CITY of CLOVIS

AGENDA • PLANNING COMMISSION

Council Chamber, 1033 Fifth Street, Clovis, CA 93612 (559) 324-2340

www.cityofclovis.com

REVISED

➡ Denotes Revisions

October 26, 2023 6:00 PM Council Chamber

In compliance with the Americans with Disabilities Act, if you require special assistance to access and/or participate in this Planning Commission meeting, please contact the Planning Division at (559) 324-2340 (TTY – 711). Notification 48 hours prior to the meeting will enable the City to make reasonable arrangements to ensure accessibility to the Council Chamber.

The Clovis Planning Commission meetings are open to the public at the physical address listed above. There are numerous ways to participate in the Planning Commission meetings: you are able to attend in person; you may submit written comments as described below; you may participate by calling in by phone (see "Verbal Comments" below); and you may view the meeting which is webcast and accessed at www.cityofclovis.com/planning-commission-agendas.

Written Comments

- Members of the public are encouraged to submit written comments at: www.cityofclovis.com/planning-commission-agendas at least two (2) hours before the meeting (4:00 p.m.). You will be prompted to provide:
  - Planning Commission Meeting Date
  - Item Number
  - Name
  - Email
  - Comment (please limit to 300 words or 3 minutes)
- Please submit a separate form for each item you are commenting on.
- A copy of your written comment will be provided to the Planning Commission noting the item number. If you wish to make a verbal comment, please see instructions below.
- Please be aware that any written comments received that do not specify a particular agenda item will be marked for the general public comment portion of the agenda.

- If a written comment is received after 4:00 p.m. on the day of the meeting, efforts will be made to provide the comment to the Planning Commission during the meeting. However, staff cannot guarantee that written comments received after 4:00 p.m. will be provided to the Planning Commission during the meeting. All written comments received prior to the end of the meeting will be made part of the record of proceedings.

Webex Participation

- Reasonable efforts will be made to allow written and verbal comment from a participant communicating with the host of the virtual meeting. To do so, a participant will need to chat with the host and request to make a written or verbal comment. The host will make reasonable efforts to make written and verbal comments available to the Planning Commission. Due to the new untested format of these meetings, the City cannot guarantee that these written and verbal comments initiated via chat will occur. Participants desiring to make a verbal comment via chat will need to ensure that they accessed the meeting with audio transmission capabilities.

Verbal Comments Made by Telephone or Webex

- If you wish to speak to the Commission on the item by telephone, you must contact the City Planner, Dave Merchen, at (559) 324-2346 no later than 4:00 p.m. the day of the meeting.

- You will be asked to provide your name, phone number, and your email. You will be emailed instructions to log into Webex to participate in the meeting. Staff recommends participants log into the Webex at 5:30 p.m. the day of the meeting to perform an audio check.

- All callers will be placed on mute, and at the appropriate time for your comment your microphone will be unmuted.

- You will be able to speak to the Planning Commission for up to five (5) minutes.

* * * * *

CALL TO ORDER

FLAG SALUTE

ROLL CALL

APPROVAL OF MINUTES

1. Planning Commission Minutes for the Meeting of September 28, 2023.

COMMISSION SECRETARY COMMENTS

PLANNING COMMISSION MEMBER COMMENTS

PUBLIC COMMENTS - This is an opportunity for the members of the public to address the Planning Commission on any matter within the Planning Commission’s jurisdiction that is not listed on the

Agenda. In order for everyone to be heard, please limit your comments to 5 minutes or less, or 10 minutes per topic. Anyone wishing to be placed on the Agenda for a specific topic should contact the Planning Division and submit correspondence at least 10 days before the desired date of appearance.

PUBLIC HEARINGS - A public hearing is an open consideration within a regular or special meeting of the Planning Commission, for which special notice has been given and may be required. When a public hearing is continued, noticing of the adjourned item is required as per Government Code 54955.1.

