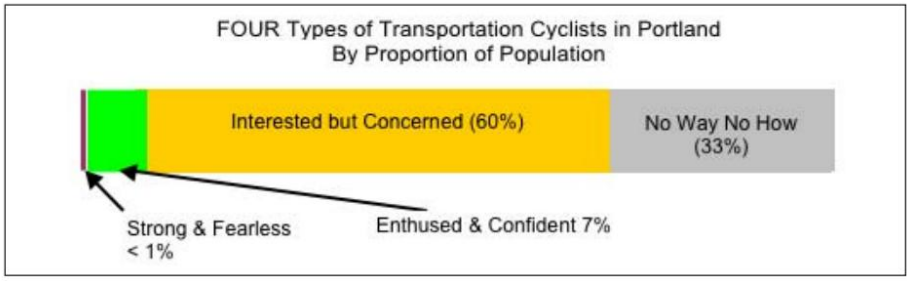
4. NEEDS ANALYSIS

This section summarizes the bicycling needs in Nevada County that have been discussed in **Chapter 3**: Existing Conditions and identified by staff, the public and during field inspections. Specific projects and programs are addressed in **Chapter 5**.

4.1 BICYCLIST NEEDS

To build a safer and more inviting network of bicycle facilities and programs, it is important to understand the specific needs of bicyclists with differing levels of riding experience and comfort in mixed traffic. This chapter identifies four types of bicyclists in Nevada County, and addresses their different needs and preferences. The rider types, according to a peer-reviewed methodology by the Portland Office of Transportation, are described below.

4.1.1 Four Rider Types



Source: Roger Geller

Strong and Fearless

These riders typically comprise less than one percent of the population. They ride in Nevada County regardless of roadway conditions, and can ride confidently in mixed traffic and hilly terrain. Many of the 0.5 percent of Nevada County's working population who commute by bicycle fall into this category.

Enthused and Confident

Enthused and Confident riders are still comfortable sharing the road with vehicle traffic, but they prefer the separation afforded by Class II bike lanes or Class III bike routes with multiuse shoulders. Compared to Strong and Fearless riders, Enthused and Confident bicyclists are more sensitive to road conditions, and less likely to ride if a roadway presents a perceived safety hazard. Research suggests that these riders are the easiest to attract to regular riding with new facilities. Nonetheless, they only comprise about seven percent of the population.

The above two categories – under 10 percent of Nevada County's population – are the most likely to use Class II bike lanes and Class III bike routes with multiuse shoulders on County collectors and arterials. The County can retain and attract these respective groups by striping and maintaining existing and proposed shoulders and Class II bike lanes.

Interested but Concerned

These riders represent the majority of Nevada County's population (approximately 60 percent). They are curious about bicycling, and may occasionally ride on paths or calm "low stress" streets, but they typically do not ride on a regular basis due to safety concerns and the relative convenience of other modes. These riders are most attracted to Class I bike paths or low speed residential areas where they experience little conflict with motor vehicles. Due to safety concerns, Interested but Concerned riders will likely not use Class II bike lanes on long stretches of major arterials and collectors. They are also unlikely to ride on Class III bike routes with multiuse shoulders along rural County roads, especially over variable terrain.

Jurisdictions can attract Interested but Concerned riders by connecting pockets of low-stress residential roads with formal bikeways and paths, providing safe routes to local schools, and through educational programs.

No Way No How

Research suggests that about a third of the population is disinterested in cycling. They do not own a bicycle, and do not intend to ride for utility or recreation. Nonetheless, these individuals are important to the future of bicycling in Nevada County. Whether they drive, take transit, or walk, No Way No How residents share the transportation system with Nevada County's cyclists. Education programs can help inform this population about bicycling and rules of the road, and bicycle facilities can increase awareness of bicyclists to motorists and transit vehicles.

4.1.2 Commuter and Recreational Needs

Bicyclists in Nevada County may ride for utility, recreation, or both. These two trip purpose categories have different characteristics and may require different measures to promote riding and bicyclist safety.

Commuting Cyclists

These individuals ride for utility – to work, school, shopping, or other destinations. Bicycle commutes are typically shorter than those made by vehicle, with many commuters riding fewer than three miles per one-way trip. Measures to support these riders may include Class II bike lanes or widened shoulders on arterials that connect residential uses to employment and shopping areas, safe routes to school, and support facilities like bike parking, lockers and showers. Commuting cyclists may also use transit to complete their trip. Jurisdictions may consider transit station bike parking, bike lanes, paths or widened shoulders to transit stations, and bike-compatible buses to encourage multimodal commutes.

Recreational Cyclists

These cyclists vary from Interested but Concerned riders who may complete a short loop on residential roads and Class I bike paths to Strong and Fearless cyclists who ride long distances on rural County roads and major arterials. Many of the improvements in this plan are designed to serve both transportation and recreation cyclists who share the same routes on local paths and roadways.

4.2 PUBLIC OUTREACH

A key component of this Bicycle Master Plan is public participation. To ensure the plan was tailored to local needs and concerns, the Project Advisory Committee hosted community workshops, developed a web site for the plan, and conducted an online survey. This section documents these outreach efforts and provides key takeaways.

4.2.1 Community Workshops

The Project Advisory Committee hosted two workshops in Grass Valley and Nevada City in February and March 2013. The workshops had an open-house format, giving residents and members of the committee the opportunity to interact and share ideas. At the workshops, approximately 50 attendees provided suggestions for the proposed bicycle network, support facilities, and educational programs.

Key takeaways from the workshops included:

- Need increased connectivity between Grass Valley and Nevada City.
- Widen shoulders and provide bike lanes when practicable. Examples include improvements to Highway 49, Newtown Road, and Rough and Ready Highway.
- Maintain existing facilities, keeping shoulders and Class II bike lanes clear of debris that force cyclists into mixed traffic.
- Provide education programs to motorists and cyclists for increased awareness and compliance with vehicle code.
- Develop safe routes to schools, including connections to Seven Hills Middle School and Deer Creek Elementary School.
- More secure bike parking at destinations.

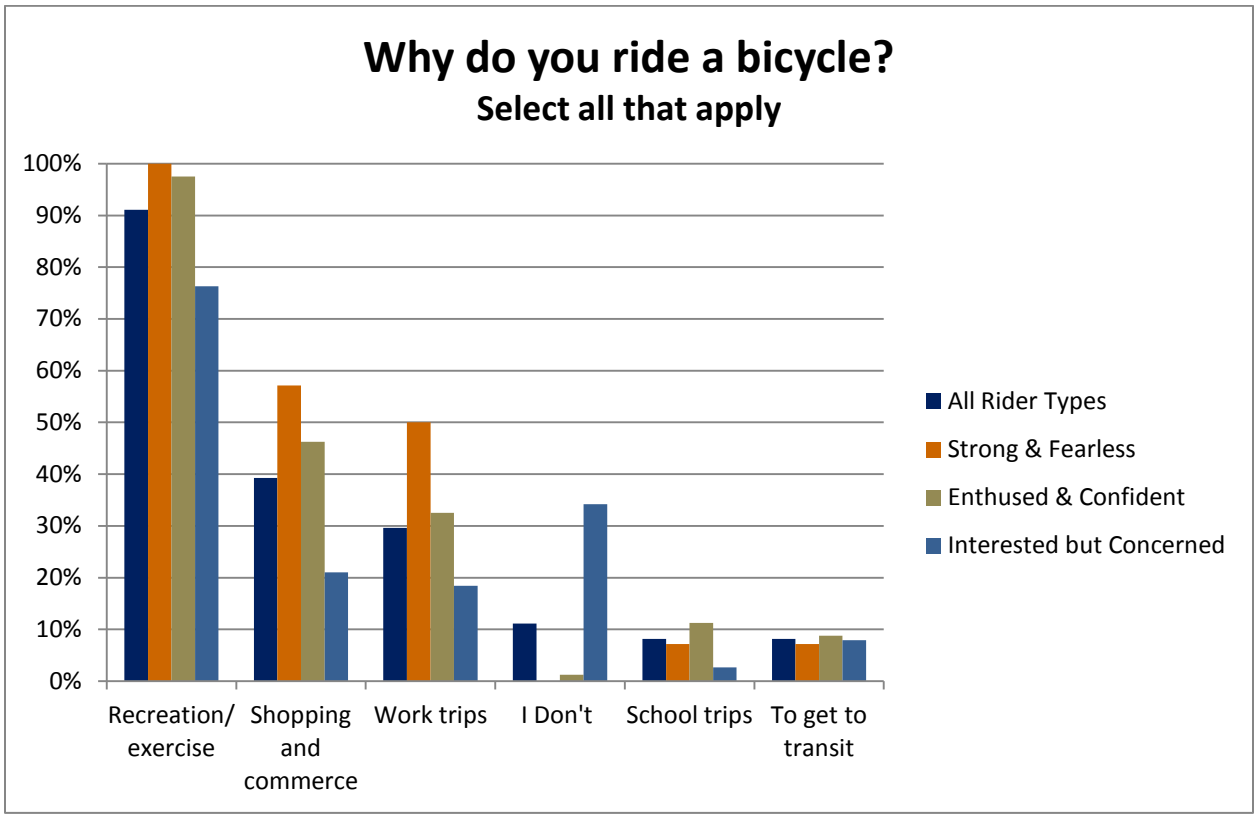
Photographs: Community workshops in Nevada City (above) and Grass Valley (below).

