CITY OF AVENAL

ACTIVE TRANSPORTATION AND SAFE ROUTES TO SCHOOL PLAN












Active Transportation and Safe Routes to School Plan

City of Avenal

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PLACEWORKS

City of Avenal CALIFORNIA

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INTRODUCTION

The Avenal Active Transportation and Safe Routes to School Plan (AT/SRTS Plan) guides the development of bicycle, pedestrian, safe routes to school, and trail facilities in the City of Avenal. The Plan ultimately supports and implements a fully integrated network accommodating all modes, as referenced in the City's General Plan. From its policies and project recommendations to its implementation program, the AT/SRTS Plan seeks to make walking and bicycling in the City of Avenal safe, pleasant, and convenient for people of all ages and abilities.

The City of Avenal AT/SRTS Plan is organized in the following manner:

Chapter 1 – Introduction: A brief summary of the purpose and organization of the Plan.

Chapter 2 – Goals, Policies, and Actions: Goals, policies, and actions that the City of Avenal will follow in implementing the Plan.

Chapter 3 – Existing Conditions: Overview of relevant planning and policy documents; description of the pedestrian, bicycle, safe routes to school and trail conditions in the City of Avenal; and summary of improvement needs.

Chapter 4 – Recommended Projects and Programs: A list of projects and programs that will promote and enhance walking and bicycling environments, as well as improve safety and accessibility in the City of Avenal.

Chapter 5 – Implementation and Funding: Recommended projects, potential phasing strategies, and potential funding sources that could expedite the implementation of plan components.

Chapter 6 – Design Guidelines: Guidelines and best practices for pedestrian, safe routes to school, bicycle and trail facilities recommended for the City of Avenal.



CHAPTER 2



GOALS, POLICIES, AND ACTIONS

This chapter establishes the framework for the implementation of Avenal's Active Transportation/Safe Routes to School Plan (AT/SRTS Plan) through a set of goals, policies, and actions. The City of Avenal's existing General Plan Circulation Element states an overarching goal to "design and maintain a fully integrated local network that provides for safe and convenient circulation using a variety of transportation modes."

To build upon and support this broader goal, the AT/SRTS Plan has developed its own focused goals, policies, and actions to advance safe, accessible, and convenient transportation through active modes of transportation such as walking and biking. Goals describe positive outcomes of implementing the AT/SRTS Plan. Policies describe methods to achieve the goals, and actions are practical steps of implementation. The following goals, policies, and actions are categorized into seven groups: General Plan; Implementation; Design; Maintenance; Education and Encouragement Programs; Safe Routes to School; Safety and Law Enforcement; and Monitoring and Evaluation.

GOAL
POSITIVE OUTCOME OF IMPLEMENTING THE AT/SRTS PLAN

POLICY
METHOD TO ACHIEVE A GOAL

ACTION
PRACTICAL STEP OF IMPLEMENTATION

GENERAL PLAN (GP)

GOAL: Continue to support City of Avenal General Plan goals and objectives.

General Plan Goal "To design and maintain a fully integrated local network that provides for safe and convenient circulation using a variety of transportation modes."

General Plan Objective D "Design streets that promote safe and pleasant conditions for residents, pedestrians, bicyclists and motorists on neighborhood streets, while preserving access for emergency vehicles, buses and other users."

IMPLEMENTATION (IMP)

GOAL: Support and facilitate implementation of the AT/SRTS Plan.

Policy 1 Integrate the bicycle and pedestrian improvements project list contained in this Plan into the City's Capital Improvement Program (CIP).

- Action 1 Consult the recommended bicycle and pedestrian network maps and project lists prior to conducting street improvements and resurfacing/restriping projects.

Policy 2 When updating the City's General Plan, the Kings County Association of Governments' (KCAG) Bicycle Plan, and other transportation plans, reflect the goals, policies, and proposed networks and projects in this AT/SRTS Plan.

Policy 3 Update the Plan every five years to accommodate best practices in bicycle and pedestrian policy and design, and to remain eligible for Active Transportation Program funding.

Policy 4 Keep track of current regional, state, and federal funding programs, and apply for competitive grant funding for the priority projects identified in this AT/SRTS Plan.

- Action 1 Pursue multi-jurisdictional funding applications and collaborate on regional active transportation policies and infrastructure projects with neighboring cities and other potential partners, such as Kings County, KCAG, and Kings Area Rural Transit (KART).
- Action 2 Apply for grant funding every other year.
- Action 3 Seek various funding opportunities, including all levels of public funding and private funding sources, such as donations and corporate sponsorships.

Policy 5 Implement design guidelines contained in this AT/SRTS Plan on all City capital and land development projects in the city. Allow the update of the design guidelines to incorporate the latest Manual on Uniform Traffic Control Devices (MUTCD) and best practice standards.

Policy 6 Prepare a feasibility study that includes conceptual designs and cost estimates for recommended priority projects.

DESIGN (DES)

GOAL: Create a Complete Streets network and maximize multi-modal connections.

Policy 1 Require short-term and long-term bicycle parking as described in this AT/SRTS Plan to be designed consistent with guidelines in the Association of Bicycle and Pedestrian Professionals (APBP) Bicycle Parking Guidelines; the Public Works Director or Community Development Director will make a determination where discrepancies exist.

Policy 2 Provide striped crosswalks on all legs of an intersection where feasible. Crossings in high traffic areas should have high-visibility crosswalks.

Policy 3 Reduce corner radii at intersections to slow turning vehicular traffic, provide protected signal phasing for left-turns, and mark crosswalks at approaches of signalized intersections.

Policy 4 Plan and implement a citywide wayfinding program for bicyclists and pedestrians to provide route guidance and travel time estimates to key destinations.

Policy 5 Coordinate with Caltrans, Kings County, and KCAG to improve regional bicycle connections.

Policy 6 Provide end-of-trip facilities to make bicycling a viable alternative to driving.

- Action 1 Encourage employers to provide end-of-trip facilities, such as shower and enclosed bicycle parking facilities.
- Action 2 Require new development to include bicycle parking and ensure approved developments provide parking facilities.
- Action 3 Install bicycle parking at high-activity destinations, such as schools and parks.

Action 4 Continue to work with KART to improve access to transit and provide bike parking at bus stops.

Policy 7 Ensure that sidewalks and other facilities meet the principle of universal design and comply with the Americans with Disabilities Act (ADA) standards.

Action 1 Upgrade sidewalks and curb ramps as part of any roadway construction project or construction improvements that entail substantial changes to the roadway.

Policy 8 Create a family-friendly walking environment through street designs, building designs, and building orientation.

Action 1 Encourage new development to provide streetscape improvements and pedestrian-friendly environments, including wide sidewalks, compact intersections, sidewalk-oriented buildings, and short block lengths.

Action 2 Encourage infill housing developments that are within walking distance to schools.

Action 3 Prepare a citywide lighting plan to systematically update street lights and provide pedestrian-scale lights near pedestrian destinations, including schools.

Action 4 Develop a community-wide strategy to increase tree planting and stormwater treatment, maintain existing street trees, and provide shade.

Policy 9 Integrate pedestrian and bicycle facilities to enhance safety, such as wide sidewalks, bikeways, and high-visibility crosswalks within close vicinity of the future Avenal transit hub located at Seventh Avenue and State Route 33.

MAINTENANCE (MAINT)

GOAL: Maintain bicycle and pedestrian facilities as part of the City's regular maintenance operations.

Policy 1 Develop a program for routine maintenance of bicycle and pedestrian facilities, including regular sweeping, pavement repairs, restriping, maintenance of traffic control devices, and landscape maintenance.

Action 1 Ensure that the costs of maintaining bicycle and pedestrian facilities are incorporated into street maintenance estimates.

Action 2 Ensure that landscapes at maturity do not interfere with safe sight distances for bicyclists, pedestrians, or drivers, and do not conflict with overhead lights, traffic controls, traffic signage, utility lines or poles, or walkway lights.

Policy 2 Require adjacent property owners to maintain landscaped areas and keep sidewalks and planting strips litter free.

Policy 3 Minimize disruption to the bicycle and pedestrian environment and/or provide alternate routes when repairing and constructing transportation facilities.

Action 1 Provide short detours with wayfinding signs for bicyclists and pedestrians during construction projects. When temporarily closing sidewalks or bike facilities, provide protected paths to accommodate existing pedestrian and bicycle traffic.

Policy 4 Develop a maintenance monitoring program that facilitates reporting and responding to maintenance problems on existing bike routes, crosswalks, and sidewalks.

Policy 5 Require a bicycle and pedestrian maintenance plan upon project construction.

EDUCATION AND ENCOURAGEMENT PROGRAMS (EEP)

GOAL: Engage and educate the community to encourage bicycling and walking in Avenal.

Policy 1 Engage and update the community on bicycle issues in Avenal through annual events, including existing Bicycle Safety Rodeos.

Action 1 Consider coordinating with local advocacy groups, such as Southern Sierra Cyclists, People for Bikes, and Kings County Velo Club.

Action 2 Identify volunteer support needs and community champions, and establish bicycle and pedestrian outreach programs, such as annual public workshops.

Policy 2 Develop adult and youth bicycle and pedestrian education and safety programs. Plan citywide events to help educate the public and promote bicycling and walking as discussed in the Recommended Projects Chapter.

Policy 3 Develop and distribute a map illustrating the citywide bicycle and pedestrian network, with the map containing tips on bicycling and walking safety.

Action 1 Place copies of maps at popular places, such as City Hall, the Library, schools, and local stores.

SAFE ROUTES TO SCHOOL (SRTS)

GOAL: Promote a safe walking and bicycling environment in School Zones.

Policy 1 Work with the Reef-Sunset Unified School District to develop programs such as "walk-to-school day" for elementary school students that would encourage more students to walk or bicycle to school.

Action 1 Work with local media to engage the community in Safe Routes to School programs and events.

Action 2 Promote family-oriented Safe Routes to School events, such as Walk to School Day and Bike Trains, to increase parental involvement.

Policy 2 Work with the local schools to identify and pursue funding for "Safe Routes to School" infrastructure improvements for bicyclists and pedestrians.

Policy 3 Establish a schedule for a regular joint meeting for the City and the School District, including the City Council and the School Board, to evaluate the implementation of the Safe Routes to School Plan and to discuss next steps or unresolved items as necessary.

SAFETY AND LAW ENFORCEMENT (ENF)

GOAL: Enhance law enforcement and implement ATP policies and programs to improve road safety.

Policy 1 Work with the Avenal Police Department to evaluate and enhance training on traffic laws related to bicyclists and pedestrians.

Policy 2 The Avenal Police department should conduct regular campaigns, enhance law enforcement education efforts, and help implement the Active Transportation Plan. The police department should educate the community regarding riding against traffic, disregarding traffic signals and signs, and the appropriate use of bicycle lights in the evening or early morning, and educate motorists concerning the rights of cyclists on the roadway.

Policy 3 Adopt ordinances that focus on improving bicycle and pedestrian safety.

- Action 1 Prohibit drivers from stopping or parking their vehicle within an intersection, in a crosswalk, or on a sidewalk.

Policy 4 Work to reduce the rate of bicycle and pedestrian collisions by implementing educational support programs and safety improvement projects.

Policy 5 Enforce pedestrian- and bicycle-related laws, especially in School Zones.

- Action 1 Provide training to the Avenal Police Department to educate them on laws pertaining to walking and bicycling near schools.
- Action 2 Double the fine for traffic violations within School Zones.
- Action 3 Increase police presence and crossing guards to control drop-off and pick-up traffic in school zones.
- Action 4 Consider reducing vehicular speeds surrounding school zones from 25 mph to 15 mph as per AB 321.

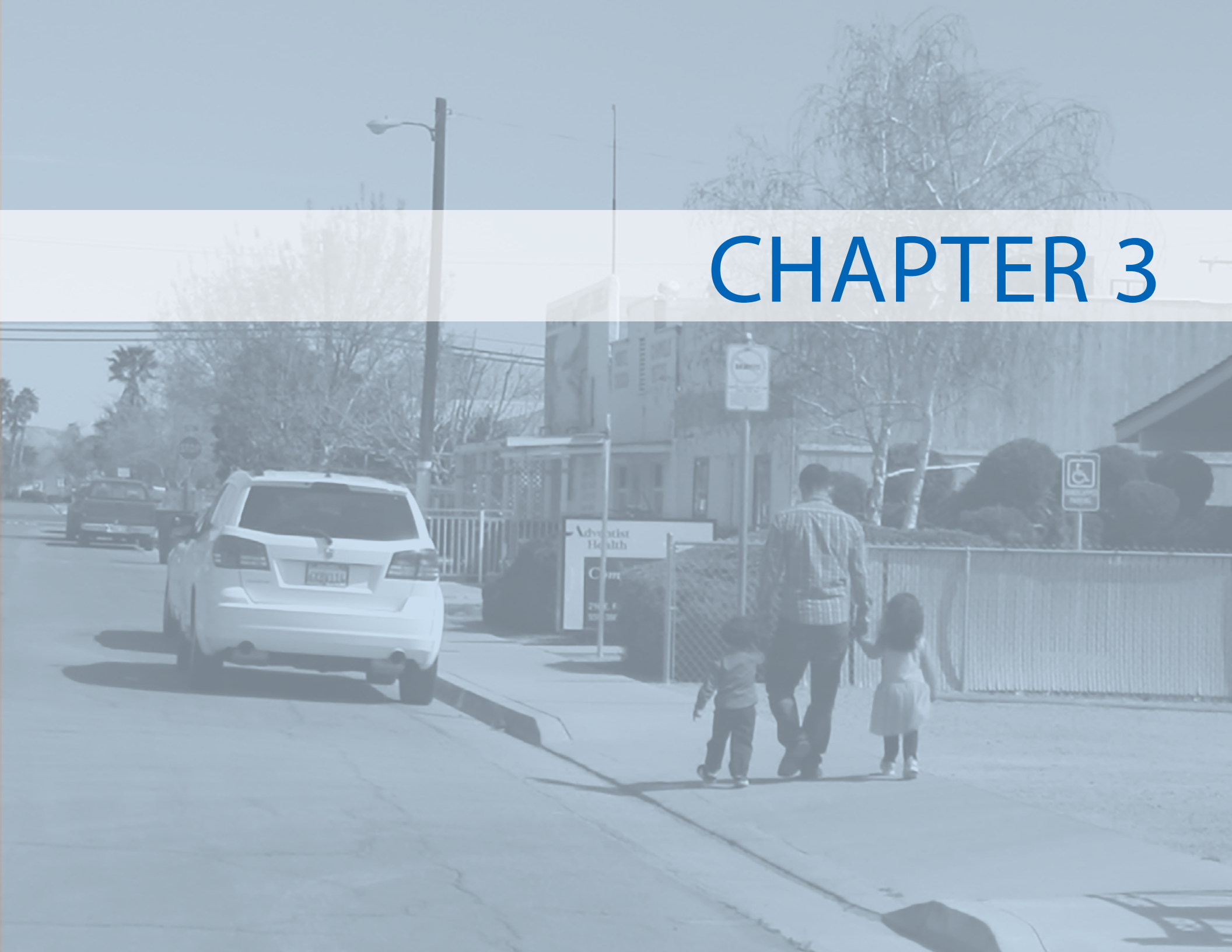
MONITORING AND EVALUATION (EVAL)

GOAL: Monitor and evaluate the effectiveness of implemented AT/SRTS Plan strategies and infrastructure improvements, activities and events.

Policy 1 Routinely monitor the performance of the AT/SRTS Plan to achieve the goals as described in the Implementation and Funding Chapter of this Plan.

Policy 2 Monitor bicycle- and pedestrian-related collision rates and seek a reduction in these collision rates.

- Action 1 Collect and evaluate pedestrian and bicycle related collision data on an annual basis. Analyze data to identify potential "trouble" locations and/or areas for focused enforcement.
- Action 2 Update the Capital Improvement Plan to prioritize improvements at "trouble" locations.
- Action 3 Conduct bicycle and pedestrian counts and surveys whenever vehicle counts are conducted to monitor the effectiveness of ATP improvements and programs. Save the count data in City-maintained databases.



CHAPTER 3



EXISTING CONDITIONS AND NEEDS ASSESSMENT

The City of Avenal's Active Transportation/Safe Routes to School Plan is part of the City of Avenal's General Plan Update and Sustainability Implementation Programs (GPU/SIP) project. This chapter summarizes existing active transportation and safe routes to school conditions in Avenal.

I. SETTING

The City of Avenal is located along the western border of Kings County in the Central Valley, as shown in Figure 3.1. Avenal is a small city with a total area of 19.4 square miles, and its urbanized area is approximately 1.5 square miles. The remainder of the city is generally made up of rural agriculture/open space and mountainous terrain.

Avenal's urbanized area is comprised predominantly of single-family residential uses. Kings Street acts as the city's downtown with commercial uses including restaurants, liquor stores, markets, and the Avenal Theater. Many other commercial uses, including Family Dollar, State Foods, and Amigo Market, and civic uses, including City Hall, Kings County Superior Court, and the library, are located along Skyline Boulevard. Multi-family residential uses are clustered together in the form of newer housing developments and are located around the periphery of the urbanized area. There are five public schools located along the periphery, with Avenal Elementary School closest to the downtown area. The city currently has two neighborhood parks, with Floyd Rice Park located between Avenal and Sunrise High Schools, and Avenal Neighborhood Park located at the intersection of Fifth Avenue and Ventura Street. Two little league fields are located directly north of Floyd Rice Park and are well-used by the community. Other notable landmarks include the Avenal Sports Complex, a large recreational area located approximately one mile south of the city's southern border, and Avenal State Prison, a 640-acre facility located in the southernmost end of the city's limits.



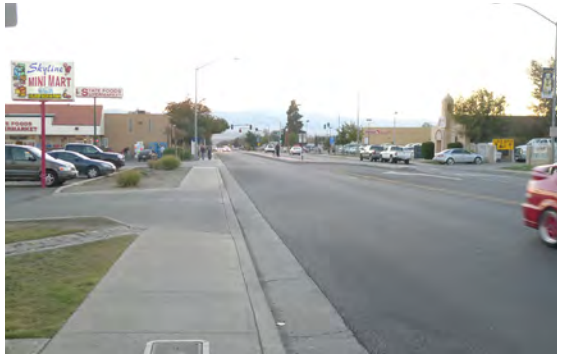
The city's urbanized area is surrounded by rural land uses.



Historic Kings Street acts as the city's downtown.



Skyline Boulevard (State Route 269) connects the city northward to Interstate 5 and other Central Valley cities.



Skyline Boulevard's commercial uses are oriented to cars rather than to pedestrians.



Avenal's urbanized area is comprised mostly of single-family residential neighborhoods.



Floyd Rice Park is one of the city's two neighborhood parks.

The city has limited public transit service with three Kings Area Rural Transit (KART) bus stops along Skyline Boulevard, which provide regional service to the City of Hanford, located at State Foods on Skyline Boulevard. There is also a Greyhound bus stop located along Lassen Street. A new bus terminal located at the corner of Seventh Avenue and State Route 33 (SR 33) is currently in the planning process and would be built by the Kings County Area Public Transit Agency (KCAPTA). The aforementioned destinations are considered pedestrian- and bicycle-related activity centers and are shown in Figure 3.1.

Three highways provide regional access of travel: SR 33 and Highway 5, which both run north-south, and SR 269 (Skyline Boulevard), which runs east-west through the urbanized part of the city and continues northbound through Highway 5. Major Collector streets that provide local traffic circulation within the city include First Avenue, Seventh Avenue, Corcoran Avenue, and San Joaquin Street.

II. DEMOGRAPHICS AND COMMUTE PATTERNS

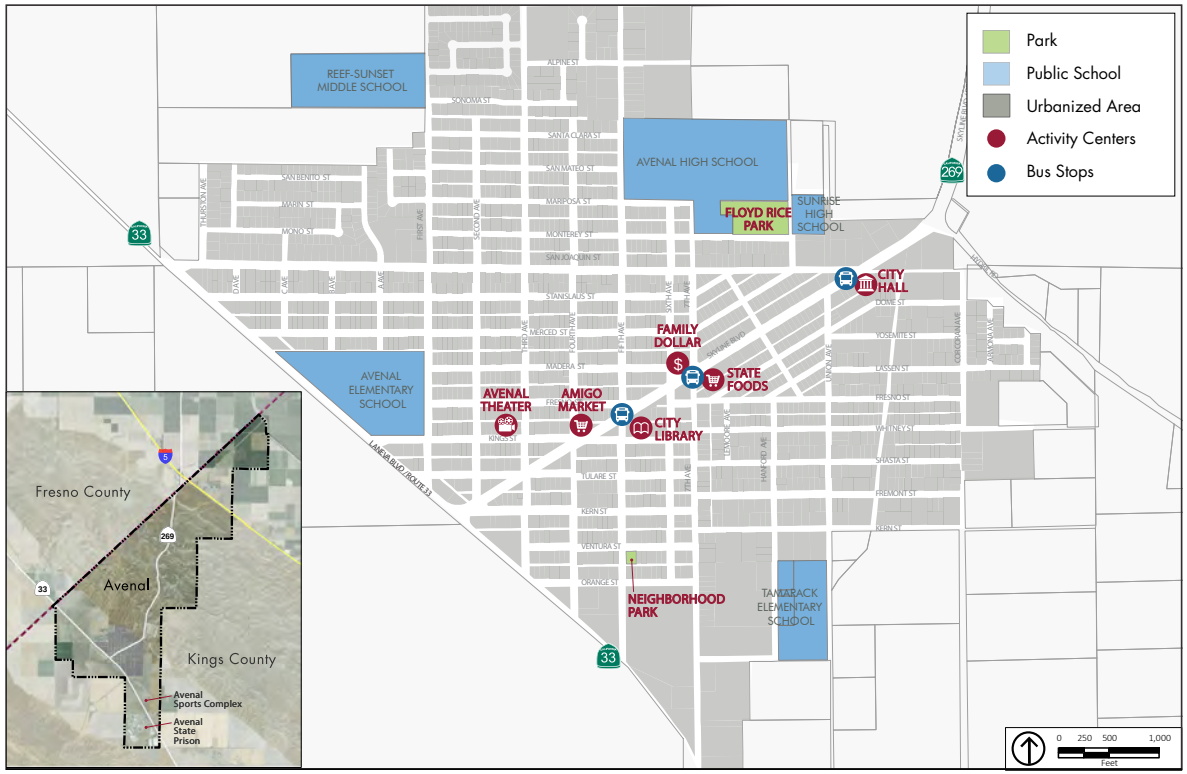
According to the US Census American Community Survey population estimates from 2015, the City of Avenal has a population of 13,301[1] people, which includes inmates at Avenal State Prison. This facility houses about 2,555[2] inmates, which accounts for approximately 20 percent of Avenal's total population.

According to American Community Survey 2010-2014 data, among 3,381 employed Avenal residents, the majority drove alone or carpooled to work

(see Table 3.1). Less than 4 percent of employed residents walked to their work place and 0 percent of employed residents biked to their work place. Although commute travel times varied (see Table 3.2), a substantial 20.1 percent of residents traveled less than ten minutes to their work place. This may mean that these residents work within the city or just outside of the city.

Avenal's major employers include the Avenal State Prison, The Wonderful Company (formerly Paramount Farms), and Reef-Sunset Unified School District. As of May 2013, only about 4 percent of Prison employees lived in Avenal. The remaining employees lived in unincorporated areas or other cities, including Coalinga, Lemoore, and Hanford. Some employees traveled over 80 miles to/from Bakersfield.[3] KART provides vanpool services for prison employees. While commute information of employees is not available, given the distance between their jobs and housing, it can be assumed the majority of prison employees did not walk or bike to their workplace.

Figure 3.1: Regional and Local Context



III. EXISTING BICYCLE AND PEDESTRIAN EFFORTS

RELEVANT PLANS

This section summarizes City, County, and regional plans that affect active transportation in and around Avenal.

CITY OF AVENAL GENERAL PLAN

The City's General Plan, adopted in 2005, guides the growth and development of the city, while

Table 3.1: Commute Patterns (Mode Share)

MODE OF TRAVEL	AVENAL	KINGS COUNTY
Car, truck, or van – drove alone	53.9%	76.1%
Car, truck, or van – carpooled	31.6%	15.0%
Public transportation	5.4%	1.5%
Walked	3.3%	2.7%
Bicycle	0.0%	0.3%
Motorcycle and other means	3.9%	1.3%
Worked at home	1.9%	3.1%

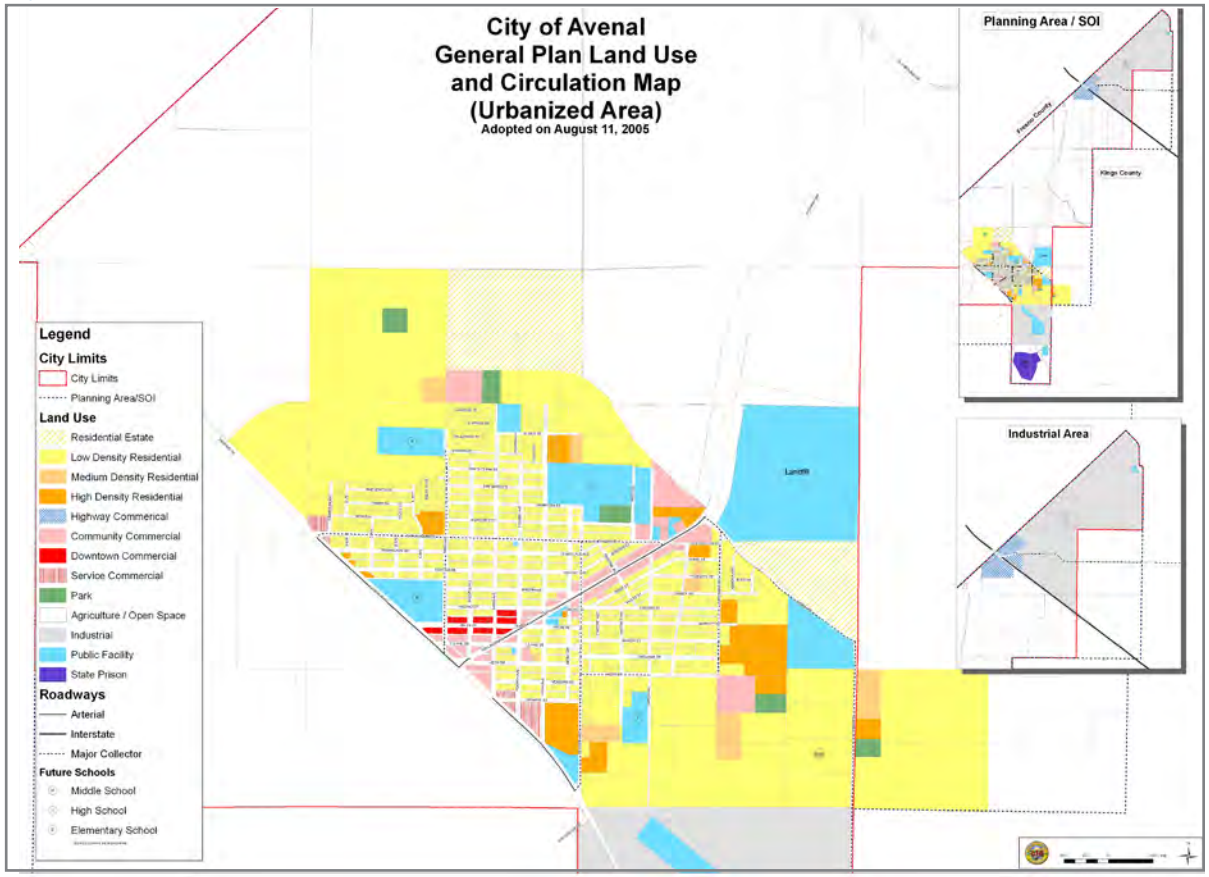
Table 3.2: Commute Patterns (Travel Time)

TRAVEL TIME TO WORK	AVENAL	KINGS COUNTY
Less than 10 minutes	20.1%	19.3%
10-14 minutes	3.7%	20.0%
15-29 minutes	23.7%	34.2%
30-44 minutes	21.4%	15.6%
45-59 minutes	14.3%	6.3%
60 minutes or more	16.8%	4.6%
Worked at home	1.9%	3.1%

aiming to conserve the city's natural resources. The General Plan contains ten elements: Noise; Safety; Open Space; Economic Development; Air Quality; Circulation; Land Use; Community Design; Public Services and Facilities; and Urban Boundary.

The Land Use Element plans for further development on mostly existing vacant land. The majority of new development is planned to be located northwest and southeast of the existing urbanized area and surrounding existing and new schools (see Figure 3.2). Most of this new development is planned for low-density residential uses. However, there are also a few planned high-density residential uses on existing vacant parcels that front onto SR 33 and Skyline Boulevard. Commercial infill is planned along the existing commercial corridors of Kings Street and Skyline Boulevard. Large industrial areas are planned at the north and south ends of the city.

Figure 3.2: Planned Land Use Map



Source: City of Avenal General Plan, 2005

The General Plan contains a Circulation Element, which includes goals and policies that promote the use of alternative modes of transportation, including transit, walking, and biking. These modes are recognized to reduce greenhouse gas emissions and create a bicycle- and pedestrian-friendly community. The City is currently updating its General Plan as part of this larger project and as a result, some policies may be revised or added.

The General Plan identifies two objectives related to alternative and active travel modes:

- Enhance the availability and accessibility of alternative modes of transportation, such as walking, bicycling, carpools, buses, and rail. (Goal B)
- Design streets that promote safe and pleasant conditions for residents, pedestrians, bicyclists and motorists on neighborhood streets, while preserving access for emergency vehicles, buses, and other users. (Goal D)

A list of existing General Plan policies that encourage bicycling and walking is included in Appendix A.

2014 REGIONAL CLIMATE ACTION PLAN

The Regional Climate Action Plan (CAP) was developed as a collaborative planning effort between Kings County Association of Governments and the Cities of Avenal and Hanford. The Plan identifies various cost-effective measures to reduce greenhouse gas emissions to 1990 levels by 2020. The Regional CAP includes a reduction measure related to the bicycle and pedestrian environment

that states, "Continue to expand and improve the bicycle and pedestrian network." Implementation actions to achieve this measure are the following:

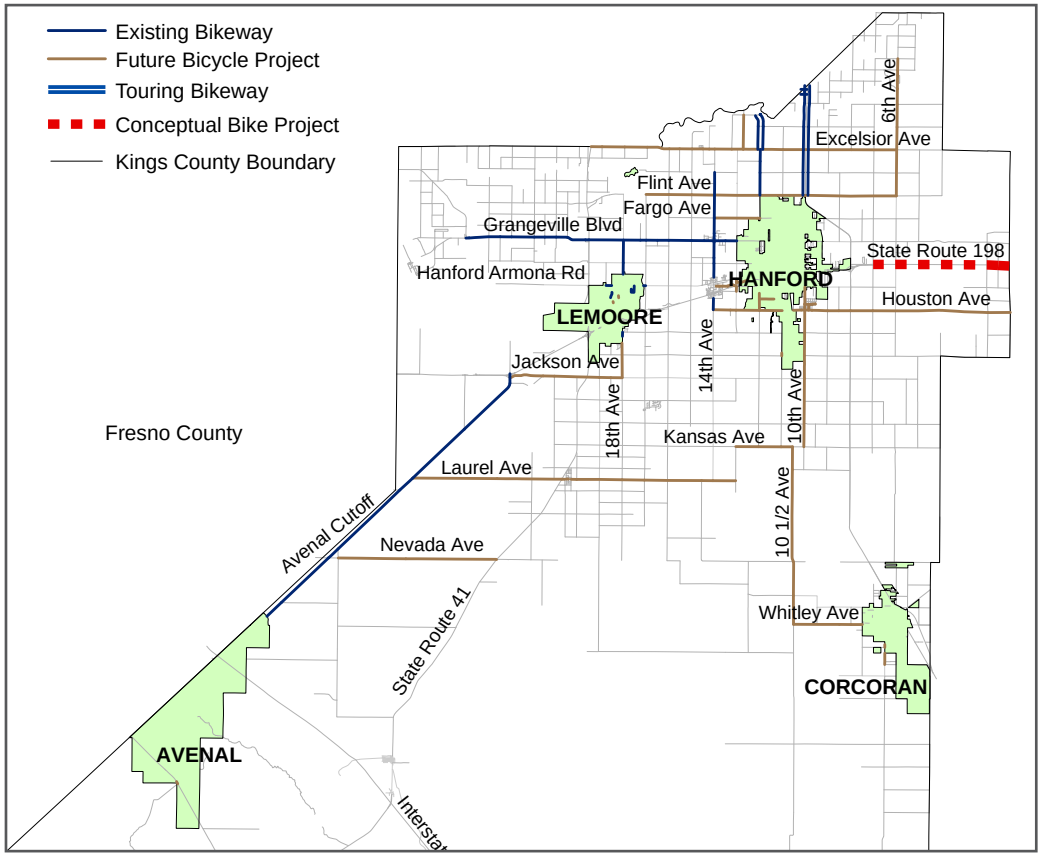
- Continue to pursue public and private funding to expand and link the regional bicycle and pedestrian network in accordance with the jurisdiction's general plan and bicycle plan, as well as the Regional Bicycle Plan.
- Incorporate multi-modal improvements into pavement resurfacing, restriping, and signalization operations where safety and convenience of users can be improved within the scope of work.
- Establish minimum design criteria for bicycle and pedestrian circulation and implement through the design review process.
- Encourage the installation of adequate and secure bicycle parking at all multi-family residential, commercial, governmental, and recreational locations throughout the region.
- Support land use planning that will promote pedestrian and bicyclist access to and from new development by encouraging land use and subdivision designs that provide safe bicycle and pedestrian circulation, including bicycle parking facilities and internal bicycle and pedestrian routes, where feasible.
- Continue to collaborate with law enforcement, school officials, and private organizations to encourage school and/or public bicycle safety programs.

