek will bring the CVP to a former railroad corridor for 4.6 miles. Finally, the CVP will reach downtown Porterville using the existing Rails-to-Trails route, which continues to Exeter.



Figure 11. Richgrove to Porterville Map

PORTERVILLE TO EXETER (20.6 OR 22.7 MILES)

Route option 1 (20.6 miles): From the Rails-to-Trails path, the CVP continues north along the former railroad corridor until Zante, where the route once again joins with the SJVR railroad for 1.3 miles until the route heads northwest along the Friant-Kern Canal until the Lewis Creek for 9.2 total miles along the waterways. The route will join the western SJVR rail line until Rocky Hill Drive, where it will turn east and enter downtown Exeter using East Pine Street. Route option 2 (22.7 miles): This route option is more scenic and will also avoid a potential land disagreement with landowners adjacent to the railroad. The 9.2-mile detour will follow the Porter Slough through Porterville until it intersects with the Friant-Kern Canal. Once the CVP passes under the SJVR Railway and Orange Belt Drive, it continues on the same route as Route option 1.



Figure 12. Porterville to Exeter Map

EXETER TO REEDLEY (41.0 MILES)

The CVP continues north along the SJVR right of way for 4.9 miles until the Saint John's River, where the route turns east for 18 miles. 3.8 miles of the path along the St. John's River already exists as the [St. Johns River Trail in Visalia](#) with ample tree cover and connection to two recreational amenities. The CVP then turns north along Highway 99 and its adjacent railroad corridor for 7 miles. While cycling near a freeway is not a low-stress experience, the tradeoff for routing the CVP near waterways outweighs the short stint through a high-stress bicycling environment. After the 7 miles along the active railroad corridor, the path turns west along the King's River for 10 miles until just north of Reedley.

REEDLEY NODE (2.1 MILES)

This 1-mile path extending from the King's River using South Reed Avenue and 10th Street connects downtown Reedley with the long-distance route.

VISALIA HANFORD NODE (21.9 MILES)

Visalia is an extremely cycle-friendly town, and while the Central Valley Passage proposed route does not pass directly through it, a 22-mile node will connect the route to Visalia and Hanford to the west. Visalia's robust Active Transportation Plan already has routes, both planned and existing, running east to west through the city. Eight miles of this node will use existing facilities until just outside of Visalia. After that segment, the rest of the node to Hanford (13 miles) will be along an active railroad corridor. The route will end in downtown Hanford, but a possibility to continue the route to the west along this route could be possible given the amount of railroad corridor space between Hanford, Leemore, and Coalinga.