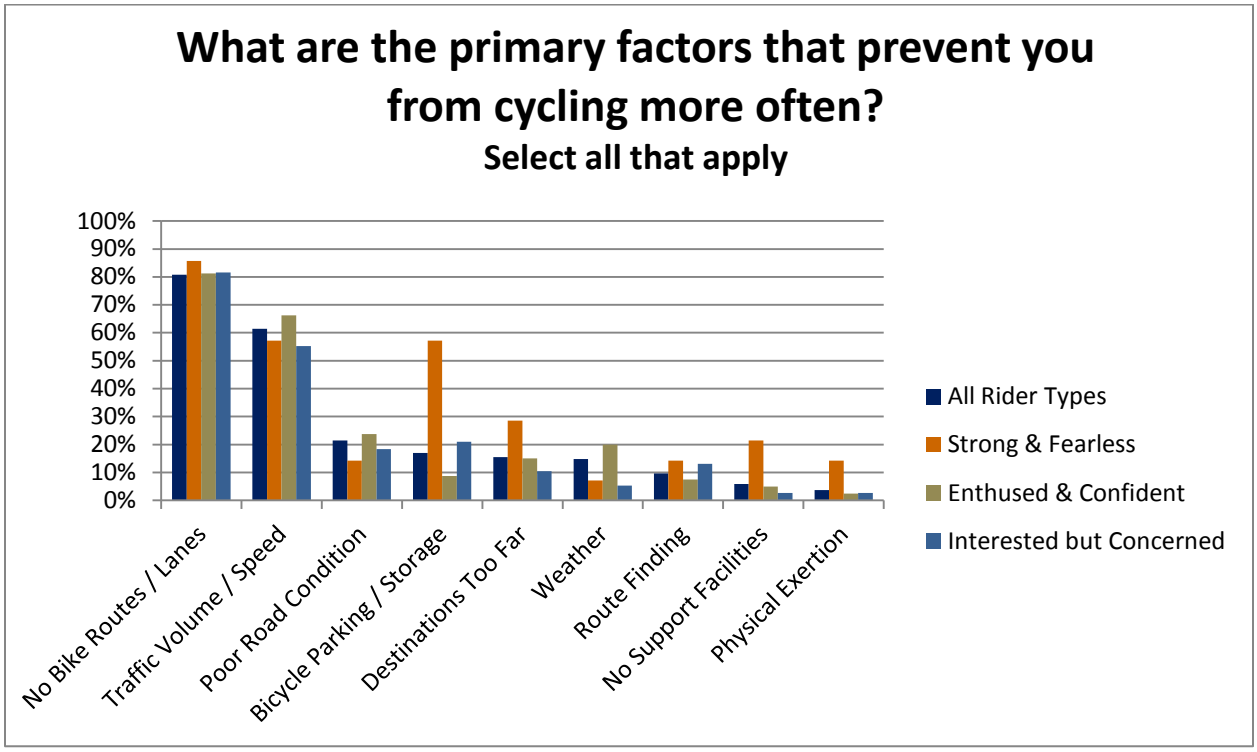
4.2.2 Survey

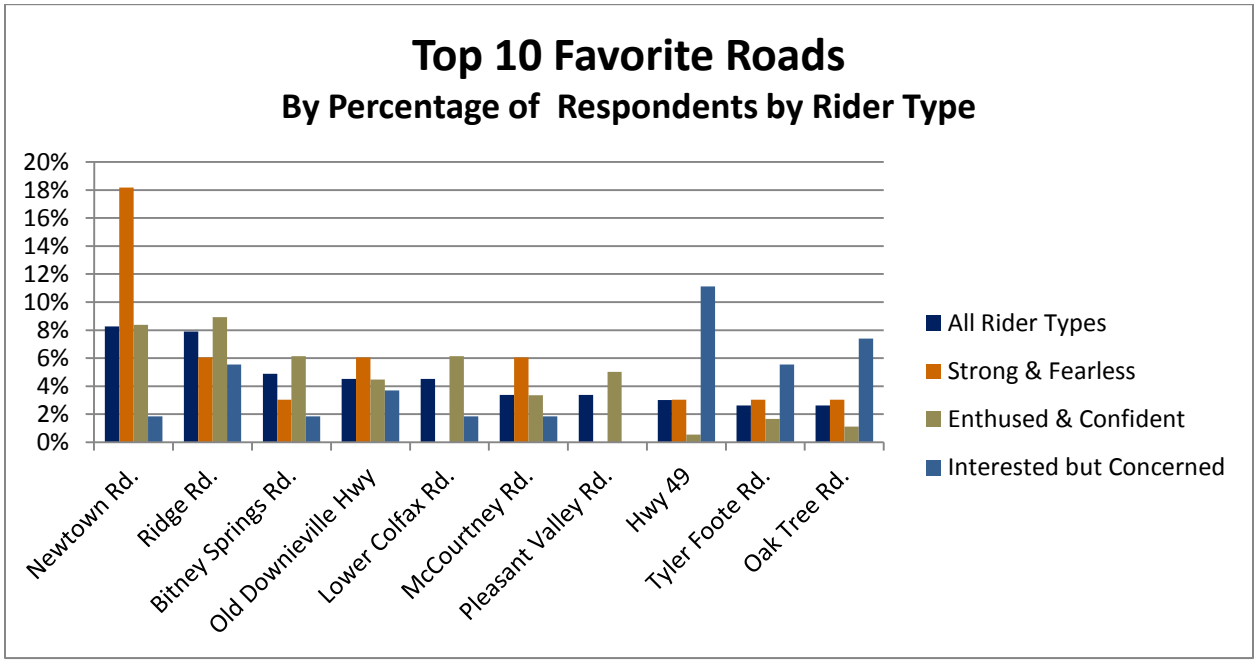
Along with outreach events, the Project Advisory Committee conducted an online survey to collect input from residents. The majority of the 160 respondents rode for recreation and exercise, and about 85 percent indicated another trip purpose like commuting to work or school, bicycling to shopping

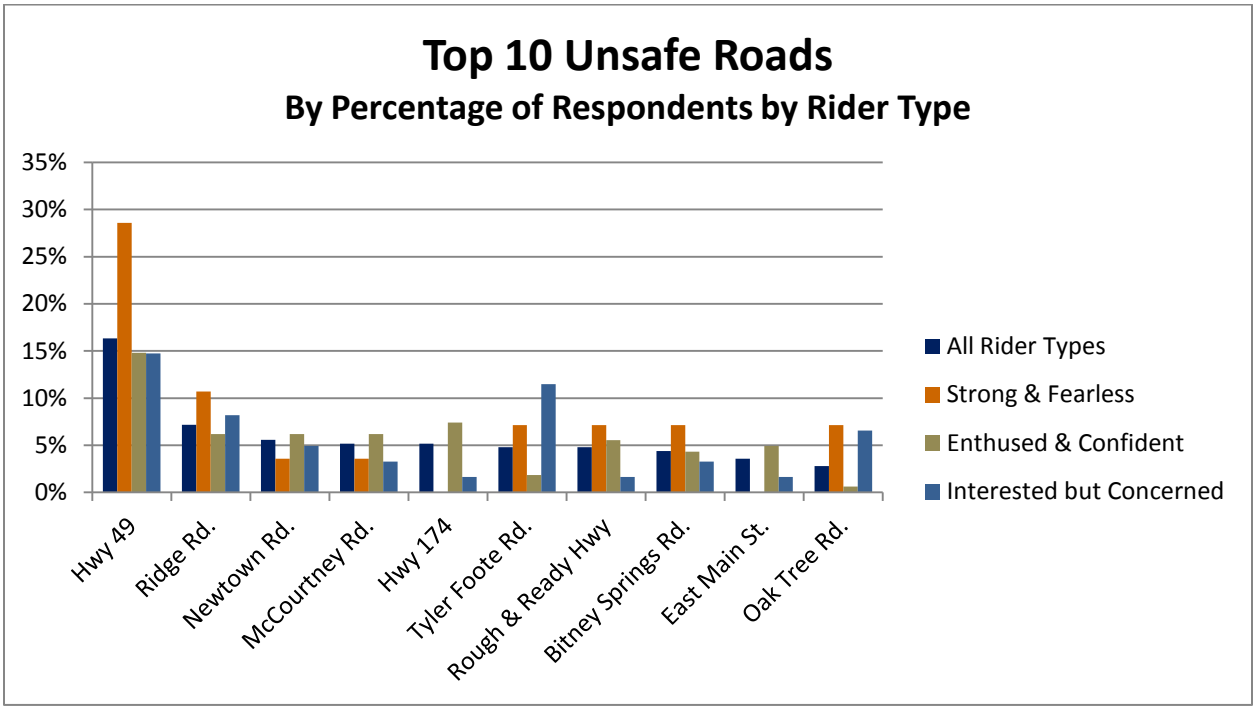
destinations, and riding to transit. While most respondents identified themselves as Enthused and Confident riders, the survey included feedback from other rider types including Interested but Concerned bicyclists, who made up about thirty percent of respondents. The Project Advisory Committee was able to separate responses by rider type to better understand feedback from different user groups.

The survey revealed similar concerns to those expressed in the community workshop, as well information contained in the following figures and **Appendix B**:




What are the primary factors that prevent you from cycling more often?
Select all that apply
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
No Bike Routes / Lanes
Traffic Volume / Speed
Poor Road Condition
Bicycle Parking / Storage
Destinations Too Far
Weather
Route Finding
No Support Facilities
Physical Exertion
All Rider Types
Strong & Fearless
Enthused & Confident
Interested but Concerned


Top 10 Favorite Roads
By Percentage of Respondents by Rider Type
20%
18%
16%
14%
12%
10%
8%
6%
4%
2%
0%
Newtown Rd.
Ridge Rd.
Bitney Springs Rd.
Old Downieville Hwy
Lower Colfax Rd.
McCourtney Rd.
Pleasant Valley Rd.
Hwy 49
Tyler Foote Rd.
Oak Tree Rd.
All Rider Types
Strong & Fearless
Enthused & Confident
Interested but Concerned



4.3 CURRENT USAGE AND FUTURE BENEFITS

4.3.1 Bicycle Usage Data

Journey to work data was obtained from the 2007-2011 American Communities Survey for Nevada County, California, and the United States. Journey to work data are shown in **Table 4-**1.

TABLE 4-1: JOURNEY TO WORK DATA

Mode	United States	California	Nevada County	
			Percent	Number of People
Bicycle	0.5%	1.0%	0.6%	239
Walked	2.8%	2.8%	3.2%	1,371
Drove Alone	76.1%	73.0%	74.7%	32,106
Carpool	10.2%	11.7%	9.9%	4,258
Public Transit	5.0%	5.1%	0.5%	216

Source: American Communities Survey, 2007-2011.

As shown, approximately 0.6 percent of the Nevada County journey-to-work trips are made by bicycle, or about 239 trips. This number is greater than the 0.3 percent mode split reported in the 2007 bicycle plan update. This modest increase may be partially explained by a number of factors including: newly constructed bicycle facilities, outreach efforts from bicycling organizations, changes in economic conditions, increased bicycling for environmental and health reasons, differences in data collection and inference between the American Communities Survey and US Census, and random sampling variation.

The data above likely underestimates the true amount of bicycling in the County. Neither Census nor American Communities Survey data include the number of people who bicycle for recreation, children who bicycle to school, or for non-work commute trips like bicycling to commercial areas. The data also reflects only a person's dominant commute mode and does not account for biking to transit. Finally, the percentage of non-commute bicycle trips is likely greater than the percentage of bicycle commute trips as commute trips tend to be longer and less bikeable than shopping or school-related trips.

4.3.2 Future Usage and Benefits

A key goal of the Bicycle Master Plan is to maximize the number of local bicycle commuters in order to help reduce traffic congestion and air pollution, and improve health outcomes. Little data currently exists to quantify the number of residents who would bicycle if conditions for cycling improved in the county. To estimate this latent demand and determine potential usage, we must rely on an evaluation of comparable communities that have improved conditions for bicycling.

Bend, Oregon

Bend is a city of about 77,000 people in Central Oregon's Deschuttes County. The city has some similarities to Nevada County, with rural, mountainous outlying areas that often experience adverse weather and an economy supported in part by recreation activities like nearby skiing and outdoor areas. Like Nevada County, Bend has a large recreational riding community and hosts a major annual bicycle race, the Cascade Classic that draws cyclists from around the region. Nonetheless, the two areas have differences that should be taken into account. First, about 73 percent of Deschutes County's employed residents also work within the county, compared to 48 percent for Nevada County.[6] This indicates that commutes in Deschutes County are shorter and therefore more bikeable. Second, the most populated areas in Bend and Deschutes County do not have the same topographical challenges as Nevada County, which has steeper grades between major destinations.

[6] *Work Area Profile Report, Nevada County* and *Work Area Profile Report, Deschutes County*, Census on the Map 2010, accessed March 2013.

Despite these differences, conditions for Bicycling in Bend are a good benchmark for Nevada County. Thanks to improved bicycle facilities, community outreach, cycling tourism, and other factors, the city has 2.5% journey to work bicycle mode share.[7]

South Lake Tahoe, California

South Lake Tahoe is another mountainous city with a large number of cyclists who ride for utility and recreation. The city shares many similarities to communities in Nevada County, but like Deschuttes County major employment and housing centers are on similar topographic profiles, mostly surrounding Lake Tahoe. The city and surrounding area also have major employers like Heavenly Ski Resort, casinos, destination restaurants, and hotels that employ large amounts of service industry workers. These workers may be more likely to commute by bike and could explain some of South Lake Tahoe's relatively high bicycle mode share.