2010 KINGS COUNTY GENERAL PLAN

The Kings County General Plan contains a Circulation Element that projects future transportation needs through 2035 and identifies policies and implementation actions to meet those needs. In the plan's Non-Motorized Systems section, the plan shows existing and planned bikeways throughout the county. Since adoption of the County General Plan, the County developed and adopted the 2011 Kings County Regional Bicycle Plan, which is described in the 2011 Kings County Regional Bicycle Plan on the following page. The County General Plan does not apply within City limits, but its goals, objectives, and policies call for coordination with other cities to enhance regional connections:

- ***GOAL A1.*** Provide a coordinated countywide circulation system with a variety of safe and efficient transportation alternatives and modes that interconnect cities, community districts,

Figure 3.3: Kings County Existing and Planned Regional Bicycle Routes



Source: 2011 Kings County Regional Bicycle Plan, 2011

adult education facilities, and adjoining cities in neighboring counties, and meets the growing needs of residents, visitors and businesses.

- ***GOAL C1.*** Integrate through the County's regional transportation system, an efficient and coordinated goods and people moving network of Highways, Railroads, Public Transit, and Non-Motorized options that reduce overall fuel consumption and associated air emissions.

2011 KINGS COUNTY REGIONAL BICYCLE PLAN

The City of Avenal's Bicycle Plan was developed by the Kings County Association of Governments (KCAG) as a part of the Kings County Regional Bicycle Plan Update. The plan includes both a regional bicycle plan as well as "stand-alone" bicycle plans for each jurisdiction. As shown in Figure 3.3, there is an existing cross-county bikeway that runs along the county boundary and extends from the northern non-urbanized section of Avenal to the southeast corner of Lemoore Naval Air Station. To provide a better connected regional bikeway network, there is a planned bikeway within Avenal's urbanized area to connect the existing cross-county bikeway with planned bikeways in non-incorporated areas.

KCAG worked with a Bicycle Advisory Committee (BAC) to identify potential bicycle routes based on existing bicycle travel patterns, locations of activity centers, and existing road conditions. From this evaluation, a list of potential bicycle routes was developed and prioritized to accommodate travel in the east-west direction across the city and north-south direction for regional access via Skyline Boulevard. These planned bikeways are located on SR 33, Third Avenue, Park Avenue, Union Avenue, and Skyline Boulevard.

2011 FRESNO COUNTY REGIONAL BICYCLE & RECREATIONAL TRAILS MASTER PLAN

Fresno County's 2011 Regional Bicycle & Recreational Trails Master Plan is relevant to Avenal because the Fresno County border is adjacent to Avenal's northwest border. Although the City of Avenal does not have planning jurisdiction over Fresno County land, there may be an opportunity to coordinate the City's bicycle network so that it connects to Fresno County's bicycle network. Fresno County's plan has existing and planned bikeways along SR 269, Interstate 5, and along the California Aqueduct up to the County border, which directly abuts Avenal.

PROGRAMS AND ACTIVITIES

The California Highway Patrol and the Kings County Sheriff Department holds educational and safety programs for elementary and middle school students at least once a year. These programs focus on teaching students about traffic rules of the road and wearing a helmet[5].

SAFE ROUTES TO SCHOOL PROJECTS

In 2012, the City constructed three high-visibility crosswalks with flashing beacons and in-pavement flashing lights near Avenal Elementary and Tamarack Elementary Schools. Two of the crosswalks are located along First Avenue at the intersections of Fresno Street and Madera Street. The total budget for this project was $165,153 and was completed in October 2012. The third crosswalk is located at the intersection of Seventh Avenue and Orange Street. The total budget for this project was $84,428 and was completed in April 2012.

LAW ENFORCEMENT EFFORTS

The Avenal Police Department (APD) is currently in the process of developing a helmet safety program as part of their annual Bicycle Rodeo event through which they give away bicycles to local youth. These bicycles are donated by residents or repaired by inmates at Avenal State Prison. The helmet safety program will give away helmets donated by retailers and will include bike safety information. Additionally, APD is planning events at all local schools to teach youth about bike safety and rules of the road.

PAST BICYCLE AND PEDESTRIAN EXPENDITURES

The City of Avenal has spent approximately $34,800 over the last 10 years on bicycle and pedestrian facilities, such as striping bike lanes, installing bicycle parking racks, and improving sidewalks and crosswalks.



High-visibility crosswalks with in-pavement flashing lights were installed at three locations near Avenal schools.

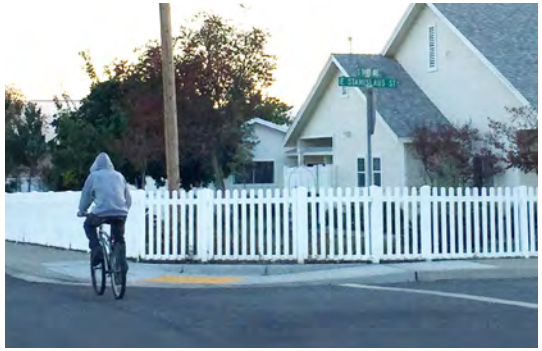
IV. BICYCLING CONDITIONS

This section describes the existing conditions of bicycle facilities and routes in Avenal and identifies existing bicycle needs.

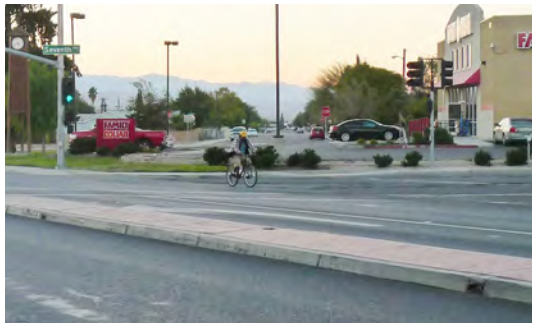
TYPE OF BIKEWAYS

Based on the California Streets and Highways Code, Caltrans identifies four types of bikeways, as described and illustrated in Figure 3-4.[4]

- **Class I bikeways (Bike Paths)**, also known as multi-use paths, are separated completely from motor vehicle traffic but may be shared with pedestrians. The California Manual on Uniform Traffic Control Devices (CA MUTCD) recommends that signage type R44A (CA) be installed along Class I bikeways.
- **Class II bikeways (Bike Lanes)** are striped in the roadway for the exclusive use of bicycles. Vehicle and pedestrian cross-flow are permitted. The striping is supported by pavement markings and signage. CA MUTCD requires signage type R81 (CA) be installed along Class II bikeways.
- **Class III bikeways (Bike Routes)** are located on roadways shared with motor vehicles. Bike routes are designated by signage and/or shared roadway bicycle markings (sharrows). CA MUTCD recommends that signage type D11-1 be installed along Class III bikeways.
- **Class IV bikeways (Cycle Tracks)** are located in or adjacent to a roadway and separated by a physical barrier (i.e. posts, on-street parking, planters) from traffic. This design allows an exclusive right-of-way for bicycle travel. The 2011 National Association of City Transportation Officials (NACTO) Urban Bikeway Design Guide recommends that a bike lane sign CA MUTCD signage type R3-17 be used for a cycle track.

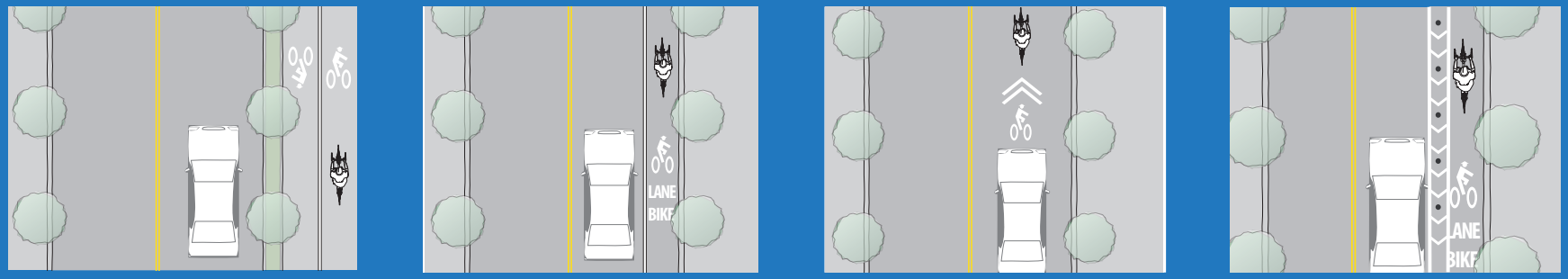


Bicycling serves as a convenient mode of travel in Avenal.



There are no bicycle facilities on Skyline Boulevard, which has relatively high traffic volumes.

Figure 3.4: Types of Bikeways



Class I (Bike Path) *Class II (Bike Lane)* *Class III (Bike Route)* *Class IV (Cycle Track)*

EXISTING BICYCLE FACILITIES

As shown in Figure 3-5, Avenal currently has around 10 miles of bikeways along Santa Clara, San Joaquin, Fresno, and Kings Streets, and Corcoran, First, Fifth, and Seventh Avenues. A few of these bikeways are bike lanes with striping, but many bike lanes do not have periodic signage or pavement markings indicating the striping as a dedicated bike lane. Existing bike lanes that currently have striping include San Joaquin Street, First Avenue, and Seventh Avenue. The bike lanes along First and Seventh Avenues do not have continuous striping for the entire length of the street. The bike lane along Seventh Avenue has pavement markings, but it is located only at the intersection of Seventh Avenue and Skyline Boulevard and is faded. Other bikeways are bike routes, which have signage to indicate a shared roadway, but the signage is limited and the bike routes do not have "sharrow" markings on the ground. Many of the streets are due for repair and/or resurfacing, which could provide a smoother surface for bicyclists to ride on.

Bicycle parking is available at most of Avenal's schools, including Avenal Elementary, Tamarack Elementary, Reef-Sunset Middle, and Sunrise High School. Bicycle parking is also available at State Foods on Skyline Boulevard. In addition, the benches at KART bus stops along Skyline Boulevard are also designed to be used as bike parking.[5]

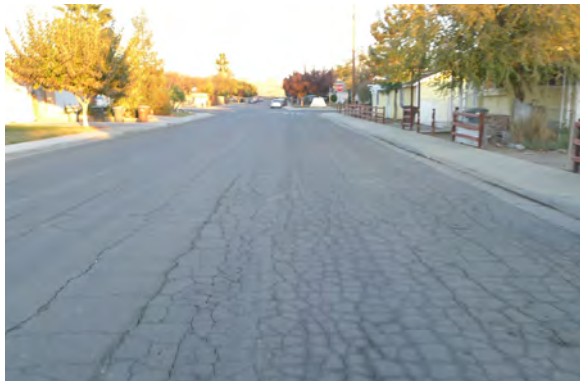
Currently, there are no support facilities in Avenal. Support facilities offer showers or lockers, particularly at destination points such as at places of employment. Support facilities also include bicycle shops, which make repair or tune-up services readily available to bicyclists.



Avenal roadways with bike routes are without "sharrow" markings on the pavement.



The bicycle lane along Seventh Avenue has pavement markings, but they are faded and infrequent. There is also some signage, but it is placed infrequently.



Cracks and ditches in roadway pavement can create an uneven and therefore unsafe surface for bicycling.



There are some bicycle racks on Avenal Streets, such as this "Loop wave" rack located on Kings Street.

PLANNED BICYCLE FACILITIES

As previously mentioned in Section 3, the 2011 Kings County Regional Bicycle Plan proposes additional bikeways along SR 33, Third Avenue, Park Avenue, Union Avenue, and Skyline Boulevard (see Figure 3-5). As part of the Active Transportation Plan process, these proposed bikeways will be revisited.

BICYCLE-VEHICLE COLLISIONS

According to a report generated by the Statewide Integrated Traffic Records System, a total of ten bicycle-vehicle collisions occurred in Avenal from 2005 to 2015, which is approximately 5% of the total collisions in the City.[6] None of these collisions resulted in a fatality or severe injury. One of the

Figure 3.5: Existing and Planned Bicycle Facilities



Source: Kings County Regional Bicycle Plan, 2011, page 36; PlaceWorks, 2015;
USDA National Agriculture Imagery Program (NAIP), 2014; ESRI, 2015

ten collisions is not shown in Figure 3.6 because of its unknown location. As shown in Figure 3.6, four of them took place along major roads, such as Skyline Boulevard, Third Avenue, and Fifth Avenue. The intersection of Skyline Boulevard and Seventh Avenue is of particular concern because this intersection reportedly is well-used by high school students, and many times jaywalking and unsafe crossings have been witnessed. These collision locations should be considered for future traffic calming devices and bicycle facilities.

As displayed in Figure 3.7 (2005-2015 Bicycle Collision Rate Per 10,000 residents), the bicycle-vehicle collision rate in Avenal is about half in comparison to the collision rates in surrounding communities and Kings County and Fresno County overall. However, the percentage of total collisions in the City of Avenal that involve bicyclists are almost three times higher versus those in Fresno County and Kings County, and are higher than any other community adjacent to Avenal (See Figure 3.8 - 2005-2015 Bicycle Collisions as a Percentage of Total Collisions). This points to a need to improve and expand bicycle infrastructure throughout the City of Avenal.

Figure 3.6: Bicycle-Vehicle Collisions, 2005 to 2015



Source: Statewide Integrated Traffic Records System, 2015; PlaceWorks, 2015; USDA National Agriculture Imagery Program (NAIP), 2014; ESRI, 2015

NEEDS ANALYSIS

Overall, Avenal's urbanized area is a great place to bicycle; it is generally flat, has easily accessible destinations, and low traffic volumes on local streets. However, some parts of the city have bicycle safety issues, requiring improvements. In creating a bicycle network in Avenal, the following elements should be considered:

- **Skyline Boulevard.** Currently, there are no bikeways along Skyline Boulevard. The 2011 Kings County Bicycle Plan identifies Skyline Boulevard as a planned touring bikeway, which is described as, "streets, county roads, and state highways which cannot be given a formal designation (i.e. Class I, II, or III) because of cost or liability concerns but are used as a primary cycling route by more experienced (and typically long-distance) cyclists." Bicycle facilities like bike lanes, signage, and crossings should be provided along Skyline Boulevard because the street runs throughout the entire urbanized area and provides connections to various activity centers and the regional bus service. As shown in Figure 3.6, one bicycle-vehicle collision was reported at the intersection of Seventh Avenue and Skyline Boulevard. Given that bicyclists are already using Skyline Boulevard, it is important to protect them from future collisions with vehicular traffic.

- **Safer Bicycle Facilities.** To improve the safety and convenience of bicycling within the city, it is important to provide adequate bicycle facilities and a well-connected bicycle network with classifications. Currently, existing bikeways in Avenal are either Class II or Class III. As described in the "Type of Bikeways" subsection under "Bicycling Conditions" (see page 3-7), appropriate design, signage, and markings should be provided along bikeways. These bikeway markings should be clear and periodic throughout the entire stretch of the bikeway. There should also be visible bike signage that is installed in periodic increments and on both sides of the road. As previously mentioned, First and Seventh Avenues need re-striping. Other streets should also be considered for inclusion within the city's bicycle network to encourage bicycling as a primary mode of travel, improve the safety of bicycle travel, and provide access to key destinations and regional connections.
- **Connectivity to Destinations and Activity Centers.** The existing bicycle network has the opportunity to expand and provide additional bicycle infrastructure on other streets. This would help improve the connectivity of the bicycle network and allow bicycle travel to be more accessible and convenient for residents. Existing bikeways along First and Seventh Avenues provide connections to Avenal Elementary School and Avenal High School. However, there are no bike routes that directly connect to Reef-Sunset Middle School, Tamarack Elementary School, Floyd Rice Park, Sunrise High School, and the downtown area on Kings Street.
- **Pavement Condition.** Some roads within the urbanized area have cracks and potholes and are in need of repair, especially streets near activity centers that serve as bike routes. These streets, such as Fresno Street, Kings Street, Fifth Avenue, and Seventh Avenue, should be prioritized for repair and resurfacing. Regularly assessing the pavement condition index (PCI) of the City's roads and repairing them accordingly can provide smoother and safer bicycling infrastructure.
- **Enforcement.** Increased police enforcement of vehicle speeding and vehicles yielding to bicyclists' right-of-way could create a safer bicycling environment and encourage increased bicycle travel. Increased enforcement can also be applicable to bicycle riding (e.g., making sure adult bicyclists stay off the sidewalk and ride in the correct direction of travel), which can improve not only bicycling safety, but also pedestrian safety.
- **Connectivity to Future Industrial Areas.** As previously mentioned, the City of Avenal's 2005 General Plan plans for large industrial areas at the north and south ends of the city. These areas are located outside of Avenal's current urbanized area and lack connectivity to the City's pedestrian and bicycle network. This lack of connectivity presents barriers to access these areas by alternative modes of travel, like walking and biking.

Figure 3.7: 2005-2015 Bicycle Collision Rate Per 10,000 residents

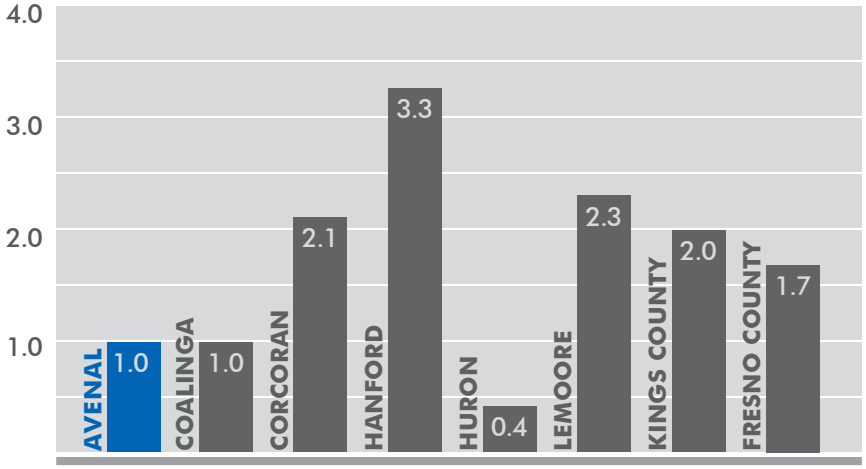
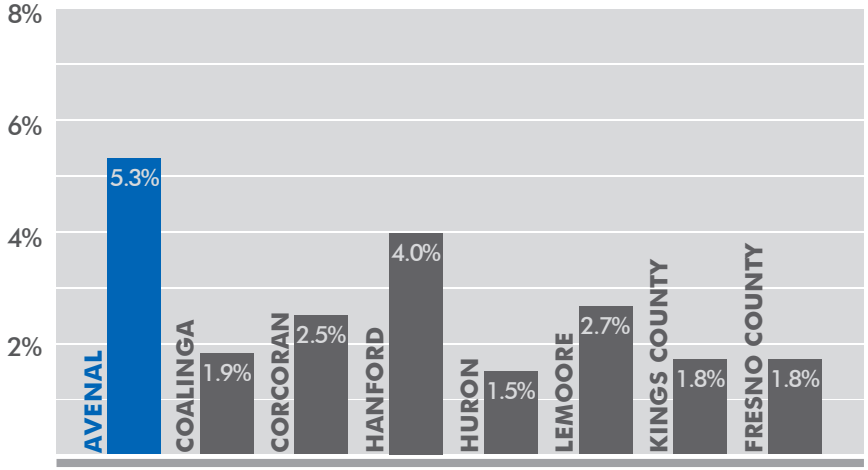


Figure 3.8: 2005-2015 Bicycle Collisions as a Percentage of Total Collisions



V. WALKING CONDITIONS

This section describes the existing conditions of the pedestrian environment and facilities in Avenal, and identifies pedestrian improvement needs.

WALKABILITY AND PEDESTRIAN FACILITIES

Walkability is a qualitative measure of the degree to which a pedestrian environment encourages walking. Walkability is influenced by all aspects of the built environment, including availability of pedestrian facilities and amenities, such as benches, store frontage, and wayfinding signage. To achieve an enjoyable pedestrian environment, pedestrian facilities should be designed with consideration of the surrounding context.

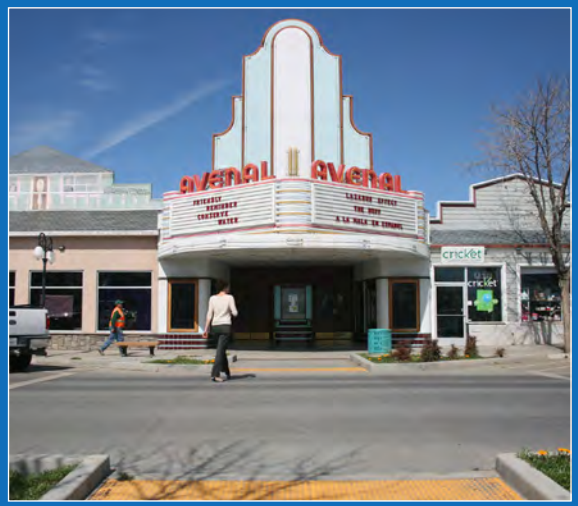
Pedestrian facilities include sidewalks and pathways, which form a connected network, as well as crosswalks, pedestrian crosswalk signals, lighting, street trees, and curb ramps. Sidewalks and pathways should be wide enough to comfortably accommodate the existing or the expected pedestrian volume, and be safe and accessible to pedestrians of all abilities. Sidewalk surfaces should be kept smooth enough to accommodate wheelchairs and strollers. All corners of intersections should have well-designed curb ramps. At signalized intersections, all crosswalks should be marked with highly visible pavement markings and signage. Traffic signal phasing should allow adequate crossing time for pedestrians. The connected network must provide access to destinations that attract pedestrian travel, such as schools, parks, and stores. Additionally, the Americans with Disabilities Act (ADA) requires other treatments, such as audible signals and curb ramps with truncated domes, to promote safety and accessibility for disabled users.

EXISTING PEDESTRIAN FACILITIES AND NETWORK

In September 2015, the Office of Community and Economic Development at Fresno State (OCED) and Pueblo Unido Mejorando Avenal (PUMA) produced a Walkability Audit report for the City of Avenal. Auditors evaluated the city's walking conditions by collecting data along Skyline Boulevard and a few residential streets. The report shows the survey results of whether auditors considered the

Walkable Kings Street: ***Avenal's historic downtown area has many pedestrian amenities, including benches, planters, waste receptacles, street trees, pedestrian-scale lighting, and decorative crosswalks.***











conditions to be high quality, adequate, or needing improvement. The report shows that the majority of auditors indicated that the following conditions need improvement:

- Width, condition, maintenance, and buffers of the sidewalks
- Bicycle racks and wayfinding signs for bicyclists
- Street, off-street, and handicapped parking
- Width and condition of the intersections, including the visibility and exposure of pedestrians and cyclists at the intersections
- Crosswalk conditions and pedestrian islands
- Quality of nighttime lighting
- Street furniture and that bike racks, seating, trash or recycling bins, restrooms, and drinking fountains were insufficient
- Visibility for safety

The report shows that the majority of auditors indicated that the following conditions are adequate or of high quality:

- Number of vehicle travel lanes, the posted speed, the observed speed, and driver behaviors.
- Placement of lighting
- Artwork, banners, and flags
- Maintenance of landscaping
- Lack of activity such as loitering or vandalism
- Mix of land uses and maintenance of buildings

The report also identifies an opportunity to create a visual and physical connection between Skyline Boulevard and Kings Street through low-cost improvements such as installing string lights, flags, landscaping, and wayfinding signs.



Avenal's urbanized area is small in size, and many residents use walking as a convenient mode of travel.



Avenal has some enhanced curb ramps that improve accessibility for those with mobility or visual impairments.



Alleyways provide informal paths of travel for residents, especially for students walking to and from school.



Directional signs installed throughout the city improve wayfinding for pedestrians and highlight key destinations in town.

The majority of Avenal's pedestrian facilities are in good condition; there are only a few missing sidewalks and curb ramps, and the infrastructure does not need immediate repair. Existing sidewalks, however, are narrow and thus do not provide adequate space for street tree plantings, except at the few newer developments where the sidewalks are wider. Despite the lack of street trees throughout Avenal, which results from the City's limited access to water, many residents do have trees in their front and back yards, which add to a pleasant walking environment for pedestrians. There are no sidewalks along SR 33, so pedestrians use the shoulders to travel north-south across town.

Most intersections in town are controlled by a two-way stop without traffic signals. There are few four-way stop intersections and many uncontrolled intersections throughout residential areas. In general, uncontrolled intersections work well in



Sidewalks on Skyline Boulevard and in many other locations in Avenal are narrow and lack a buffer from vehicular traffic.



Poor pavement conditions and faded crosswalk markings result in accessibility and safety concerns in some locations in Avenal.



Sidewalks should be located on both sides of the street to provide a continuous and complete sidewalk network.



Crosswalk markings are required in areas located close to schools. Faded crosswalk markings should be made more visible.

residential neighborhoods where traffic volumes are low. However, the residential areas around the public schools get relatively high traffic volumes during pick-up and drop-off hours, resulting in traffic issues related to pedestrian safety, such as illegal stopping and stop sign violations. There are few marked crosswalks throughout the City, most of which are located around schools, in the downtown area, and along Skyline Boulevard. Except for the three recently installed flashing crosswalks, enhancements are needed to make existing crosswalks more visible, such as high-visibility striping, ladder patterns, and flashing beacons.

Most of the residential neighborhoods contain mid-block alleyways/paseos that run east-west adjacent to the rear property lines of residences. These alleyways are restricted to public vehicular access, but are open to the public and provide informal paths for pedestrians to cross through. The downtown area along Kings Street, between 2nd and 3rd Avenues, contains unique pedestrian-friendly amenities such as decorative street lighting, patterned crosswalks, street trees, and bulb outs. There are no signalized crossings, but all crossings are marked with a crosswalk.

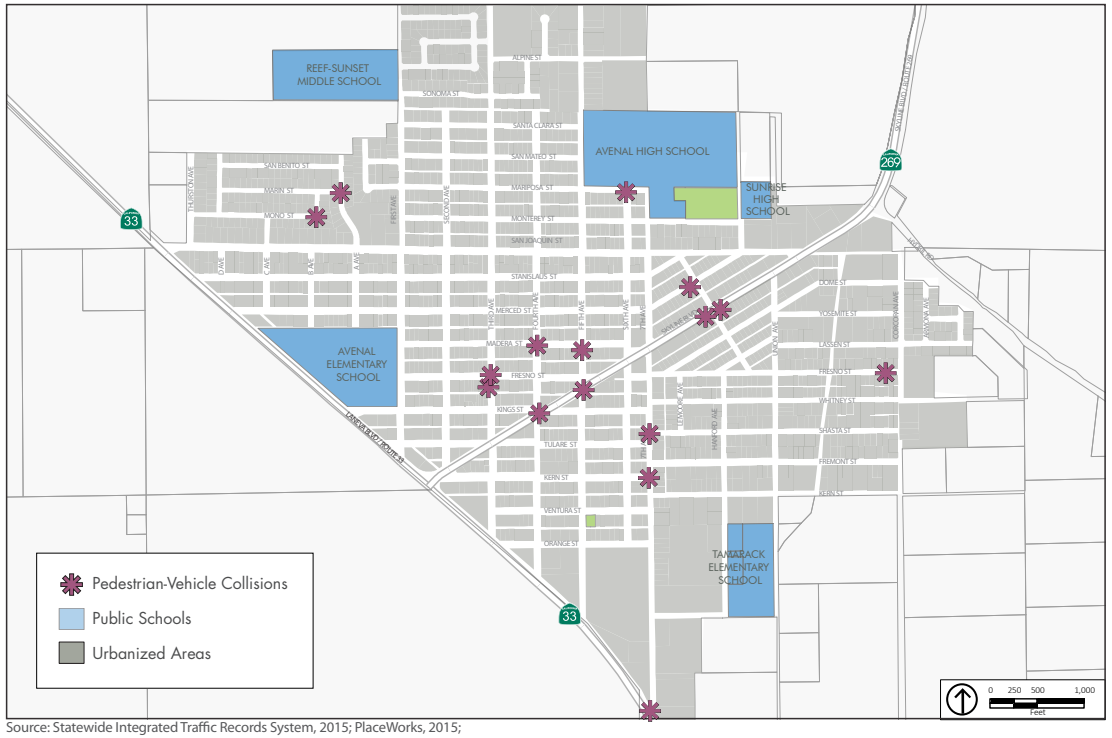
Skyline Boulevard is a well-traveled street by various types of users, including bus riders, drivers, bicyclists, and pedestrians, but it is not the safest street in the city. Because Skyline Boulevard runs diagonally through the city's grid system, the intersections along Skyline Boulevard are skewed. These skewed intersections often result in unsafe crossing conditions due to acute corners and lack of lateral visibility. Cars turning into or out of Skyline Boulevard tend to speed up without paying close attention to pedestrians, who attempt to cross streets. Students in particular need to cross Skyline Boulevard in order to get to and from Avenal Elementary. At the unsignalized intersection of Skyline Boulevard, Kings Street, and Fourth Avenue, pedestrians need to negotiate with cars coming from many different directions to continue their journey along the north side of Skyline Boulevard. In addition, crosswalks along Skyline Boulevard are sparse, and the majority of them are not signalized. In particular, there are no crosswalks in the stretch between Seventh and Union Avenues, which have more pedestrian activity because of nearby Avenal High School, restaurants, retail, services, and other commercial uses. In response to the lack of striped crosswalks, pedestrians sometimes jaywalk across Skyline Boulevard.

Currently, there is a wide shoulder along the west side of Skyline Boulevard and outside of the urbanized areas. Pedestrians occasionally use this shoulder for recreational purposes. This shoulder is not a designated pedestrian pathway and does not provide any buffer between pedestrians and high speed traffic. While there are no reported collisions in this segment, it contributes to unsafe walking conditions.