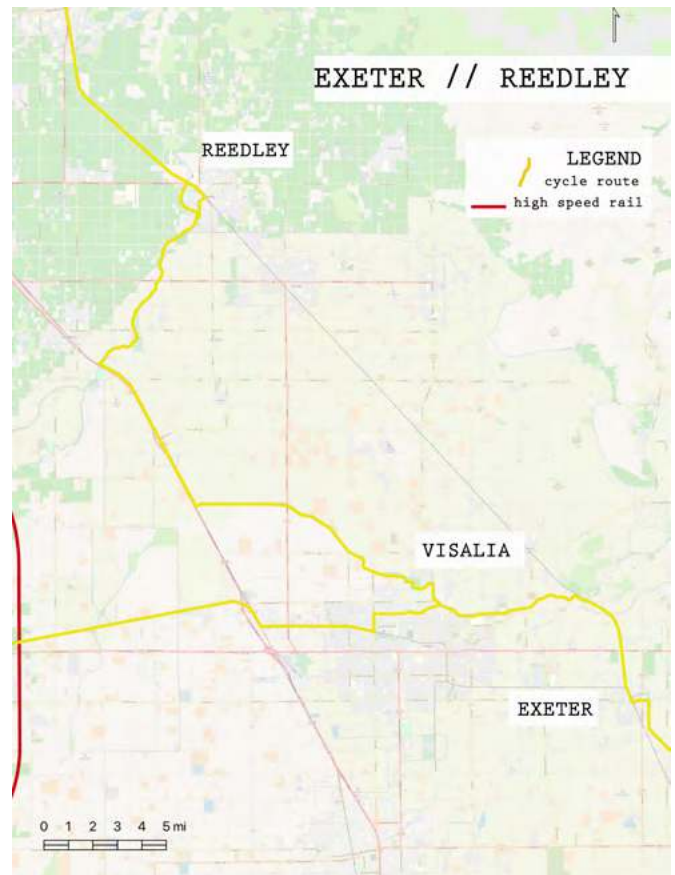


Figure 13. Exeter to Reedley Map

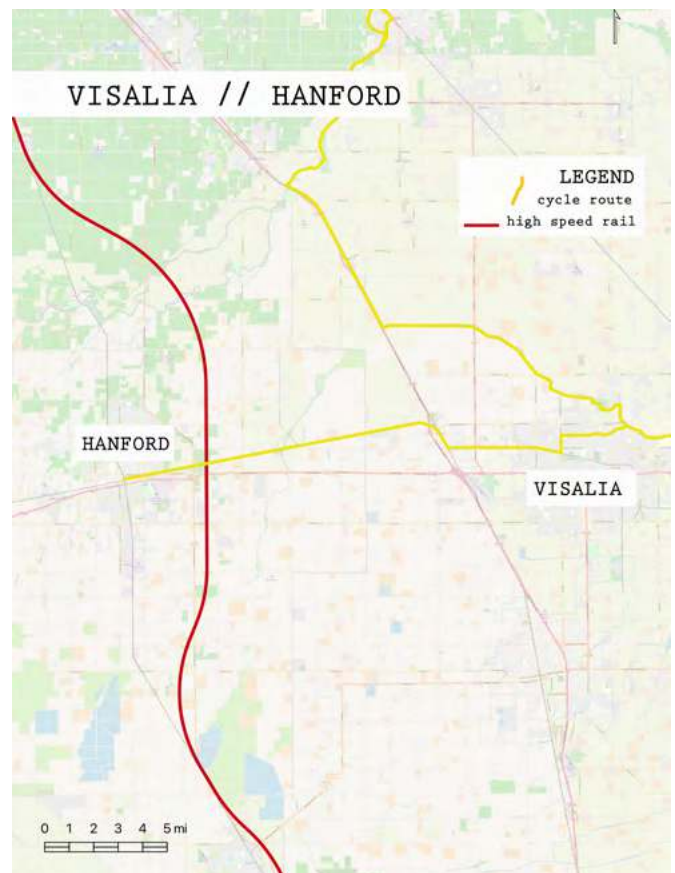


Figure 14. Visalia Hanford Node Map

REEDLEY TO FRESNO (27.0 MILES)

From the connection with either downtown Reedley or just north of the city on the St. John's River, the CVP follows the northwest SJVR railroad corridor for 18 miles, passing through the City of Sanger at its midway point. The CVP then joins with the Fresno County Bridal Trail until the Central No. 23 canal. A series of turns along railroad corridors bring the trail to the High-Speed Rail Corridor, where the route turns northwest until just north of Fresno. This portion of the trail along the HSR corridor is already part of Fresno's 2017 Active Transportation Plan and, therefore, will require signage but no other expenses.



Figure 15. Reedley to Fresno Map

FRESNO TO MADERA (23.1 MILES)

North of Fresno, the CVP snakes through the existing Roeding Park and joins the Cole No. 40 Canal and the Herndon No. 39 Canal for 7 miles until again joining the High-Speed Rail corridor for 14.3 miles until Madera. The route then continues north to Madera.