South Lake Tahoe has a 4.5% journey to work bicycle mode share, which could serve as a high-end benchmark for Nevada County.[8]

Forecasting Bicycle Usage

The average journey to work mode share for the above communities is 3.5%. Due to the rural nature of Nevada County and its unique topographic challenges relative to other communities, it is reasonable to expect a slightly lower forecasted mode share. Nevada County's goal is to achieve a bicycle mode share of three percent by the year 2025. By interpolating growth from the year 2000, the estimated population of workers over 16 years of age is about 45,000. The potential impacts of achieving this goal are available in **Table 4-2**.

[7] *Means of Transportation to Work*, American Communities Survey 2007-2011 5-year estimates, accessed March 2013

[8] Ibid.

TABLE 4-2: BENEFITS OF IMPROVED BICYCLE MODE SPLIT (YEAR 2030)				
2030 Bicycle Mode Split	**Bicycle Commuters**	**Annual Vehicle Trips Saved**	**VMT Saved**	**Lbs CO_2 Saved**
0.6% (Existing Mode Split)	252	80,637	645,092	593,434
2.8% (State Goal Mode Split)	1,268	405,775	3,246,201	2,986,251
3.0% (Nevada County Goal Mode Split)	1,359	434,759	3,478,072	3,199,555
Source: Fehr & Peers, 2013				

5. PROPOSED NETWORK AND IMPROVEMENTS

This chapter presents the proposed bicycle network and improvements for Nevada County. The recommended system and improvements consist of bicycle facilities: including the bikeway system, parking and support facilities, and bicycle programs related to safety, education and outreach. It is recommended that all the jurisdictions of Nevada County adopt the infrastructure and program plan recommended in this section to ensure effective and consistent implementation countywide.

5.1 INTRODUCTION

The recommended bicycle circulation strategy consists of a comprehensive network of utilitarian and recreational bikeways connecting residential areas of Nevada County with destinations like schools and commercial centers. The proposed network is shown in **Figure 5-1**; **Figure 5-2** shows the trails and bikeways network proposed in the Town of Truckee Trails and Bikeways Master Plan. **Tables 5-1** through **5-4** include a summary of the proposed bikeways by jurisdiction. The tables are sorted by facility type and include cost estimate and prioritization information. **Chapter 6** describes the methodology for cost estimates and prioritization; **Appendix D** includes the proposed bikeway lists sorted by benefit score and feasibility score. Cost estimate and prioritization information for projects in the Town of Truckee is included in the Town of Truckee Trails and Bikeways Master Plan.

The system and project prioritization were selected according to input from agency staff and members of the Project Advisory Committee, and members of the public through surveys and workshops.

5.1.1 Creating a Network

A bikeway network consists of facilities that provide superior conditions for bicyclists compared to other roadways in the county. It is important to state that by law bicyclists are allowed on all streets and roads, except where they are specifically prohibited, regardless of whether they are part of the bikeway system. The bikeway network is a tool that allows the County and its jurisdictions to focus and prioritize implementation efforts where they will provide the greatest community benefit.

The Project Advisory Team selected proposed facilities according to the following criteria:

- Existing bicycling patterns and levels of expected usage
- Traffic volumes and speeds
- Safety concerns, including prior collisions involving bicycles
- Available right-of-way
- Connectivity to key destinations
- Closures of critical gaps in the existing bicycle network

Additionally, members of the public and the Project Advisory Committee expressed particular interest in improving connectivity between Nevada City and Grass Valley. Intercity connectivity was therefore used as a key evaluation criterion for projects in and around these incorporated areas.

It is important to note that the bikeway system and project prioritization serve as guidelines to those responsible for implementation. The system and projects themselves may change over time according to shifts in bicycling patterns, implementation constraints, and new opportunities for bicycle facilities.

5.1.2 Environmental Protection

Bicycling is one of the most environmentally sound forms of travel, especially as an alternative to motor vehicle use. Nonetheless, some pathway proposals in this plan may have environmental impacts, including impacts to biological resources. All of the projects in this plan will require additional feasibility analysis, which must include required environmental analysis.

5.2 PROPOSED BIKEWAY NETWORK

Recommended segments are divided into Class I bike paths, Class II bike lanes, Class III bike routes with multi-use shoulder, and Class III bike routes. Additionally, the Town of Truckee Trails and Bikeways Master Plan includes several proposed recreational trails; proposed recreational trails in western Nevada County are described in the Western Nevada County Non-motorized Recreational Trails Master Plan. The fully built-out network in western Nevada County would consist of approximately 9.6 miles of Class I bike paths, 17.4 miles of Class II bike lanes, 61.2 miles of Class III bike routes with multi-use shoulder, and 174.1 miles of shared Class III bike routes. Prioritization and implementation strategies are found in **Chapter 6**.

5.2.1 Class I Bike Paths

Several segments of new Class I bike paths are proposed in this plan. The locations of these segments were determined according to existing rights of way, including the presence of existing but informal pathways, and the evaluation criteria described in section 5.1.1.

Additional opportunities for Class I bike paths beyond those proposed in this plan may exist. Jurisdictions within the region should begin exploring with Caltrans opportunities to relinquish non-essential areas in the controlled access corridor to the appropriate jurisdiction to allow for use of these areas for Class I bike paths or pedestrian paths.

Litton Pathway Extension

This proposed facility extends the existing paved Litton Pathway in Grass Valley from its current terminus at Sierra College Drive, through and around the campus in a loop with a spur connecting to existing bicycle lanes on Ridge Road. This alignment would pave an existing dirt pathway along public property and provide school access as well as recreational opportunities for cyclists and pedestrians.

Idaho Maryland Pathway

The 2011 Nevada County Pedestrian Improvement Plan proposed a multi-use path on the south side of Idaho Maryland Road from Main Street to Sutton Way. The path would provide a separated bikeway for cyclists to access key destinations including shopping centers on Sutton Way and the proposed Loma Rica Ranch Specific Plan Area. There are no existing dirt pathways on the proposed alignment.

Loma Rica Ranch Pathways

The Loma Rica Ranch Specific Plan identified a multi-use path extending from Sutton Way to the eastern extent of the plan area. The proposed path includes a northeast/southwest extension that would connect to proposed Class II bike lanes on Brunswick Road.

Brunswick Road Pathway

This pathway would pave an existing trail that runs along Brunswick Road from Idaho Maryland Road to Town Talk Road.

State Route 20 Overcrossing at Freeman Lane

The final proposed Class I bike path in Grass Valley is an overcrossing that would connect Freeman Lane to West Empire Street at the State Route 49 Northbound off ramp. The only existing State Route 49/20 crossing between downtown Grass Valley and McKnight Way is the multi-lane arterial adjacent to the proposed Class I bike path. However, the existing configuration requires cyclists to either ride on State Route 20 / West Empire Street with high speed traffic, or dismount and walk via a pedestrian path that accesses the overcrossing and a sidewalk on the north side of the structure. The proposed Class I bike path overcrossing would provide a low stress alternative for bicyclists and pedestrians and close a critical gap between the southeast and southwest neighborhoods of Grass Valley. The overcrossing is a long-term project; further feasibility assessment is necessary to determine if it could be constructed as a standalone structure or cantilevered off of the south side of the existing West Empire Street overcrossing.

Seven Hills to Deer Creek Pathway

This pathway in Nevada City would extend from Reward Street through Seven Hills Middle School, contour the back of the school, and then connect to Deer Creek Elementary School. The pathway would connect these two major destinations, and also provide a safe alternative for children who ride to school on Zion Street. The proposed alignment is located on school property.

Class I Bike Paths in Truckee

The proposed Class I bike paths in Truckee are the same as those included in the 2012 Truckee Trails and Bikeways Master Plan. They include an extension of the Truckee River Trail, an alignment along Brockway Road, and a proposed facility that would provide a more convenient connection between communities on Northwoods Boulevard and downtown Truckee.

5.2.2 Class II Bike Lanes

Bicycle lanes are primarily recommended in the developed or developing areas of Nevada County. They would connect key destinations, separate bicycle traffic on busier roadways, and close critical gaps in the bicycle network to maximize the benefits of existing facilities. Bike lanes could not be recommended for many streets in downtown cores of Grass Valley and Nevada City due to roadway width limitations. Also, while many rural County roads provide access to destinations, these facilities typically do not meet minimum lane widths and have topographical challenges that could make implementing Class II bike lanes impractical. In addition, bicycle lanes have striping and stenciling requirements that may not be consistent with the character of rural roadways. Key proposed Class II bike lanes in western Nevada County include:

- **Nevada City Highway** – close the critical gap on this roadway by connecting the Class II bike lanes in Nevada City to those in Grass Valley.
- **Ridge Road** – complete Class II bike lanes from Rough & Ready Highway to Nevada City.
- **Old Tunnel Road** – provide bike lanes that would help connect Grass Valley communities east of the State Route 20 Freeway to Nevada City via Banner Lava Cap Road.
- **Brunswick Road** – three proposed projects would connect Grass Valley communities west of the State Route 20 Freeway with shopping centers to the east and the Loma Rica area.
- **Critical Gap Closures near Sierra College** – projects would continue bike lanes on Sierra College Drive and Hughes Road to existing bike lanes on Nevada City Highway.
- **Freeman Lane** – bicycle lanes would connect to shopping centers along the road, and to newly striped bike lanes on East McKnight Way.

Several Class II bike lane projects are proposed in the Town of Truckee Trails and Bikeways Master Plan. Major proposed Class II bike lane projects in Truckee include **Glenshire Drive**, segments of **Donner Pass Road**, **Prosser Dam Road**, **Brockway Road**, **East and West River Street**, **Alder Creek Road**, and **SR 89**.

Tables 5-1 through **5-4** and **Appendix D** describe the proposed Class II bike lanes. Cost estimates, implementation strategies, phasing and prioritization for these bicycle lanes are provided in **Chapter 6**.

5.2.3 Class III Bike Routes

These routes are proposed in busy downtown and developed areas that lack the available street width to reasonably accommodate bicycle lanes. They would be signed with Caltrans standard bicycle route signs and, where appropriate, include Shared Roadway Bicycle Marking stencils. The stencils alert motorists to the presence of cyclists on the roadway and guide cyclists to ride outside the door zone of parked vehicles. Key Class III bike routes in western Nevada County include:

- **East and West Main Street** – provide a bike route through downtown Grass Valley that would extend existing Class II bike lanes that currently terminate at Alta Street.
- **Richardson Street** – designate a parallel bike route to the proposed Class III bike route on Main Street for bicycles to avoid heavier motor vehicle traffic.
- **Broad Street (including East and West spurs)** – provide a bike route through downtown Nevada City connecting to the Rood Center and State Route 49.
- **Old Downieville Highway** – designate this popular alternative to State Route 49 with low vehicle traffic as a bicycle route.

The Town of Truckee Trails and Bikeways Master Plan includes proposed Class III bike routes on segments of **Sierra Drive**, **Richards Boulevard**, and **Donner Lake Road**.

Tables 5-1 through **5-4** and **Appendix D** describe the proposed Class III bike routes. Cost estimates, implementation strategies, phasing prioritization and segment details for these facilities are found in **Chapter 6**.