PEDESTRIAN-VEHICLE COLLISIONS

As shown in Figure 3.9, during the 10-year period from 2005 to 2015, there were 16 (7% of total collisions in the city) reported collisions in Avenal involving pedestrians, which resulted in the death of two pedestrians (12% of pedestrian-vehicular collisions and 1% of total collisions in the City), and 11 injuries, three of which were severe (19% of pedestrian-vehicular collisions and 1% of total collisions in the City).[7] Three collisions were caused by the motorist failing to yield to a pedestrian in

Figure 3.9: Pedestrian-Vehicle Collisions, 2005 to 2015



Source: Statewide Integrated Traffic Records System, 2015; PlaceWorks, 2015; USDA National Agriculture Imagery Program (NAIP), 2014; ESRI, 2015

Figure 3.10: 2005-2015 Pedestrian Collision Rate Per 10,000 residents

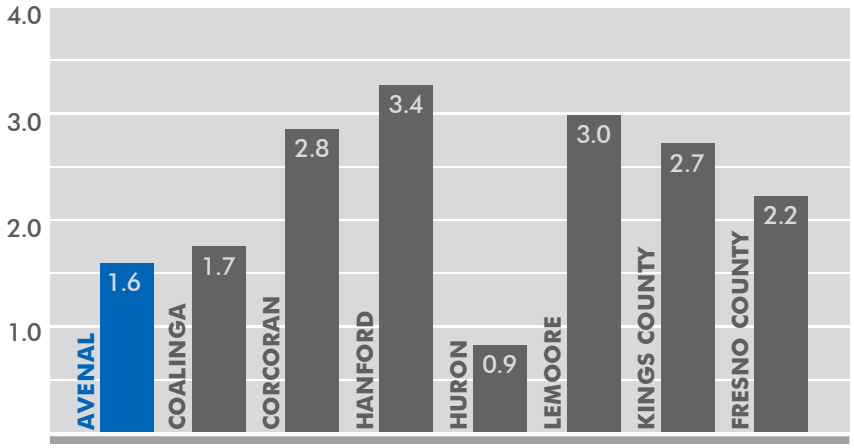
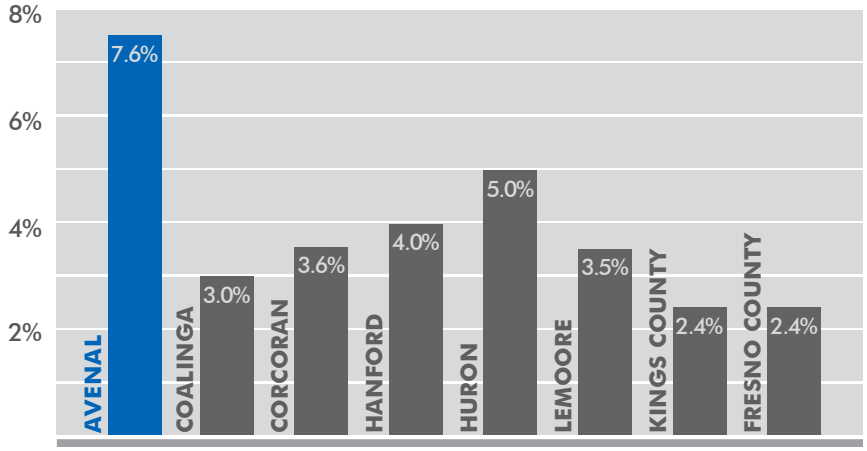


Figure 3.11: 2005-2015 Pedestrian Collisions as a Percentage of Total Collisions



the crosswalk, while ten collisions were due to a pedestrian violation, such as jaywalking. Most accidents have occurred around Skyline Boulevard and in the vicinity of the downtown area, where there is a high volume of pedestrian activity. One of the collisions is not shown in the figure because the location is outside of the map's boundaries but still within the city.

As displayed in Figure 3.10 (2005-2015 Pedestrian Collision Rate Per 10,000 residents), the pedestrian-vehicle collision rate in Avenal is below most of its surrounding communities, and has a lower collision rate versus Kings County and Fresno County overall. However, the percentage of total collisions in the City of Avenal that involve pedestrians are over three times higher versus those in Fresno County and Kings County, and are higher than any other community adjacent to Avenal (See Figure 3.11 - 2005-2015 Pedestrian Collisions as a Percentage of Total Collisions). In addition, pedestrian fatalities as a percentage of total collisions in Avenal are some of the highest in Kings County and Fresno County, further pointing to a need to improve pedestrian infrastructure throughout the City of Avenal.

NEEDS ANALYSIS

As discussed above, the pedestrian network in the city is almost complete, but requires improvements. Furthermore, collision data shows that some intersections or segments of streets need special treatment to improve safety. In creating a complete pedestrian network in Avenal, the following elements should be considered:

- **Sidewalk Network and Americans with Disabilities Act Compliance.** The Americans with Disabilities Act (ADA) requires a consistent and complete sidewalk network that meets ADA standards, such as a minimum sidewalk width, a smooth sidewalk surface, and a maximum curb ramp slope. Some parts of the sidewalk network in the city are not currently ADA compliant because they are discontinuous and/or missing, and because a few intersections have ramps without truncated domes. In particular, the signalized intersection at Seventh Avenue and Skyline Boulevard lacks audible signals.
- **Wayfinding and Signage.** Directional signs to Avenal's key destinations can help residents and visitors better navigate for pedestrians and bicyclists within the city's urbanized area.
- **Streetscape.** Streetscape improvements can enhance the pedestrian's walking experience and improve the character of a neighborhood. These improvements include lighting, trash cans, benches, colored and/or patterned pavement treatments, street tree plantings, and other sidewalk landscaping. Many of these streetscape improvements exist along Kings Street in the City's downtown area.
- **Crossing Conditions.** Street intersections should provide safety features and infrastructure for pedestrians, especially around areas with high pedestrian traffic, such as schools and activity centers. At unsignalized intersections, high-visibility crossings include flashing signage, in-pavement flashing lights, and/or other pavement markings. Currently, there are few high-visibility crosswalks throughout the City and more could be installed around schools and parks. Many intersections also do not have crosswalks, or crosswalks are faded and need restriping.
- **Recreational Pathway along Skyline Blvd.** There are no sidewalks along Skyline Boulevard north of Hydril Road. However, this section of road is often used by pedestrians for recreational purposes. Since Skyline Boulevard is also a State highway, vehicles travel at a higher speed. Pedestrian facilities should be considered for this section of roadway to protect people from interfering with oncoming traffic. The City needs to collaborate with Caltrans for potential pedestrian improvement projects.

VI. TRAIL CONDITIONS

EXISTING TRAIL FACILITIES

The City of Avenal currently has an extensive network of unpaved dirt pathways north of Avenal High School and Floyd Rice Park within the Kettleman Hills. Some of the pathways are City-owned right-of-ways, including the roadway to the former City water tank site and the roadway going north from the eastern side of Lodging House Inn and Sunrise High School. Other roadways in the vicinity are privately owned, such as the unpaved path to the equestrian stables immediately north of Floyd Rice Park. In addition, there are many other "unofficial" trails in the northern hillsides of Avenal, cut by drivers, motocross riders and hikers. As a result, these unpaved dirt pathways are susceptible to flooding during the rainy season and erosion throughout the year.

In regards to land ownership surrounding the trails north of the City, most of the land in Kettleman Hills is owned by Chevron Corporation, although they currently allow public use of the unpaved pathways. Use of the roadways runs the gamut from walking

(especially along the arroyo trail adjacent to Highway 269, which is a popular walking route among local residents), to running (as Avenal High School's Cross Country team often uses the nearby paths for their running course), to driving off-road vehicles and motocross riding. The area's rolling topography and variety of unpaved roadways attract riders and drivers from other Central Valley cities including Fresno, Visalia, Hanford, and Bakersfield. While public access enables strong utilization of Kettleman Hills for a variety of purposes, uncontrolled access and lack of maintenance in the area has led to concerns about trash and dumping of large household items.

While there are no defined trails on the southern side of town, the City of Avenal has right-of-way easements along Big Tar Canyon Road and along the south side of Tamarack Elementary School between Seventh Avenue and Union Avenue. This right-of-way easement allows for direct access from the 102-acre Avenal Sports Complex to the urbanized section of the City about a mile north of it. This facility is the largest public park in the City, with recreational soccer fields, two softball diamonds, three pavilions, playground equipment, an exercise course, horseshoe pits, restrooms, and a concession stand. Existing access to the Sports Complex is limited to two roadways, the first being Big Tar Canyon Road, a dirt roadway with no sidewalks, curb or gutter. The second access point is on Laneva Boulevard (Highway 33), a paved two-lane high-speed roadway that contains a mix of long-distance truck and passenger vehicle traffic. Construction of a multi-use trail will significantly improve access and use of the Avenal Sports Complex.

NEEDS ANALYSIS

The City of Avenal is an ideal setting for a multi-use trail network. Avenal's location between the Coast Ranges and the Kettleman Hills in the western San Joaquin Valley is well-suited for running and hiking, with large park facilities anchored at the northern and southern end of the community. While much of the town is small enough that these amenities can be accessed by walking, bicycling or running from the urbanized section of the City, based on distance to amenities, there are no official trail facilities that exist within the City of Avenal. This includes a lack of designated trailheads, no maintenance of unpaved roadways, and no wayfinding or maps noting trail locations. However, many opportunities exist within Avenal to link several citywide destinations together through a network of paved and unpaved trails.

TAKE ADVANTAGE OF RIGHT-OF-WAY OPPORTUNITIES

The City's 60-foot easement along Big Tar Canyon Road allows for a great opportunity to construct a



The City of Avenal has an extensive network of unpaved roadways in the Kettleman Hills, just north of Avenal High School and Floyd Rice Park.



While many unpaved roadways north of Avenal are publicly accessible, they often access private property, including these equestrian stables just north of Floyd Rice Park.



Avenal currently has an easement along Big Tar Canyon Road from Salem Road to the Sports Complex, affording the City a potential opportunity to construct a multi-use trail along the right-of-way.

paved and lighted multi-use trail, which will help reduce vehicular congestion to and from the Avenal Sports Complex. The facility is within one to three miles from the City's urbanized area, an easy walking and biking distance for most of Avenal's residents. In addition, easements owned by private property owners such as those by Hearthstone Village Apartments and The Wonderful Company Preschool may allow for additional access points from the proposed multi-use path to existing bike lanes installed along Seventh Avenue, as well as to future bike lanes on Union Avenue.

CONTINUE AGREEMENTS ON PUBLIC USE AND IMPROVE MAINTENANCE OF EXISTING TRAILS

In the northern side of town, the City currently has an agreement with Chevron Corporation for public access of unpaved roadways. While this allows for recreational opportunities on privately owned land, this also creates issues with maintenance and degradation of existing open space, including landslides, flooding, and erosion of unpaved roadways. The City should consider improving a couple of key roadways within the existing Kettleman Hills network. Roadways selected should be those that have direct access to City easements and owned right-of-ways, as well as easy access to Floyd Rice Park. Use of the arroyo trail directly to the west of Highway 269 would also be important, as it is a highly popular walking route for existing residents. Improvements to roadways include limiting access to just walkers, runners and bicyclists, constructing a trailhead at the foot of the network at the northern end of Floyd Rice Park, and compacting existing roadways with materials that will restrict runoff. This will decrease impacts of landslides, flooding and erosion, ultimately improving the recreational experience for active modes of transportation.

CREATE A NETWORK OF TRAILS, UNLOCKING BICYCLE AND PEDESTRIAN ACCESS THROUGHOUT AVENAL

Once a paved trail is constructed from the Avenal Sports Complex to Tamarack Elementary School, this will allow for connections to the Seventh Avenue Bike Lane and the future Union Avenue Bike Lane. With this connection, this will allow for direct access to Floyd Rice Park, Avenal High School, Sunrise Continuation School and the improved unpaved trails north of the City without leaving a dedicated bicycle or pedestrian facility. Along with longer-term improvements supporting a touring bikeway along Skyline Boulevard and a multi-use path along Highway 33, as well as proposed bikeways within the City, creation of a citywide trails and bicycle network will help unlock Avenal's capacity to promote active recreation throughout the City as well as reduce reliance on driving.



The area's abundant open spaces, rolling topography and panoramic views attract a variety of users, who often cut their own pathways, impacting the surrounding hillsides.

VII. ROUTES TO SCHOOLS CONDITIONS

This section describes walking and biking conditions specifically around Avenal's five public schools. These descriptions are based on interviews with school staff, input received from parents and students at a workshop that PlaceWorks and City staff facilitated on November 12, 2015, and field observation. A summary of the workshop is included as Appendix B. Figures 3.12 to 3.15 illustrate the existing walking and biking conditions within the vicinity of each of the five schools.

In addition, PlaceWorks and City staff asked parents to fill out a survey form that was designed by the National Center for Safe Routes to School (NCSRTS). The school principals helped distribute the NCSRTS survey forms school-wide so that parents who were not at the survey site could fill them out and return them to the school at a later date. The results of the NCSRTS survey was made available in February 2016 and is summarized in the following sections.

AVENAL ELEMENTARY SCHOOL

Avenal Elementary is located along the western perimeter of Avenal's urbanized area. It is bounded by SR 33 (Laneva Boulevard) to its west and First Avenue to its east. The school is surrounded by older single-family housing to its north and east, and industrial buildings to its south. The school is also located near Kings Street, the city's downtown area. According to the school's staff, out of 824 students, the majority (approximately 80 percent) walk and the remaining get a ride by car to school. Very few students bike to school, and five special education



Students and parents mapped their routes to school at the Safe Routes to School Workshop.

Figure 3.12: Existing Conditions in the Vicinity of Avenal Elementary School



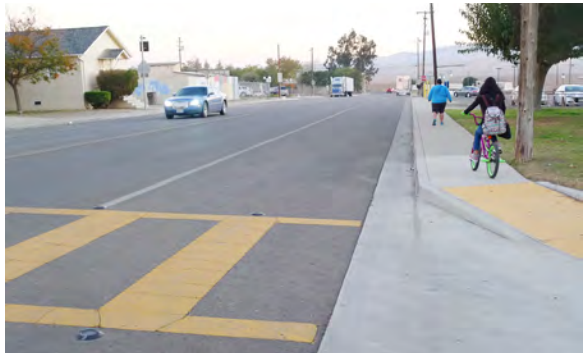
Source: PlaceWorks, 2015

students ride a school bus. The school bus drops off these students in front of the office on First Avenue. First Avenue also serves as a drop-off and pick-up area for parents, as well as smaller streets, including Fresno Street near the Life Church and Kings Street. Bike parking is available in the parking lot. Although there are no crossing guards, the intersections of Madera and Fresno Streets at First Avenue have flashing pedestrian crossings.

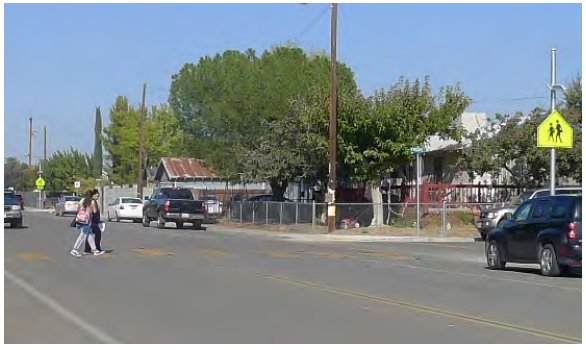
Many students who walk to school first travel along the nearest east-west street and then continue to walk north or south along First Avenue to arrive at the school's entrance.

The highest foot and vehicular traffic is concentrated along First Avenue from San Joaquin Street to Kings Street. Frequently traveled east-west streets by pedestrians include San Joaquin Street, Stanislaus Street, Fresno Street, and Kings Street. Since Reef-Sunset Middle School is located approximately half a mile directly north of Avenal Elementary School, the two schools share First Avenue as a convenient route for access. Therefore, some traffic to Reef-Sunset Middle School along First Avenue adds to the traffic of those getting to Avenal Elementary School.

At the workshop, students and parents noted the heavy traffic on First Avenue during school pick-up and drop-off times, and expressed concern about the high vehicular speeds, cars not stopping for students crossing the street, and the need for crossing guards. There were also comments about the heavy traffic and high travel speeds along San Joaquin Street and Skyline Boulevard. Several students noted poor street lighting conditions along Fresno Street, which is perpendicular to the school's entrance.



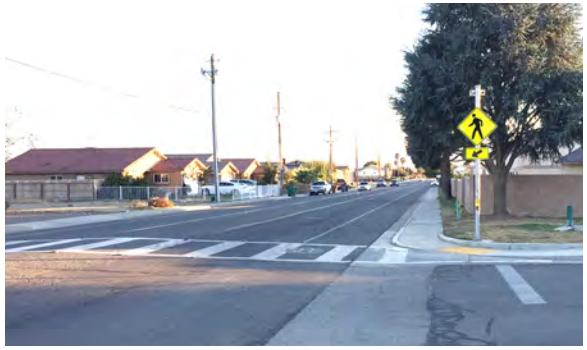
Students walking and bicycling to Avenal Elementary School.



Two crossings with in-pavement flashing lights along First Avenue near the entrance to Avenal Elementary School.



At Tamarack Elementary School, parents turn into the parking lot at the end of Hanford Avenue to pick up and drop off students.



Flashing pedestrian crossing located at the intersection of Orange Street and Seventh Avenue near Tamarack Elementary School.

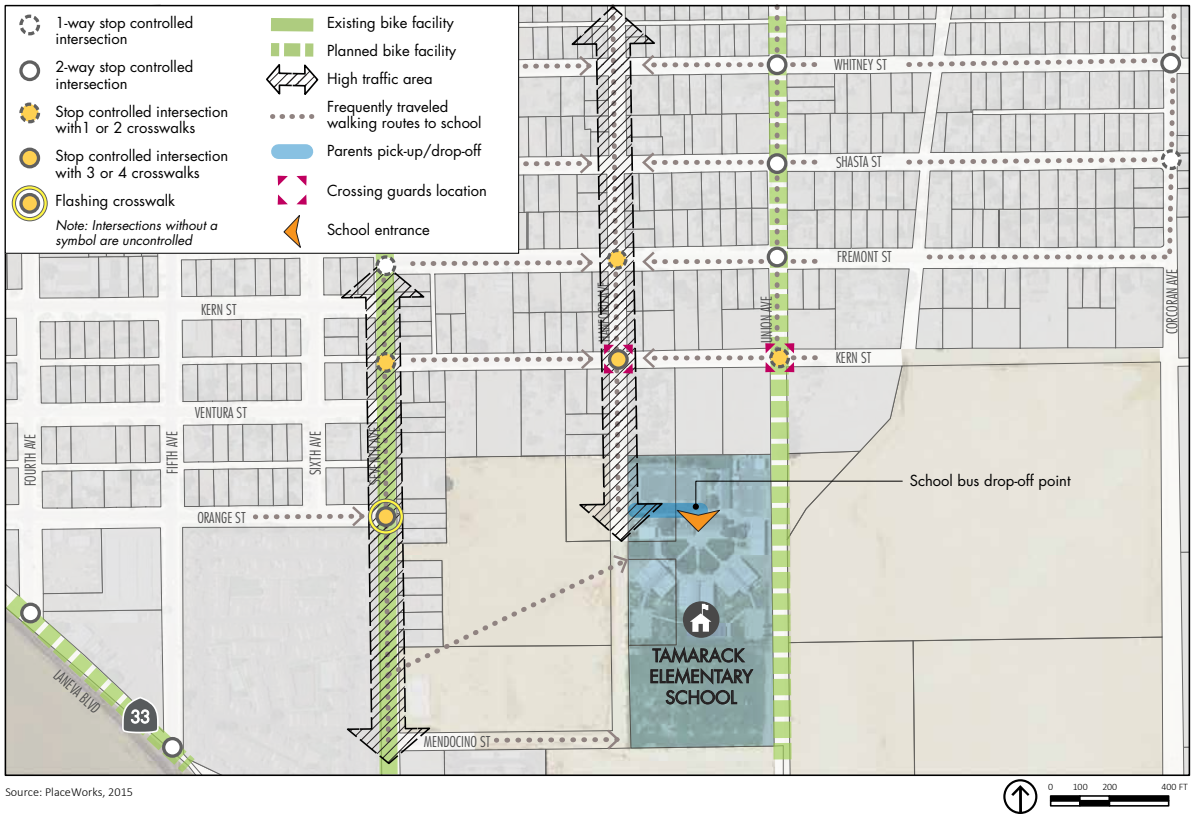
TAMARACK ELEMENTARY SCHOOL

Tamarack Elementary is located at the southeastern corner of Avenal's urbanized area. Hanford Avenue runs along the school's western edge and Union Avenue runs along the school's eastern edge. Single-family neighborhoods are located to the north of the school, while apartment neighborhoods are located to its south and west. According to the school's staff, out of 503 students, approximately 75 percent walk, 20 percent get a ride by car, and 5 percent ride a bike to school. There is no bus service to the school. Bike parking racks and bike lockers are available to students, which are located near the preschool building on the school site.

Parents typically drive via Hanford Avenue into the school parking lot and use two designated lanes within the parking lot to pick-up and drop-off students. When school is released, students wait in line by the entrance gate, or in the cafeteria during poor weather conditions to get picked up. To access Hanford Avenue, students frequently travel first along east-west routes such as Orange, Fresno,

Whitney, Fremont, and Kern Streets. In addition, Hanford, Seventh, Corcoran, and Union Avenues are frequently traveled north-south streets used to get to the school. Students who live in the southern apartment complexes use Mendocino Street and dirt roads to access the school from the south end. In the morning, for approximately 20 minutes, the Kern Street/Hanford Avenue and Kern Street/Union Avenue intersections are safe-guarded by crossing guards. The southern section of Union Avenue is primarily used by school faculty since it leads to the entrance of their designated parking lot. At the workshop, Seventh Avenue, especially from Ventura Street to Shasta Street, was identified as a hazardous area because the street has high vehicular and pedestrian traffic and vehicles do not stop at stop signs. In the morning, Seventh Avenue becomes busy because of vehicles traveling toward SR 33. In the afternoon, this street is especially busy because many of the students are using it to get home to the apartment complexes located south of Orange Street. The Kern Street and Hanford Avenue intersection was identified as a busy and unsafe intersection. After school is released in the afternoon, it is difficult for vehicles traveling north on Hanford Avenue to turn left onto Kern Street due to waiting for the critical mass of pedestrians crossing the street, which causes vehicular back-up. Students identified several locations near the school that need better lighting, including along Kern, Fremont, and Whitney Streets. Students also indicated the need for bike lanes along Fremont Street and Sixth Avenue.

Figure 3.13: Existing Conditions in the Vicinity of Tamarack Elementary School



Source: PlaceWorks, 2015

REEF-SUNSET MIDDLE SCHOOL

Reef-Sunset Middle School is located at the northwestern edge of Avenal's urbanized area. The school is almost completely surrounded by undeveloped land and First Avenue is its only adjacent street along the eastern edge. According to the school's staff, out of 315 students, approximately 95 percent walk, 5 percent get a ride by car, less than 1 percent bike to school, and one student takes a school bus to school. The designated bus drop-off area is located between the parking lot and office building. Bicycle parking is available on the school site.

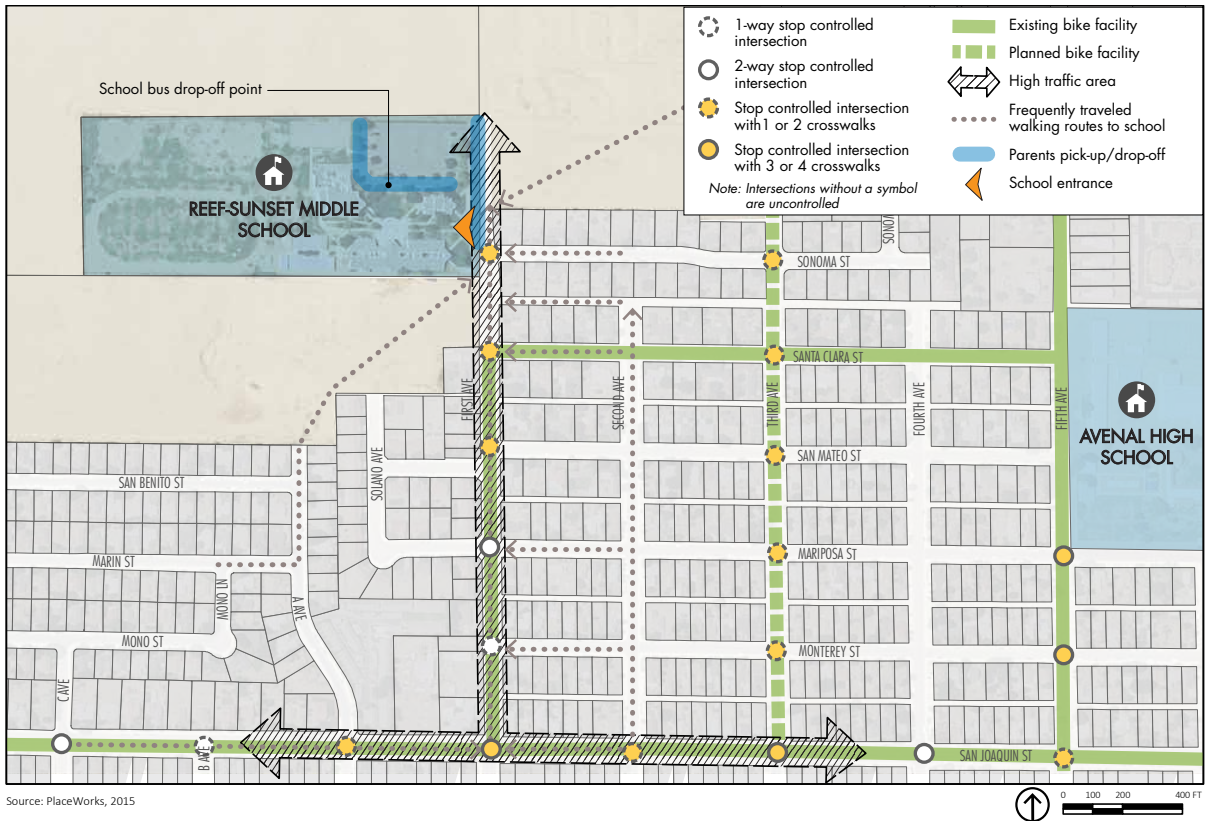
Similar to Avenal Elementary School, many students travel to school via the nearest east-west streets by foot and all routes end at First Avenue to reach the school's parking lot and entrance. Most of the traffic along First Avenue occurs north of Stanislaus Street via San Joaquin, Mariposa, and Sonoma Streets. Alternatively, pedestrians use Second Avenue as their main north-south corridor to school. Students also choose to cross through dirt roads in the surrounding undeveloped areas to get to school.

Because First Avenue is the only street that feeds to the school, there is high vehicular and pedestrian activity along that street. The parking lot in front of the school entrance is a designated area for pick-up and drop-off, but it requires parents to drive all the way to the northern "dead end" of First Avenue, then turn and circle around the parking lot in order to exit. To avoid the long travel route, parents often choose to pick-up and drop-off students in the middle of First Avenue and/or wait along First Avenue during pick-up. This causes a safety issue of students crossing First Avenue without using designated crosswalks.

AVENAL HIGH SCHOOL

Avenal High School is located at the northeastern edge of town. It is surrounded to the west and east by single-family housing, to the north by apartment housing, and is adjacent to Floyd Rice Park. According to the school's staff, out of 641 students, the majority (approximately 80 percent) walk to school and the remaining either drive, get a ride by car, or take the school bus. The school bus is shared with Sunrise High School and serves students who live in Kettleman City. These students are dropped off at the parking lot at Monterey Street and Seventh Avenue. Many students take Seventh Avenue, Mariposa Street, or Fifth Avenue to walk to school. Students who get a ride by car wait at the front of the school along Mariposa Street to get picked up. In the past, bike parking was available at the back of the school, but has been removed.

Figure 3.14: Existing Conditions in the Vicinity of Reef-Sunset Middle School



Source: PlaceWorks, 2015



At Reef-Sunset Middle School, the bike lane striping on First Avenue does not continue to the school entrance.



At Reef-Sunset Middle School, many parents wait along First Avenue in their cars to avoid turning into the parking lot to pick up and drop off students.

SUNRISE HIGH SCHOOL

Sunrise High School is a small continuation high school located along the eastern edge of town. There are approximately 40 students, and according to the school's staff, most walk or drive to school. Two students take the shared school bus from Kettleman City and get dropped off at the parking lot at Monterey Street and Seventh Avenue to get to school. Students who get a ride by car wait in front of the school at the intersection of Park Avenue and Monterey Street to get picked up. Bike parking racks are available for use in the school's parking lot.

SUMMARY OF NCSRTS PARENTS SURVEY

As mentioned above, the project team conducted a Parents Survey, which was designed by the NCSRTS, with help from each school. The project team and the local school staff distributed the survey forms at each school in November 2015 and collected them in December 2015. During this time, bilingual fliers, which promoted the survey in English and Spanish, were distributed at each school site. The survey forms and flyer are included in Appendix C. The collected surveys were sent to the NCSRTS, which then entered survey data into their online database.

Figure 3.15: Existing Conditions in the Vicinity of Avenal High School and Sunrise High School



Source: PlaceWorks, 2015

As shown below, a total of 366 responses were collected, many of which were submitted in Spanish. The following is a summary of the survey results which is presented in Figures 3.16 through 3.21. The full report of the survey results can also be found in Appendix D.

FREQUENT COMMENTS MENTIONED IN SURVEY RESPONSES

The following issues related to safety were mentioned more frequently in the free answer section:

- Concern for child's safety with strangers walking to and from school alone; and
- Concern for child's safety crossing streets and the high amount of traffic along streets near schools, including First, Seventh, and Union Avenues. Suggestions included adding crossings and utilizing crossing guards.

SUMMARY ANALYSIS

The results of the surveys show that in general, students who live closer to school are more likely



Students who get a ride by car wait at the front of Avenal High School to get picked up.

to walk to school. Many families in Avenal live less than a quarter mile from a school and the majority of families in the City live within one mile from a school. However, there is still a large number of students who are driven to school in a family vehicle and live within a close distance to school (i.e. within a quarter mile). The two most reported issues that affect a parent's decision to not allow a child to walk or bike to/from school were "weather or climate" and "safety of intersections and crossings."

The majority of students either walk or ride a family vehicle to arrive at or depart from school. More students walk departing from school than arriving to school and correspondingly, fewer students ride a family vehicle departing from school than arriving to school. The reason for this could be because parents are unavailable to give their child a ride to school in a car due to their work schedules.

The very few students who ride the school bus or carpool live more than two miles away from school. No parents indicated that their child rides transit or a bike as a mode of transportation to school.