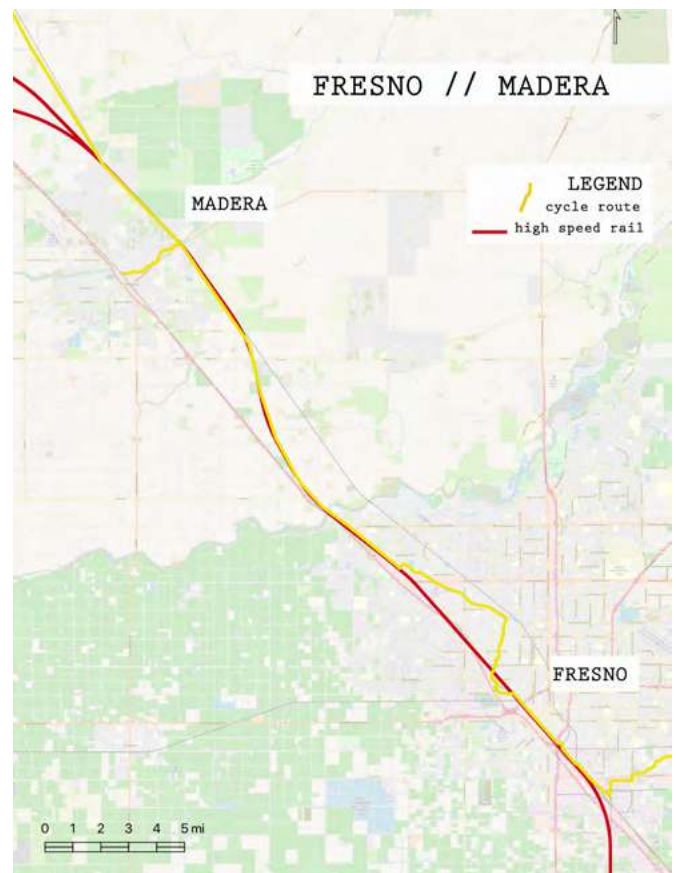


Figure 16. Fresno to Madera Map

MADERA NODE (2.5 MILES)

To access Madera, the trail will include a 2.4-mile node along the Fresno River into downtown Fresno. This node will be a single path for both inbound and outbound cycle traffic for those who wish to stop in Madera.



Figure 17. Madera Node Map

MADERA TO MERCED (36.1 MILES)

For 3.8 miles, the CVP will continue along the HSR corridor until the High-Speed Rail turns toward Chowchilla. At that point, the long-distance route will follow the Burlington Northern Santa Fe Corp (BNSF) railroad corridor for 31.9 miles until reaching Merced, where the trail will make its final turn onto Martin Luther King Jr. Boulevard until the High-Speed Rail Station.



Figure 18. Madera to Merced Map



ROUTE CLASSIFICATIONS

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Creating [low-stress](#) segments and nodes is the key to ensuring maximum ridership for both commuters and adventure cyclists on the Central Valley Passage. The route classification system seen below will aid in design and implementation.

Class	Classification	Description
Class I	I (A)	Paved Bikeway designed for relatively high-speeds with no pedestrians allowed
	I (B)	Paved Multi-use path (most common Class I)
	I (C)	Unpaved multi-use path
Class II	II (A)	Buffered bike lane, or wide bike lane on low-speed, low-traffic street
	II (B)	Regular bike lane (may be stressful)
Class III	III (A)	Traffic-calmed, very low-traffic, very low-speed, bicycle boulevard with safe crossings
	III (B)	Low-traffic, low-speed street, usually with sharrows
	III (C)	Shared route, moderate or high-speeds and volumes, marked with sharrows
Class IV	IV (A)	Designated, bike-only space separated from parked and moving cars with a physical barrier.

Most of the route will be Class I(B) and II(A) paths as those consistently provide the lowest stress environments for cyclists. Because the use of existing facilities will include shared-use paths, this project proposes continuing that shared-use nature of the route by constructing multi-use facilities rather than bike-only paths. The Rails-To-Trails Conservancy is committed to building shared-use paths in existing and former railroad corridors with many planned routes within the Central Valley following rail corridors such as the Union Pacific line and others.

ROUTE TYPES

The Central Valley Passage will run adjacent to four different geographic or structural features: active railroad corridors, former railroad corridors, waterways, and roads. The following section explains the benefits and drawbacks of constructing a bikeway near each element.

Waterway-Adjacent Routes

Under the supervision of the United States Bureau of Reclamation (USBR), a subsidiary of the Department of the Interior, the [Central Valley Project](#) manages water distribution in the Sacramento River, San Joaquin River, and Tulare Basins within the Central Valley. A 400-mile series of canals weave through the area supplying the valley with water

for irrigation and power generation.

The area directly adjacent to the canals is often underutilized. Some segments have already been converted into mixed-use paths for cyclists and pedestrians. Improvements like this can be seen in the Ballona Creek Path in Los Angeles, and more recently, the Friant-Kern Canal path in Bakersfield, which will stretch six miles along the canal.

Because the canals in the Central Valley run continuously without many intersections or interruptions, they create excellent opportunities for planners to design recreational paths in their right-of-way. To obtain the right to build on this land, local jurisdictions or the state government must request to construct and maintain the proposed paths.

According to a recent study by the USBR outlined in the [License for Bakersfield Multi-Use Trail along the Friant-Kern Canal](#) draft document, the Friant-Kern path would produce no significant impact on the quality of the human or environmental landscape. The USBR approved the project to continue under Kern County's jurisdiction. Using this model, more of the canals in the Central Valley can potentially support a cycle network.