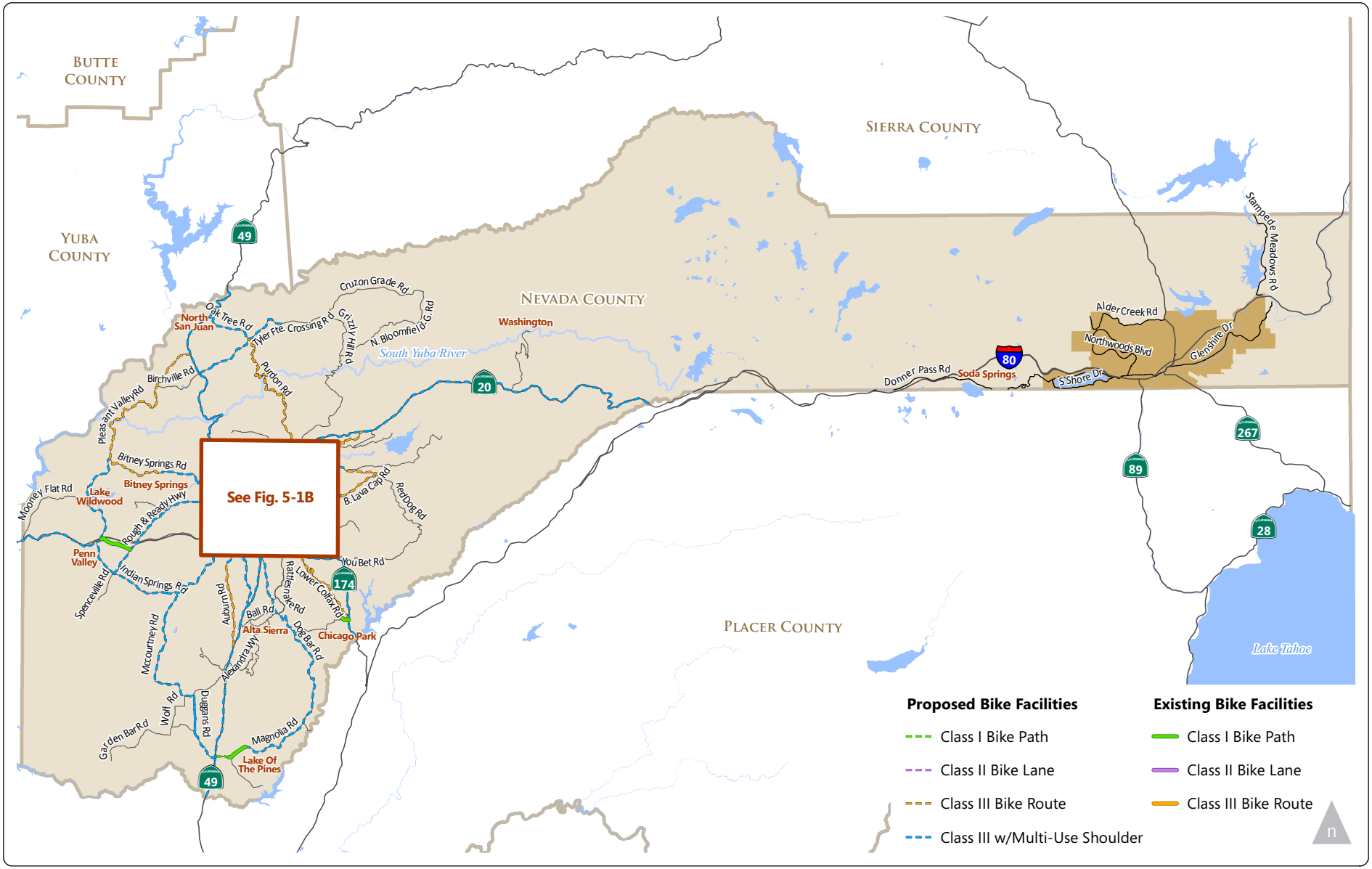
5.2.4 Class III Bike Routes with Multi-Use Shoulder

These facilities are proposed on County roadways and state routes where traffic volume, speed, bicycle usage and other factors support the need for enhanced shoulders for cyclists. While these routes may lack the shoulder width and striping requirements of Class II bike lanes, they are intended to provide a 4-5 foot shoulder where widening is practical. For areas with topographic and right-of-way challenges, priority may be given to the uphill shoulder, which would act as a climbing lane to separate slow-speed cyclists from high-speed motor vehicles.

During public outreach, many residents expressed concerns about discontinuous shoulders. Where practical, multi-use shoulders should not drop suddenly from the roadway, especially in conflict areas with a high speed differential between cyclists and motor vehicles. Class III bike route signage should be used to alert motorists to the presence of cyclists along these routes, and especially in areas with little to no shoulder. Key Class III bike routes with multi-use shoulder include:

- **Newtown Road** – widen shoulders where possible and provide signage on this popular recreational route between State Route 49 and Bitney Springs Road.
- **Bitney Springs Road** – provide a Class III bike route with multi-use shoulder from Rough & Ready Highway to Newtown Road.
- **California State Highways** – where bicycle travel is permitted, provide widened shoulders on all state routes. Projects include shoulder widening on State Route 49 between Newtown Road and Old Downieville Highway, and State Route 174 from Grass Valley to Rattlesnake Road and Lower Colfax Road bike routes.

Tables 5-1 through **5-4** and **Appendix D** describe the proposed Class III bike routes with multiuse shoulder. Cost estimates, implementation strategies, phasing prioritization and segment details for these facilities are found in **Chapter 6**.



FEHR PEERS

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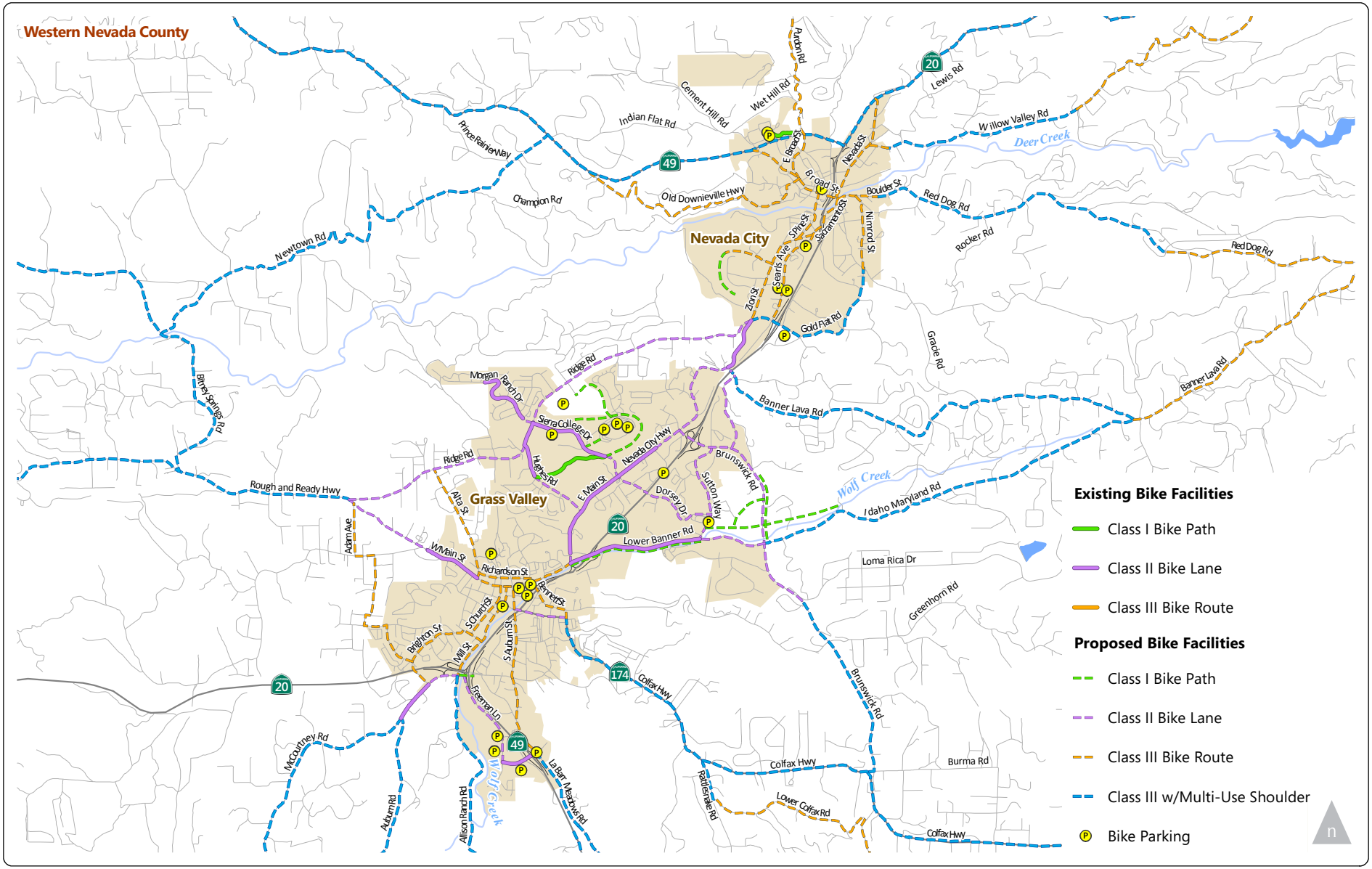
PROPOSED BICYCLE FACILITIES