Figure 3.17: Survey Responses

	# OF SURVEYS DISTRIBUTED	# OF SURVEYS COLLECTED
Avenal Elementary School (K-6th Grade)	824	40
Tamarack Elementary School (K-5th Grade)	503	186
Reef-Sunset Middle School (6th to 8th Grades)	314	16
Avenal High School (9th-12th Grades)	663	124

Figure 3.18: Grade Levels of Children Represented in Survey

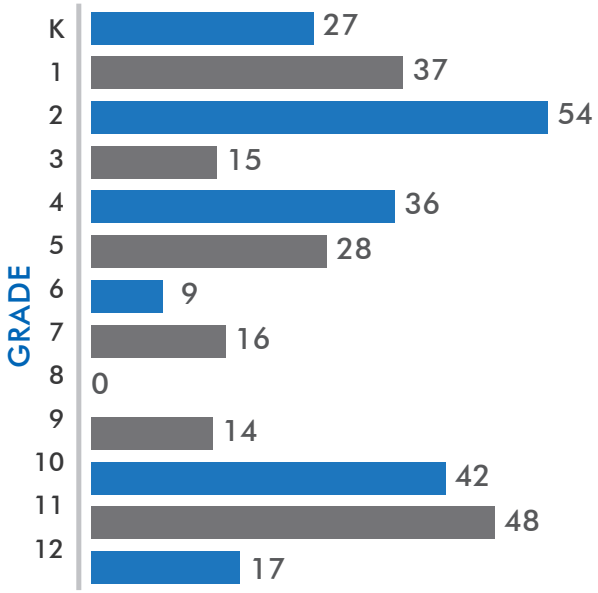


Figure 3.16: Typical Mode of Arrival at and Departure from School

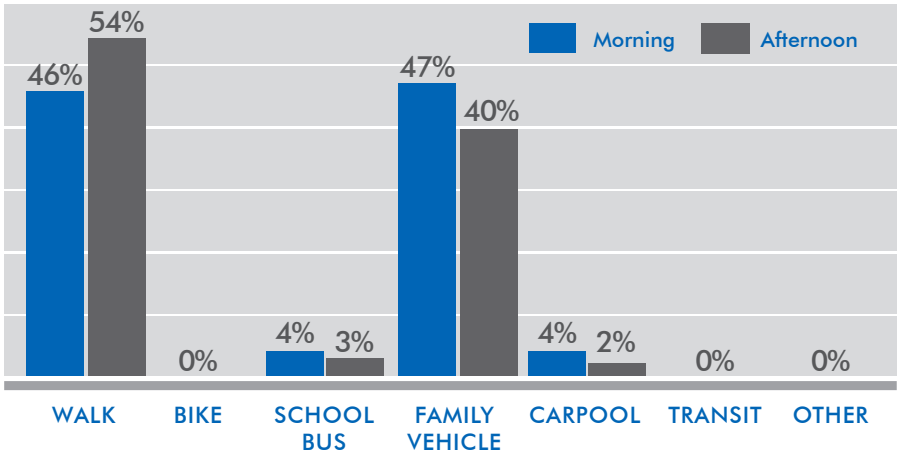


Figure 3.19: Parent Concerns That Limit Walking/Bicycling

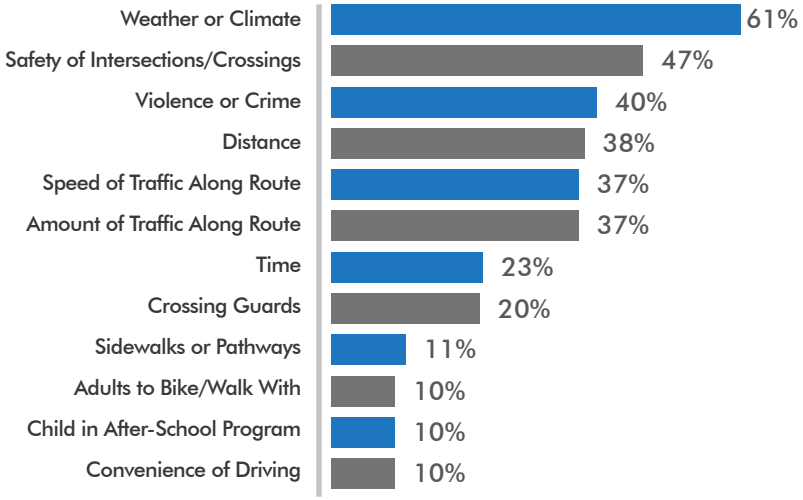


Figure 3.20: Typical Mode of School Arrival by Distance

DISTANCE	# OF RESPONSES	WALK	BIKE	SCHOOL BUS	FAMILY VEHICLE	CARPOOL	TRANSIT	OTHER
Less than 1/4 mile	74	64%	0%	1%	35%	0%	0%	0%
1/4 mile up to 1/2 mile	54	39%	0%	0%	54%	7%	0%	0%
1/2 mile up to 1 mile	74	38%	1%	0%	61%	0%	0%	0%
1 mile up to 2 miles	48	44%	0%	0%	52%	4%	0%	0%
2 miles or more	22	36%	0%	23%	36%	5%	0%	0%

Figure 3.21: Typical Mode of School Departure by Distance

DISTANCE	# OF RESPONSES	WALK	BIKE	SCHOOL BUS	FAMILY VEHICLE	CARPOOL	TRANSIT	OTHER
Less than 1/4 mile	69	64%	0%	0%	35%	1%	0%	0%
1/4 mile up to 1/2 mile	51	51%	0%	0%	47%	2%	0%	0%
1/2 mile up to 1 mile	60	55%	2%	0%	42%	0%	0%	0%
1 mile up to 2 miles	39	54%	0%	0%	41%	5%	0%	0%
2 miles or more	17	35%	0%	29%	35%	5%	0%	0%

CHAPTER SOURCES

[1] United States Census Bureau, http://www.census.gov/quickfacts/table/PST045215/0603302, Accessed August 17, 2016.

[2] Department of Corrections and Rehabilitation, State of California, 2016, http://www.cdcr.ca.gov/Reports_Research/Offender_Information_Services_Branch/Monthly/TPOP1A/TPOP1Ad1507.pdf, Accessed August 17.

[3] City of Avenal, Strategic Plan, 2013.

[4] California Streets and Highways Code Section 890.4.

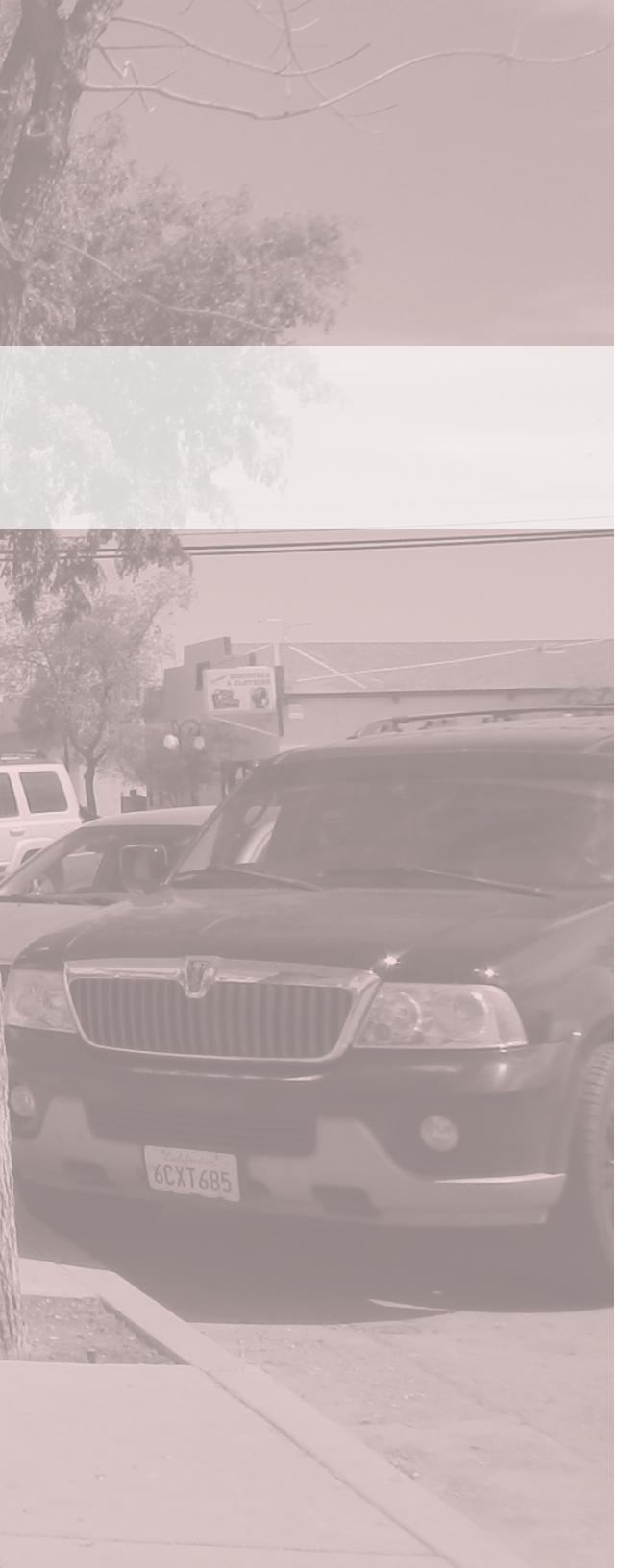
[5] Kings County, Regional Bicycle Plan, 2011, page 35.

[6] Statewide Integrated Traffic Records System (SWITRS), http://iswitrs.chp.ca.gov/Reports/jsp/CollisionReports.jsp, accessed on December 18, 2015.

[7] Statewide Integrated Traffic Records System (SWITRS), http://iswitrs.chp.ca.gov/Reports/jsp/CollisionReports.jsp, accessed on March 14, 2012.



CHAPTER 4



RECOMMENDED PROJECTS AND PROGRAMS

This chapter recommends a list of projects that will enhance walking and bicycling environments and improve safety and accessibility in Avenal. These projects are categorized into four groups: Citywide Improvements, Pedestrian Improvements, Safe Routes to School Improvements, and Bicycle and Trail Improvements. Each project contains a detailed description of the proposed improvements. Sections I and II include figures that illustrate the locations of the recommended improvements.

The recommended projects and programs described in this chapter are necessary to create a comprehensive bicycle and pedestrian network. However, these types of improvements entail significant resources including capital costs and City staff time, which are currently limited. The City will implement the recommended projects as funds and grant opportunities become available and in conjunction with the City's other capital improvement needs. Chapter 5 provides guidance on how the City of Avenal can implement the following projects and programs and identifies potential outside funding opportunities the City can pursue.

The recommended projects and programs have been prioritized in into three phasing groups: Phase I (short-term projects), Phase II (medium-term projects), and Phase III (long-term projects) in order to help the City effectively utilize limited financial resources. The phasing of the projects and programs are described further in the Funding and Implementation Chapter.

I. CITYWIDE IMPROVEMENTS

LIGHTING

Certain areas of Avenal could benefit from better lighting to improve the safety and security of its residents. Improving lighting conditions also encourages people to walk and bike during later hours because of enhanced safety and increased visibility. In Avenal, there is a growing concern to light unlit areas, increase illumination in areas where there are existing lights, and extend illumination hours to accommodate residents and businesses, especially in Downtown.

- Develop a citywide lighting plan or program to enhance existing lighting, increase the illumination of sidewalks, and create a sense of security, especially near downtown, schools and high-activity areas.
- Consider the following areas to install new or enhance existing pedestrian-scaled lighting and/or light bollards per City-approved standards:
  - Avenal High School – along Fifth Avenue between Mariposa and Alpine Streets
  - Floyd Rice Park – along Monterey Street and around perimeter of park
  - Tamarack Elementary – Kern Street from Seventh to Union Avenues
  - Avenal Elementary – along First Avenue, Madera and Fresno Streets
  - Reef-Sunset Middle School – First Avenue at Sonoma Street
  - Skyline Boulevard between Seventh and Laneva Boulevard
  - Along South Corcoran Avenue
  - Near the Lodging House Inn and US Post Office on San Joaquin Street

WAYFINDING

Helping people navigate Avenal and locate key destinations can enhance the pedestrian and bicycling experience so that it is more convenient and enjoyable. Wayfinding can take the form of signage and/or streetscape improvements such as sidewalk furnishings, and its design can create a unique identity for the city or a certain area of the city.

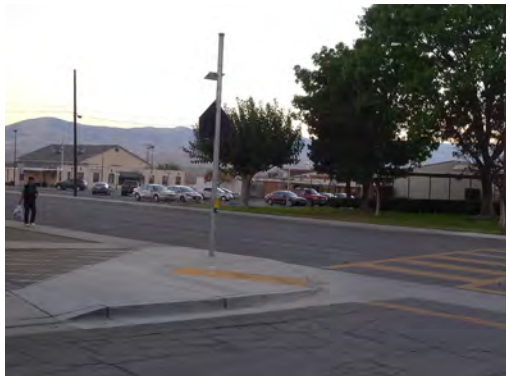
- Install information signs and kiosks at key locations such as parks, schools, and City Hall. The information signs and kiosks would provide a map of the city and directions on how to get to the other key locations.
- Extend streetscape improvements from Kings Street to all along Skyline Boulevard through installing special lighting, banners, and/or flags to create a physical and visual connection. Streetscape improvements would be located along the entire urbanized stretch of Skyline Boulevard between Laneva Boulevard and Hydril Road.

ALLEYWAY IMPROVEMENT PROGRAM (MID-BLOCK PEDESTRIAN PATHWAYS)

Many students utilize the alleyways located between the rears of residential properties as pathways on their school routes. These alleyways currently lack formal maintenance and present an opportunity to



Pedestrian-scaled lighting is recommended around the perimeter of Floyd Rice Park.



Pedestrian-scaled lighting is recommended on streets adjacent to Avenal Elementary School.



Pedestrian-scale lightpost on Kings Street.



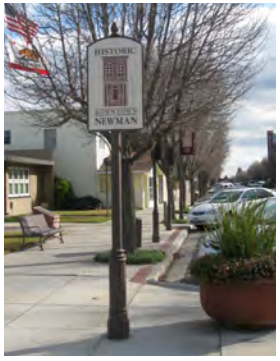


Types of wayfinding that can be installed in Avenal include bicycle-oriented directional signage and sidewalk kiosks.



Streetscape enhancements along Skyline Boulevard (above) can include wayfinding features such as banners, signage, and pedestrian lighting (examples below).







Alleyways like this one across from Avenal Elementary School can be enhanced to provide pleasant, safe environments for walking.

create unique spaces that could serve as a valuable amenity for various neighborhoods.

- Improve public alleyways so they create a pleasant pedestrian environment for students walking to school. The City would develop an alleyway improvement program that provides a range of recommended improvements, such as special pavement treatments, landscaping, and low-level lighting. Neighboring residents could apply to this program for City approval, specifying the improvements for the alleyway that cuts through their block.

STREET CLOSURE EVENTS

Temporary street closures for public events can foster a sense of community and act as a catalyst for envisioning how public spaces can be transformed to have more non-motorized circulation over motorized circulation. Kings Street would be a good fit for a street closure since it is located in the heart of Downtown. Additional foot traffic would benefit surrounding businesses.

- Hold street closure events on Kings Street

POLICY FOR FUTURE DEVELOPMENT

Tamarack Elementary and Reef-Sunset Middle Schools are surrounded almost completely by undeveloped land, which presents challenges for access and connectivity to other uses. As Avenal continues to develop outwards, the City should require developer impact fees to provide benefits to the community such as new streets with lighting, landscaping, sidewalks, and bikeways.

- Adopt policy stating that future development adjacent to Tamarack Elementary and Reef-Sunset Middle Schools should provide streets that provide adequate walking and biking connectivity to the schools.
  - With future development, consider potentially reconfiguring drop-off/pick-up areas to improve safety and flow of traffic.

II. PEDESTRIAN IMPROVEMENTS

Figure 4.1 shows existing and proposed pedestrian improvement projects within the City.

NEW CROSSWALKS

The following intersections are highly utilized by pedestrians but do not have crossing improvements.

- New high-visibility crosswalks (e.g., ladder, zebra, or continental patterns) along high-traffic streets should be installed at the following intersections, at every leg of an intersection, to improve the safety of pedestrians:
  - Skyline Boulevard at Second, Third, Sixth, Central, and Union Avenues, San Joaquin Street, and Hydril Road
  - San Joaquin Street at Thurston, D, C, B, Fourth, and Park Avenues, and Stanislaus Street
  - First Avenue at Tulare, Monterey, and Mariposa Streets
  - Seventh Avenue at Ventura, Fremont, Tulare/Shasta, Merced, and Stanislaus Streets
  - Hanford Avenue at Tamarack Elementary, Shasta, Whitney, and Fresno Streets



High-visibility crosswalks are recommended at Seventh Avenue and Fremont Street.



Enhanced high-visibility crosswalks are recommended to replace existing crosswalks at several locations.



Flashing beacons or a 4-way stop can be considered for Union Avenue and Kern Street near Tamarack Elementary School.

- At intersections with existing crosswalks and along high-traffic streets, add new high-visibility crosswalks so that there is a crosswalk at every leg of the intersection, such as at the following locations:
  - First Avenue at San Mateo, Stanislaus, Merced, Madera, Fresno, and Kings Streets
  - San Joaquin Street at First, Second, Third, Fifth, and Seventh Avenues, and Merced Street
  - Skyline Boulevard at Fourth and Fifth Avenues
  - Seventh Avenue at Fresno, Whitney, Kern, and Orange Streets
  - Hanford Avenue at Fremont Street
  - Mariposa Street at Fifth Avenue (not a high-traffic street, but still a poor intersection)
- At intersections with existing crosswalks and *not* along high-traffic streets, add new standard crosswalks so that there is a crosswalk at every leg of the intersection, such as at the following locations:
  - A Avenue at Stanislaus and Merced Streets
  - Second Avenue at Stanislaus Street
  - Third Avenue at Sonoma, Santa Clara, San Mateo, Mariposa, Monterey, and Madera Streets
  - Fifth Avenue at San Mateo and Madera Streets
  - Sixth Avenue at Mariposa Street

IMPROVE EXISTING CROSSWALKS

The following intersections currently have crosswalks, but they only have standard crosswalk striping. To increase the visibility/safety of these intersections, the following improvements are recommended:

- Restripe all existing crosswalks that cross high traffic streets so that they become high-visibility crosswalks.
  - Skyline Boulevard at Fourth, Fifth, and Seventh Avenues
  - San Joaquin Street at First, Second, Third, Fifth, and Seventh Avenues, and Merced Street
  - First Avenue at Kings, Merced, Stanislaus, San Mateo, Santa Clara, and Sonoma Streets
  - Seventh Avenue at Kern, between Kings and Whitney (consider relocating this crosswalk to a more appropriate location on Seventh Avenue), Fresno, Monterey, and Mariposa Streets
  - Hanford Avenue at Kern and Fremont Streets
  - Mariposa Street at Fifth Avenue (not along a high traffic street, but still a poor intersection)
- Consider installing flashing beacons to enhance the visibility of crossing pedestrians, especially students, in close proximity to a school
  - Kern Street at Seventh and Hanford Avenues
- Consider flashing beacons and in-pavement lighting to further enhance the visibility of crossing pedestrians, especially students, in close proximity to a school
  - Union Avenue at Kern Street
  - First Avenue at Sonoma Street

NEW CONTROLS AT INTERSECTIONS

A few of Avenal's controlled intersections would benefit from increased controls to help calm traffic and increase safety for pedestrians and bicyclists.

Figure 4.1: Pedestrian Improvement Projects in City's Urbanized Area





The existing traffic median along Skyline Boulevard between Central and Fifth Avenues could be reconfigured and enhanced to include landscaping and/or pedestrian crossing islands (as seen in the examples below).



Example of a landscaped median with drought-tolerant planting.



Example of a pedestrian crossing island.

- Add 4-way stops at key intersections:
  - Kings Street at Second Avenue (has existing crosswalks)
  - Seventh Avenue at Kern/Ventura Streets (confusing and busy intersection) and Fresno Street (has existing crosswalks – proposed to become high-visibility)
  - Union Avenue at Kern and Fremont Streets (no existing or proposed crosswalks at Fremont Street)
  - Hanford Avenue at Fremont Street (has existing crosswalks – proposed to become high-visibility)
  - Adopt a policy to add crosswalks at all controlled intersections

TRAFFIC CALMING INFRASTRUCTURE

Avenal has several intersections that have a large amount of paved street right-of-way, but these intersections lack infrastructure that provide safety for pedestrians. For example, excess pavement can make it difficult for pedestrians to cross streets and be visible to drivers. Replacing excess pavement with traffic calming infrastructure can help slow traffic, increase pedestrian safety, and provide beautification to the neighborhood.

- Reduce areas of excess pavement with traffic calming features (e.g., curb extensions, landscaped traffic islands, pedestrian medians, etc.)
  - San Joaquin Street at Central Avenue and Merced Street
  - Fresno Street at Valley Street/Hanford Avenue

SKYLINE BOULEVARD IMPROVEMENT AREA

Skyline Boulevard plays an important role in city and regional travel in Avenal. Although it is a well-used street, the community has expressed concern that the high amount of traffic hinders walking and biking experiences along this corridor. Implementing projects that help calm traffic on Skyline Boulevard can create a pleasant travel environment for various modes of transportation.

- Reconfigure and redesign existing traffic median between Central and Fifth Avenues to include landscaping and/or a pedestrian crossing island
- Implement traffic calming features at the following intersections:
  - Skyline Boulevard at Hydril Road, San Joaquin Street, Sixth, Fifth, and Fourth Avenues

SIDEWALK AND CURB RAMP IMPROVEMENTS

As mentioned earlier in this Plan, the majority of Avenal's sidewalks are in good condition and do not need immediate repair. Nonetheless, routinely monitoring the City's sidewalk conditions and gaps in the sidewalk network can help maintain an optimal walking environment. Laneva Boulevard (SR 33) is utilized as a walking path for residents, including students. Because this roadway does not have sidewalks, pedestrians travel in the shoulder, which presents unsafe walking conditions.

The issue of speeding along Laneva Boulevard is a concern and good reason for adding sidewalks along the roadway.

- Fill sidewalk gaps or provide new sidewalks:
  - Sidewalks along Laneva Boulevard (SR 33)
  - Sidewalks connecting east-west to Laneva Boulevard
- Continue working with the Office of Community and Economic Development at Fresno State (OCED) and Pueblo Unido Mejorando Avenal (PUMA) to conduct an audit of sidewalks and curb ramps for the entire city, and identify other locations that need to be updated to meet the minimum ADA requirements.
- Repair cracked sidewalk surfaces and upgrade curb ramps that are identified in the audit, prioritizing locations in proximity to key destinations.

III. SAFE ROUTES TO SCHOOL IMPROVEMENTS

PHYSICAL PROJECTS

Avenal's schools need to minimize the conflict between parents picking up/dropping off students to and from school and students crossing nearby streets to travel to school or back home. The recommendations below are intended to meet the following goals: (1) slow traffic on school routes, (2) increase safety and visibility for students when crossing school routes, (3) clearly identify school zones to encourage drivers to be more cautious when driving in these areas, and (4) create efficient and designated drop-off/pick-up areas.

- Consider adding speed bumps or speed tables near school sites to calm vehicular traffic.
- Consider adding crosswalks at intersections along frequently traveled walking routes to school that were not identified as high-traffic streets, including:
  - Stanislaus, Merced, Madera, Fresno, Kings, Whitney, Shasta, Fremont, Kern, Sonoma, Santa Clara, Mariposa, and Monterey Streets
  - Corcoran, First, Fifth, Seventh, and Hanford Avenues
- Add speed trailers along high traffic streets, including San Joaquin Street, Skyline Boulevard, First Avenue, Seventh Avenue, and Hanford Avenue to help improve traffic law enforcement.
- Install "school zone" signs within school vicinity
- Identify designated drop-off/pick-up areas through signs and/or pavement markings
- Reconfigure/study existing angled parking on First Avenue at Avenal Elementary School
- Widen sidewalks around schools if the roadway has adequate right-of-way
- Fill in missing sidewalk along Fresno Street at the church and consider reconfiguring the existing angled parking
- Consider Installing flashing beacons at key crosswalks (see Pedestrian Improvements)
- Recommend off-site improvements to address other important issues of arriving at school safely

PROGRAMS

In addition to infrastructure projects, the Reef-Sunset Unified School District should also implement programs that inform students about the benefits of walking and biking and how to safely do so.

- Hold educational and promotional events to inform students about traffic safety and promote walking and biking. For example, a Walk-and-Roll to School Day would designate a school day to encourage all students to use an active form of transportation to get to school such as walking, biking, scootering, or rollerblading.
- Create a Safe Routes to School map that identifies school walk zones and school zones.
- Provide crossing guards at every elementary and middle school at key crosswalks and during drop-off and pick-up times. Possible guarded intersections can include:
  - First Avenue at Madera, Fresno, and Kings Streets (Avenal Elementary)
  - Seventh Avenue at Ventura and Kern Streets (Tamarack Elementary)
  - First Avenue at Sonoma and Santa Clara Streets (Reef-Sunset Middle School)
- Create a "walking school bus" program, which allows students to walk together in a group to school with one or more adults.

IV. BICYCLE IMPROVEMENTS

Figure 4.2 shows existing and proposed bicycle improvement projects within the City.

ROAD MAINTENANCE

Monitoring the conditions of roads and repairing them accordingly will provide a smooth, and therefore safer, surface for bicycling.

- Repair roads that have cracked, uneven, or potholed surface conditions, especially on roads with existing and/or planned bikeways:
  - Skyline Boulevard
  - San Joaquin Street (east of Third Avenue)
  - First Avenue (north of Santa Clara Street if putting in new bike lane)
  - Seventh Avenue (especially near school traveling north of Merced Street if putting in new bike lane)
  - Fifth Avenue (especially south of Santa Clara Street)
  - Fresno Street (west of Skyline Boulevard)

Develop a program for routine maintenance of bikeway and walkway network facilities, including regular sweeping, pavement repairs, restriping crosswalks, and trimming vegetation.

INSTALL NEW OR IMPROVE EXISTING BIKEWAYS

The existing bikeway network "on the ground" is in need of improvement. Some of the bikeways are faded and lack adequate signage and stencil markings that indicate the striping is for bike use. Clearly and properly identifying roads with designated bikeways as such will help bikers recognize the city's bikeway network and help drivers share the road with bicyclists. Additionally, the planned bikeway network identified in Kings County Regional Bicycle Plan has yet to be completed.

- Install appropriate design signage and markings (e.g., sharrows and "bike lane" stencils) on existing bike lanes and routes.
- Repaint existing, faded "bike lane" marking at intersection of Seventh Avenue and Skyline Boulevard.
  - Add markings throughout entire bikeway
  - Bike signage installed in periodic increments and on both sides of the road
- Restripe existing bicycle lane along San Joaquin Street and explore the idea of implementing a Class IV bikeway along the roadway.
  - Repaint existing bicycle lanes on both sides on First Avenue and Seventh Avenue to reduce "dooring" incidents.
- Continue existing bike lanes:
  - Seventh Avenue (north of Merced Street to Mariposa Street)
  - First Avenue (south of Kings Street to Laneva Boulevard and north of Santa Clara Street to northern boundary of Reef-Sunset Middle School)
- Create separation between on-street parking and bike lanes to prevent dooring accidents by doing one of the following:
  - Stencil door zone marks in existing bike lanes
  - If lane is too narrow, install "no parking" signs to prevent cars from parking in bike lane
- Install planned bikeways identified in Kings County Regional Bicycle Plan and in this Plan:
  - Laneva Boulevard/SR 33 (multi-use path)
  - Skyline Boulevard (touring bikeway)
  - Third Avenue (Class III with stripe)
  - Park Avenue (Class III with stripe)
  - Union Avenue (Class II)

EXPAND BIKEWAY NETWORK

The planned bikeway network identified in the Kings County Regional Bicycle Plan could be expanded even further to provide improved bicycle connectivity throughout the city. New bikeways should also be provided to other key destinations beyond the city's urbanized area such as the Kettleman Hills, the Sports Complex, the Sand Drags, and future industrial areas.

- Install Class II bicycle lanes and signs:
  - Extend existing bike lane on First Avenue north to Reef-Sunset Middle School
  - Extend planned bike lane on Union Avenue south to Salem Avenue to provide links to the Sports Complex and Sand Drags
  - Salem Avenue
  - Fremont Street between Seventh to Corcoran Avenues
  - Corcoran Avenue (currently Class III)
  - Hydril Road
  - 36th Avenue
- Install Class III bicycle routes and signs:
  - Kings Street (from First to Fifth Avenues) and consider changing existing angled parking to angled back-in parking

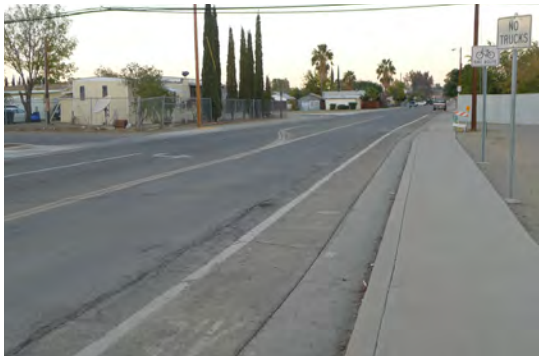
Figure 4.2: Bicycle Improvement Projects in City's Urbanized Area



Source: Kings County Regional Bicycle Plan, 2011, page 36; PlaceWorks, 2015



Bike Route in Avenal with signage but no sharrow pavement markings.



Faded "BIKE LANE" marking on Seventh Ave. at Skyline Blvd.



In some Avenal locations (such as First Avenue at Avenal Elementary School), bicycle lanes lack striping to delineate the bicycle lane from parked vehicles.

- Orange Street
- Mariposa Street
- Hanford Avenue (from Fresno Street to Tamarack Elementary School)
- Monterey Street (from Seventh to Park Avenues)
- Alpine Street

NEW RECREATIONAL MULTI-USE PATHS/ TRAILS

Avenal is unique in that its small urbanized area is surrounded by large amounts of open space. This context provides opportunities for recreational paths and trails that can be used by both pedestrians and bicyclists. To the north, pedestrians and bicyclists can enjoy trails that traverse into mountainous landscapes and terrain and have convenient regional access along Skyline Boulevard. To the south, pedestrians and bicyclists can conveniently access recreational uses such as the Sports Complex and the city's annual Sand Drags event. Figure 4.3 shows existing and proposed citywide bicycle improvement projects.

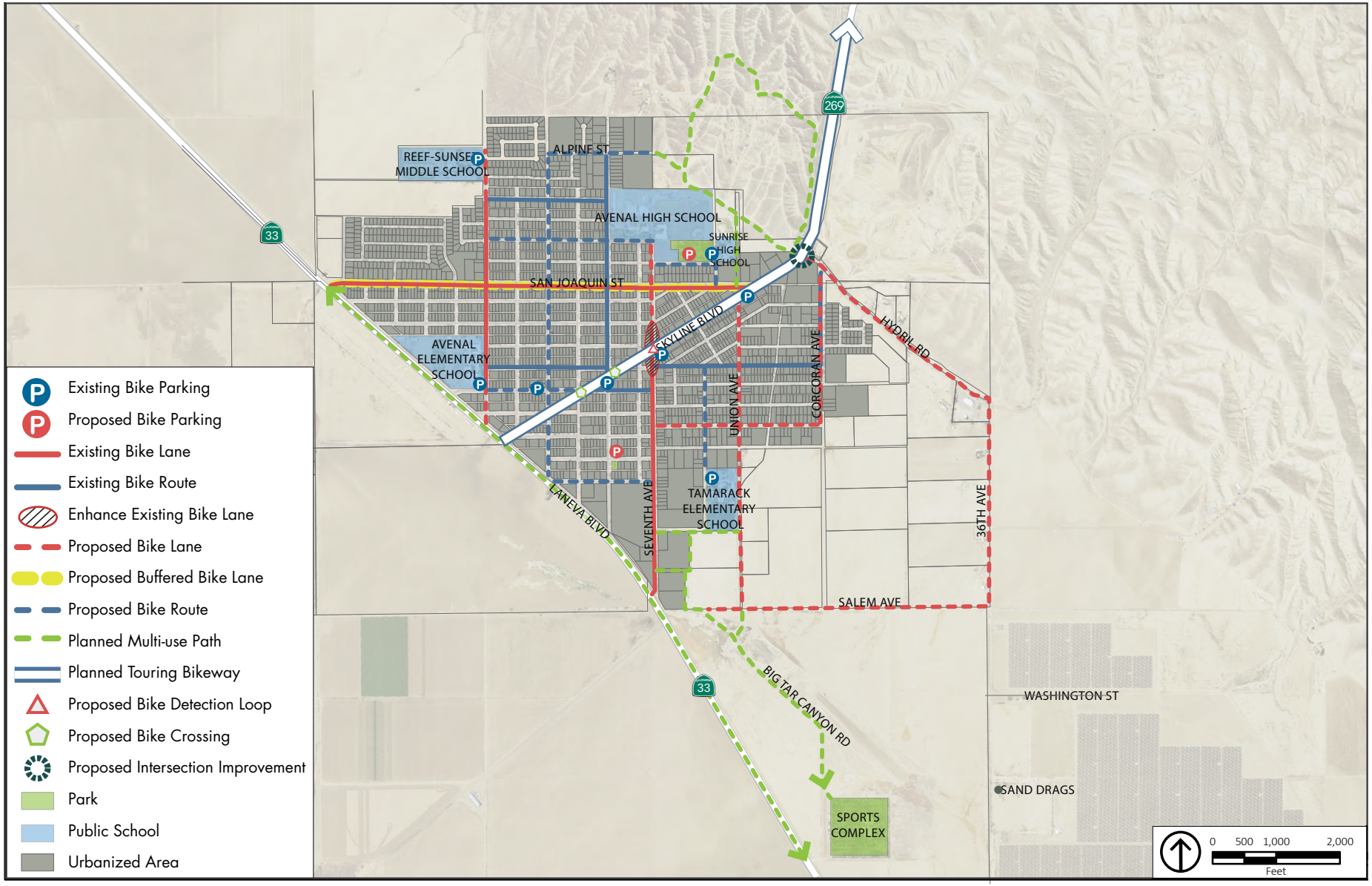
- Create new recreational multi-use path/trails in the following areas:
  - Paved path along Skyline Boulevard, north of Hydril Road
  - Series of unpaved trails to the west of SR 269 that would be accessed from Alpine Street and Union Avenue
  - Paved path along Big Tar Canyon Road from Seventh Avenue to the Sports Complex
  - Along Laneva Boulevard/SR 33 per the Kings County Regional Bicycle Plan's recommendations

BICYCLE AMENITIES

Bicycle amenities are an important complementing component to a bicycle network. Bicyclists need a safe and convenient designated area to park/store their bicycles once reaching their destinations. Shower facilities help encourage bicyclists to use bicycling as a form of transportation, especially for employees who bicycle to their places of employment. Bicycle amenities such as bicycle detection loops, stencils, and crossing warning signs help increase safety for bicyclists at busy intersections.