Figure 19. *Friant-Kern Canal*

Active Railroad Corridors

Active Rail Corridors often have between 50 and 100 feet of right of way on either side of the rail's centerline, with a 5-foot-wide track. For reference, the [SMART train in Sonoma](#) has been awarded a grant to build a parallel multi-use path in the train's corridor with a required 40-foot setback from the centerline of the tracks or a 15-foot setback if a dividing structure is built.

Therefore, the project must consider using railroad corridors wide enough to accommodate this type of setback. Building along these corridors requires little to no land acquisition. Plus, because of grading for the railroad tracks, these corridors provide relatively flat and low-grade areas where the cost of constructing bikeways is low. Like canals, cross streets infrequently interrupted these corridors, and infrastructure for overpasses, tunnels, and bridges already exist.

Former Railroad Corridor Routes

When a railroad is no longer in use, the land it once occupied is either completely abandoned or still technically belongs to the railroad operator. While repurposing this land into active transportation corridors can be challenging, systems are in place to make the process easier.

The first step is determining whether or not the land is still in the railroad company's possession. If this is the case, it is necessary to work with the railroad operator to railbank the railroad section, per 16 U.S.C. § 1247. A railbanking request means when a railroad is out of commission, the corridor is not considered abandoned and can be "sold, leased or donated to a trail manager without reverting to adjacent landowners."

The Rails-to-Trails conservancy has an extensive [Trail-Building Toolbox](#) with specific steps detailed on how to create multi-use paths on former and active railroad corridors. If a railroad is completely abandoned, the process to acquire the land may be more difficult. When the rail lines were initially built, parcels of land were pieced together to create a contiguous right-of-way.

In some cases, the land remained in possession of the original landowner, and the railroad had an easement. In other cases, the land was sold to the railroad companies, but with the understanding that if the railroad became defunct, the land would return to the original owners. Local or state governments may need to use eminent domain to gain control of abandoned railroad corridors that have been unused for some time.

New Road-Adjacent Bicycle Routes

Building new bicycle facilities along or on roads can prove the most expensive and complicated because of land acquisition. Using the People for Bikes' guide to determine stress levels for on-street cycle facilities when designing new segments will ensure the entire route's low-stress nature.

Existing Road-Adjacent Bicycle Routes

Using existing cycle routes and multi-use paths is frequent in cities and towns with existing active transportation plans. For portions of the long-distance route that fall into this category, way-finding will be an essential investment to help riders remain on the long-distance route and find their way to the route from other facilities within cities.



Figure 20. A former-railroad corridor multi-use path



BUDGET

ROUTE CONSTRUCTION

This proposed budget is based on cost estimates of comparable construction undertakings in the Central Valley with similar adjacent geographic features. Most of our cost estimates are concurrent with the [2018 Kern County Active Transportation Plan](#) with input from other projects such as the [Friant-Kern Canal](#). The overall total budget is in 2020 dollars and includes a budget buffer of 10%. The total proposed budget is approximately \$230,000,000.

Land Acquisition

Land acquisition costs are much of the final budgetary undertaking, however considering the route passes through many jurisdictions, a team should conduct more research to determine the land cost. Caltrans managing this project means the only land costs available are those falling within the Caltrans right-of-way as the land acquisition cost would be \$0.

Tree Cover

A rather large part of our proposed budget for the Central Valley Passage will go toward tree planting. From a recent survey conducted by CalBike, respondents said lack of shade was a significant contributor to stress levels along the route. Therefore, the budget includes funding for the appropriate tree cover, according to our calculations.

According to a [2006 study](#) conducted by the USDA Forest Service, the average tree on public land and public projects costs \$30, with a 35% mortality rate over 40 years. Plan to plant trees 50 feet apart to allow a canopy to develop and to provide adequate room for roots. Therefore, 106 trees per mile should be planted on both sides of the street, equaling 212 trees per mile of route.



NEXT STEPS + IMPLEMENTATION

PHASES

Because of the project's scope and size, the Central Valley Passage is designed to be implemented in phases as funding at the local, state, and federal funding becomes available. The plan prioritizes commuter biking over recreational riders and tourists. The Central Valley Passage's final iteration will serve both groups. Therefore, the CVP's first phase covers areas with denser populations and existing bicycle infrastructure.

Much of Phase I of the Central Valley Passage lies within Kern County. This phase will coordinate with the county's comprehensive Active Transportation Plan and High-Speed Rail Phasing Plan. While Bakersfield is the southernmost point of the current proposed CVP, a southern extension could eventually follow the second phase of the High-Speed Rail Plan as it continues toward Los Angeles.