FIGURE 5-1A



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PROPOSED BICYCLE FACILITIES

FIGURE 5-1B

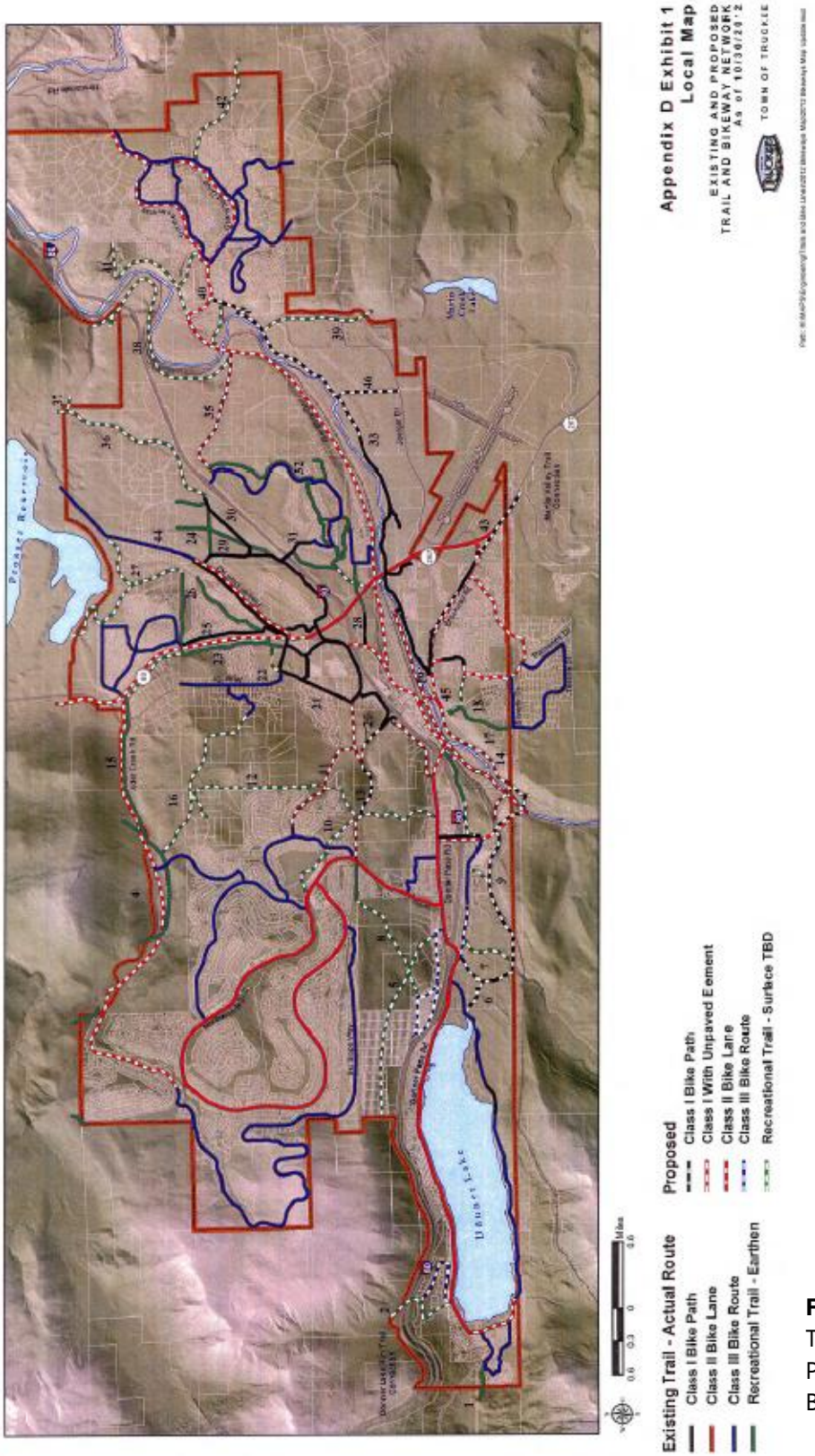


Figure 5-2: Town of Truckee Existing and Proposed Trails and Bikeways

TABLE 5-1: SUMMARY OF PROPOSED BIKEWAYS – GRASS VALLEY					
Improvement	**Limits**	**Distance (mi)**	**Cost**	**Benefit Score**	**Feasibility Score**
Class I bike path to Sierra College	Sierra College Dr. to Sierra College southwest parking lot	0.14	$73,500	Med	High
Class I bike path overcrossing of SR 20	Freeman Ln. to SR 20 NB off ramp	0.02	$710,000	Med	Low
Class I bike path in Loma Rica Ranch development	Segment 4 to Brunswick Rd.	0.34	$179,300	Low	Med
Class I bike path in Loma Rica Ranch development	Sutton Way to Wolf Creek	1.05	$555,300	Low	Low
Class I bike path improvements to Litton Trail	Sierra College Dr. north of campus to Sierra College Dr. south of campus	1.03	$546,100	Med	Low
Class I bike path from Litton Trail to NUHS	Segment 1 to NUHS Dwy.	0.45	$235,500	Med	Med
Class I bike path along Idaho Maryland Rd.	SR 20 ramps to Sutton Way	1.01	$532,400	Low	Low
Class I bike path along Brunswick Rd.	Town Talk Rd. to Idaho Maryland Rd.	0.61	$320,500	Low	Med
Class II bike lanes on Sutton Way	Brunswick Rd. to Idaho Maryland Rd.	0.81	$322,200	Med	Med
Class II bike lanes on Sierra College Dr.	Litton trail to Nevada City Hwy.	0.23	$48,400	High	High
Class II bike lanes on Ridge Rd.	Rough & Ready Hwy. to Nevada City Hwy.	0.77	$163,200	High	Med
Class II bike lanes on Old Tunnel Rd.	Brunswick Rd. to Banner Lava Cap Rd.	0.52	$163,200	Med	Med
Class II bike lanes on Nevada City Hwy.	Joersche Dr. to Banner Lava Cap Rd.	1.05	$1,118,500	High	Low
Class II bike lanes on Morgan Ranch Dr. extended to Ridge Rd.	Vistamont Dr. to Ridge Rd.	0.07	$15,600	Med	High
Class II bike lanes on McCourtney Rd.	Brighton St. to Freeman Ln.	0.23	$49,600	Low	High
Class II bike lanes on Idaho Maryland Rd.	SR 20 ramps to Brunswick Rd.	1.52	$720,000	Med	Low
Class II bike lanes on Hughes Rd.	Litton trail to Nevada City Hwy.	0.45	$95,400	Med	High
Class II bike lanes on Freeman Ln.	McCourtney Rd. to E McKnight Way	0.88	$257,100	Med	Med
Class II bike lanes on Dorsey Dr.	Nevada City Hwy. to Sutton Way	0.85	$541,400	Med	Low
Class II bike lanes on Colfax Ave. under SR 20	Auburn St. to Ophir St.	0.40	$84,600	Med	High
Class II bike lanes on Brunswick Rd.	Idaho Maryland Rd. to Bet Rd.	0.59	$124,000	Med	Med
Class II bike lanes on Brunswick Rd.	Nevada City Hwy. to Idaho Maryland Rd.	1.77	$643,200	Med	Low
Class II bike lane completion on E Main St. north of Idaho Maryland Rd.	Scandling Ave. to Idaho Maryland Rd. roundabout	0.08	$16,100	Med	High
Class III with multi-use shoulder on La	McKnight Way to Southern City Limits	0.34	$136,600	Low	Low

TABLE 5-1: SUMMARY OF PROPOSED BIKEWAYS – GRASS VALLEY					
Improvement	**Limits**	**Distance (mi)**	**Cost**	**Benefit Score**	**Feasibility Score**
Barr Meadows Rd.					
Class III with multi-use shoulder on Colfax Hwy. 174	Ophir St. to Mercury Dr.	0.47	$153,100	Low	Low
Class III with multi-use shoulder on Allison Ranch Rd.	McCourtney Rd. to Southern City Limits	0.66	$383,500	Low	Low
Class III bike route on S Church St.	W Main St. to Chapel St.	0.35	$600	Med	High
Class III bike route on S Auburn St.	W Main St. to E McKnight Way	1.33	$2,100	Med	High
Class III bike route on Richardson St.	Alta St. to E Main St.	0.43	$700	Med	High
Class III bike route on Packard Dr.	Wlker Dr. to Brighton St.	0.57	$900	Low	High
Class III bike route on Mill St.	W Main St. to McCourtney Rd.	0.81	$1,300	Med	High
Class III bike route on Main St.	Alta St. to Idaho Maryland Rd.	0.75	$1,200	Med	High
Class III bike route on Chapel St. / Brighton St.	Mill St. to McCourtney Rd.	0.89	$1,400	Low	High
Class III bike route on Bennett St./Ophir St.	E Main St. to Colfax Ave.	0.42	$700	Med	High
Class III bike route on Alta St.	Ridge Rd. to W Main St.	0.29	$500	Low	High
Source: Fehr & Peers, 2013.					

TABLE 5-2: SUMMARY OF PROPOSED BIKEWAYS – NEVADA CITY					
Improvement	**Limits**	**Distance (mi)**	**Cost**	**Benefit Score**	**Feasibility Score**
Class I bike path behind Seven Hills and Deer Creek Schools	Reward St. to Deer Creek Elementary School	0.53	$280,000	High	Mid
Class III with multi-use shoulder on Gold Flat Rd.	Gracie Rd. to Ridge Rd.	1.27	$736,100	Mid	Low
Class III bike route on Zion St. / Sacramento St.	Ridge Rd. to S Pine St.	0.76	$1,200	High	High
Class III bike route on Willow Valley Rd.	Nevada St. to Nevada City city limits	0.15	$200	Low	High
Class III bike route on W Broad St.	SR 49 to Broad St.	0.49	$800	Mid	High
Class III bike route on Searls Ave.	Ridge Rd. to Sacramento St.	0.80	$1,300	Mid	High
Class III bike route on Sacramento St.	S Pine St. to Broad St.	0.47	$700	Low	High
Class III bike route on S Pine St.	Sacramento St. to Broad St.	0.42	$700	High	High
Class III bike route on Reward St.	Reward St. to Heilman Ct.	0.11	$200	High	High
Class III bike route on Old Downieville Hwy / Monroe St.	Nevada City city limits to Broad St.	0.58	$900	High	High
Class III bike route on Nimrod St.	Boulder St. to Gracie Rd.	0.58	$900	Low	High
Class III bike route on Nevada St.	Boulder St. to SR 49	0.86	$1,400	Low	High
Class III bike route on E Broad St.	SR 49 to Broad St.	0.38	$600	Mid	High
Class III bike route on Broad St. / Boulder St.	W Broad St. to Nevada City city limits	0.69	$1,100	High	High
Bicycle detection project at SR 49 / E Broad St.	SR 49 / E Broad St.	N/A	$10,000	High	High

Source: Fehr & Peers, 2013.

TABLE 5-3: SUMMARY OF PROPOSED BIKEWAYS – TRUCKEE		
Improvement	**Limits**	**Distance (mi)**
Class I bike path adjacent to Brockway Rd.	Estates Dr. to existing Brockway Rd. Class I bike path	0.48
Class I bike path adjacent to N Shore Rd.	Martis Dr. to Schaffer Mill Rd.	0.80
Class I bike path adjacent to Sanitation District Rd.	Joerger Dr. to proposed Truckee River Trail extension	0.59
Class I bike path along SR 89	North of Railroad Tracks to southeast of Truckee River	0.71
Class I bike path extension of the Truckee River Trail	Existing Truckee River Trail to Glenshire Dr.	2.16
Class I bike path south of Deerfield Dr.	S Shore Dr. and Donner Pass Rd. to SR 89	2.22
Class I bike path with unpaved element along Truckee River	SR 89 and segment 1 to S River St.	1.35
Class I bike path with unpaved element extension/improvement of Overland Trail	Fairway Dr. to Glenshire Dr.	1.22
Class I bike path with unpaved element from along I-80	Lincoln Hwy to Euer Valley Rd.	0.70
Class I bike path with unpaved element from Mougle Ln to Comstock Dr.	Mougle Ln to segment 7 to Comstock Dr.	1.57
Class I bike path with unpaved element north of Coyote Moon Golf Course	Northwoods Blvd to Euer Valley Rd.	1.25
Class II bike lanes on Alder Creek Rd.	Fjord Rd. to SR 89	4.44
Class II bike lanes on Brockway Rd./Bridge St.	Donner Pass Rd. to Hwy 267	1.67
Class II bike lanes on Donner Pass Rd.	SR 89 to segment 9 west of I-80 WB off ramp	2.84
Class II bike lanes on Dorchester Dr.	Glenshire Dr.	1.39
Class II bike lanes on Fjord Rd.	Northwoods Blvd. to Alder Creek Rd.	0.09
Class II bike lanes on Glenshire Dr.	Donner Pass Rd. to Martis Peak Rd.	6.64
Class II bike lanes on Mclver Crossing	Donner Pass Rd. Roundabout to W River St.	0.17
Class II bike lanes on Ponderosa Dr./Martis Valley Rd. loop	Brockway Rd./Pallisades Dr. to Brockway Rd./Martis Valley Rd.	2.06
Class II bike lanes on Prosser Dam Rd.	SR 89 to north of Ghirard Rd.	1.14
Class II bike lanes on S Shore Dr.	Donner Pass Rd. to Conifer Dr. E	0.60