➡ 2. Consider items associated with updating the City's Active Transportation Plan:

a) Consider Recommendation for Approval, Res. 23-___, A request to approve an environmental finding of a Negative Declaration for the City of Clovis Active Transportation Plan Update.
b) Consider Recommendation for Approval, Res. 23-___, A request to approve City of Clovis Active Transportation Plan Update.

Staff: Ryan Burnett, Engineering Program Manager
Recommendation: Approve

ADMINISTRATIVE ITEMS - Administrative Items are matters on the regular Planning Commission Agenda other than Public Hearings.

ADJOURNMENT

MEETINGS & KEY ISSUES

Regular Planning Commission Meetings are held at 6 P.M. in the Council Chamber. The following are future meeting dates:

November 16

December 14

* * * * *

Any writings or documents provided to a majority of the Planning Commission regarding any item on this agenda will be made available for public inspection at the City of Clovis Planning Division, located in the Planning and Development Services building, between 8:00 a.m. and 4:00 p.m. Monday through Friday. In addition, such writings and documents may be posted on the City's website at www.cityofclovis.com.

CLOVIS PLANNING COMMISSION MINUTES
September 28, 2023

A meeting of the Clovis Planning Commission was called to order at 6:00 p.m. by Chair Antuna in the Clovis Council Chamber.

Flag salute led by Commissioner Hinkle

Present: Commissioners Bedsted, Hatcher, Hebert, Hinkle, Chair Antuna

Absent: None

Staff: Renee Mathis, PDS Director
Dave Merchen, City Planner
Lily Cha-Haydostian, Senior Planner
Marissa Jensen, Assistant Planner
Joyce Roach, Planning Technician II
Sean Smith, Supervising Civil Engineer
Scott Cross, City Attorney

MINUTES – 6:01
ITEM 1 – APPROVED.

Motion by Commissioner Bedsted, seconded by Commissioner Hinkle, to approve the August 24, 2023, minutes. Motion carried by unanimous consent.

COMMISSION SECRETARY – 6:02
None.

PLANNING COMMISSION MEMBERS COMMENTS – 6:02
Commissioner Hinkle recommended researching Senate Bills 9 and 10, providing a brief summary of what each allows.

PUBLIC COMMENTS – 6:03
None.

PUBLIC HEARINGS
ITEM 1 - 6:04 – APPROVED – **RES. 23-19**, A REQUEST TO APPROVE A CONDITIONAL USE PERMIT TO ALLOW A DRIVE-THROUGH CARWASH FACILITY AT 3741 SHAW AVENUE. CLOVERLEAF CAPITAL, LLC., OWNER AND APPLICANT; MARICELA MARTINEZ, REPRESENTATIVE.

Motion by Commissioner Hatcher, seconded by Commissioner Hebert, for the Planning Commission to approve **Resolution 23-19,** a resolution recommending approval of a request for a conditional use permit allowing a drive-through carwash facility at 3741 Shaw Avenue. Motion carried by unanimous consent.

ADJOURNMENT AT 6:19 P.M. UNTIL the Planning Commission meeting on October 26, 2023.

____
Alma Antuna, Chairperson

CITY of CLOVIS

REPORT TO THE PLANNING COMMISSION

TO:	Clovis Planning Commission
FROM:	Planning and Development Services
DATE:	October 26, 2023
SUBJECT:	Consider items associated with updating the City's Active Transportation Plan:

a) Consider Recommendation for Approval, Res. 23-___, A request to approve an environmental finding of a Negative Declaration for the City of Clovis Active Transportation Plan Update.

b) Consider Recommendation for Approval, Res. 23-___, A request to approve City of Clovis Active Transportation Plan Update.

Staff: Ryan Burnett, Engineering Program Manager
Recommendation: Approve

ATTACHMENTS:
1. Res. 23-___, Negative Declaration
2. Res. 23-___, Active Transportation Plan Update
3. Initial Study/Negative Declaration
4. Draft City of Clovis Active Transportation Plan Update

CONFLICT OF INTEREST
None.