Phase II includes building in the central area of the proposed Phase I of the High-Speed Rail Projects. This phase is of lower priority as more considerable distances exist between large cities in this area.

Phase III contains segments key to completing a contiguous long-distance route. However, based on the population in these areas and rates of inter-city bicycle travel they represent a lower priority.

Phase	Segments	Counties Included
Phase I	Bakersfield-McFarland	Kern
	Shafter-Wasco Node	Kern
	Mcfarland Node	Kern
	McFarland-Richgrove	Kern
	Delano Node	Kern
	Fresno-Madera	Fresno, Madera
	Madera Node	Madera
Phase II	Porterville-Exeter	Tulare
	Exeter-Reedley	Tulare
	Reedley Node	Fresno
	Visalia-Hanford Node	Tulare, Kings
Phase III	Porterville-Exeter Alternate	Tulare
	Richgrove-Porterville	Tulare
	Reedley-Fresno	Fresno
	Madera-Merced	Madera, Merced

POTENTIAL FUNDING SOURCES

Because the Central Valley Passage will stretch across numerous jurisdictions, several potential funding sources can provide the money needed to build this vital route.

The Rails-to-Trails Conservancy lists four potential funding types for long-distance cycle routes: federal funding, formula grant funding, discretionary grant funding, and innovative financing strategies. For this project, there are also potential state and local funding sources more specific to our locale.

Funding Category	Funding Source(s)
Federal Funding	- Fixing America's Surface Transportation Act (lapses in 2020) -USDOT Transportation Alternatives Set-Aside Program
Formula Grant Funding	-The Congestion Mitigation and Air Quality Improvement (CMAQ) Program -Surface Transportation Block Grant Program (STBG) -Highway Safety Improvement Program and the Federal Lands Access Program
Discretionary Grant Funding (Federal grants to encourage different forms of transportation on a state and local level)	-Better Utilizing Investments to Leverage Development (BUILD)
Innovative Financing Strategies	-Transportation Infrastructure Financing and Innovation Act (TIFIA)
Local Funding Sources	-Active Transportation Program (Caltrans)



APPENDICES

APPENDIX A: LITERATURE REVIEW AND BEST PRACTICES

Domestic and International Bicycle Routes

Much of the literature surrounding long-distance cycle routes is based on recreation rather than transportation. The dual purpose of the Central Valley Passage will ensure both recreational and active transportation components. The coupling of the CVP with the High-Speed Rail project will provide the possibility of using this route for inter-city commuting.

Most communities see [major long-distance bike routes](#) as opportunities for adventurous escapism. They focus on completing an entire trail. This plan takes a different approach, however. Its goals strive for both connectivity between cities and a contiguous route through the Central Valley. Exploring other long-distance paths from different locales for insights concerning shelter placement, access to services, and safety and signage help inform final implementation recommendations in this report.

The Rijnfietsroute, Holland



Figure 21. The Rijnfietsroute, Holland

The [Rijnfietsroute in Holland](#) runs for 168-miles on an inland cycle route through the Rhone basin. It is part of the Landelijke Fietsroutes (LF) system, a series of long-distance cycle routes throughout the country. Portions of the Rijnfietsroute follow rivers and other bodies of water while others follow mountain foothills or run directly through populated cities and towns. While the overall climate differs from that of the Central Valley, the route provides a guide for signage, mapping, and path deviations.

Signage

The LF system has consistent signage, with the name of a specific route printed onto the top or bottom of the sign to aid cyclists in staying on the correct route. Consistent signage for major routes, key destinations and sights (including rivers, canals), and rest facilities like bathrooms, drinking water, and deviations that point to locations farther from the proposed route, for example, historic towns should be provided by Caltrans to ensure continuity through the many districts and municipalities along the route.

Mapping

The LF Route website provides detailed interactive maps of routes and the locations of campsites, lodging, services, and points of interest. The website also offers an option to “Plan Your Route,” which takes the guesswork out of planning a cycle trip and guarantees lodging at the end of every day.

Path Deviations

The LF-Route system comprises over a dozen long-distance trails throughout Holland. The paths interact with one another seamlessly by following excellent signage that lets riders choose which route to take while ensuring a low-stress environment. The Central Valley Passage will connect to other existing cycle routes when passing through cities and towns. Having consistent signage and low-stress transitions along the route will make cyclists more confident in their ability to navigate without GPS assistance.