TABLE 5-3: SUMMARY OF PROPOSED BIKEWAYS – TRUCKEE		
Improvement	**Limits**	**Distance (mi)**
Class II bike lanes on SR 89	Donner Pass Rd. to W River St.	0.90
Class II bike lanes on SR 89	0.6 mi north of Alder Creek Rd. to Donner Pass Rd.	2.61
Class II bike lanes on W River St./E River St.	SR 89 to Truckee River Trail Crossing	2.27
Class III bike route on Deerfield Dr.	Segment 1 terminus to existing Class III bike route	0.50
Class III bike route on Donner Lake Rd.	Donner Pass Rd. to I-80 EB ramps	0.87
Class III bike route on Thomas Dr./Sierra Dr.	Donner Pass Rd. (Lolipop)	1.73
Recreational trail to Truckee River Trail proposed alignment	Glenshire Dr. to segment 5	0.46
Recreational trail along E Alder Creek Rd.	Ghirard Rd. to Prosser Resevoir	1.52
Recreational trail along Railroad Alignment	Glenshire Dr. to north of I-80	2.45
Recreational trail along SR 267	Truckee River to trails southeast of SR267/I-80	0.63
Recreational trail along SR 89	Alder Creek Rd. to existing trail segment	0.68
Recreational trail east of Glenshire Dr.	Glenshire Dr. to the southeast	1.09
Recreational trail east of Northwoods Blvd.	Northwoods Blvd. to Donner Pass Rd.	1.76
Recreational trail east of segment 67	Segment 67 to Prosser Dam Rd.	0.53
Recreational trail from I-80 to Prosser Dam area	Union Mills Rd. to Prosser Resevoir	1.87
Recreational trail from Truckee River to Ponderosa Dr.	S River St. to Ponderosa Dr.	0.45
Recreational trail improvements to College Trail	SR 89 to Sierra College Truckee Tahoe Campus	0.36
Recreational trail near Donner Lake Rd.	Donner Lake to north of I-80 Ramps	0.78
Recreational trail north of Alder Dr.	Just north of Alder Dr.	0.09
Recreational trail north of segment 1	Segment 1 to segment 52	0.52
Recreational trail north of segment 1	Segment 1 to Deerfield Dr.	0.21
Recreational trail north of Sierra Dr.	Sierra Dr. to Northwest	1.79
Recreational trail northeast of Thomas Dr.	Thomas Dr. to existing Powerline Trail	1.10

TABLE 5-3: SUMMARY OF PROPOSED BIKEWAYS – TRUCKEE		
Improvement	**Limits**	**Distance (mi)**
Recreational trail south of Alder Creek	Alder Creek to segment 63	2.33
Recreational trail south of Truckee River Trail	Truckee River Trail proposed alignment to the south	1.07
Recreational trail west of Beacon Rd	Beacon Rd. to west of segment 64	1.28
Recreational trails along Old US Highway 40	Glenshire Dr. to Old US Highway 40	1.71
Source: Fehr & Peers, 2013.		

TABLE 5-4: SUMMARY OF PROPOSED BIKEWAYS – NEVADA COUNTY					
Improvement	**Limits**	**Distance (mi)**	**Cost**	**Benefit Score**	**Feasibility Score**
County Roadways					
Class I bike path along Combie Rd.	SR 49 to existing Class I	0.74	$390,400	High	Med
Class II bike lanes on Brunswick Rd.	Grass Valley city limits to Bet Rd.	0.20	$41,900	High	High
Class II bike lanes on Nevada City Hwy	Nevada City city limits to Grass Valley city limits	0.09	$30,000	High	High
Class II bike lanes on Old Tunnel Rd.	Banner Lava Cap Rd. to Grass Valley city limits	0.09	$70,000	Mid	High
Class II bike lanes on Pleasant Valley Rd.	Lake Wildwood Dr. to SR 20	1.37	$290,200	High	Med
Class II bike lanes on Pleasant Valley Rd.	Wildflower Dr. to Lake Wildwood Dr.	1.58	$1,058,000	Mid	Low
Class II bike lanes on Ridge Rd.	Pear Orchard Rd. to Nevada City city limits	0.54	$399,000	Mid	Med
Class II bike lanes on Ridge Rd.	Rough & Ready Hwy to city limits	1.06	$660,300	Mid	Low
Class II bike lanes on Ridge Rd.	Grass Valley city limits to Pear Orchard Rd.	0.91	$572,200	Mid	Low
Class II bike lanes on Rough & Ready Hwy	Ridge Rd. to Grass Valley city limits	0.77	$486,000	Mid	Med
Class III bike route on Adam Ave. / Walker Dr. / Butler Rd.	Rough & Ready Hwy to city limits	0.78	$1,300	Low	High
Class III bike route on Alta St.	Ridge Rd. to Grass Valley city limits	0.56	$900	Mid	High
Class III bike route on Auburn Rd.	Archery Rd. to SR 49	4.65	$7,400	Low	High
Class III bike route on Banner Lava Cap Rd.	Idaho Maryland Rd. to Red Dog Rd.	2.50	$4,000	Low	High
Class III bike route on Bitney Springs Rd.	Pleasant Valley Rd. to Gold Fork Rd.	3.54	$5,700	Low	High
Class III bike route on Lower Colfax Rd.	Rattlesnake Rd. to SR 174	6.62	$10,600	Mid	Low
Class III bike route on Old Downieville Hwy	SR 49 to Nevada City city limits	1.52	$2,400	Low	High
Class III bike route on Pleasant Valley Rd.	SR 49 to Bitney Springs Rd.	8.96	$14,300	Mid	High
Class III bike route on Purdon Rd.	Tyler Foote Crossing to SR 49	28.58	$45,700	Low	Med
Class III bike route on Red Dog Rd.	Quaker Hill Cross to Banner Lava Cap Rd.	1.60	$2,600	Low	High
Class III bike route on Willow Valley Rd.	Scotts Valley Rd. to SR 20	0.29	$500	Low	High
Class III with multi-use shoulder on	Grass Valley city limits to SR 49	3.02	$1,753,300	Low	Low

TABLE 5-4: SUMMARY OF PROPOSED BIKEWAYS – NEVADA COUNTY					
Improvement	**Limits**	**Distance (mi)**	**Cost**	**Benefit Score**	**Feasibility Score**
Allison Ranch Rd.					
Class III with multi-use shoulder on Auburn Rd.	McCourtney Rd. to Archery Rd.	1.27	$737,200	Low	Low
Class III with multi-use shoulder on Banner Lava Cap Rd.	Nevada City Hwy to Gracie Rd.	2.32	$1,345,500	Mid	Low
Class III with multi-use shoulder on Banner Lava Cap Rd.	Gracie Rd. to Idaho Maryland Rd.	1.23	$715,400	Low	Low
Class III with multi-use shoulder on Bitney Springs Rd.	Gold Fork Rd. to Empress Mine Rd.	1.65	$957,300	Mid	Low
Class III with multi-use shoulder on Bitney Springs Rd.	Empress Mine Rd. to Rough & Ready Hwy	1.89	$1,066,000	Mid	Low
Class III with multi-use shoulder on Brunswick Rd.	Bet Rd. to Hwy 174	1.23	$414,600	High	Med
Class III with multi-use shoulder on Dog Bar Rd.	La Barr Meadows Rd. to Alta Sierra Dr.	1.78	$622,600	High	Low
Class III with multi-use shoulder on Dog Bar Rd.	Alta Sierra Dr. to Mt Olive Rd.	1.94	$1,127,900	High	Low
Class III with multi-use shoulder on Dog Bar Rd.	Mt Olive Rd. to Magnolia Rd.	5.43	$3,156,500	Low	Low
Class III with multi-use shoulder on Idaho Maryland Rd.	Brunswick Rd. to Banner Lava Cap Rd.	3.07	$1,653,200	Mid	Low
Class III with multi-use shoulder on Indian Springs Rd.	Pleasant Valley Rd. to Spenceville Rd.	2.22	$1,287,800	Low	Low
Class III with multi-use shoulder on La Barr Meadows Rd.	Grass Valley city limits to Dog Bar Rd.	1.62	$470,400	Mid	Med
Class III with multi-use shoulder on Lime Kiln Rd./Duggans Rd./Wolf Rd.	McCourtney Rd. to SR 49	5.97	$2,481,600	Mid	Low
Class III with multi-use shoulder on Magnolia Rd.	Dog Bar Rd. to Class I at Kingston Rd.	4.00	$2,321,400	Mid	Low
Class III with multi-use shoulder on McCourtney Rd.	Auburn Rd. to Indian Springs Rd.	4.70	$2,034,600	Mid	Low
Class III with multi-use shoulder on McCourtney Rd.	Indian Springs Rd. to Lime Kiln Rd.	5.09	$2,293,000	Mid	Low
Class III with multi-use shoulder on Newtown Rd.	SR 49 to Bitney Springs Rd.	3.93	$2,280,400	Mid	Low
Class III with multi-use shoulder on Oak Tree Rd.	SR 49 to Tyler Foote Crossing	2.67	$1,549,900	Mid	Low
Class III with multi-use shoulder on Penn Valley Dr.	SR 20 to Spenceville Rd.	0.59	$340,500	Mid	Med

TABLE 5-4: SUMMARY OF PROPOSED BIKEWAYS – NEVADA COUNTY					
Improvement	**Limits**	**Distance (mi)**	**Cost**	**Benefit Score**	**Feasibility Score**
Class III with multi-use shoulder on Pleasant Valley Rd.	Bitney Springs Rd. to Wildflower Dr.	2.55	$1,435,400	Mid	Low
Class III with multi-use shoulder on Rattlesnake Rd.	SR 174 to Lower Colfax Rd.	0.31	$177,400	Mid	Med
Class III with multi-use shoulder on Red Dog Rd.	Nevada City city limits to Quaker Hill Cross	2.45	$1,423,200	Mid	Low
Class III with multi-use shoulder on Rough & Ready Hwy	Bitney Springs Rd. to Ridge Rd.	1.34	$611,300	Mid	Low
Class III with multi-use shoulder on Rough & Ready Hwy	SR 20 to Bitney Springs Rd.	4.07	$2,225,400	Mid	Low
Class III with multi-use shoulder on Spenceville Rd.	Penn Valley Dr. to Indian Springs Rd.	1.51	$878,500	Mid	Low
Class III with multi-use shoulder on Tyler Foote Crossing	SR 49 to Oak Tree Rd.	3.33	$1,931,400	Mid	Low
Class III with multi-use shoulder on Tyler Foote Crossing	Oak Tree Rd. to Cammena Rd.	1.89	$1,100,000	Low	Low
Class III with multi-use shoulder on Willow Valley Rd.	Nevada City city limits to Scotts Valley Rd.	1.50	$868,500	Low	Low
Caltrans Highways					
Class III with multi-use shoulder on SR 174	Grass Valley City Limits to Rattlesnake Rd.	1.15	$602,100	High	Low
Class III with multi-use shoulder on SR 174	Brunswick Rd. to You Bet Rd.	2.18	$1,125,000	High	Low
Class III with multi-use shoulder on SR 174	Rattle Snake Rd. to Brunswick Rd.	1.38	$757,900	Mid	Low
Class III with multi-use shoulder on SR 174	You Bet Rd. to Lower Colfax Rd.	3.46	$2,011,600	Mid	Low
Class III with multi-use shoulder on SR 174	Lower Colfax Rd. to county limits	1.17	$681,100	Mid	Low
Class III with multi-use shoulder on SR 20	Nevada St. to Willow Valley Rd.	3.77	$2,188,600	Mid	Low
Class III with multi-use shoulder on SR 20	Willow Valley Rd. to Casci Rd.	4.69	$2,724,500	Mid	Low
Class III with multi-use shoulder on SR 20	Casci Rd. to Washington Rd.	4.22	$2,450,300	Mid	Low
Class III with multi-use shoulder on SR 20	Washington Rd. to Chalk Bluff Rd.	3.38	$1,960,800	Mid	Low
Class III with multi-use shoulder on	Chalk Bluff Rd. to county limits	5.99	$3,479,900	Mid	Low