- Install short-term bicycle parking racks at the following locations:
  - In front of businesses or activity centers along Skyline Boulevard and Kings Street
  - Every park
  - Schools without existing bicycle parking, including Avenal High School
  - Future Avenal transit hub
- Consider installing long-term bicycle parking and shower facilities at destinations outside of the urbanized area, including large recreational facilities
- Install bicycle detection loops and stencils at the following signalized intersection:
  - Skyline Boulevard and Seventh Avenue
- Install bicycle crossing warning signs at the following unsignalized intersections:
  - Skyline Boulevard and Kings Street
  - Skyline Boulevard and Fresno Street

Figure 4.3: Citywide Bicycle and Trail Improvement Projects



Source: Kings County Regional Bicycle Plan, 2011, page 36; PlaceWorks, 2015

CHAPTER 5


AVENAL
AVENAL
FRIENDLY
REMINDER
CONSERVE
WATER
LAZARUS EFFECT
THE DUFF
A LA MALA EN ESPANOL
cricket
authorized dealer
OPEN
cricket
FX4
SUPER DUTY



IMPLEMENTATION AND FUNDING

The purpose of this section is to provide guidance on how to implement the recommended projects and programs described in Chapter 4 over a twenty-year timeframe. This involves prioritizing the projects and programs into different levels of priority, coordination within the jurisdiction and with other local and regional agencies, and being proactive in applying for outside monies to fund the projects and programs. The implementation subsection lists the steps and actions required to implement the Plan. The funding subsection identifies funding opportunities that might help fund the implementation of Avenal Active Transportation and Safe Routes to Schools projects and programs and aid the City in prioritizing which improvements or programs are eligible or best suited for each type of grant funding. The funding opportunities listed in this chapter include funding for further planning, construction, and implementation.

Implementation Process



I. IMPLEMENTATION

IMPLEMENTATION PROCESS

The following outlines typical steps that are expected during the implementation process:

1. Apply for grants to fund improvements.
2. Reach out and coordinate with other jurisdictions, agencies, and interested stakeholders as necessary.
3. Develop further design, engineering, and cost estimates as necessary.
4. Secure environmental review and permitting as necessary.
5. Construct the project or establish the program.
6. Monitor performance measures for safety and active transportation use through tracking accident data and performing regular bike and pedestrian counts at key intersections, respectively.
7. Establish accountability through annually reporting implementation progress to the City Council at one of its hearings.

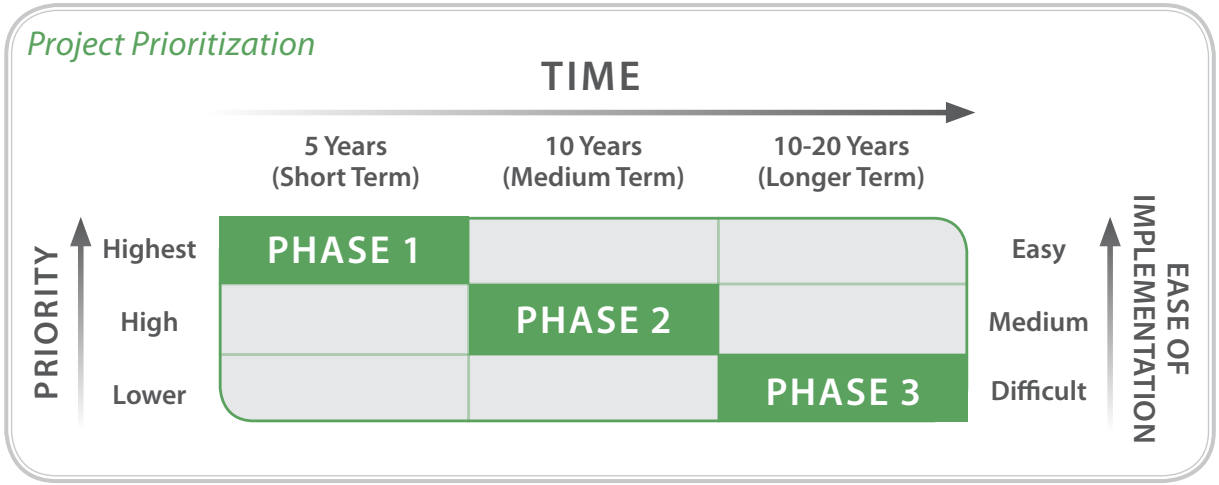
IMPLEMENTATION STRATEGIES

- Designating bicycle and pedestrian planning management tasks to a key existing staff member or members in the City can help the City focus on implementing pedestrian and bicycle improvements. This City staff member would be responsible for overall implementation of the Active Transportation and Safe Routes to School Plan (AT/SRTS), as well as plan review, coordination with other agencies, and financing. The following describes the roles and responsibilities of the bicycle and pedestrian City staff member:
  - Participate in the City's plan review process, including traffic impact studies, street improvement projects, and development projects, so as to manage the implementation of recommended projects, the collection of impact fees, and the application of design guidelines and goals presented in this Plan.
  - Prepare a monitoring plan in coordination with the Avenal Police Department to evaluate bicycle and pedestrian-related collision data and provide needed enforcement with regard to issues of security, vandalism, and crime along the pedestrian and bicycle network.
  - Monitor funding opportunities and prepare funding applications especially for competitive funding sources that require coordination with other local and regional agencies.
  - Take the lead in developing and implementing a maintenance plan for pedestrian and bicycle facilities and collaborating with the Public Works Department.
  - Work closely with adjacent communities and regional agencies, including the Kings County Association of Governments and Caltrans, and other City Departments, including Police, Public Works, Finance, and Parks and Recreation, to capture all opportunities to implement the AT/SRTS Plan.
  - Provide information and updates to the public and decision makers about the implementation status of projects and programs in this Plan.

PROJECT PRIORITIZATION

Prioritization of improvements is essential to effectively utilize limited financial resources while reflecting urgent community needs. This section contains the methodology used to prioritize recommendations, which are described in detail in Chapter 4 of the AT/SRTS Plan.

- The recommended projects are categorized in three groups: Citywide; Pedestrian and Safe Routes to School; and Bicycle and Trails. Specific project and program recommendations are listed under each group and an implementation timeframe (short-, medium-, or longer-term) has been identified for each recommendation.
- **Phase 1 (Short-Term):** These recommendations are the highest priority and/or easily implementable. The goal is to try to implement these recommendations in the next five years.
- **Phase 2 (Medium-Term):** These recommendations are high priority but may not be as easily implemented or as high priority as Phase 1 recommendations. The goal is to try to implement these recommendations within 10 years.
- **Phase 3 (Longer-Term):** Even if these recommendations have the lowest priority, they are still important elements in completion of the bicycle and pedestrian network and should be implemented should funding be available. These recommendations may be more costly to implement and/or require more extensive coordination with third parties such as property owners, businesses, multiple City departments, and regional agencies. The goal is to implement these recommendations within 10 to 20 years.



- The prioritization of the recommended projects and programs are based on input from City staff, the Citizens' Advisory Committee, Trails Committee, and the community. There were several outreach efforts for receiving input during the development of the plan, including the following events:
  - Information booth and exercise at the Harvest Festival, held at Avenal Elementary School on October 22, 2015.
  - Safe Routes to School Workshops at Avenal Elementary, Tamarack Elementary, and Reef-Sunset Middle Schools during parent-teacher conferences on November 12, 2015.
  - Distribution and collection of bilingual National Center of Safe Routes to School Parent Surveys conducted from November to December 2015. 366 responses were collected, many of which were submitted in Spanish.
  - Citizens' Advisory and Trails Joint Committee Meeting on September 15, 2016.
  - City Council and Planning Commission Joint Study Session on November 1, 2016.
  - From the Plan's public engagement efforts, several themes of priorities emerged. The themes and methodology of prioritization are further described for each recommendation type on the following pages.

CITYWIDE RECOMMENDATIONS

The recommendations in the tables below apply to the city as a whole and encompass both the needs of pedestrians, bicyclists, and those who take other methods of non-motorized transportation. The community expressed a high-priority need for better lighting around the city, especially at key destinations such as schools, parks, and businesses. Improvements such as the Alleyway Improvement Program and streetscape enhancements are identified as lower priority since they require more coordination with third parties such as businesses and property owners.

PEDESTRIAN AND SAFE ROUTES TO SCHOOL RECOMMENDATIONS

Many of the pedestrian recommendations below have a focus on improving safety for students walking to school, especially crossing intersections of high traffic streets. The community emphasized a higher priority on improvements located on routes to schools and along Skyline Boulevard. There was a lower priority for pedestrian improvements along Laneva Boulevard and routes located outside of school walking routes. Based on this input, pedestrian recommendations were prioritized using the methodology below:

- **Phase 1:** Projects located within a ¼ mile of school entrances and along a street providing direct access to schools (e.g.., First, Seventh, and Hanford Avenues). Preparation for Phase 2's Skyline Boulevard improvements should also occur in Phase 1, which includes coordination with Caltrans since Skyline Boulevard is a State route.
- **Phase 2:** Projects located within ¼ mile of school entrances but not providing direct access and improvements along Skyline Boulevard. Preparation for Phase 3's Laneva Boulevard improvements should occur in Phase 2, which includes coordination with Caltrans since Laneva Boulevard is a State route.
- **Phase 3:** Remaining projects further than ¼ mile of school entrances, including along Laneva Boulevard.

Pedestrian improvements listed in the Recommendations section in Chapter 4 were consolidated for each identified intersection to become an enhanced crossing project. It is recommended that when the City applies for outside funding to implement crossing improvements, all of the improvements (e.g., new high-visibility crosswalks, traffic calming features, restriping, four-way stops, etc.) are included as a part of the proposed project. See Figure 5.1 for a map of the phasing of enhanced crossing improvements, labeled by the map key number referenced in Tables 5.3 - 5.5.

Table 5.1: Phasing of Citywide Projects

IMPROVEMENT	LOCATION	PHASE
Wayfinding information signs and kiosks	Key locations (e.g., parks, schools, City Hall)	2
Extend streetscape improvements	Kings Street to Skyline Boulevard	3

Note: Costs for implementing projects/programs vary dramatically depending on breadth of scope, complexity of programs, and/or location of project(s).

Table 5.2: Phasing of Citywide Programs

PROGRAM	PHASE
Citywide Lighting Plan/Program	1
Policy stating that future development adjacent to Tamarack Elementary and Reef-Sunset Middle Schools should provide streets that provide adequate walking and biking connectivity to the school and possibly reconfiguration of the schools' drop-off/pick-up areas	1
Routine maintenance program of bikeway and walkway network facilities	1
Street closure events on Kings Street	2
Alleyway Improvement Program	3

Note: Costs for implementing projects/programs vary dramatically depending on breadth of scope, complexity of programs, and/or location of project(s).

*Table 5.3: Enhanced Crossings - **Phase 1***

MAP KEY#	CROSS STREET 1	CROSS STREET 2	IMPROVEMENTS	PRELIMINARY COST ESTIMATE*
1	First Avenue	Tulare Street	New high-visibility crosswalks	$9,000
2	First Avenue	Kings Street	Restripe existing crosswalks to be high-visibility; add high-visibility crosswalk(s) at intersection leg(s) without a crosswalk	$12,000
3	First Avenue	Fresno Street	Restripe existing crosswalks to be high-visibility; add high-visibility crosswalk(s) at intersection leg(s) without a crosswalk	$12,000
4	First Avenue	Madera Street	Restripe existing crosswalks to be high-visibility; add high-visibility crosswalk(s) at intersection leg(s) without a crosswalk	$12,000
5	First Avenue	Merced Street	Restripe existing crosswalks to be high-visibility; add high-visibility crosswalk(s) at intersection leg(s) without a crosswalk	$12,000
6	First Avenue	Stanislaus Street	Restripe existing crosswalks to be high-visibility; add high-visibility crosswalk(s) at intersection leg(s) without a crosswalk	$12,000
7	First Avenue	Mariposa Street	New high-visibility crosswalks	$12,000
8	First Avenue	San Mateo Street	Restripe existing crosswalks to be high-visibility; add high-visibility crosswalk(s) at intersection leg(s) without a crosswalk	$9,000
9	First Avenue	Santa Clara Street	Restripe existing crosswalks to be high-visibility	$12,000
10	First Avenue	Sonoma Street	Restripe existing crosswalks to be high-visibility; consider installing flashing beacons and in-pavement lighting	$102,000
11	Hanford Avenue	Tamarack Elementary	New high-visibility crosswalks	$12,000
12	Hanford Avenue	Kern Street	Restripe existing crosswalks to be high-visibility; consider installing flashing beacons	$56,000
13	Hanford Avenue	Fremont Street	Restripe existing crosswalks to be high-visibility; add 4-way stops; add high-visibility crosswalk(s) at intersection leg(s) without a crosswalk	$1200 signs. $400 striping/stenciling
14	Hanford Avenue	Shasta Street	New high-visibility crosswalks	$12,000
15	Seventh Avenue	Merced Street	New high-visibility crosswalks	$12,000
16	Seventh Avenue	Stanislaus Street	New high-visibility crosswalks	$12,000
17	San Joaquin Street	Seventh Avenue	Restripe existing crosswalks to be high-visibility; add high-visibility crosswalk(s) at intersection leg(s) without a crosswalk	$12,000
18	Seventh Avenue	Monterey Street	Restripe existing crosswalks to be high-visibility	$12,000

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** Note that all cost estimates provided in this table are high-level and should be used for planning purposes only, as costs for Active Transportation improvements can range dramatically depending on the site and other project characteristics.*

Phase 1, Continued

MAP KEY#	CROSS STREET 1	CROSS STREET 2	IMPROVEMENTS	PRELIMINARY COST ESTIMATE*
19	Seventh Avenue	Mariposa Street	Restripe existing crosswalks to be high-visibility	$6,000
20	San Joaquin Street	Merced Street	Restripe existing crosswalks to be high-visibility	$3,000
21	San Joaquin Street	Park Avenue	Add traffic calming features; add high-visibility crosswalk(s) at intersection leg(s) without a crosswalk	$170,000 (2 curb extensions, ped islands, and beacons)
22	Mariposa Street	Fifth Avenue	Restripe existing crosswalks to be high-visibility ; add high-visibility crosswalk(s) at intersection leg(s) without a crosswalk	$12,000

*Table 5.4: Enhanced Crossings - **Phase 2***

MAP KEY#	CROSS STREET 1	CROSS STREET 2	IMPROVEMENTS	PRELIMINARY COST ESTIMATE*
1	Skyline Boulevard	Second Avenue	New high-visibility crosswalks	$12,000
2	Skyline Boulevard	Third Avenue	New high-visibility crosswalks	$12,000
3	Skyline Boulevard	Fourth Avenue	Restripe existing crosswalks to be high-visibility; new high-visibility crosswalks; traffic calming features; add high-visibility crosswalk(s) at intersection leg(s) without a crosswalk	$170,000
4	Skyline Boulevard	Fifth Avenue	Restripe existing crosswalks to be high-visibility; new high-visibility crosswalks; traffic calming features; add high-visibility crosswalk(s) at intersection leg(s) without a crosswalk	$170,000
5	Skyline Boulevard	Sixth Avenue	New high-visibility crosswalks; traffic calming features	$170,000
6	Skyline Boulevard	Seventh Avenue	Restripe existing crosswalks to be high-visibility	$12,000
7	Skyline Boulevard	Central Avenue	New high-visibility crosswalks	$12,000
8	Skyline Boulevard	Union Avenue	New high-visibility crosswalks	$12,000

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** Note that all cost estimates provided in this table are high-level and should be used for planning purposes only, as costs for Active Transportation improvements can range dramatically depending on the site and other project characteristics.*

Figure 5.1: Phasing of Enhanced Crossing Projects



Phase 2, Continued

MAP KEY#	CROSS STREET 1	CROSS STREET 2	IMPROVEMENTS	PRELIMINARY COST ESTIMATE*
9	Skyline Boulevard	San Joaquin Street	New high-visibility crosswalks; traffic calming features	$170,000
10	Skyline Boulevard	Hydril Road	New high-visibility crosswalks; traffic calming features	$145,000
11	First Avenue	Monterey Street	New high-visibility crosswalks	$12,000
12	Seventh Avenue	Orange Street	Add high-visibility crosswalk(s) at intersection leg(s) without a crosswalk	$2,400
13	Seventh Avenue	Ventura Street	New high-visibility crosswalks	$12,000
14	Seventh Avenue	Kern/Ventura	Add 4-way stops	$2,400
15	Seventh Avenue	Kern Street	Restripe existing crosswalks to be high-visibility; consider installing flashing beacons; add high-visibility crosswalk(s) at intersection leg(s) without a crosswalk	$62,000
16	Seventh Avenue	Fremont Sreet	New high-visibility crosswalks	$12,000
17	Seventh Avenue	Tulare/Shasta	New high-visibility crosswalks	$12,000
18	Seventh Avenue	Between Kings St and Whitney St	Restripe existing crosswalks to be high-visibility; consider relocating crosswalk to more appropriate location on Seventh Ave	$12,000
19	Seventh Avenue	Fresno Street	Restripe existing crosswalks to be high-visibility; add 4-way stops; add high-visibility crosswalk(s) at intersection leg(s) without a crosswalk	$2400 for stops, $12,000 for high-visibility crosswalks
20	Hanford Avenue	Whitney Street	New high-visibility crosswalks; add high-visibility crosswalk(s) at intersection leg(s) without a crosswalk	$12,000
21	Hanford Avenue	Fresno Street	New high-visibility crosswalks; traffic calming features	$170,000
22	Union Avenue	Kern Street	Consider installing flashing beacons and in-pavement lighting; add 4-way stops	$52,000
23	Union Avenue	Fremont Street	Add 4-way stops	$2,400
24	San Joaquin Street	First Avenue	Restripe existing crosswalks to be high-visibility; add high-visibility crosswalk(s) at intersection leg(s) without a crosswalk	$12,000
25	San Joaquin Street	Fifth Avenue	Restripe existing crosswalks to be high-visibility; add high-visibility crosswalk(s) at intersection leg(s) without a crosswalk	$12,000
26	San Joaquin Street	Sixth Avenue	Restripe existing crosswalks to be high-visibility; add high-visibility crosswalk(s) at intersection leg(s) without a crosswalk	$12,000

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** Note that all cost estimates provided in this table are high-level and should be used for planning purposes only, as costs for Active Transportation improvements can range dramatically depending on the site and other project characteristics.*

Phase 2, Continued

MAP KEY#	CROSS STREET 1	CROSS STREET 2	IMPROVEMENTS	PRELIMINARY COST ESTIMATE*
27	San Joaquin Street	Stanislaus St/ Central St	New high-visibility crosswalks; traffic calming features	$170,000
28	Kings Street	Second Avenue	Add 4-way stops	$2,400
29	Third Avenue	Madera Street	Add standard crosswalk(s) at intersection leg(s) without a crosswalk	$500 per crosswalk
30	Second Avenue	Stanislaus Street	Add standard crosswalk(s) at intersection leg(s) without a crosswalk	$500 per crosswalk
31	A Avenue	Merced Street	Add standard crosswalk(s) at intersection leg(s) without a crosswalk	$500 per crosswalk
32	A Avenue	Stanislaus Street	Add standard crosswalk(s) at intersection leg(s) without a crosswalk	$500 per crosswalk
33	Fifth Avenue	San Mateo Street	Add standard crosswalk(s) at intersection leg(s) without a crosswalk	$500 per crosswalk
34	Sixth Avenue	Mariposa Street	Add standard crosswalk(s) at intersection leg(s) without a crosswalk	$500 per crosswalk
35	Third Avenue	San Mateo Street	Add standard crosswalk(s) at intersection leg(s) without a crosswalk	$500 per crosswalk
36	Third Avenue	Santa Clara Street	Add standard crosswalk(s) at intersection leg(s) without a crosswalk	$500 per crosswalk
37	Third Avenue	Sonoma Street	Add standard crosswalk(s) at intersection leg(s) without a crosswalk	$500 per crosswalk

** Note that all cost estimates provided in this table are high-level and should be used for planning purposes only, as costs for Active Transportation improvements can range dramatically depending on the site and other project characteristics.*

*Table 5.5: Enhanced Crossings - **Phase 3***

MAP KEY#	CROSS STREET 1	CROSS STREET 2	IMPROVEMENTS	PRELIMINARY COST ESTIMATE*
1	San Joaquin Street	Thurston Avenue	New high-visibility crosswalks	$6,000
2	San Joaquin Street	D Avenue	New high-visibility crosswalks	$6,000
3	San Joaquin Street	C Avenue	New high-visibility crosswalks	$12,000
4	San Joaquin Street	B Avenue	New high-visibility crosswalks	$6,000
5	San Joaquin Street	A Avenue	Restripe existing crosswalks to be high-visibility; add high-visibility crosswalk(s) at intersection leg(s) without a crosswalk	$12,000
6	San Joaquin Street	Second Avenue	Restripe existing crosswalks to be high-visibility; add high-visibility crosswalk(s) at intersection leg(s) without a crosswalk	$12,000
7	San Joaquin Street	Third Avenue	Restripe existing crosswalks to be high-visibility; add high-visibility crosswalk(s) at intersection leg(s) without a crosswalk	$12,000
8	San Joaquin Street	Fourth Avenue	New high-visibility crosswalks	$12,000
9	Fifth Avenue	Madera Street	Add standard crosswalk(s) at intersection leg(s) without a crosswalk	$500 per crosswalk
10	Third Avenue	Monterey Street	Add standard crosswalk(s) at intersection leg(s) without a crosswalk	$500 per crosswalk
11	Third Avenue	Mariposa Street	Add standard crosswalk(s) at intersection leg(s) without a crosswalk	$500 per crosswalk

Table 5.6: Phasing of Other Pedestrian Programs

PROGRAM	PHASE	COST ESTIMATE*
Safe Routes to School map	1	$15,000
Safe Routes to School educational and promotional events	1	varies
"Walking School Bus" program	1	Depends on location and length of route
Crossing guards at every elementary and middle school	1	Depends on location and # of crossing guards
Citywide sidewalk and curb ramp audit	2	$20,000

Table 5.7: Phasing of Other Pedestrian Projects

IMPROVEMENT	LOCATION	PHASE	MILES	COST ESTIMATE*
Reconfigure and redesign existing traffic median	Skyline Boulevard between Central and Fifth Avenues	3	0.3	$575,000
Fill sidewalk gaps and install new sidewalks	Along Laneva Boulevard and connecting east-west to Laneva Blvd	3	1.25	$700,000

** Note that all cost estimates provided in this table are high-level and should be used for planning purposes only, as costs for Active Transportation improvements can range dramatically depending on the site and other project characteristics.*

BICYCLE AND TRAIL RECOMMENDATIONS

The recommendations listed below apply to enhancing and expanding Avenal's bikeway network and creating new multi-use paved and unpaved trails. For bicycle improvements, the community expressed a higher priority on improvements located on routes to schools, bicycle access and connectivity to the Avenal Sports Complex, and a buffered bike lane on San Joaquin Street. Community members also prioritized access and trail connections to the Kettleman Hills just north of the City. Bicycle connections along Laneva Boulevard, Skyline Boulevard, and non-school routes were a lower priority. Based on this input, bicycle and trail recommendations were prioritized using the methodology below:

- **Phase 1:** Bicycle improvements on routes that lead directly to schools or located on school premises, a new trail to the Avenal Sports Complex, and lower-cost bicycle improvements
- **Phase 2:** Other bicycle improvements within the urbanized Avenal area and unpaved trails in the Kettleman Hills
- **Phase 3:** Bicycle improvements outside of the urbanized Avenal area

See Figure 5.2 for a map of the phasing of physical bicycle and trail projects, labeled by the map key number referenced in Tables 5.8 - 5.11.

*Table 5.8: Bicycle and Trail Network Improvement Projects - **Phase 1***

STREET	SEGMENT OR CROSS STREET	IMPROVEMENTS	LENGTH (MI)	PRELIMINARY COST ESTIMATE*
First Avenue	Reef-Sunset Middle School to Laneva Boulevard	Repair road north of Santa Clara Street; repaint existing bicycle lanes on both sides to reduce dooring incidents; install appropriate design signage and markings for existing bicycle lane; continue existing bicycle lane south of Kings Street to Laneva Boulevard and north of Santa Clara Street to northern boundary of Reef-Sunset Middle School	0.75	$165,000
Seventh Avenue	Mariposa St. to Laneva Boulevard	Repair road, especially north of Merced Street; repaint existing bicycle lanes on both sides to reduce dooring incidents; repaint existing faded "bike lane" marking at intersection of Seventh Avenue and Skyline Boulevard; install appropriate design signage and markings for existing bicycle lane; continue existing bicycle lane north of Merced Street to Mariposa Street	1.0	$225,000
Hanford Avenue	Fresno Street to Tamarack Elementary School	New Class III bike route	0.35	$8,000
Monterey Street	Seventh Avenue to Park Avenue	New Class III bike route	0.2	$4,500
Big Tar Canyon Rd	Seventh Avenue to Sports Complex	Paved multi-use path	0.95	$2,300,000
San Joaquin Street	Skyline Boulevard to Laneva Bouleavrd	Repair road from Third Avenue to Skyline Boulevard; restripe existing bicycle lane; install appropriate design signage and markings for existing bicycle lane; convert to Class IV bikeway	1.25	$450,000

** Note that all cost estimates provided in this table are high-level and should be used for planning purposes only, as costs for Active Transportation improvements can range dramatically depending on the site and other project characteristics.*

*Table 5.9: Bicycle and Trail Network Improvement Projects - **Phase 2***

STREET	SEGMENT OR CROSS STREET	IMPROVEMENTS	LENGTH (MI)	PRELIMINARY COST ESTIMATE*
Third Avenue	Alpine St. to Laneva Blvd.	New Class III with stripe (per Kings County Regional Bicycle Plan)	0.95	$23,000
Park Avenue	Entire Segment	New Class III with stripe (per Kings County Regional Bicycle Plan)	0.15	$4,500
Union Avenue	Entire Segment	New Class II (per Kings County Regional Bicycle Plan); extend planned bike lane south to Salem Avenue to provide links to the Sports Complex and Sand Drags	1.0	$60,000
Salem Avenue	Corcoran Ave. to 36th Ave.	New Class II bike lane	0.5	$37,500
Fremont Street	Seventh Ave. to Corcoran Ave.	New Class II bike lane	0.5	$37,500
Corcoran Avenue	Hydril Rd to Fremont St.	Convert Class III to Class II bike lane; extend bikeway south of Fresno Street to Fremont Street	0.5	$37,500
Kings Street	First Ave. to Seventh Ave.	Install appropriate design signage and markings for existing bike route; new Class III bike route from First to Fifth Avenues; consider changing existing angled parking to angled back-in parking	0.5	$12,000
Orange Street	Entire Segment	New Class III bike route	0.3	$7,500
Mariposa Street	First Ave. to Seventh Ave.	New Class III bike route	0.5	$12,000
Alpine Street	Entire Segment	New Class III bike route	0.3	$7,500
Northern hillside (west of Skyline Boulevard)	Northern hillside (west of Skyline Blvd.)	Unpaved trails accessed from Alpine Street and Union Avenue	1.8	$1,100,000
Santa Clara Street	Entire Segment	Install appropriate design signage and markings for existing bike route	0.35	$8,500
Fifth Avenue	Fresno St. to Alpine St.	Repair road, especially south of Santa Clara Street; install appropriate design signage and markings for existing bike route	0.65	$115,000
Fresno Street	Entire Segment	Repair road from First to Fifth Avenues; install appropriate design signage and markings for existing bike route	0.35	$60,000

** Note that all cost estimates provided in this table are high-level and should be used for planning purposes only, as costs for Active Transportation improvements can range dramatically depending on the site and other project characteristics.*

Figure 5-2. Phasing of Bicycle and Trail Improvement Projects

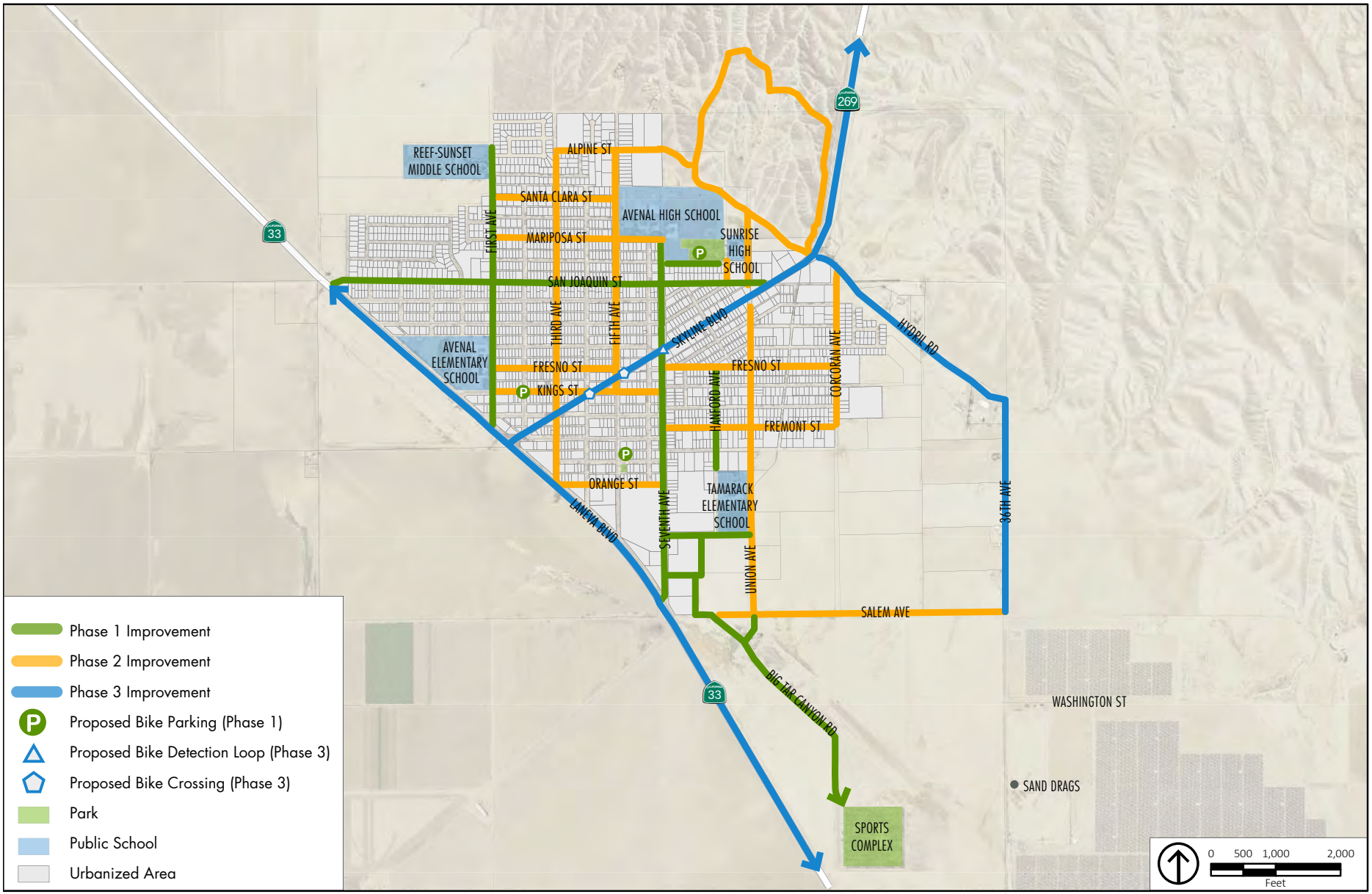


*Table 5.10: Bicycle and Trail Network Improvement Projects - **Phase 3***

STREET	SEGMENT OR CROSS STREET	IMPROVEMENTS	LENGTH (MI)	PRELIMINARY COST ESTIMATE*
Laneva Boulevard/ SR 33	Within Avenal City Limits	New multi-use path (per Kings County Regional Bicycle Plan)	4.75	$5,700,000
Skyline Boulevard/ SR 269	Within Avenal City Limits	Repair road from Laneva Boulevard to Hydril Road; new touring bikeway (per Kings County Regional Bicycle Plan)	1.0	$350,000
Hydril Road	Entire Segment	New Class II bike lane	0.7	$42,000
36th Avenue	Hydril Rd to Salem Ave.	New Class II bike lane	0.6	$36,000
Skyline Boulevard	North of Hydril Rd.	New paved recreational multi-use path	4.5	$5,400,000
Skyline Boulevard	Seventh Ave.	Bicycle detection loop and stencil at signalized intersection (2 units)	N/A	$2,000
Skyline Boulevard	Kings St.	Bicycle crossing warning sign at unsignalized intersection (2 units)	N/A	$1,000
Skyline Boulevard	Fresno St.	Bicycle crossing warning sign at unsignalized intersection (2 units)	N/A	$1,000

** Note that all cost estimates provided in this table are high-level and should be used for planning purposes only, as costs for Active Transportation improvements can range dramatically depending on the site and other project characteristics.*

Table 5.11: Phasing of Other Bicycle Projects

IMPROVEMENT	LOCATION	PHASE
Install short-term bicycle parking racks	Schools without existing bicycle parking, parks, in front of businesses or activity centers along Skyline Boulevard and Kings Street	1
Create separation between on-street parking and bike lanes (stencil door zone marks or install "no parking" signs)	Along designated Class II Bike Lanes	2
Install long-term bicycle parking and shower facilities	Destinations outside urbanized area	3

Note: Costs for implementing other bicycle projects vary dramatically depending on breadth of scope, complexity of programs, and/or location of project(s).