Rails-to-Trails Conservancy

The Rails to Trails Conservancy’s (RTC) mission is to convert former and active railroad corridors into active transportation routes

across the United States. These corridors are flat or gently sloping. Cycle paths built along them would have a consistent low-grade conducive to multiple types of active mobility such as cycling, walking or running.

By partnering with local organizations, the RTC decides where exactly a new trail along a rail corridor could contribute to the overall connectivity to the entire local trail network. While the Conservancy has specific plans to build a long-distance route across the United States, they also focus on planning routes along corridors to augment existing cycle routes.

Resources

Many active and former rail lines through the Central Valley run through Bakersfield and Merced with corridors that could be repurposed through partnerships with the Rails-to-Trails Conservancy. The Central Valley long-distance route will use existing and planned local cycle routes as part of its overall plan and learning from Rails-to-Trails, the High-Speed Rail corridor will be a supplemental resource for inter-city travel.

Erie Canal Bike Trail

Developed and operated by the [New York State Canal Corporation](#) (NYSCC), the Erie Canal Bike Trail stretches 365 miles along the right-of-way of the Erie Canal in northern New York between the cities of Buffalo and Albany. The [NYSCC](#) is a public-benefit corporation responsible for the oversight and maintenance of New York’s Canals.

Most of the route is unpaved and filled in with gravel. Its long, uninterrupted stretches



Figure 22. Erie Canal Bike Trail

Starting town: Rochester
Ending town: Syracuse
☐ Include round trip mileage

[Select All Businesses / Services]
[UNselect All Businesses / Services]

Restaurant

Grocery

Vending

Lodging

Camping

Bike Shop

Repair Station

ATM

Parking

Library

Visitor Info

Restroom

Water

Point of Interest

Playground

Winery / Brewery

Figure 23. *Bike Erie Canal Trip Planner*

through tranquil hillsides, along waterways, and through towns of northern New York make the route perfect for riders of all ages.

Trip Planning

The [Bike Erie Canal](#) website is an excellent trip planning platform with information on lodging, bike shops, transportation, grocery stores, and even breweries. By choosing the state and endpoint of a trip, riders can see exactly what to expect along their route and plan accordingly. A feature like this along the Central Valley route could encourage ridership by providing complete transparency about what services and support infrastructures (rest stops, water) are available.

Management and Oversight

The NYSCC manages the entire Erie Canal Bike Trail. This gives a great deal of continuity to the project and provides a single funding source that allows quick maintenance response. Having a group, such as the California State Parks, be responsible for the Central Valley Passage upon completion may allow for more consistent maintenance and continuity.

Great Central Valley Bicycle Route and Michael Smiley

The Great Central Valley Bicycle Route, designed and planned by Michael Smiley, an architect and urban planner by trade and an active adventure cyclist, represents the demand for a designated cycle route through the Central Valley of California. Smiley's proposed route stretches from Bakersfield in the south to Lake Shasta in the north.

This route does not propose new construction but identifies low-stress (either Class I or Class II route) existing roads and cycle paths for cyclists to use in traversing areas of the Central Valley. The route's design highlights historic sites and takes cyclists to the heart of most major cities along the route, including our study area of Bakersfield, Fresno, and Merced. Smiley's goal with this route is eventually to have it serve as the southern leg of USBR 87.

Route Placement

Smiley designed this route to ensure cyclists have access to food and water every 10-20 miles, bicycle repair and retail every 25-30 miles, and overnight accommodations every 40-60 miles. These accommodations include campgrounds and hotels, and more research surrounding long-term bicycle parking is necessary.

This spacing is ideal for both long-distance cyclists and a commuter cyclist, as it provides adequate access with appropriate frequency to food and water along the route. Smiley's proposed route runs mostly east of Highway 99, through the more populated areas of the Central Valley. Caltrans proposes the HSR run west of Highway 99 due to fewer land constraints. While the ease of constructing the long-distance path entirely within the Caltrans right-of-way is tempting, a note from this plan shows the importance of locating the path along a more populated route for safety and ease of cycling.

APPENDIX B: CYCLISTS AND WEATHER

Cyclist Class

When planning the Central Valley Passage, accessibility for a myriad of cyclists is critical. The “design cyclist” is someone who needs a water break with shade every 5-10 miles and is interested but concerned with safety. The “design cyclist” needs a high degree of protection from car traffic and can ride 12 mph on a traditional bicycle and 20mph with an electric bike. When designing resting points along the Central Valley Passage with water access, every type of cyclists’ capacity for hydration, physical activity, and water storage must be considered. Using the “design cyclist” as a baseline for planning the CVP, the maximum amount of accessibility in our design is ensured.