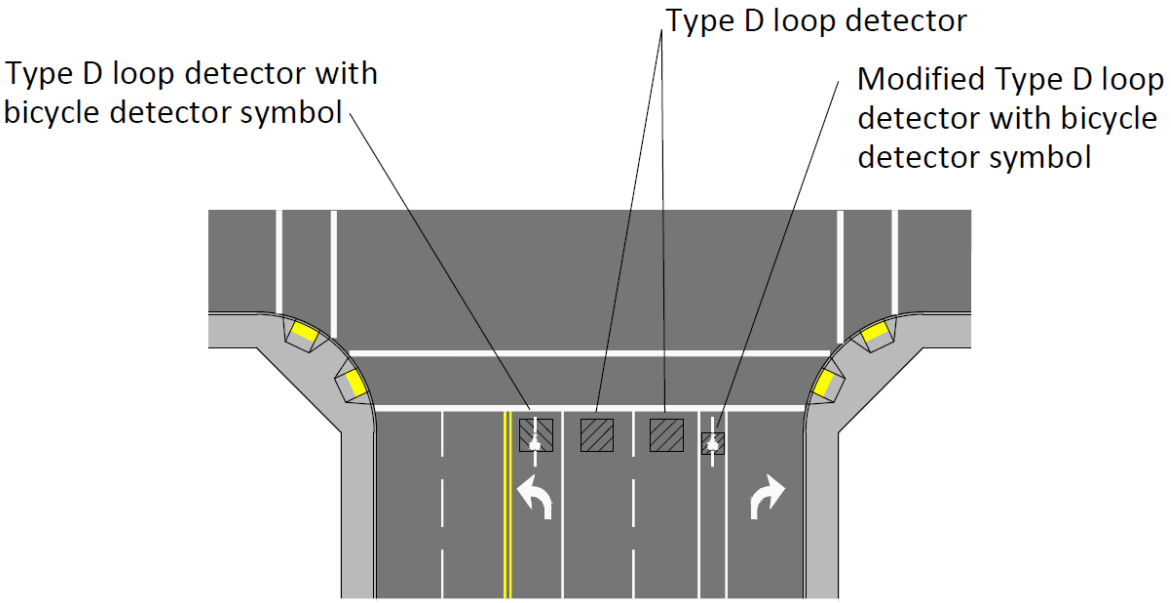
TABLE 5-4: SUMMARY OF PROPOSED BIKEWAYS – NEVADA COUNTY					
Improvement	**Limits**	**Distance (mi)**	**Cost**	**Benefit Score**	**Feasibility Score**
SR 20					
Class III with multi-use shoulder on SR 49	Combie Rd. to county limits	2.37	$113,500	High	Med
Class III with multi-use shoulder on SR 49	Auburn Rd. to Combie Rd.	5.81	$393,100	High	Med
Class III with multi-use shoulder on SR 49	Newtown Rd. to Old Downieville Hwy	0.44	$253,200	Mid	Med
Class III with multi-use shoulder on SR 49	Crestview Dr. to Allison Ranch Rd.	2.54	$223,300	Mid	Med
Class III with multi-use shoulder on SR 49	Tyler Foote Crossing to Newtown Rd.	8.12	$4,575,000	High	Low
Class III with multi-use shoulder on SR 49	Oak Tree Rd. to Pleasant Valley Rd.	2.52	$1,462,100	Mid	Low
Class III with multi-use shoulder on SR 49	Pleasant Valley Rd. to Tyler Foote Crossing	1.09	$632,600	Mid	Low
Class III with multi-use shoulder on SR 49	Old Downieville Hwy to Nevada City city limits	1.13	$657,100	Mid	Low
Class III with multi-use shoulder on SR 49	Allison Ranch Rd. to Auburn Rd.	2.35	$1,229,800	Mid	Low
Class III with multi-use shoulder on SR 49	County limits to Oak Tree Rd.	2.30	$1,335,800	Mid	Low

Source: Fehr & Peers, 2013.

5.3 PROPOSED ADDITIONAL BICYCLE IMPROVEMENT PROJECTS

5.3.1 Bicycle Detection

The California MUTCD requires the provision of bicycle detection on all new and modified approaches to traffic-actuated signals. Research has shown that Type D loop detectors are most capable of detecting bicyclists. This plan recommends Type D detectors at the limit lines of actuated signals so that bicyclists can be detected from any lane. Bike lanes at signalized intersections should also include modified Type D loop detectors.



Other general recommendations for bicycle loop detection include the following:

- Regularly calibrate detectors so that they are sensitive to the metal in bicycle frames.
- Apply pavement stencils above bicycle loop detectors so that cyclists will know where to position their bicycles to actuate the signal.
- Consider alternative detection methods including video image detectors that can extend green time for slower approaching vehicles such as bicycles, and detect non-metallic bicycles like those made from carbon fiber.

5.3.2 Bicycle Parking

Bicycle parking is needed in commercial areas, schools, and other major destinations, and should be provided where there is space and demand. Due to roadway and sidewalk width limitations, many areas of downtown Grass Valley and downtown Nevada City may not have adequate space to install bicycle racks. In these areas, signs, parking meters, and other objects may provide enough parking capacity. Public works departments should be responsive to requests for bicycle racks even in areas where space is difficult to find.

5.3.3 Bike Route Signage

During the public outreach sessions, residents and staff expressed interest in improving wayfinding for bicyclists in the county. Wayfinding signage includes Class III bike route signs, and other signs that direct riders or identify a route of particular significance. For example, along with bike route signage on some County roads, cyclists also requested individualized signs for different recreational loops, and for routes to popular destinations like schools and shopping centers. As a general rule, all wayfinding systems should convey direction, destination, and distance.

Residents also expressed interest in Share the Road signs, which may be used in conjunction with wayfinding signs to alert motorists to the presence of cyclists. The latest research from the American Association of State Highway and Transportation Officials (AASHTO) indicates that these signs do not significantly improve conditions for cycling and should not serve as a replacement for appropriate geometric design.[9] Nonetheless, Share the Road signage may be used at the ends of bike lanes and multi-use shoulders, construction areas, or other areas where bicycles must transition to a mixed flow facility. Another similar sign that may be used is the "Bicycles May Use Full Lane" sign. This sign could be used on narrow or rural roadways where motorists and cyclists cannot operate side by side.

5.4 PROPOSED ENFORCEMENT, EDUCATION AND SUPPORT PROGRAMS

The Nevada County Bicycle Master Plan provides both physical recommendations, such as bike lanes, and program recommendations. Some of the program recommendations, including zoning requirements for bicycle parking, have already been covered by policies in **Chapter 2**. This section addresses future efforts to educate bicyclists and motorists, and efforts to increase the use of bicycles as a form of transportation and recreation.

5.4.1 Safe Routes to Schools

Safe Routes to Schools is a program designed to reduce local congestion around schools and improve safety by increasing the number of children walking and biking to school. A Safe Route program can integrate health, fitness, traffic relief, environmental awareness, and safety, among other elements. A typical program has four components:

Encouragement – Events, contests and promotional materials are incentives that encourage children and parents to try walking and biking.

Education – Classroom lessons teach children the skills necessary to navigate through busy streets and persuade them to be active participants in the program. Safe Routes Instructors have developed curriculum that includes on-the-bike instruction, walking instruction and lessons on health and the environment.

Engineering – A certified traffic engineer typically assists schools in developing a plan to provide a safer environment for children who walk and bike to school. This plan includes engineering improvements, enhanced enforcement, and driver outreach.

[9] *Guide for the Development of Bicycle Facilities, 4th ed.,* American Association of State Highway and Transportation Officials, 2012.

Enforcement – Working with local law enforcement, the program increases police presence around the school while developing public education efforts that increase drivers' awareness of the behaviors that endanger children.

Walking or biking to school gives children a sense of freedom and responsibility, allows them to enjoy fresh are and an opportunity to get to know their neighborhood, while arriving at school alert and ready to begin the day. Studies also show that children who are physically active perform better academically (California Department of Education, December 2002).

Communities elsewhere in California have experienced reduced traffic congestion and collisions in and around schools, and decreased speeds in residential neighborhoods. Children learn valuable traffic safety skills and responsibility and more people of all ages are able to walk and bike in the neighborhood due to improved access.

5.4.2 Adult Bicycle Education

Many less-experienced adult bicyclists are unsure how to negotiate intersections and ride with traffic on streets and roads. Adult education classes sponsored by government agencies, volunteer groups and local employers can help address this need. An annual or semi-annual class could help provide information on how to avoid collisions and citations. Instructors from elsewhere in the state or qualified local instructors or volunteers could teach this class to cyclists, tailored to local needs and issues. Future expansion could include adding on-the-bike training.

5.4.3 Share the Road

Nevada County's jurisdictions should consider developing a Share the Road outreach program to help improve awareness of roadway etiquette for cyclists and motorists. The program could be a partnership between local cycling groups and Nevada County law enforcement. Nevada County or NCTC, in partnership with local agencies could seek annual funding to develop several elements of the program including:

- **Share the Road presentations** – to be given at public meetings, community events, employment centers and driver's education.
- **Checkpoints** – local law enforcement could establish checkpoints to distribute Share the Road information and educate cyclists and motorists. These checkpoints could be located on popular bike routes or in areas with high collision density.

6. IMPLEMENTATION

This chapter addresses the benefits and feasibility of proposed facilities, and provides recommendations for implementing priority projects.

6.1 COST ESTIMATES

Unit cost estimates were developed on a linear foot basis for material cost and adjusted to account for mobilization, minor items, design fees, construction management, and contingencies. Material costs were derived from the 2009 and 2011 editions of the *Caltrans Cost Data Book* and similar projects in Caltrans District 3 and the San Joaquin Valley Region. Right-of-way acquisitions are not included in the unit cost estimates. **Table 6-1** shows the cost estimates for bicycle facilities.

TABLE 6-1: UNIT COST ESTIMATES

Bikeway Classification	Improvement Type	Unit Cost (per linear foot)
Class I Bike Path	Bike Path	$100
	Overcrossing	$1,400
	Railroad Undercrossing	$2,000
Class II Bike Lanes	Striping Only	$40
	Widening	$140 (+$12,000 per signal)
	Widening Curb/Gutter	$600 (+$100,000 per signal)
Class III Bike Route	Signage Only	$0.30
	Multi-Use Shoulder	$110

Source: Fehr & Peers, 2013.

Table 6-2 shows the cost estimate totals for short-, mid-, and long-term projects by bikeway type.