II. FUNDING

Available funding is affected by the economic climate, and as a result this list is subject to change. The City of Avenal should pursue applications for the majority of grant funding opportunities.

A variety of potential funding sources, including federal, state, local, and non-traditional programs, can be used to construct active transportation improvements. The City should also take advantage of private contributions in implementing pedestrian and bicycle improvements. This could include a variety of resources, such as volunteer labor during construction or monetary donations towards specific improvements. The funding sources considered appropriate for Avenal are discussed in detail below.



FEDERAL

The primary sources of federal funding for bicycle and pedestrian facilities are from the US Department of Transportation and the US Department of Housing and Urban Development. Federal funding sources provide large sums of money to fund projects and programs, but they are very competitive and require robust City resources for the initial application process and subsequent reporting. Avenal should consider designating City staff member(s) to monitor these grant programs and manage projects that receive funding. Avenal AT/SRTS projects that are most suitable for federal funding include those that meet the program's requirements, have a high price tag of $1 million dollars or more, and those in which the City can contribute a percentage (usually 10 to 12 percent) as a local matching fund.

SURFACE TRANSPORTATION BLOCK GRANT (STBG)

In 2015, President Obama signed into law the Fixing America's Surface Transportation Act (FAST Act). The FAST Act replaces the previous two-year transportation authorization bill, Moving Ahead for Progress in the 21st Century (MAP-21), and provides long-term funding certainty for surface transportation. The FAST Act includes a set-aside Surface Transportation Block Grant (STBG) program funding for transportation alternatives (TA), which were previously a part of MAP-21's Transportation Alternatives Program (TAP). Eligible projects for STBG TA funding include smaller-scale transportation projects, including pedestrian and bicycle facilities, recreational trails, and Safe Routes to School projects. TA funding is suballocated based on population through a competitive process.

More information is available at https://www.fhwa.dot.gov/fastact/factsheets/transportationalternativesfs.cfm

HIGHWAY SAFETY IMPROVEMENT PROGRAM (HSIP)

The Highway Safety Improvement Program (HSIP) is also a part of the FAST Act and helps fund projects that reduce fatalities and serious injuries on all public roads. Eligible projects include projects on any public road, bicycle or pedestrian pathway, or trail. The program is data-driven and requires data such as crash experience, crash potential crash rate, etc. HSIP funds are managed and distributed by Caltrans. The minimum funding amount is $100,000.

More information is available at http://dot.ca.gov/hq/LocalPrograms/hsip.html

CONGESTION MITIGATION AND AIR QUALITY IMPROVEMENT PROGRAM (CMAQ)

The Congestion Mitigation and Air Quality Improvement Program (CMAQ) is a federal program supporting a range of projects that reduce transportation-related air emissions in air quality nonattainment areas. Kings County Association of Governments (KCAG), as the Kings County region's MPO, administers the CMAQ grant on a per-population and competitive basis in Kings County. The CMAQ funds support transportation projects that are likely to reduce air pollution and are included in KCAG's current transportation plan and transportation improvement program (TIP). Bicycle and pedestrian facilities programs are one of the eligible activities. The CMAQ program authorizes approximately $2.2 billion per year. Based on population, KCAG receives approximately $1.8 million per year.

More information is available at: http://www.fhwa.dot.gov/map21/cmaq.cfm

COMMUNITY DEVELOPMENT BLOCK GRANT PROGRAM

Since 1974, the US Department of Housing and Urban Development has administered CDBG funds. The Department of Housing and Community Development administers the State's CDBG program. The goal of the CDBG program is the development of viable urban communities by providing decent housing and a suitable living environment and by expanding economic opportunities, principally for persons of low and moderate income. Under CDBG's General Allocation, funding is available for a number of different types of projects, including housing reha-

bilitation, new housing construction, community facilities, public services, and public works projects. Potential projects in the Avenal AT/SRTS that could be eligible for CDBG funding include new sidewalks and sidewalk improvements.

More information is available at: http://www.countyofkings.com/departments/community-development-agency/information/cdbg

EPA ENVIRONMENTAL EDUCATION (EE) GRANTS

Environmental Education (EE) Grants fund environmental education projects that promote environmental awareness and stewardship in an effort to protect the environment. Construction projects or outreach programs that do not include any educational component are not eligible. The EE Grant program requires non-federal matching funds of at least 25 percent of the total cost of the project and each grant is approximately no more than $91,000. Educational programs recommended in the Avenal AT/SRTS, such as safe routes to school educational programs that encourage walking and biking, would be best suited for this grant.

More information is available at: http://www2.epa.gov/education/environmental-education-ee-grants

TRANSPORTATION INVESTMENT GENERATING ECONOMIC RECOVERY (TIGER) DISCRETIONARY GRANT

The TIGER grant is funded by the U.S. Department of Transportation (USDOT) and provides funding for the construction of large-scale transportation infrastructure projects, including higher-priced bicycle and pedestrian infrastructure. The grant program is highly competitive and supports projects that are considered innovative, including multi-modal and multi-jurisdictional projects. A minimum of 20 percent of the funds are designated for projects in rural areas.

More information is available at: https://www.transportation.gov/tiger



STATE

The following discussion describes State funds that could be used for transportation solutions that were identified in this Plan. Each of the fund sources requires a competitive grant application process. Funds for transportation-related projects are available from the Transportation Development Act (TDA) and from various State programs and agencies, including the California Department of Transportation (Caltrans) and the California Office of Traffic Safety (OTS).

CALIFORNIA ACTIVE TRANSPORTATION PROGRAM (ATP)

In September 2013, the State created the Active Transportation Program (ATP), consolidating existing federal and state transportation programs, including the Transportation Alternatives Program, the Bicycle Transportation Account, and the State Safe Routes to School Program. The ATP is intended to promote the use of active modes of transportation, such as walking and biking. The program budget is allocated by the California Transportation Commission (CTC) and varies per year. The most recent Cycle 3 Call-for-Projects includes 19/20 and 20/21 state funding years totaling about $240 million. Fifty percent of ATP funds are distributed on a competitive statewide basis, forty percent is provided to Metropolitan Planning Organizations (MPO) in urban areas with populations greater than 200,000, and the final ten percent goes to small urban and rural areas with populations of less than 200,000, which would include the City of Avenal.

Furthermore, the ATP prioritizes projects and planning in disadvantaged communities. Up to 10 points (out of 100 total) in the scoring criteria are issued if the project provides a benefit to a disadvantaged community. Avenal would score well in this criteria because it qualifies as a disadvantaged community, having a median household income under 80% of the statewide median, and over 75% of the students in Reef-Sunset Unified School district are eligible for free or reduced-price meals under the National School Lunch Program. The ATP also prioritizes Safe Routes to School projects and Recreational Trails projects. Safe Routes to School projects are defined by those that directly impact the safety and convenience for school children to walk/bike to/from school. The project must be located within two miles of a public school or within the vicinity of a public school bus stop. Recreational Trails projects include the construction of trails for non-motorized recreational use and must comply with national Recreational Trails Program (RTP) standards.

The next solicitation for ATP funding (Cycle 4) is anticipated to occur in 2018. The City should consider submitting high-cost, high-priority projects and/or programs related to Safe Routes to School and new recreational trails for the ATP. These projects could be consolidated so that the requested funding amount is high.

More information is available at: http://www.dot.ca.gov/hq/LocalPrograms/atp/index.html, and at http://www.dot.ca.gov/hq/LocalPrograms/saferoutes/sr2s.htm

OFFICE OF TRAFFIC SAFETY (OTS) GRANTS

The Office of Traffic Safety (OTS) administers federal traffic safety grant funds that are apportioned to California under the National Highway Safety Act. The OTS has several priority areas for grant funding, including Pedestrian and Bicycle Safety. The OTS supports a wide variety of traffic safety programs including pedestrian and bicycle safety programs for children, child passenger safety outreach, and support for increased law enforcement services and resources (such as safety helmet distribution), and court diversion programs for safety helmet violators. Grants are awarded on a competitive basis.

More information is available at: http://www.ots.ca.gov/Grants/Pedestrian_and_Bicycle_Safety.asp

ENVIRONMENTAL ENHANCEMENT AND MITIGATION PROGRAM (EEMP)

The EEMP is a State fund established by the Legislature to fund beautification improvements along roadsides to mitigate the effects of transportation projects. It offers a total of $10 million each year for grants to local, State, and federal governmental agencies and to nonprofit organizations for projects to mitigate the environmental impacts caused by new or modified public transportation facilities. Eligible projects must be directly or indirectly related to the environmental impact of the modification of an existing transportation facility or construction of a new transportation facility. Typical grants range from $200,000 to $250,000. Up to a 25 percent local

match is usually required. Grants are awarded in the categories of highway landscaping and urban forestry, resource lands, roadside recreation, and mitigation projects beyond the scope of the lead agency. Grants are awarded on a competitive basis. Potential projects in the Avenal AT/SRTS Plan that could be eligible for EEMP funding include improvements to portions of State Highways 33 and 269 that run through the city.

More information is available at: http://resources.ca.gov/bonds_and_grants/eemp/

TECH TRANSFER TRAFFIC SAFETY ASSESSMENT (TSA)

The University of California, Berkeley Institute of Transportation Studies' Technology Transfer Program provides no-cost Traffic Safety Assessments for various transportation safety issues. This program is funded by the California Office of Traffic Safety (OTS), through the National Highway Traffic Safety Administration. If awarded this grant, the jurisdiction is designated a small team of traffic safety experts to provide planning services to assess the jurisdiction's specific transportation safety issues. At the end of the assessment, a report with findings and suggestions is provided. Safety issues include traffic calming, road diets, and enforcement capabilities and improvements.

More information is available at: http://www.techtransfer.berkeley.edu/services/traffic-safety-assessments

SUSTAINABLE TRANSPORTATION PLANNING GRANT PROGRAM

The Sustainable Transportation Planning Grant Program is funded by federal sources and distributed by Caltrans. The program consists of two types of grants: the Strategic Partnerships grant program and the Sustainable Communities grant program. The Strategic Partnerships grant program is funded by the Federal Highway Administration and encourages partnerships between Caltrans and regional agencies to collaborate on projects in the state highway system. In Avenal, this grant program is especially relevant because this Plan proposes active transportation improvements on State Route 33 (Laneva Boulevard) and State Route 269 (Skyline Boulevard). Therefore, project planning and implementation on these streets would require careful planning collaboration with Caltrans.

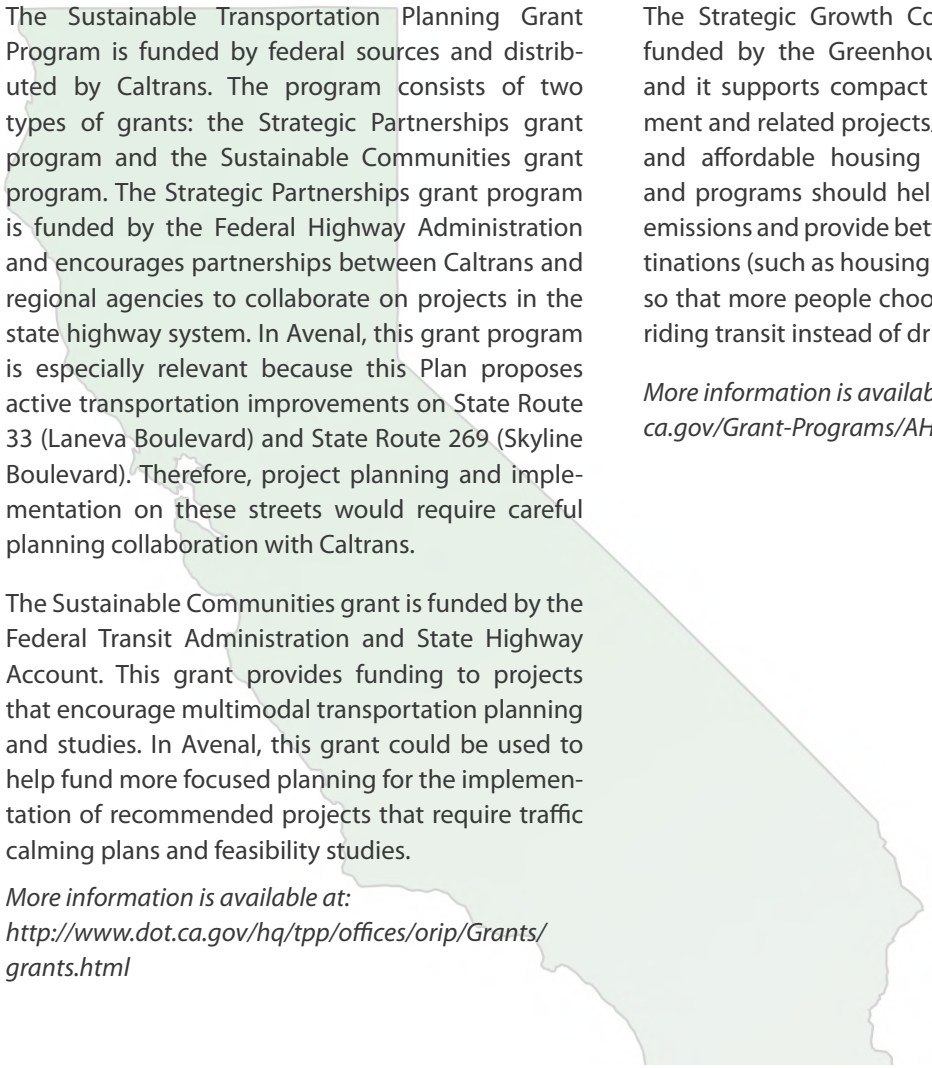
The Sustainable Communities grant is funded by the Federal Transit Administration and State Highway Account. This grant provides funding to projects that encourage multimodal transportation planning and studies. In Avenal, this grant could be used to help fund more focused planning for the implementation of recommended projects that require traffic calming plans and feasibility studies.

More information is available at: http://www.dot.ca.gov/hq/tpp/offices/orip/Grants/grants.html

AFFORDABLE HOUSING AND SUSTAINABLE COMMUNITIES (AHSC) PROGRAM

The Strategic Growth Council's AHSC Program is funded by the Greenhouse Gas Reduction Fund, and it supports compact transit-oriented development and related projects/programs through grants and affordable housing loans. Awarded projects and programs should help reduce greenhouse gas emissions and provide better accessibility to key destinations (such as housing and employment centers) so that more people choose walking, bicycling, and riding transit instead of driving.

More information is available at: http://www.sgc.ca.gov/Grant-Programs/AHSC-Program.html



LOCAL

An alternative to competitive grant funding at the Federal and State level is local funding to fund public infrastructure projects.

DEVELOPMENT IMPACT FEES

Developers may contribute funding in support of neighborhood infrastructure and needs in the form of development impact fees. Development impact fees are payments required by local governments of new development for the purpose of providing new or expanded public capital facilities. The City should have a list of priority projects or CIPs to justify the use of development impact fees from one area to construct sidewalks or other improvements in a priority area. Also, the City may require, as a condition of approval for new development, that the developer provide certain improvements, such as sidewalk improvements, stormwater treatment, or transit amenities.

MELLO-ROOS COMMUNITY FACILITIES DISTRICTS

The Mello-Roos Community Facilities Act of 1982 allows any County, City, special district, school district, or joint powers authority to establish a Community Facilities District (CFD), which allows for financing of public improvements and services through taxation within the district. The services and improvements that CFDs can finance include streets, sewer systems, and other basic infrastructure. A CFD is created by a sponsoring local government agency and includes all properties that will benefit from the improvements to be constructed or services to be provided. A CFD cannot be formed without a two-thirds majority vote of residents living within the proposed boundaries. Once the CFD is approved, a Special Tax Lien is placed against each property in the CFD, and property owners pay a special tax annually.

NON-TRADITIONAL

SAN JOAQUIN VALLEY AIR POLLUTION CONTROL DISTRICT - REMOVE II PROGRAM

The REMOVE II Program is intended to reduce motor vehicle emissions within the San Joaquin Valley Air Pollution Control (SJVAPC) District to attain the requirements of the California Clean Air Act. The Bicycle Infrastructure Component of this program provides incentives for Class I, II, and III bikeway construction. The incentive amount for bicycle projects will be determined based on the California Air Resources Board (ARB) calculation methodology for cost effectiveness and emissions reductions. The maximum incentives for Class I projects are up to $150,000 per project and for Class II and III projects are $100,000 per project. Projects are considered for funding on a first-come, first-serve basis until program funds are exhausted. An applicant may submit multiple applications throughout the year.

More information is available at: http://valleyair.org/grants/bikepaths.htm

ADOPT-A-TRAIL OR PATH PROGRAMS

The City may establish Adopt-A-Trail or Adopt-A-Path programs to coordinate with local groups on trail or path development and maintenance. Local businesses and organizations may adopt a trail or a bicycle path similar to the adoption of a segment of the Interstate Highway System. The adoption is in the form of an annual commitment to pay for the routine maintenance of the trail or path. The supporters and their contribution should be indicated on the signs posted along the trail or path.

INSTALLATION OF BIKEWAYS DURING RESURFACING AND REPAVING PROJECTS

The City of Avenal should take advantage of opportunities to add bikeways through routine accommodation, as street resurfacing and pavement projects occur on a consistent basis. This requires close collaboration between the Community Development Department and Public Works Department so that bicycle upgrades are not left out of street maintenance projects.

CORPORATE DONORS AND PRIVATE FOUNDATIONS

Private foundations or corporate donors can be great resources for funding projects or programs. A few local donors and foundations are listed on the following page. Lower cost projects and programs from the Avenal AT/SRTS (less than $100,000) should be considered for this type of funding. The City can find a number of other foundations that support pedestrian and bicycle improvements through the Foundation Center online database.

More information is available at: http://fconline.fdncenter.org.

WONDERFUL COMMUNITY GRANTS PROGRAM

The Wonderful Company (formerly Paramount Farms) is a major employer to many of Avenal's residents and provides grant funding to Central Valley communities through its Wonderful Community Grants program. The grant program's goal is to give back and improve the communities of its employees residing in Avenal, Wasco, and Sanger/Del Rey. Grants are awarded at three levels ($10,000, $25,000, and $50,000) and encourage health and wellness, community beautification, and supporting families. Examples of past funded projects include infrastructure improvements such as sidewalk installation and road paving. Local government agencies are eligible and encouraged to apply for funding through this grant. Projects are to be completed within one calendar year of the grant period and sustained after the grant period. Up to two applications can be submitted for each city. Potential projects in the Avenal AT/SRTS that could be submitted for this funding are lower cost projects that could be completed in a shorter timeframe (within one year).

More information is available at:
http://www.wonderfulcommunitygrants.com/

REGIONAL SUSTAINABILITY COMPETITIVE GRANT

The Central Valley Community Foundation provides grant funding to Central Valley communities for projects that advance smart growth strategies. Avenal's AT/SRTS projects and programs would more likely qualify for the grant's requirements to "improve public health, neighborhood safety, and/or access to green space" and "support for policies and infrastructure restructuring that leads to reduced air pollution." This grant's program guidelines evolve year by year and active transportation projects and programs may not always be eligible. Potential projects for this type of funding are lower cost projects.

More information is available at:
http://www.fresnoregfoundation.org/grantmaking/environmentgc.html

KAISER PERMANENTE CENTRAL VALLEY COMMUNITY BENEFIT PROGRAM

Kaiser Permanente Central Valley offers financial support to nonprofit organizations, emphasizing outreach to underserved communities. The goal of this grant program is to improve the health of Central Valley communities and one of its major funding priorities is to "increase opportunities for physical activity in low income, under-resourced communities." The amount of grant funding issued varies and the application process involves submitting a formal request letter to Kaiser Permanente's Charitable Contributions division. Potential projects for this type of funding are lower cost projects.

More information is available at:
https://share.kaiserpermanente.org/article/northern-california-central-valley/

FUNDRAISING EVENTS

The City and School District can raise funds through special events, such as Avenal Elementary's annual Harvest Festival, Avenal High School's football games, parent-teacher conferences hosted by schools, the Tri-County Carnival hosted by Avenal Youth Pirate Football, Spring and Fall Nationals at the Avenal Sand Drags, Avenal Farmers Market, annual Kids 'n Kites Festival, and the City's Summer Concert Series.

PARENT TEACHER ORGANIZATION

Avenal's Parent Teacher Organization (PTO) could be a source for funding SRTS projects and programs. It is important to work with PTOs and school districts to have their input as well as to catch funding opportunities.

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CHAPTER 6



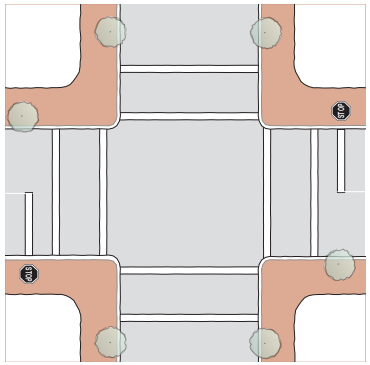


DESIGN GUIDELINES

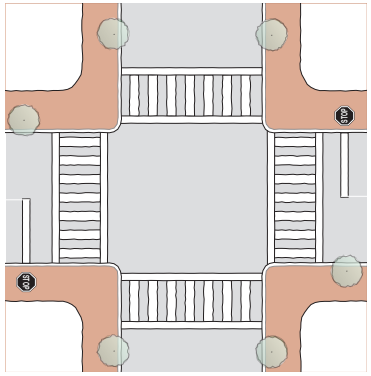
In September of 2008, the California Complete Streets Act of 2008 was signed into law. Complete streets are roads designed to accommodate all users including pedestrians, bicyclists, children, the elderly, persons with disabilities, transit riders, and motorists. The legislation requires that cities and counties include complete streets policies as part of their general plans so that roadways are designed to safely accommodate all road users. The California Department of Transportation later issued a revised Deputy Directive titled Complete Streets – Integrating the Transportation System. This chapter describes a framework for non-motorized improvements in Avenal following Complete Streets principles. Incorporating the design guidelines mentioned in this chapter into development and redevelopment projects should improve the safety and enjoyment of pedestrians and bicyclists in Avenal and provide accessibility for pedestrians of all mobility abilities.

The pedestrian design guidelines described in this chapter are based upon the federal and State (California Title 24) accessibility standards. The Americans with Disabilities Act (ADA) of 1990 prohibits public agencies from discriminating against individuals with disabilities. All public facilities in Avenal must comply with the Americans with Disabilities Act Accessibility Guidelines (ADAAG) and the State of California Code of Regulations Title 24. The California Disabled Accessibility Guidebook (CalDAG) synthesizes the recommendations from both sources and is the basis for many of the following guidelines. Similarly, the pedestrian network is influenced by the State and national standards for transportation design, such as the California Manual on Uniform Traffic Control Devices (CA MUTCD) and the American Association of State Highway and Transportation Official's (AASHTO's) Green Book. However, historically these standards are designed primarily to facilitate automobile traffic and pedestrian safety, and they are not necessarily focused on the pedestrian goals of walkability or accessibility.

This chapter outlines design guidelines and best practices for bicycle facilities recommended for the City of Avenal to improve bicycle safety and accessibility on all streets. These guidelines are based on the Caltrans Highway Design Manual (HDM), the California Manual on Uniform Traffic Control Devices (CA MUTCD), and the American Association of State Highway and Transportation Officials (AASHTO) Guide for the Development of Bicycle Facilities, as well as best practices in other communities. The bicycle design guidelines presented in this chapter are intended as a supplement to the previously mentioned documents.



Transverse crosswalk striping



Ladder-type crosswalk striping



Marked crosswalk and decorative intersection markings on Kings Street in Avenal

I. PEDESTRIAN GUIDELINES

CROSSINGS

Pedestrian crossings benefit both pedestrians and drivers in a number of ways. They prepare drivers for the potential of encountering a pedestrian, guide pedestrians to safe crossing locations, and provide important links for pedestrian connectivity. Well-designed pedestrian crossings are useful, compact, and visible.

- **Useful:** Pedestrian crossings should be useful in that they are placed in response to pedestrian need or desire. The usefulness of crosswalks should be carefully considered based upon the surrounding land uses and the safety of preferred crossing locations.
- **Compact:** The more compact a pedestrian crossing is, the less time a pedestrian is in potential conflict with vehicles. Methods of reducing the crossing distance include keeping pedestrian crossing distances compact by incorporating narrow turning radii, discouraging free right turns, and narrowing roadway width with curb extensions (also known as bulb outs) which extend the sidewalk into the adjacent parking lane
- **Visible:** The pedestrian crossing should be clearly marked, and pedestrians in crossings and waiting to use crossings should be clearly visible. Visibility is generally described as sight distance. As a general rule, pedestrians should be clearly visible by motorists for at least 250 feet.

Markings can be either painted or thermoplastic, which is a plastic-based material applied to the road surface. Thermoplastic markings are generally a preferred option because of their increased durability, reflectivity, and lack of toxic solvents.

The City of Avenal primarily uses transverse-style striping, which is the conventional crosswalk striping consisting of two parallel lines, generally used for controlled intersections. Ladder-type crosswalk markings consist of two parallel lines with ladder bars striped across the width of the crosswalks. This striping is especially useful to enhance crossings at uncontrolled intersections and mid-block locations, including those in commercial corridors or near schools and parks. Ladder-style crosswalk treatments are recommended at all uncontrolled crossing locations within ¼ mile of a school.

The City has replaced transverse striping with ladder-type markings on Kings Street (at 2nd and 3rd Avenues) and on First Avenue near Avenal Elementary School (at Fresno and Madera Streets).

High-visibility crosswalks at controlled intersections can be paired with advance stop bars, which provides a cue for drivers to stop well in front the crosswalk, keeping the crosswalk clear and providing some buffer between vehicles and pedestrians in the crosswalks.

CROSSINGS AT CONTROLLED INTERSECTIONS

Crossings that are controlled by traffic signals or stop signs and can be located at intersections or at mid-block crossings. The following are recommendations for treatments at controlled intersections.

- **Signalized Intersections:** Standard transverse style crosswalk markings (two parallel white lines) should be installed on all approaches of the intersection. Advance stop bars should be

included in advance of the crosswalk. Advance stop bars are 24 inch white lines installed 7 feet prior to a crosswalk. The stop bars help to prevent drivers from stopping and/or encroaching on the crosswalk.

- **Stop-Controlled Intersections:** Standard crosswalk markings should be installed at all controlled approaches. Enhanced visibility measures (high-visibility crosswalks) should be located adjacent to major destinations, schools, and at locations with potential pedestrian safety concerns.

CROSSINGS AT UNCONTROLLED INTERSECTIONS

The crossings discussed in this section are located at intersections without traffic controls (uncontrolled intersections), including both marked and unmarked crossings, and at marked mid-block crossings.

There has been an ongoing debate about the potential safety implications of marked or unmarked crossings at uncontrolled intersections. The California Vehicle Code states that the driver of a vehicle shall yield the right-of-way to a pedestrian crossing the roadway within any marked crosswalk or within any unmarked (not striped) crossing at an intersection, except if directed otherwise. Unfamiliarity with the Vehicle Code may prevent drivers from knowing that they need to yield at an unmarked crosswalk for pedestrians. This same lack of knowledge may deter pedestrians from crossing at unmarked intersections or may actually encourage safer habits (looking both ways) because pedestrians do not think that drivers are required to yield to them if the crossing is not marked.

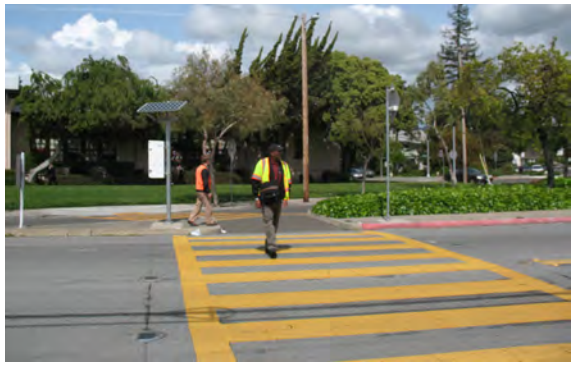
It is recommended that marked crosswalks be included at any uncontrolled intersection if the location is farther than 300 feet from a controlled crossing location with a marked crosswalk, and if the location has the required 250-foot sight distance and has no other safety concerns for a crosswalk. Additionally, pedestrian demand can identify the need for a marked crosswalk.