Central Valley Weather

The [weather in the Central Valley](#) can be extreme at points of the year, and during the summer months, the area reaches consistent

high temperatures of 98 degrees. The average wind speed in the Central Valley is 7.9 mph in 2020, with a max wind speed of 27.7mph in February. According to the [Beaufort Scale](#), a 10-mph wind can impede travel if directly opposing cyclists, and it is understood winds above 30mph to be [unsafe for cycling](#).

Because of these considerations, the Central Valley Passage needs to construct or ensure the existence of shaded rest stations every 5-10 miles along the route and avoid constructing the route along windy corridors.

To reduce wind speeds and increase shade along the Central Valley Passage, tree planting and the construction of shade structures is recommended. Shade structures along corridors will increase the visibility of the route as well as serve as an opportunity to bring art and color to large swaths of land along the route.

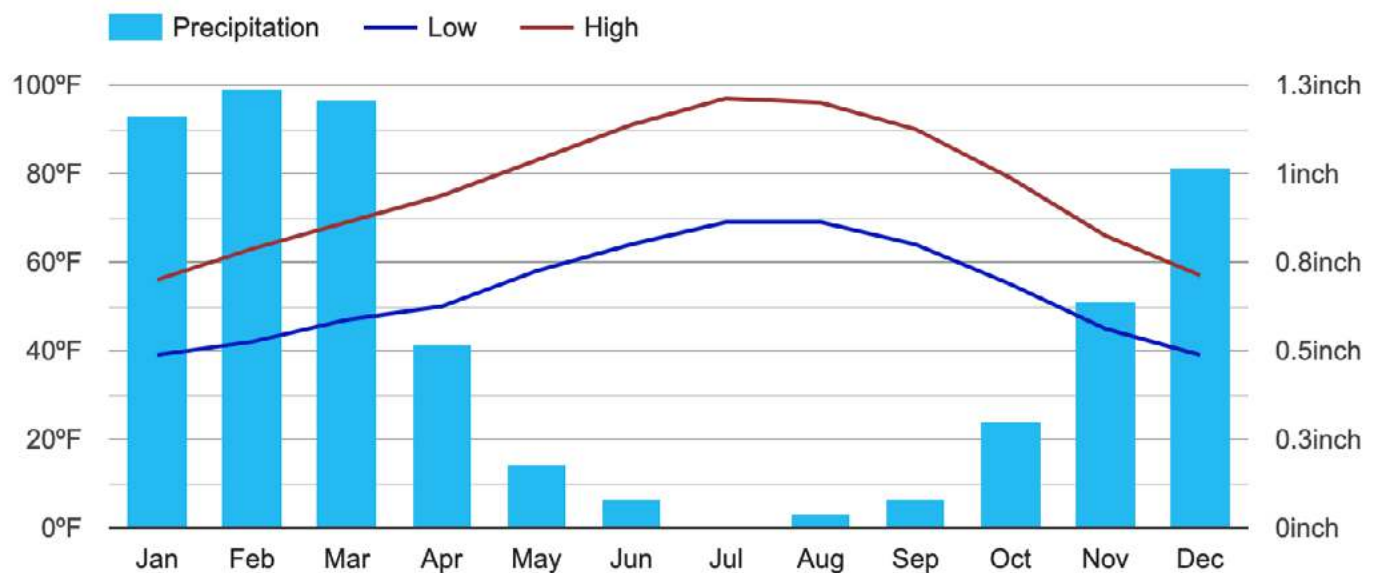


Figure 24. Annual weather chart for the Central Valley

APPENDIX C: CONSTRUCTION

Materials

According to a [study by the University of Illinois](#), planners should decide on which construction materials to use by three procedures: determining pavement use, construction traffic, and climate. Pavement use is split into light duty (able to be used by low-speed vehicles such as golf carts), regular duty (able to be used by pickup trucks weighing up to one ton), and heavy duty (includes single-axle dump trucks, full-size garbage trucks, and commercial boom/bucket trucks).

Most bike lanes are constructed at a regular duty rating. However, because service vehicles may need to access portions of rail corridors, it may be necessary to build parts of the route using the heavy duty rating.