TABLE 6-2: PROJECT COST ESTIMATES

Bikeway Classification	Grass Valley	Nevada City	Nevada County	Total
Class I Bike Paths	$3.2 million	$280,000	$390,000	$3.8 million
Class II Bike Lanes	$4.0 million	$0	$3.6 million	$7.7 million
Class III Bike Routes with Multi-Use Shoulder	$673,000	$736,000	$68.1 million	$69.5 million
Class III Bike Routes	$9,000	$10,000	$95,000	$114,000
Total	$7.9 million	$1.0 million	$72.2 million	$81.1 million

Source: Fehr & Peers, 2013.

As shown in **Table 6-2**, the total capital cost for the proposed system of bicycle facilities is approximately $81.1 million. Cost estimates for Class III bike routes with multi-use shoulder represent the majority of expenditures, given their relatively high cost and high proposed mileage.

6.2 PROJECT PRIORITIZATION

6.2.1 Grass Valley

Proposed facilities in Grass Valley include approximately four miles of new Class I bike paths, 9.5 miles of Class II bike lanes and 7.3 miles of Class III bike routes and Class III bike routes with multi-use shoulders. To prioritize the implementation of these facilities, each was evaluated according to factors described in **Appendix C** and listed below:

- Access to key destinations
- Closure of a critical gap
- Facilitation of intercity travel to Nevada City
- Level of projected use
- Safety factors
- Project feasibility, including cost

Several high-priority projects in Grass Valley involve closing critical gaps in the existing bicycle network. These projects include Class II bike lanes on Sierra College Drive, Hughes Road, and a small segment of East Main Street north of Idaho Maryland Road. These projects have relatively high benefit because they leverage the existing network and high feasibility due to their length and lack of right-of-way constraints. A complete list of projects and prioritization can be found in **Appendix D.** The highest-priority and highest-feasibility projects, all of which could be implemented in the short-term, are described below:

Class II Bike Lanes on Sierra College Drive

This project would connect existing bike lanes on Sierra College Drive to bike lanes on Nevada City Highway. The bike lanes would close a critical gap in the existing network and facilitate relatively high levels of bicycle travel to key destinations like Sierra College, Nevada Union High School, and commercial uses on Nevada City Highway. The project would not require any street widening or additional infrastructure and is estimated to cost about $48,000.

Class I Bike Path to Sierra College

This project would convert an existing pathway from Sierra College Drive to the Sierra College southwest parking lot into a Class I bike path. The proposed bike path would have relatively high usage as it would provide a convenient cut-through for bicyclists and pedestrians accessing the campus. The project would require additional pathway widening and is estimated to cost about $74,000.

Class II Bike Lanes on Morgan Ranch Drive

This small project would connect the existing bike lanes on Morgan Ranch Drive with bike lanes on Ridge Road, closing a critical gap in the existing bicycle network. It would not require roadway widening and is estimated to cost about $16,000.

Class II Bike Lanes on Hughes Road

This project would connect existing bike lanes on Hughes Road with Nevada City Highway. The project would have similar benefits to the above Sierra College Class II bike lane project, and is estimated to cost about $95,400.

Class II Bike Lanes on East Main Street

This small project would connect existing bike lanes on East Main Street / Nevada City Highway to the Idaho Maryland Road roundabout, closing a critical gap in the existing bicycle network. The project would not require widening and is estimated to cost about $16,000.

Class III Bike Route on East and West Main Street

The proposed bike route would access key destinations in downtown Grass Valley. Signage for the route is estimated to cost about $1,000.

Notably absent from the high-priority projects are the proposed Class II bike lanes on Nevada City Highway and Old Tunnel Road that would connect Nevada City with Grass Valley. Members of the public expressed interest in these routes, but their relatively high cost would likely mean mid-term project delivery. These facilities have significant benefits that should be taken into account when prioritizing mid-term projects.

6.2.2 Nevada City

Most proposed facilities in Nevada City are Class III bike routes due to roadway width limitations. All Class III bike route projects are relatively low cost, high feasibility alternatives.

Another higher-priority project in Nevada City would install bicycle loop detectors at the signalized intersection of East Broad Street and State Route 49. Bicycle detection at this location would provide enhanced safety and access for bicyclists riding to the Eric Rood Center, or traveling to and from downtown Nevada City. The signal detection is estimated to cost about $10,000 and is considered to be a high-priority project that could be constructed in the short-term.

A complete list of projects can be found in **Appendix D**. Prioritization criteria for Nevada City were the same as those used for Grass Valley and are available in **Appendix C**.

6.2.3 Nevada County

Proposed facilities in unincorporated Nevada County include Class III bike routes with multi-use shoulders, and a small number of Class II bike lanes and Class I bike paths near developed areas. Projects in the County were evaluated based upon the following criteria, also available in **Appendix C**:

- Roadway traffic volume
- Roadway speed limit
- Vehicle and bicycle collisions
- Expected bicycle usage
- Cost

The highest feasibility, priority projects involve closing critical gaps between Nevada City and Grass Valley on Old Tunnel Road and Nevada City Highway, and extending proposed Class II bike lanes on Brunswick Road. While these projects are ideal for short-term delivery, they should be coordinated with adjacent projects in Grass Valley and Nevada City. Other high-priority projects include those listed below:

Class I Bike Path along Combie Road

This bike path would connect an existing bike path to Bear River High School to the Higgans Village Shopping Center and State Route 49. The project would access key destinations and provide a safer route for students to ride to school. The project is estimated to cost about $390,000 and could be constructed in the mid-term.

Class II Bike Lanes on Pleasant Valley Road

This project would stripe Class II bike lanes on Pleasant Valley Road from State Route 20 to Lake Wildwood Drive, connecting Lake Wildwood with Penn Valley and Class III bike routes in the area. The project is estimated to cost about $290,000 and could be constructed in the mid-term.

See **Appendix D** for a complete list of proposed bikeways and prioritization in Nevada County.

6.3 PROCEDURES FOR IMPLEMENTATION

6.3.1 Class I Bike Paths

Each of the proposed Class I bike paths will require a feasibility assessment for implementation. The feasibility assessment should identify or include:

- A preferred route
- Bike path or trail surface type (pavement versus aggregate)
- Proposed solutions to key roadway or waterway crossings
- Preliminary engineering and cost estimates
- Statements of stakeholder interest

Following a feasibility assessment, the responsible agency can fund project design and construction, add the cost to a schedule of development impact fees, or pursue grant funding.

While most Class I bike paths proposed in this plan are on city or County lands, the proposed alignment for the Seven Hills Middle School pathway is on Nevada City School District property. Nevada City should take necessary preparations to work with the school district before and during project implementation.

6.3.2 Class II Bike Lanes

Where Class II bike lanes are proposed, the responsible agency should require that roadways are modified to the desired standard for Class II bike lanes when various roadway projects are completed. Width for bike lanes can be acquired in two ways:

1. Add width to the existing roadway
2. Reduce the width of travel lanes on the existing roadway

Further feasibility assessment should determine the proposed implementation strategy for individual Class II bike lane projects.

6.3.3 Class III Bike Routes

For proposed Class III bike routes with a paved multi-use shoulder, the County can first sign these roadways as a Class III bike route with signage only and add "Share the Road" signage as appropriate. Similar to the strategy outlined for Class II bike lane projects, the County should require that roadways are modified to the desired standard for a Class III bike route with paved multi-use shoulder when various roadway projects are completed. For key segments or gap closures, the County can either fund project design and construction or pursue grant funding.

Where space for a multi-use shoulder is not possible on both sides of a roadway, preference should be given to adding shoulder width on the uphill side (also known as a "climbing lane" or "climbing shoulder") and on the inside of bends in the roadway. Shoulder width on the uphill side is beneficial to bicyclists because their speed is significantly lower when going uphill. Shoulder width on the inside of roadway bends is preferable because sight distance for vehicles is most limited through the inside of roadway bends.

The County can group the signage for all Class III bike routes into one project and apply for grant funding. This signage should include both the CAMUTCD D11-1 "Bike Route" signage, CAMUTCD W11-1 and W16-1 "Share the Road" signage, and guide signs for bicycle facilities.

6.4 FUNDING

6.4.1 Federal Funds

In 2012, Moving Ahead for Progress in the 21st Century (MAP-21) replaced previous legislation as the primary source for federal transportation funding. While many of its impacts remain uncertain, the law made important structural changes that may affect proposed project financing.

Transportation Alternatives Program (TA) – This program combines the former Transportation Enhancements (TE), Federal Safe Routes to School, and Recreational Trails programs. Transportation Alternatives designates funds to regional planning agencies and states. Two percent of the amounts provided to states are allocated respectively to bike and pedestrian trails, and safe routes projects for children and persons with disabilities.

Congestion Mitigation and Air Quality (CMAQ) – This program was carried over from previous legislation and will remain largely intact. CMAQ will be funded at $2.26 billion in FY2013 and $2.28 billion in FY 2014.

6.4.2 Statewide Funds

The State of California uses both federal sources (such as the Transportation Alternatives Program) and its own budget to fund projects and programs. Sponsors apply directly to the state, or to regional agencies for funding, depending on the program.

Bicycle Transportation Account (BTA) – The BTA is an annual statewide discretionary program that awards grants to local jurisdictions. The emphasis of the program is on projects that benefit utilitarian bicycling. Caltrans anticipates awarding $7.2 million during this year's funding cycle.

Local Transportation Fund (LTF) - Limited amounts from the Local Transportation Fund (LTF), which is derived from a ¼ cent of the general sales tax collected statewide, can be used for bicycle facilities.

Safe Routes to School – Prior to 2012, the state and federal Safe Routes to School programs were potential funding sources for both bicycle and pedestrian planning and infrastructure projects that improve access to schools. Caltrans administered two Safe Routes to School programs: the state-legislated program (SR2S), authorized by California Streets and Highways Code Section 2330-2334, and the federal program (SRTS), authorized by the SAFETEA-LU federal funding bill. The SR2S and SRTS programs provided $24.25 million and $21 million, respectively, in annual funding. As of March 2013, the future of Safe Routes to School funding is improbable. Neither MAP-21, the federal funding bill for transportation spending, or the proposed California's Governor's Budget 2013-14, include set-aside funds for Safe Routes to School projects.

Highway Safety Improvement Program (HSIP) – This is a core federal-aid program that aims to reduce traffic fatalities and serious injuries on public roads. Caltrans administers the program in California and expects to receive $100 million for the 2012/13 Federal Fiscal Year. HSIP funds can be used for projects such as bike lane projects on local roadways, improvements to Class I multi-use paths, or for traffic calming measures. Applications that identify a history of incidents and demonstrate their project's improvement to safety are most competitive for funding.

Land and Water Conservation Program – This program offers funds to states and through states to local governments for trails acquisition and development.

Environmental Justice: Context Sensitive Planning Grants – The Caltrans-administered program funds planning activities that assist low-income, minority, and Native American communities in becoming active participants in transportation planning and project development. The grant is funded by the State Highway Account.

6.4.3 Other Funding Sources

Private/local funding for bicycle projects comes primarily from development projects, either in the form of improvements constructed directly by developers or through development fee programs.

New policies at the federal level have resulted in a series of programs that promise to provide increased funding in the coming years for bicycle projects. The HUD-DOT-EPA Interagency Partnership for Sustainable Communities has generated a series of new grant programs to-date, including Urban Circulator grants, TIGER grants, and Sustainable Communities Planning grants. DOT Secretary Ray LaHood recently announced a new DOT policy initiative, indicating "well-connected walking and bicycling networks [are] an important component for livable communities."