In addition, the following enhancements are appropriate at uncontrolled intersections that need additional safety improvements.

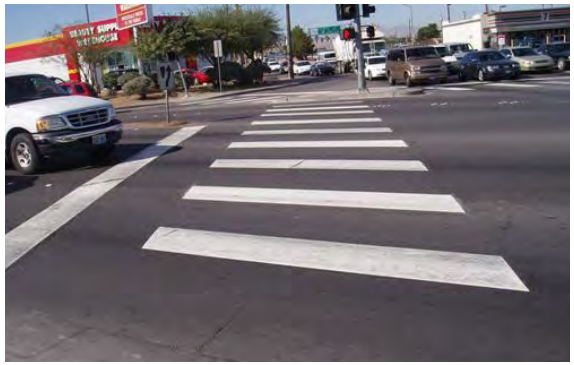
- Curb extensions, such as those located on Kings Street, at locations where increasing pedestrian visibility will improve the safety of the crosswalk.
- Overhead signs and flashing beacons showing the universal pedestrian symbol, including both standard yellow, fluorescent yellow, and LED displays, that hang from a mast arm that extends over the street. Flashing red or yellow beacons enhance overhead signs.
- Raised crosswalks using special pavers, concrete, or asphalt, to create a raised crosswalk by extending the sidewalk across the road and bringing motor vehicle traffic up to the level of pedestrians. Raised crosswalks have the dual purpose of slowing traffic (similar to a speed table, which is a long speed hump with center flat section) and improving visibility of pedestrians. Since the crosswalk is at the same level as the sidewalk, there is no additional need for curb ramps.
- Pedestrian activated in-pavement lighted crosswalks accompanied by a flashing sign at the crosswalk, which may increase the number of vehicles yielding to pedestrians.



Crossing at uncontrolled intersection with ladder-type crosswalk markings



Ladder-type crosswalk with in-pavement flashing lights in a school zone



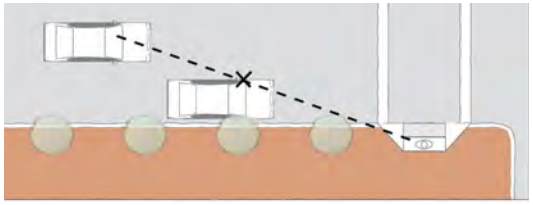
Continental crosswalk marking with an advance stop bar



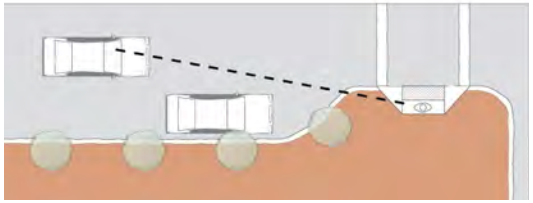
Pedestrian safety island at a midblock crossing with continental crosswalk markings



Midblock pedestrian safety island on residential street



Limited visibility - Parking too close to an intersection can hinder pedestrian visibility



Improved visibility - Curb extensions can help improve pedestrian visibility

- Pedestrian activated signals at uncontrolled intersection crossings or in areas where pedestrians need greater visibility at a crosswalk. Pedestrian actuated signals are pedestrian push buttons which activate a crosswalk light or traffic signal to turn.

PEDESTRIAN SAFETY ISLAND

A pedestrian refuge island provides a safe space in the middle of the street at pedestrian crossings. They are especially useful on streets with higher traffic speeds and volumes, and larger roadway widths. They are typically a roadway-level "cut through" between sections of a raised center median.

- A refuge island should be at least 6 feet wide, but preferred width is 8-10 feet.
- The cut-through should equal the width of the crosswalk.
- Medians at intersections should have a "nose" extending past the crosswalk toward the intersection

CROSSINGS AT SKEWED INTERSECTIONS

The street network in Avenal is primarily a grid based on cardinal directions, except for Skyline Boulevard and a four-block area bounded by San Joaquin Street, Union Avenue, Fresno Street and 7th Avenue. Skyline Boulevard runs diagonally through the city's grid system, resulting in a number of skewed intersections where the angle between intersecting streets is either obtuse or acute (See Existing Conditions Chapter).

Ideally, skewed intersections should be redesigned closer to a right angle, but this would likely require land dedications and may not be possible in Avenal.

In order to reduce pedestrian crossing distances at skewed intersections, curb extensions can be installed at the obtuse-angle corners. Extensions are generally not possible on the acute-angle corners because they require larger curb radii in order to accommodate turns by larger vehicles. In addition to curb extensions, pedestrian refuge islands can be provided at skewed intersections on Skyline Boulevard to provide a safe waiting area for pedestrians who aren't able to cross the entire street by the end of the walk phase.

VISIBILITY AT CROSSINGS

Visibility of pedestrians at intersection crossings is important for the safety of all roadway users. Visibility is a great concern at crossing locations where parked cars, street furnishings, utilities and landscaping can potentially obstruct the line of sight for pedestrians and motorists. Pedestrians should have an unobstructed view of oncoming vehicles, and vehicles need to easily see pedestrians approaching or waiting at a crossing. Because of their lower height, pedestrians in wheelchairs and small children are especially difficult for drivers to see at an intersection. The following recommendations will improve the visibility of pedestrians at an intersection.

- Parking adjacent to intersections and crosswalks should be prohibited for a minimum of 20 feet from the crosswalk. On streets with higher speeds and at locations with previous collision history or noted visibility issues, this distance should be increased. The CA MUTCD defines stopping sight distance requirements based on the approaching speed of vehicles.

- Street furniture, utility boxes and poles, signal poles, signage, trees, and newspaper racks all have the potential to reduce visibility at corners. It is recommended that no solid opaque object that is taller than 32 inches be allowed within 10 feet of a crosswalk or 20 feet of an unmarked intersection. Utility poles, street trees, or signs should not be allowed within 5 feet of a crosswalk or 10 feet of an unmarked intersection.
- Street trees to be planted adjacent to an intersection should be chosen based upon their characteristics. They should be fast growing, upward branching, and a minimum of 30 feet tall at mature height. All street trees should be maintained and pruned to provide adequate visibility.
- Curb extensions can be used at corners to widen the sidewalk and allow the pedestrian to safely get closer to cars to improve their visibility. When street amenities or other objects might obstruct the visibility at a corner, curb extensions should be considered.

CURB RAMPS

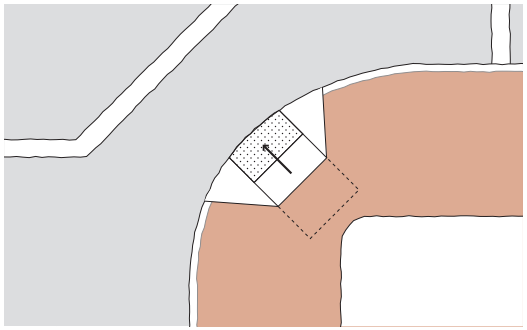
Curb ramps provide access between a sidewalk and a surface that is located above or below an adjacent curb. Curb ramps are required wherever a pedestrian path crosses a curb, typically at every corner of an intersection. Curb ramps are an important link in providing accessibility and creating connectivity throughout the pedestrian network. Without curb ramps, curbs can create barriers for people with many types of mobility limitations. However, people with visibility limitations often rely on the curb for navigation and to identify the transition between the sidewalk and street; curb ramps can obscure this information. Given these conflicting interests, specific design strategies should be followed to ensure a safe and accessible environment for all users. The design of curb ramps is limited by site constraints, and it may not be possible to incorporate the ideal design in every situation. The following section outlines the minimum ADA requirements for curb ramps, the best practice design, and options for creating suitable design when an optimal design cannot be accommodated. The minimum ADA requirements for the construction of curb ramps are as follows:

- Curb ramp is a minimum of 4 feet in width.
- Slope of the curb ramp cannot exceed 8.33 percent.
- Curb ramp lies generally in a single sloped plane, with a minimum of surface warping and cross slope.
- Finished surface of the ramp contrasts from the adjacent sidewalk and is stable, firm, and slip resistant.
- No surface of the curb ramp contains any vertical edges greater than a ¼ inch.
- A level landing a minimum of 48 inches deep extends the full width of the ramp, provided at the upper end of the curb ramp, or the slope of the fanned or flared sides does not exceed 8.33 percent.
- Slope of the top landing area does not exceed 2 percent in any direction.
- Built-up curb ramps do not project into vehicular traffic lanes.

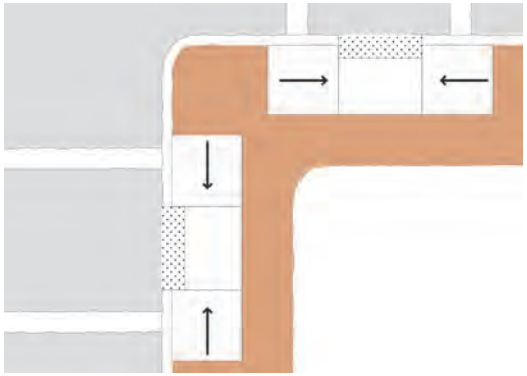


Curb ramp and grooved border at a crosswalk

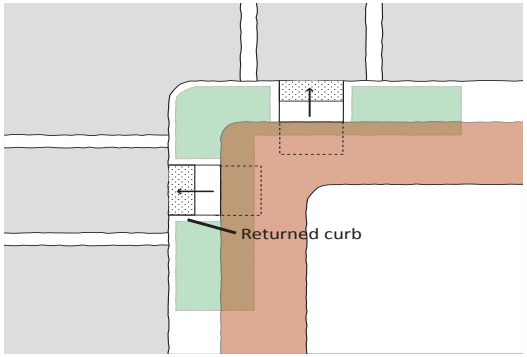

Curb ramp along a sidewalk at a driveway intersection



Diagonal curb ramp



Parallel curb ramps



Returned-Curb curb ramps

- Transitions from the ramp to the sidewalks, gutters, or streets are flush and free of abrupt changes.
- A 12-inch grooved border is provided along top and sides of the ramp at level surface of the sidewalk.
- Slope of the road, gutter, or sidewalk adjoining the curb ramp does not exceed 5 percent within 4 feet of the top and bottom of the curb ramp.
- Curb ramps shall be located or protected to prevent their obstruction by parked vehicles.
- Curb ramps are currently required to have detectable warnings as per ADA guidelines, (e.g. raised domes and tactile warnings) that extend the full width and depth of the curb ramp, excluding the flared sides inside the grooved border.

The type of curb ramp used is dependent upon the location. The most common types of curb ramps are perpendicular curb ramps, returned-curb curb ramps, diagonal curb ramps, and parallel curb ramps, which are discussed further below.

PERPENDICULAR CURB RAMPS

The most common type of curb ramp is a perpendicular curb ramp, which is designed so that the ramp is perpendicular to the curb and directly in line with the crosswalk. Perpendicular curb ramps require the sidewalk to be wide enough to accommodate the width of the ramp and the minimum 4-foot landing area. The minimum width of the sidewalk required to accommodate a perpendicular curb ramp is dependent upon the height of the curb. The slope requirements for the flared sides depend on the width of the sidewalk at the top of the ramp. If the landing area is 4 feet or more, then the flared sides may slope up to 10 percent (1:10) but not more. Perpendicular curb ramps without sufficient landings create barriers because they force individuals to travel over the ramp flare, which is inaccessible.



RETURNED-CURB CURB RAMPS

Returned-curb curb ramps are perpendicular curb ramps that are used when pedestrians are not required to walk across the ramp, such as when the curb ramp is within a landscaped zone adjacent to the sidewalk. Returned-curb curb ramps have returned curbs, rather than flared curbs, on one or either side of the ramp. Returned curbs are the vertical sides to the ramp, continuing the street curb up onto the sidewalk and ending at the landing. Returned curb ramps are favorable for pedestrians with vision impairments because the curbs provide informative cues.

DIAGONAL CURB RAMPS

A diagonal curb ramp is a single curb ramp that is located at the apex of the corner radii at an intersection. Diagonal curb ramps are aligned so that the pedestrian traveling down the ramp will be diagonally facing the intersection and will need to maneuver to the right or left to travel within the crosswalk. Similar to parallel curb ramps, diagonal curb ramps require a level landing at the top of the

ramp and can include returned curbs. Diagonal curb ramps require a minimum of 2 feet of straight curb located on each side of the curb ramp and within the marked crossing. Diagonal curb ramps require that both crosswalks direct pedestrians to the landing below the curb ramp. It is necessary that the crosswalk stripes meet and delineate a 4-foot clear space at the base of the curb ramp.

PARALLEL CURB RAMPS

A parallel curb ramp consists of two ramps joined in the middle by a landing that is level with the roadway. Each side of the ramp requires a level landing at the top of the ramp. Parallel curb ramps run parallel to the curb and usually take up the whole width of the sidewalk. Parallel ramps can be installed on very narrow sidewalks because the landing at the top of the ramp does not include additional sidewalk width. Parallel curb ramps are not ideal because they require pedestrians walking along the sidewalk to navigate to ramp changes, whether or not they are utilizing the crosswalk. Depending on the location and turning radius, an intersection may have either one or two parallel curb ramps.

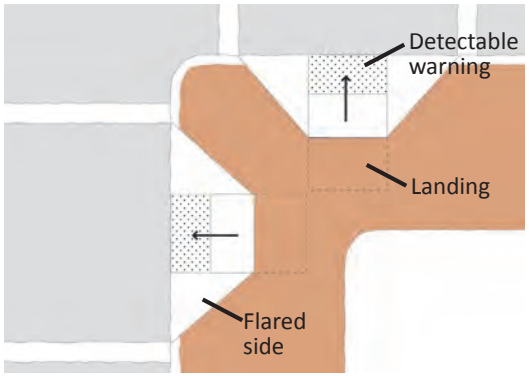
BEST PRACTICES

The best practice for pedestrians is to have perpendicular curb ramps with either flared sidewalk or returned curbs. Perpendicular curb ramps require wide enough sidewalks to provide a top landing, which allows pedestrians not using the curb ramps to continuously walk across a level surface. Additionally, perpendicular curb ramps position users on a direct path along a crosswalk, and are positioned within the center of a crosswalk. Perpendicular curb ramps should be used at all locations within Avenal that have wide enough sidewalks to accommodate the minimum design requirements. If a location does not have the space to accommodate the minimum design requirements, the use of curb extensions or widening the sidewalk at the back of the walk should be considered before utilizing another form of curb ramp.

Returned curbs are the best practice only in locations where pedestrians cannot walk across the curb ramp, such as in a planting strip. Returned curbs should not be used when the curb ramp is within the pedestrian path of travel because the curbs will create a tripping hazard.

Diagonal curb ramps are not best practice because they direct pedestrians into the street at a diagonal orientation, requiring the pedestrian to enter the street and be exposed to traffic before turning to proceed within the crosswalk. Additionally, diagonal curb ramps make it more difficult for pedestrians with limited visibility to orient to the path of the crosswalk. Diagonal curb ramps should only be designed when the limitations of the location demands, such as areas with a narrow turning radius. Diagonal curb ramps may be acceptable as retrofits in residential areas where traffic volumes are very low.

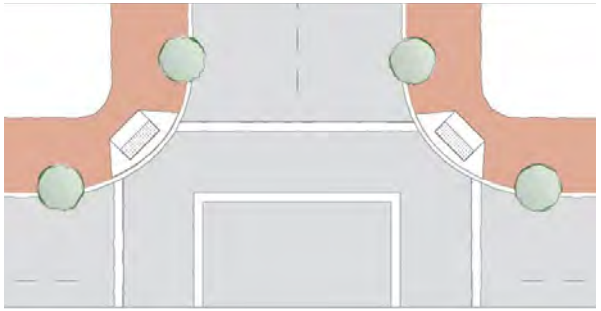
Parallel curb ramps should only be used in locations with narrow sidewalks that cannot accommodate the spatial requirements of parallel curb ramps, or in locations that require longer ramp lengths because of high curbs. Ideally, two parallel curb ramps should be used so that the direction of the curb ramp lines up with the direction of the crosswalk.



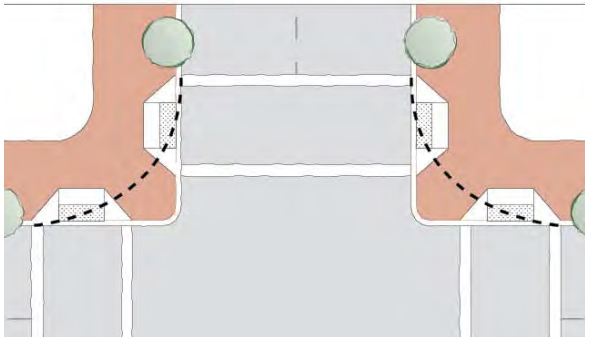
Perpendicular curb ramps - preferred



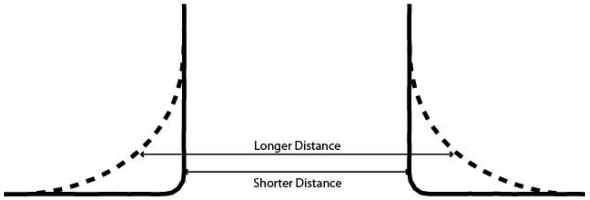
Preferred perpendicular curb ramps



Larger Turning Radii - widen pedestrian crossing and limit amount of sidewalk available for perpendicular curb ramps



Smaller Turning Radii - reduce the pedestrian crossing distance and create more sidewalk room for perpendicular curb ramps



Larger versus smaller turning radius

TURNING RADIUS

The size of a corner turning radius has a significant effect on the operation and safety of an intersection. Intersections with larger turning radii promote fast traffic speeds and widen the walking distance for pedestrians. Intersections with smaller turning radii promote slower traffic speeds, shorten the pedestrian walking distance, and provide for more sidewalk space at corners. The additional sidewalk space at corners allows for perpendicular curb ramps to be used. Smaller corner turning radii are also beneficial for street sweeping operations. However, too small of a corner turning radii can reduce the efficiency of an intersection, which can have negative impacts on motor vehicle traffic and attempts by pedestrians to cross the intersection.

The general rule for choosing a corner turning radius should be to choose the smallest possible, acknowledging that each location has a unique set of factors that determine the appropriate radius. The turning radius should accommodate the expected amount and type of traffic for safe turning speeds. As the curb radius increases, incomplete stops become more frequent and drivers make turns at higher speeds.

Minimum turning radius recommendations are provided in "A Policy on Geometric Design of Highways and Streets" (AASHTO). Historically, these minimum turning radii have been exceeded in order to facilitate the efficient movement of larger vehicles. However, recent interest in balancing the needs of pedestrians and bicyclists highlight the need to adhere to minimum turning radii standards and consider alternative ways to accommodate vehicles with larger turning radii. The following are recommendations for the design of curb radii:

- At locations with curbside parking a 10-foot radius is recommended.
- At locations with no parking lane, a maximum 20-foot radius is recommended.

Potential alternatives to accommodate vehicles with larger turning radii are:

- Move stop lines back from the intersection.
- Allow vehicles that cannot navigate a tight turning radius to turn into the out-of-lane roadway.
- Add a parking lane adjacent to the corner to increase the relative turning radius.

CURB EXTENSIONS

Curb extensions extend the sidewalk into the roadway, effectively narrowing the roadway and widening the pedestrian zone. They can occur at intersections (called bulb-outs) or at mid-block locations.

CURB EXTENSIONS AT INTERSECTIONS

Curb extensions at intersections are beneficial because they increase motorists' visibility of pedestrians, reduce the distance pedestrians have to walk across an intersection, provide space for perpendicular curb ramps, reduce corner turning radii, and provide extra sidewalk space for street furnishings or landscaping. Corner curb extensions (bulb-outs) also reduce the capacity to park illegally at corners and crosswalks. Curb extensions should be considered for implementation at any pedestrian

crossing location where they would help to improve pedestrian safety or provide extra room to allow for the construction of an accessible curb ramp that otherwise could not be implemented.

CURB EXTENSIONS AT MID-BLOCK LOCATIONS

Curb extensions at mid-block pedestrian crossings, like corner curb extensions, improve visibility of pedestrians and reduce crossing distances. They are also used as a traffic calming measure to narrow the street.

The design of mid-block curb extensions should adhere to the following guidelines:

- Curb extensions should extend the existing sidewalk for a maximum of 6 feet into the street adjacent to parallel parking, or 12 feet adjacent to diagonal parking.
- Curb extensions should be designed to exercise special care not to create conflicts between bicyclists and pedestrians. Where bike lanes exist adjacent to a curb extension, the bike lane should be painted continuously adjacent to the curb extension.
- The return of the curb extension to the existing curb should be designed as a concave return with a radius of approximately 12 to16 feet. This curve in the return will facilitate easier street sweeping and prevent the corner from accumulating large amounts of trash. The minimum radius possible should be considered during design to reduce impacts to parking.

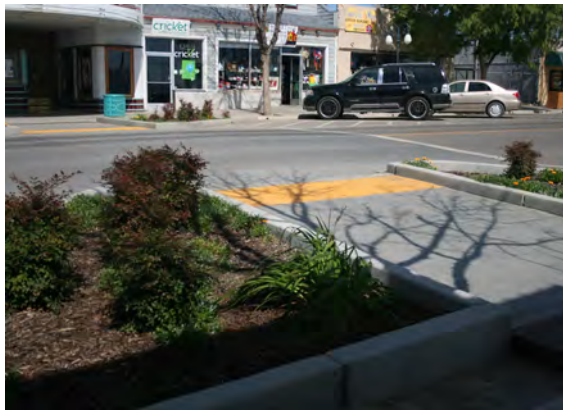
When planning for corner or mid-block curb extensions, it is important to consider the existing curb, gutter, and drainage. Relocating on-street storm drains may be required when implementing curb extensions, which can significantly increase construction costs. An alternative, less expensive design, would be to construct the curb extension as an island and span the sidewalk to the island with a grate. This may initially be a cost saving device, but can increase the cost of future maintenance.



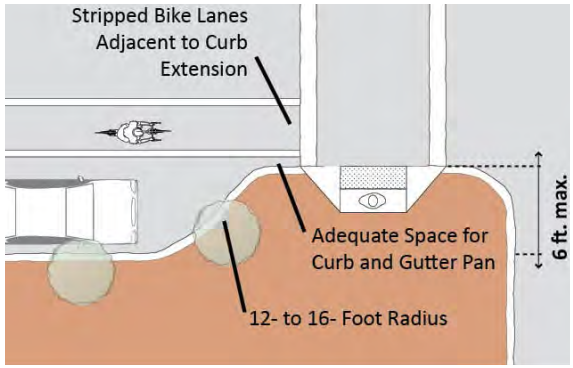
Curb extension on Kings Street in Downtown Avenal



Example of a curb extension at a mid-block crossing



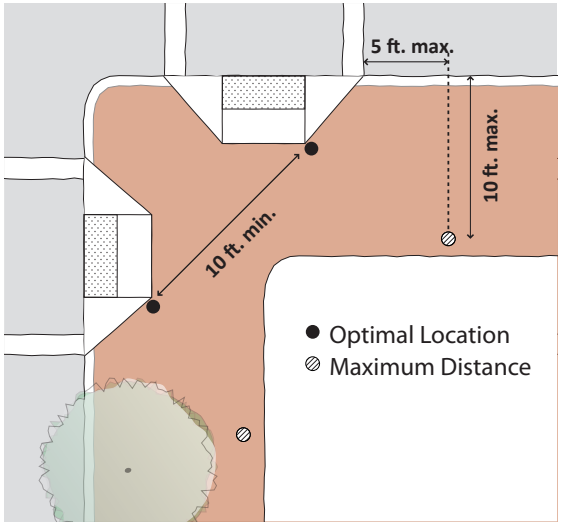
Curb extension at midblock crossing on Kings Street in Downtown Avenal



Curb extension guidelines



Example of a pedestrian actuated signal push button.



Recommended installation for accessible pedestrian signals

PEDESTRIAN SIGNALS

Pedestrian safety at signalized intersections can be enhanced by signal mechanisms that communicate more information to the pedestrian.

SIGNAL TIMING

The CA MUTCD recommends that controlled crossings should be timed for a walking speed of 3.5-feet per second, measured from the top of the curb ramp on one side of the street to the top of the curb ramp on the opposite side of the street. However, a pedestrian's walking speed is dependent upon many factors, including age and mobility. Pedestrian signal crossing times should be adjusted accordingly near major activity destinations, at intersections that are unusually long or difficult to navigate, and adjacent to any location that might have a higher proportion of pedestrians with slower walking speeds, such as senior centers.

ACCESSIBLE PEDESTRIAN SIGNALS

The CA MUTCD defines an Accessible Pedestrian Signal (APS) as "providing in non-visual format (such as audible tones, verbal messages, and/or vibrating surfaces)." They are used to help guide pedestrians with impaired vision and/or hearing. The following Accessible Pedestrian Signal guidelines are based upon the National Highway Research Program's Guidelines for Accessible Pedestrian Signals.

The recommended features for an APS include:

- **Push Button Locator Tone:** The tones are intended to notify pedestrians approaching the crosswalk that they need to press the button to get a WALK indication. CA MUTCD recommends locator tones that sound at one second intervals.
- **Tactile Arrow:** Tactile arrows are required to indicate which crosswalk is controlled by which push button. The arrow should be aligned in the direction of travel on the crosswalk.
- **Actuation Indication:** Actuation indication allows the pedestrian to know that they have activated the push button. This may be in the form of either a tone or speech message.
- **Audible WALK Indication:** Audible WALK indication tone should be activated for duration of the walk interval. It is recommended to repeat ten times per second and differ from locator tone in its repetition rate.
- **Vibrotactile WALK indication:** The vibrotactile arrow indicates the WALK interval to persons who have both vision and hearing limitations. The push button or raised arrow on the APS vibrates during the WALK interval.
- **Response to Ambient Sound:** It is recommended that all APS are responsive to ambient sound by increasing the volume to be heard above ambient noise levels.
- **Push button Information Message:** Push button information messages provide users with the name of the street controlled by the signal.
- **Louder Signal (Beaconing Signal):** A louder signal is to assist pedestrians who have vision and hearing impairments. A louder signal is typically activated by an extended button press.

The location of an APS is important to prevent ambiguity about which crosswalk is being signaled.

Ideally, there are two push buttons (one for each direction) on one corner, which are mounted on two separate poles. Mounting the APS on a traffic signal is acceptable as well. The optimal location for a push button-integrated APS meets the following criteria:

- The optimal APS location is between 1.5-6 feet from the edge of the curb, with a maximum of 10 feet from the curb.
- The optimal location of the APS is between the furthest (extended) crosswalk line and the curb ramp, with the maximum distance of 5 feet from the edge of the furthest (extended) crosswalk line.
- The APS should be located adjacent to a level all-weather surface.
- The control face and tactile arrow should be carefully aligned with the direction of travel.
- At corners with two APS, they should be separated by a minimum of 10 feet.
- The optimal height for the placement of APS is between 32-42 inches. The CA MUTCD recommends a mounting height of 3.3 feet (40 inches).

INNOVATIVE PEDESTRIAN SIGNALIZATION

There are a number of innovative treatments for pedestrian signals that help to enhance safety at pedestrian crossings. Pedestrian crossings that might require innovative treatments are intersections with high volumes of pedestrians, a history of pedestrian and vehicle collisions, or extra wide intersections. Innovative treatments include:

- **Leading Pedestrian Interval** provides pedestrians with a WALK signal while the parallel traffic still has a red stop light. This allows pedestrians to establish themselves in the crosswalk, increasing their visibility and reducing conflicts between pedestrians and turning vehicles.
- **"No Right Turn on Red" Restrictions** for vehicles reduce pedestrian-vehicle conflicts at locations with high numbers of pedestrians. Drivers who are turning right on red are concentrating on looking to their left to find a gap in oncoming traffic, thus not seeing the pedestrian that may be crossing in front of them. Additionally, right turns on red create confusing information for individuals with limited vision, as traffic sounds help them to orient and navigate the intersection. This type of treatment should be considered on a case-by-case basis; limiting right turns on red reduces roadway capacity and may increase congestion or cause traffic diversions.
- **Countdown Signals** are useful at signalized locations because they provide information to the pedestrian regarding the amount of time remaining to safely cross the street. There should be adequate crossing time for the pedestrian to traverse the entire distance, and countdown signals should be used as a default.



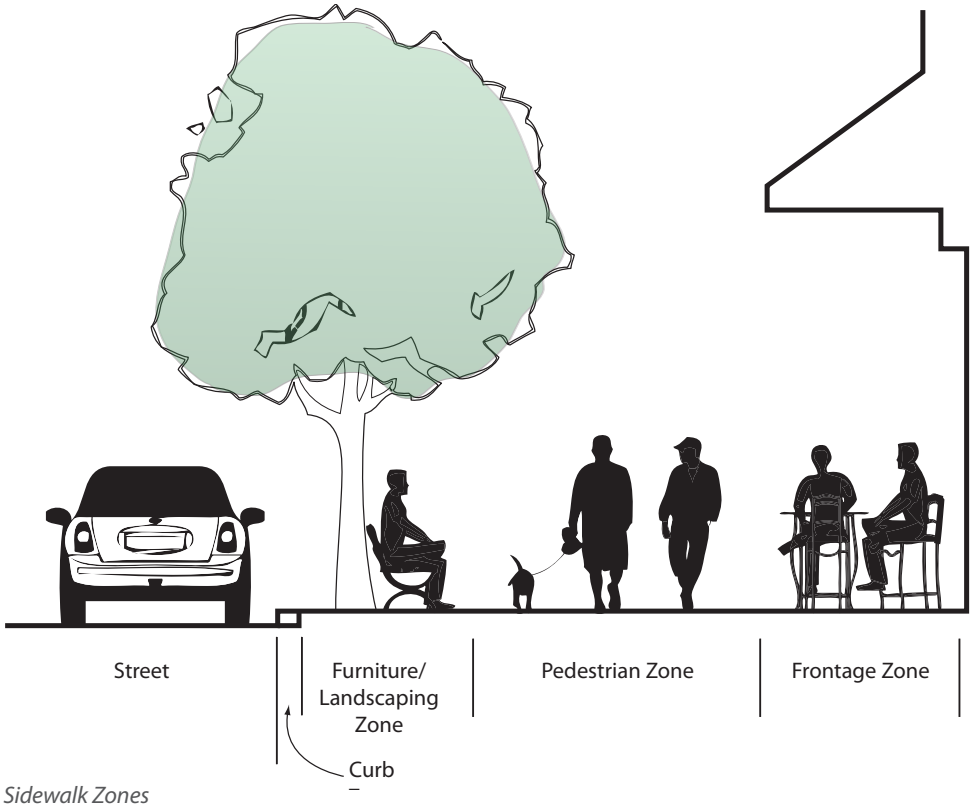
Countdown signal

SIDEWALKS

Sidewalks provide space for more than just the movement of pedestrians. They also accommodate outdoor seating and street furniture.

SIDEWALK DESIGN

There are three distinct sidewalk zones that are applicable in different locations and have different design requirements. The three zones include the furniture/landscaping zone, pedestrian zone, and frontage zone.



Sidewalk Zones

- **Furniture/Landscaping Zone:** The furniture zone is the interface between the curb and the pedestrian zones. This zone provides a buffer between the walking areas for pedestrians and vehicle traffic. The furniture zone is necessary to ensure that the pedestrian zone is free of any obstacles. The furniture zone provides space for opening car doors, landscape buffers, street trees, trash receptacles, utility poles, street furnishings, and other similar items.
- **Pedestrian Zone:** The pedestrian zone is the area where pedestrians can easily travel. The pedestrian zone should provide an unobstructed pedestrian path of travel. ADA standards require a minimum width of 4 feet of unobstructed pedestrian way. However, when this width is not available because of natural barriers, right-of-way restrictions, or other existing conditions, the minimum width may be reduced to 3 feet. Sidewalks that are narrower than 5 feet must have a passing space of 5 feet by 5 feet every 200 feet.
- **Frontage Zone:** The frontage zone is the area adjacent to the property line. This zone is generally applicable to commercial areas with street-fronting buildings, such as Kings Street. This zone provides space for pedestrians to enter and exit buildings, include street furnishings, and in some cases functions as an extension of the interior use by providing areas for outdoor displays.