Concrete vs. Asphalt

[Climate and maintenance](#) are the two factors in choosing between concrete and asphalt. Concrete is more expensive to install and repair, but the final product lasts longer with an approximate 30-year lifespan and requires less maintenance while performing well in warm or tropical climates.

Asphalt is less expensive to install and easier to repair than concrete, but often requires more frequent repairs and has a shorter lifespan of 20 years. In extreme heat, the petroleum used to bind asphalt can melt and make the surface of the route slick.

Considering temperatures in California's Central Valley reach up to 100 degrees in the summer with a high number of sunny days, using concrete, despite the additional cost, will produce a longer-lasting and safer bicycle route.

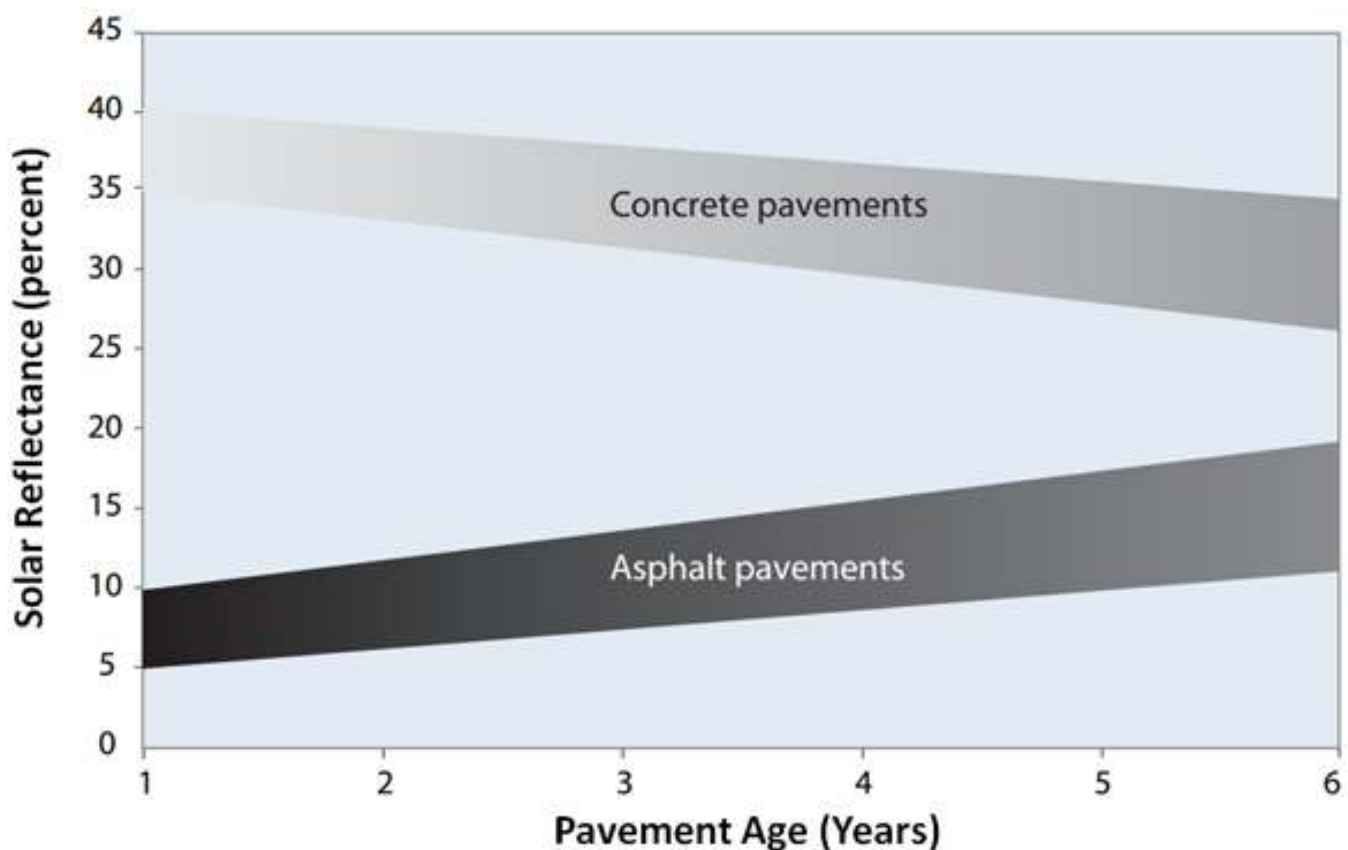


Figure 25. Solar Reflectance of concrete vs asphalt pavements