Design requirements for each zone can vary based on the adjacent uses, such as commercial and residential uses.

SIDEWALK ZONES IN COMMERCIAL AREAS

- **Furniture/Landscaping Zone:** Within retail areas and areas with a significant number of pedestrians, the furniture/landscaping zone should be a minimum of 4 feet wide, and optimally be six to eight feet wide. A six- to eight-foot wide zone provides ample room for landscaping, bicycle parking, and signage, while still providing space for car doors to be easily opened without infringing on the pedestrian zone.
- **Pedestrian Zone:** Commercial areas should have a minimum pedestrian zone width of 5 feet, with an optimal width of 8 feet; the optimal 8 feet provides a comfortable walking environment where pedestrians can conveniently pass one another.
- **Frontage Zone:** Frontage zones should be a minimum of 2 feet to accommodate pedestrians entering and exiting buildings. In retail areas frontage zones can greatly contribute to the liveliness of the pedestrian environment. Frontage zones can be up to 12 feet to accommodate uses such as outdoor seating.

SIDEWALK ZONES IN RESIDENTIAL AREAS

- **Furniture/Landscaping Zone:** The furniture/landscaping zone should be a minimum of 2 feet wide in residential areas to provide a buffer between the pedestrian zone and the street. This minimum width provides space for signs and posts to be placed without obstructing the pedestrian route of travel. Ideally this zone in residential areas should be 4 feet wide and mainly used for landscaping. It also can provide ample space for the location of driveway ramps.
- **Pedestrian Zone:** For the City of Avenal, it is recommended that residential areas should have a minimum pedestrian zone of 5 feet.
- **Frontage Zone:** Residential areas are not required to have a frontage zone because, typically, the building is set back from the property line.

SURFACE AND CROSS SLOPE

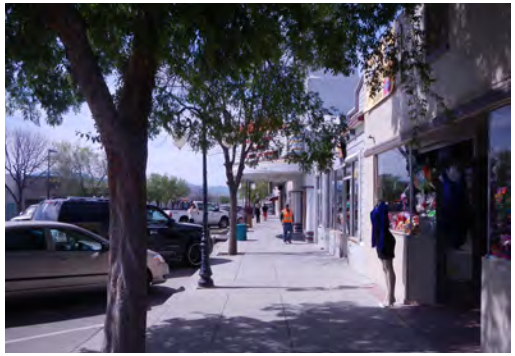
ADA requirements dictate that walkways must be a continuous common surface that is not interrupted by changes in level. The slope of a sidewalk cannot exceed 5 percent in the travel direction, or 2 percent in the cross slope direction. The surface of public walkways must be slip-resistant.

SIDEWALK AMENITIES: STREET FURNITURE

Sidewalk amenities such as street furniture create a welcoming environment for pedestrians. Amenities such as trash receptacles, benches, signage, and drinking fountains all contribute to the character and sense of community. Kings Street between 1st Avenue and Skyline Boulevard already includes a number of sidewalk amenities including seating, waste receptacles, and landscaping. Additional amenities should be located in areas where they will be used by the highest number of pedestrians. When locating amenities, it is important to understand that an area's needs may change over time, and the placement of amenities should be flexible to change.

The following guidelines should influence the location and choice of amenities:

- Whenever possible, sidewalk amenities should be located in the furniture zone. At no time





Sidewalks on Kings Street in Avenal



A residential sidewalk in Newman, California.



Pedestrian scale lighting on Kings Street



Sidewalk vegetation contributing to a pleasant pedestrian environment in Santa Barbara, California (left) and Seattle, Washington (right)

should the placement of amenities impede the accessible path of travel. The location of amenities should be carefully coordinated with the location of other objects within the sidewalk such as utility vaults and light poles.

- The City should utilize a consistent palette of street furniture and amenities.
- Placement of amenities should respond to, and not hinder, adjacent on-street parking or transit boarding zones.

SIDEWALK AMENITIES: PEDESTRIAN-SCALE LIGHTING

Pedestrian-scale street lighting will not only help improve security, but will also add to the character of the street and neighborhood. Sidewalks and landscaped areas should be lit to enhance safety and comfort. The following guidelines should influence the placement choice of pedestrian-scaled lighting.

- Sidewalks should be illuminated through the use of pedestrian-scaled pole fixtures (10 to 14 feet in height) or fixtures attached to the face of the buildings.
- The type and size of fixture should be consistent along a single block.
- Placement of lighting should not interfere with the pedestrian path of travel and should not distract or interfere with vehicular circulation.
- Street lamps should be oriented toward the ground and designed with "dark sky" technology to help preserve views of the night sky and minimize glare.

LANDSCAPING AND TREES

Landscaping and trees contribute greatly to a more attractive and comfortable pedestrian environment. In addition to their aesthetic benefits, they improve comfort for people traveling on the sidewalk by providing shade and reducing heat, and they have clean air benefits as well. Because of Avenal's dry climate, it is likely not feasible (or water-wise) to provide shade trees throughout the city, but street trees are especially beneficial in high pedestrian areas such as Kings Street, at bus shelters, and near schools. Avenal's dry climate provides a challenge for establishing and maintaining vegetation, but through the utilization of drought-tolerant plantings, proper maintenance, and irrigation when necessary, Avenal can provide road users – and especially sidewalk users – a more comfortable and attractive urban environment.

The following guidelines should guide the choice and planting of landscaping:

- The vegetation chosen for the pedestrian network should reflect the identity of Avenal and be climate appropriate.
- Drought tolerant plants and trees with minimal water and maintenance requirements should be chosen to reduce water consumption and maintenance costs.
- Due to Avenal's dry climate, even drought-tolerant trees require regular irrigation until they are well-established. Where desirable, trees should be placed within irrigated planting areas and tree wells. Alternatively, trees can be watered during the dry season by water truck and/or by using slow-release tree watering bags.

- Trees should be located in tree wells at least 5'x5' in size to ensure a sufficient permeable area.
- Tree grates should be located as to not disrupt the minimum 4 feet of sidewalk. The openings in tree grates should be a maximum of ½ inch wide.
- When planting vegetation within planting strips or tree wells it is important that the planting areas do not create tripping hazards.

DRIVEWAY RAMPS

Driveways allow vehicles to cross the sidewalk and gain access between the street right-of-way and private parcels. It is the driver's responsibility to yield to pedestrians on the sidewalk; however, this relationship inherently places pedestrians in potential conflict with vehicles. A change of grade or slope of driveway poses as a challenge for people with disabilities and people pushing strollers. In Avenal, this sometimes results in people in wheelchairs or pushing strollers to walk in the roadway.

The design of driveway aprons also affects the accessibility and safety of the sidewalk. The driveway apron and the flare of the driveway apron (the sloped transition between the driveway apron and the sidewalk) create changes in the sidewalk cross slope that pedestrians must navigate.

The optimal design for a driveway that crosses a pedestrian walkway includes a level path of travel along the sidewalk at the back of the driveway with a more steeply sloped driveway apron at the street edge. This design requires an area that is wide enough to accommodate both the driveway ramp and a separate pedestrian zone. Ideally, the sloped driveway ramp could be accommodated in a planting strip area and pedestrians would be entirely separated from the driveway ramp and the driveway flares. In areas where there is not enough sidewalk right-of-way to accommodate this design, the City should work with property owners to gain additional right-of-way easements across adjacent property to accommodate a jogged pedestrian path.

New development should be designed to incorporate a minimum number of driveway ramps. Additionally, in areas with numerous driveways, adjacent businesses should be encouraged to combine driveway ramps, and unused driveway ramps should be removed.

ALLEYS

Public alleys in Avenal often provide informal paths for pedestrians and bicyclists, away from street traffic. Alleys can be transformed from underutilized, unattractive spaces into public space assets with features such as permeable paving, vegetation, and stormwater management features. Although typically alleyways would function as shared streets accommodating all travel modes, in some cases where they are not necessary for property access, alleys can be converted into pedestrian- and bicycle-only pathways enhanced by landscaping, seating, pedestrian-scale lighting, play opportunities, etc. Because alleyways often contain blank facades, murals can greatly improve aesthetics and provide visual interest.



Rendering of a public alley transformed into a pleasant pedestrian-friendly amenity



Blank facades in alleys can be transformed by painted murals



Optimal driveway design provides a smooth and continuous sidewalk with the driveway apron at the street edge within the planting strip



II. BICYCLE GUIDELINES

BICYCLE FACILITIES

Bikeway planning and design in California typically relies on the guidelines and design standards established by Caltrans as documented in "Chapter 1000: Bikeway Planning and Design" of the Highway Design Manual (HDM). Chapter 1000 follows standards developed by AASHTO and the Federal Highway Administration (FHWA), and identifies specific design standards for various conditions. These standards provide a good framework for future implementation, but may not always be feasible given specific constraints. Bikeway design and planning standards are continually changing and expanding. Despite this, most agencies adopt the Caltrans or AASHTO standards as a minimum.

TYPES OF BIKE FACILITIES

Based on the California Streets and Highways Code, Caltrans identifies three types of bikeways, as described and illustrated below.

- **Class I bikeways (Bike Paths)**, also known as multi-use paths, are separated completely from motor vehicle traffic but may be shared with pedestrians.
- **Class II bikeways (Bike Lanes)** are striped in the roadway for the exclusive use of bicycles. Vehicle and pedestrian cross-flow are permitted. The striping is supported by pavement markings and signage.
- **Class III bikeways (Bike Routes)** are located on roadways shared with motor vehicles. Bike routes are designated by signage and/or shared roadway bicycle markings (sharrows).
- **Class IV bikeways (Cycle Tracks)** are located in or adjacent to a roadway and separated from traffic by a physical barrier (e.g., bollards, on-street parking, planters, raised medians). The 2011 National Association of City Transportation Officials (NACTO) Urban Bikeway Design Guide recommends that a bike lane sign CA MUTCD signage type R3-17 be used for a class IV bikeway.

CLASS I BIKEWAYS: BIKE PATHS

Bike paths, or multi-use paths, are typically separated from roads by buffers or barriers, and cross traffic should be minimized along these paths in order to avoid conflict. Bike paths are also often part of a shared-use path for pedestrians. These paths are an important component of every bikeway network because they can provide a car-free environment for a large portion of a bicycling trip. Such paths are typically located along an existing corridor such as a canal, riverfront, or railroad.

Within a bikeway network, Class I bike paths can also close a gap in motor vehicle access such as connecting two dead-end roads, traversing a park, or by providing more direct access in a subdivision between a residential street and surrounding major roadways.

Two-way bike paths must be a minimum of 8 feet wide with an additional two foot wide shoulder, required by Caltrans standards. A minimum width of 12 feet is preferable when moderate volumes of pedestrian traffic are expected along the path. A separate path for pedestrians may be appropriate if high volumes of pedestrian traffic are expected. Asphalt or concrete should be used for the bicycling path, while decomposed granite can be used for

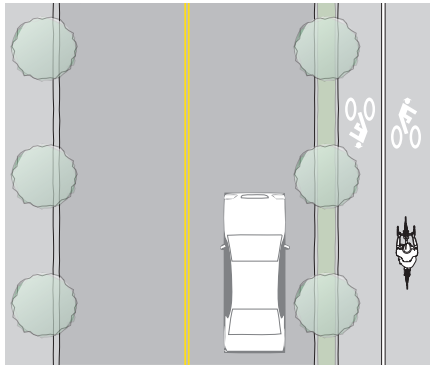
a separated pedestrian path and the pathway shoulder.

Signage for Class I Bike Paths

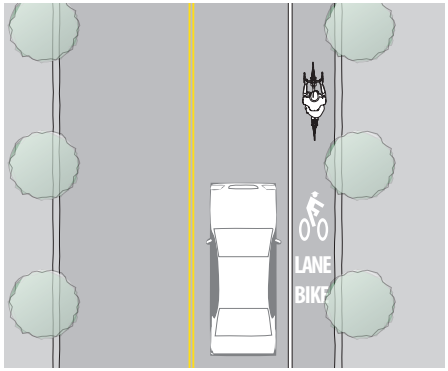
- **Pavement Markings:** When bike paths are of sufficient width for two lanes, lane markings should be used. A solid yellow or white 4-inch-wide stripe may be used to separate the two directions of travel where passing is not permitted. A broken yellow or white line with a 1-to-3 segment-to-gap ratio should be used where passing is permitted.
- **Signage:** Signage should be used at multi-use path roadway crossings to alert drivers of pedestrians and bicyclists. Signage should be placed along the roadway in advance of a crossing to alert drivers to the upcoming intersection with bicyclists and pedestrians. CA MUTCD recommends that signage type R44A (CA) be installed along Class I bikeways. Wayfinding, or destination and directional information signs should be provided at important locations along bike paths. These signs can include mileage to a destination, mark upcoming junctions, or contain directional arrows.

Class I Bike Path Crossings

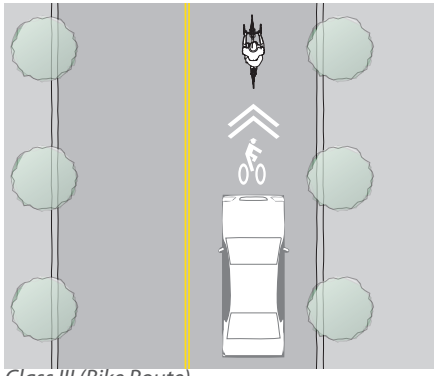
Based on the AASHTO and CA MUTCD guidelines for crossing treatments, the primary objective for crossings is a safe and convenient intersection for all mode types. When paths cross roadways at intersections, they should be assigned the same traffic control as the parallel roadway. For example, if the parallel roadway has a green signal, the path should also have a green/walk signal at the same time. A



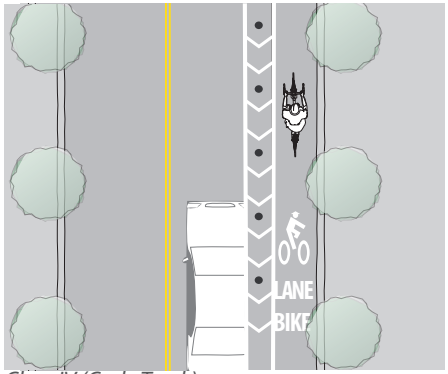
Class I (Bike Path)



Class II (Bike Lane)



Class III (Bike Route)



Class IV (Cycle Track)

CLASS I BIKE PATH	
Minimum Width	8 feet with additional 2 foot wide shoulder
Preferred Width	12 feet when moderate volumes of traffic are expected along the path, with additional 2 foot wide shoulder



Class I Bikeway (Bike Path)



Class II bike lane with painted buffers providing separation from vehicular traffic and parked vehicles.

CLASS II BIKE LANE	
Adjacent to marked parallel parking	Minimum width: 5 feet Preferred width: 6 feet
Adjacent to unmarked parallel parking	Minimum bike lane and parking width: 12 feet With a rolled curb: 11 feet
Adjacent to curb and gutter	Minimum width: 5 feet Preferred width: 6 feet
On roadways without curb and gutter	Minimum width: 4 feet Preferred width: 5-6 feet Additional width is desirable with speeds over 35mph

leading green/walk signal time for path users is recommended to give pedestrians and bicyclists a visible head start and to avoid potential conflicts with vehicle movement. If the path is crossing an all-way stop intersection, then STOP signs should be placed along the path at each intersection approach. At uncontrolled intersections, STOP or YIELD signs should be used to give right-of-way to either the path or the roadway.

CLASS II BIKEWAYS: BIKE LANES

Bike lanes are typically used on streets with higher traffic volumes or greater speeds. The bike lanes improve conditions for bicyclists in the corridor by delineating separate rights-of-way assigned to bicyclists and to motorists. Bike lanes should be considered when adequate lane width is available for striping without loss to level-of-service, such as on two-lane or wider roads that allow motor vehicles to safely pass bicyclists.

Variables on the roadway, including on-street parking, curb and gutters, and roadway speeds, influence the width and design of bike lanes. The following Class II bike lane widths are recommended:

Bike Lanes Adjacent to On-street, Parallel Parking:

- Marked parking stalls or continuous parking stripe: Bike lanes should be a minimum of 5 feet wide, required by Caltrans standards, but 6 feet is preferred. Many jurisdictions prefer a minimum six foot bike lane to provide extra space for bicyclists to keep them safely outside the door zone. The door zone refers to the area where bicyclists are vulnerable to being hit by an opening car door.

Bike Lanes Adjacent to Curb and Gutter:

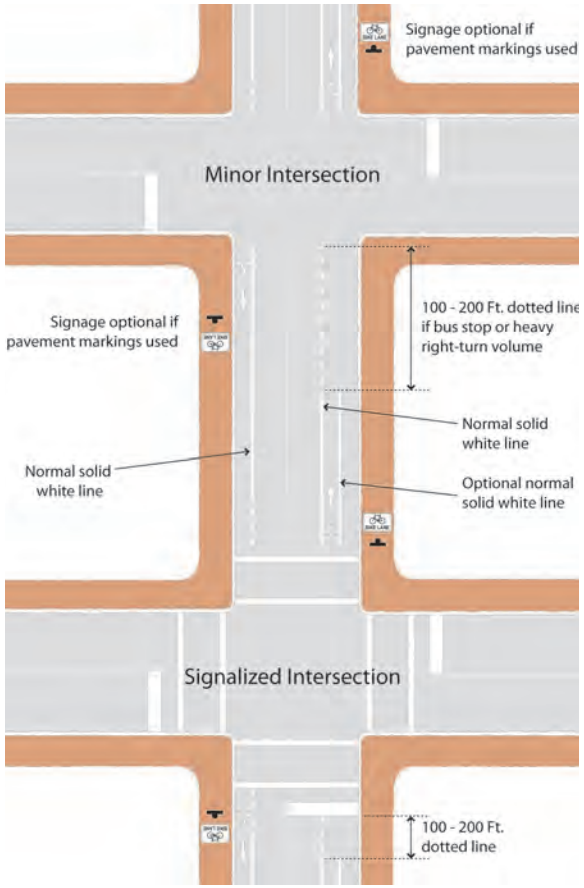
- A minimum 5 foot width with a standard gutter. However, it is preferred to maintain a minimum of 2 ½ foot clear surface beyond the gutter.
- Roadway speeds impact recommended bike lane widths at the following levels:
- 35 mph or less: 5 foot bike lanes
- 40 to 50 mph: 6 foot bike lanes
- Greater than 50 mph: 8 foot bike lanes. These wide lanes should only be used when necessary and clearly marked with bike lane signs and symbols and 'No Parking' signs so that the bike lane is not misconstrued as a travel or parking lane. Bike lanes of this width are also recommended for rural highways.
- On Roadways without Curb and Gutter: The minimum width is 4 feet. At locations where motor vehicle speeds exceed 35 mph, lane width should be increased to a minimum of 5 feet, although at least 6 feet is desired.

Striping and Signage for Class II Bike Lanes

- **Pavement striping:** Bike lane striping should allow bicyclists to follow a straight path. Bike lanes along roads with parking permitted should not be directed toward the curb at intersections. A six inch-wide, solid white line should be used at the right edge of the outside travel lane to designate the portion of the roadway for bicyclists. A six inch-wide, solid white line should also be striped between the bike and vehicular parking lane. At an intersection where right turns are permitted, the bike lane line should terminate 100 to 200 feet prior to the intersection or be sub-

stituted by a dashed line marked up to the intersection.

- **"BIKE LANE" pavement markings** should be used to further define bike lane space for bicyclists and motorists. These should be placed at the start of all bike lanes, on the far side of each intersection, and at other desired locations. The bike lane pavement marking should include a directional arrow and one of the accompanying word or bicycle symbols.
- **Bikeway signage:** The bike lane signs (CA MUTCD R81) should be placed at the beginning of each designated bike lane, on the far side of arterial intersections, at major changes in direction, and at ½ mile intervals. The BEGIN (CA MUTCD R81A) and END (CA MUTCD R81B) signs may be used below the required R81-sign to mark the beginning or end of a bike lane. If bike lane pavement markings are used it is not necessary to include the bike lane sign at each pavement marking. Signs may also be used to state BICYCLE WRONG WAY (CA MUTCD R5-1b) on the back of bike lane signs to reinforce appropriate traffic flow for bicyclists.
- **Colored pavement:** An additional enhancement to bike lane markings includes coloring sections of bike lanes with green paint. This is especially beneficial in high-conflict areas such as intersections to alert motorists to the presence of bicyclists and bike lanes.
- **Painted buffers** along bicycle lanes can enhance safety and comfort by providing spatial separation from moving vehicles and parked vehicles. Buffers between the bike lane and parked vehicles protect the bicyclist from collisions when drivers



Typical locations of signage and pavement markings for Class II bike lanes



Some California bike lane signage



Colored bike lane



Colored "elephant track" bike lane markings through intersection



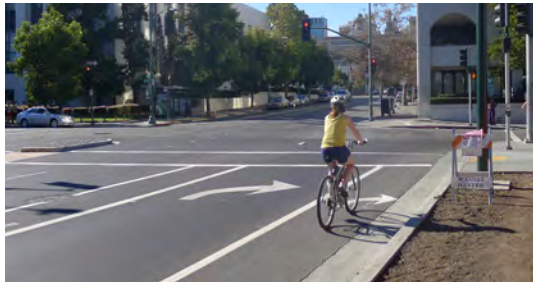
Colored pavement across driveway intersection



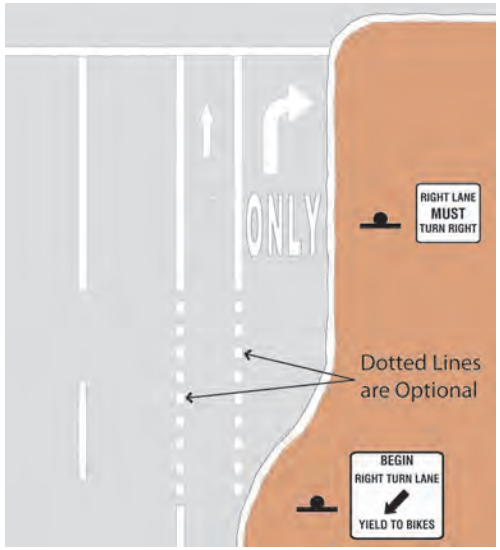
Push button and signage for bicycle crossing



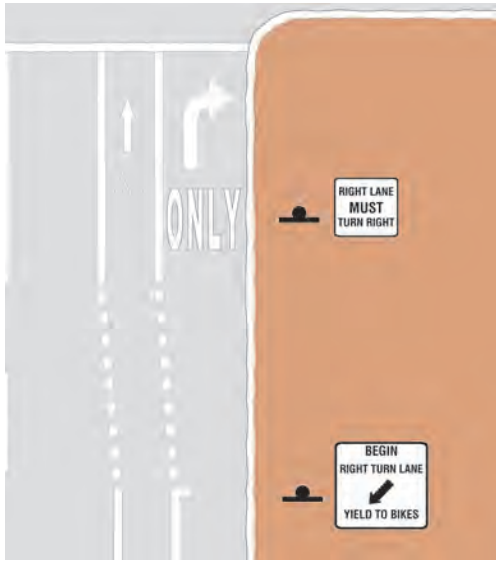
Bicycle detection sign and pavement markings



Bicycle turn lane



Bike lane pocket at right turn only lane.



Parking lane becoming right-turn lane

open their driver's side vehicle door. Painted buffers should be considered where there is sufficient space in the roadway to accommodate them.

Class II Bike Lanes at Intersections

As stated earlier, collisions between motorists and bicyclists most often occur at intersections. There are several treatments that can reduce intersection conflicts. Caltrans provides recommended intersection treatments in the Highway Design Manual (HDM), including loop detectors and bike lane "pockets" at right- and left-turn only lanes. The following recommendations are provided to improve safety and accessibility for bicyclists through intersections.

- **Bicycle Detection at Actuated Traffic Signals:** Detection at actuated traffic signals provides bicyclists the ability to trigger a traffic signal, rather than activating a pedestrian push button or illegally crossing a red light. These signals should be provided where possible, particularly along bikeways. Bicycle detection can be provided with bicycle-sensitive loop detectors or video detection that prompt traffic signals to change. A bicycle detector symbol must be painted on the roadway to show bicyclists where they should be located to trigger the detection.
- **Intersections with Turn Lanes:** Bicycle lane pockets provide a marked route for bicyclists to avoid potential conflicts with turn-only lanes. An alternate treatment is a sharrow, or "shared right-of-way" marking, in the through lane adjacent to the right-turn lane.

CLASS III BIKEWAYS: BIKE ROUTES

Class III bike routes are recommended for combined use of cars and bicyclists. The roadway is shared with cars, and routes are designated with signs and pavement markings only; there is no dedicated bike lane. Wider curb lanes, pavement maintenance, and traffic calming measures make them suitable for shared use. Class III bike routes can be used on a variety of street types, ranging from low-volume residential streets to busy arterials where widening for a dedicated bike lane is infeasible. Class III bike routes are most commonly used on slower or bicycle-friendly roads. These routes typically connect to other bike lanes.

A 14 foot minimum lane width is recommended for Class III bike routes. Lane width is determined from the edge stripe to the lane line or the gutter joint to the lane line. If 15 feet or more is available for the lane next to the curb line, striping the bike lane should be considered. Streets with speed limits above 25 mph should not be designated as Class III bike routes.

Signage for Class III Bike Routes

- **Pavement Markings:** Although Class III Bike Routes do not have required pavement markings, the shared roadway bicycle marking or "sharrow" can be used on a Class III bike route or roadway with no bikeway designation. Sharrows are on-street markings that reinforce the bikeway designation. These markings are put in place to help bicyclists avoid the hazard of the door zone and to alert road users of the location a bicyclist should occupy within the travelway. Although, according to the CA MUTCD, sharrows are only used on roadways with on-street parking, they can be used on roadways without on-street parking but with high volumes of bicycle traffic and when other options are not available.
- **Shared roadway bicycle markings (sharrows)** should be placed so that the centers of markings are a minimum of 11 feet from curb face or edge of paved shoulder. They should be used immediately after an intersection and spaced at intervals of 250 feet thereafter.

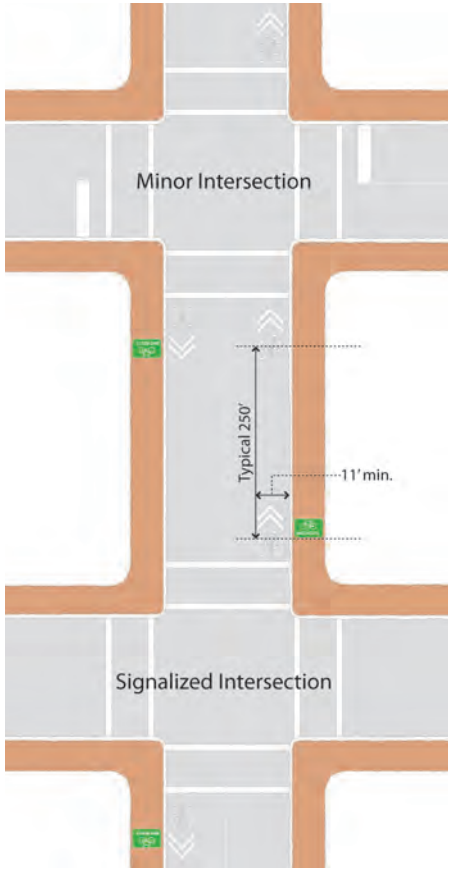


Sharrow marking (left), MUTCD Bike Route signs (right)



Bike Route Sharrow pavement marking

CLASS III BIKE ROUTE	
Preferred Width	14 feet minimum lane width
Additional Considerations	If 15 feet or more are available for the lane, striping the bike lane should be considered



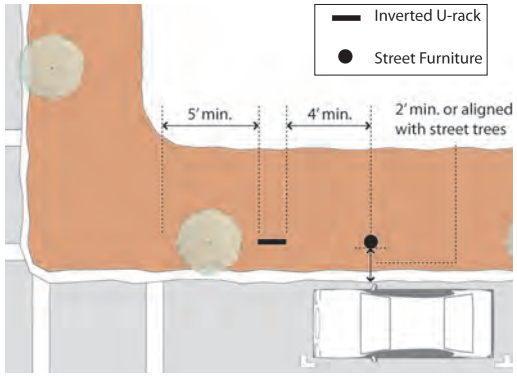
Location of signage and pavement markings on Class III bike route



Custom bicycle rack



Inverted-U bicycle parking



Inverted U-Rack spacing recommendations

BICYCLE PARKING

Safe and secure bicycle parking is a critical component to most bicycle trips, and thus in promoting bicycle use. The following describes typical bicycle parking units for both long- and short-term parking.

SHORT-TERM BICYCLE PARKING

Short-term bicycle parking is intended for bicyclists that plan to leave their bicycle for only a few hours. Short-term parking is generally provided with bicycle racks and is appropriate at shopping areas, libraries, and other places where the typical parking duration is about two hours or less. Bike racks should support the bicycle upright and in two places, enabling the frame and one or both wheels to be secured.

- **Inverted U-Rack:** This is a relatively low-cost device that provides a location to lock a bicycle. The U-rack is generally preferred because it can provide the greatest area of support for the bicycle, is less likely to result in damage to the bicycle frame, and is easiest for access.
- **Other Bicycle Racks:** Bicycle racks come in many shapes and sizes and can be manufactured to complement any design scheme.

Bicycle Rack Placement

Bike racks should be visibly located and near intended destinations. Bike racks are typically installed on the sidewalk or plaza spaces, but they should be placed outside of the typical pedestrian travel path. Some communities are providing bicycle parking in the street, within space converted from a vehicle parking space. Typically, parking for 10 bicycles can be provided in one vehicle space.

The following guidelines for bike rack placement should be followed to ensure that they are safe from vandalism, are easily accessible to bicyclists, avoid adversely impacting pedestrian circulation, and can be used to their maximum design capacity:

- Racks should not be obscured by landscaping, fences, or other obstructions.
- Racks should be in a well-lit location at night to protect both the bicycle and the user.
- Visibility should be provided to at least one of the following: security guard, station agent, parking garage attendants, clerks, vendors, or passing pedestrians.
- Ground surface of the bicycle parking area should be an all-weather and drainable material such as asphalt or concrete; care should be taken when using other materials that can become slippery when wet.
- Racks should be located outside the typical pedestrian travel path, with additional room for bicyclists to maneuver outside the pedestrian way.
- Racks should be of a minimum height so as to increase their visibility to pedestrians.
- Racks should be located at a sufficient distance from motor vehicles to prevent damage to parked bicycles and motor vehicles.

LONG-TERM BICYCLE PARKING

Long-term bicycle parking protects the entire bicycle and its components from theft, vandalism, and the weather. Long-term parking is appropriate for a few hours use up to a full day and overnight,

and is usually found at employment or transit centers. Bicycle lockers, bike cages or rooms, and bike stations with valet parking are examples of long-term parking.

- **Bicycle Locker:** Bicycle lockers are covered storage units that can be locked individually, providing secure parking for one bicycle. Lockers that are accessed with a key can be assigned or reserved for the use of one individual. Electronic lockers allow on-demand access to the locker when it is needed and, consequently, more efficient use of the parking space. Users must have a bicycle parking card to use the lockers, and a nominal parking fee is generally charged.
- **Locked Bike Cage:** A locked bike cage or room provides long-term secure bicycle parking at a place of business or a residential development. Access should be limited to employees or residents with the use of a key, code, or access card. For additional security, it is recommended that bike racks be installed within the cage or room.



Bicycle lockers



Bicycle cage in a parking garage