RECOMMENDATION
Staff recommends that the Planning Commission take the following actions with regard to the Project:

- Adopt a resolution recommending City Council's approval of a Negative Declaration for the City of Clovis Active Transportation Plan Update; and

- Adopt a resolution recommending City Council's approval of the City of Clovis Active Transportation Plan Update.

EXECUTIVE SUMMARY

The City's Active Transportation Plan Update (Plan) supports walking, bicycling, transit, rolling, and use of other emerging modes of non-motorized personal transport as alternatives to driving within Clovis, to neighboring cities, and regional destinations. The Plan defines a clear vision for the City's active transportation network and proposes a framework for implementing projects, programs, and policies to turn the vision into a reality. Additionally, an updated Active Transportation Plan is required to receive local Measure C funds and increases access to other future regional, state, and federal funding opportunities.

BACKGROUND

In April 2021, the City entered into a consultant services contract with Toole Design Group, LLC for the preparation of an update to the original Active Transportation Plan. The original version was approved by City Council in October 2016. Planning and Development Services Department staff took the lead in developing the updated Plan (**Attachment 4**) with close coordination from other City Departments, other public agencies, stakeholders, and non-profit agency partners.

Public engagement and community feedback were solicited as part of the Plan update through community meetings, an online survey, interactive map and webpage (including the City's website), and media postings. Two public comment periods were held during the draft plan period as well. The first comment period was held in early 2022. Shortly after that meeting, the City decided to "pause" the update due to some staff changes on both the City and consultant side. An amendment to the April 2021 contract was signed in October 2022, extending Toole's contract and allowing the update to resume. In summer of 2023, a second public comment period was held which re-engaged and invited stakeholders and those interested to review the most up-to-date Plan.

The Vision for the City's Active Transportation Plan is to provide a complete and connected network of trails, pathways, and bikeways that provides convenient and intuitive connections to key destinations and supports travel within and between neighborhoods. The network seeks to improve quality of life by encouraging users to consider alternative, non-motorized forms of transport for transportation and recreation.

The City has set the following goals for the implementation of the Plan:

- Improve the safety of people walking and bicycling.
- Develop a well-connected network of trails, walkways, and bikeways.
- Create a network that allows people of all physical abilities and socioeconomic circumstances the ability to travel safely throughout the City, without a car.
- Increase access to recreation by providing access to trails, walkways, and bikeways.
- Increase the share of people who walk or ride a bicycle to get to work, school, shopping, and other activities.

PROPOSAL AND ANALYSIS

<u>Overview of the ATP Update</u>

The City's Active Transportation Plan meets all the requirements of the federally funded Active Transportation Program and it conforms to the State of California's Active Transportation Plan

Guidelines. Building off of the original 2016 version, the updated Plan identifies strategies to improve safety and accessibility for active forms of travel such as walking and bicycling. It tiers off of and supplements the City of Clovis General Plan (2014) relative to the creation of a sustainable and multi-modal transportation network.

The plan includes the following Chapters:

- Chapter 1: Plan Purpose (Introduction) – Highlights the plan’s vision and goals, consistency with other plans, public participation, and outreach.

- Chapter 2: Walking and Bicycling in Clovis Today – Identifies the existing conditions summary for bicycling, trails, and paseos, and walking, discusses safety trends amongst user groups and State and Regional efforts to improve safety in Clovis.

- Chapter 3: Bicycle Network – Gives an in-depth overview of the Plan recommendations for the proposed Bicycle Network.

- Chapter 4: Pedestrian Network – Provides the Plan recommendations for the proposed Pedestrian Network and crossing improvements.

- Chapter 5: Support Programs – Recommends considerations for other relative programming such as Bicycle Parking, E-Bicycle policy recommendations, encouragement programs such as safe routes to school, and educational campaigns.

- Chapter 6: Implementation Strategy – Discusses project prioritization criteria, identifies recommended improvements, construction cost estimates, and implementation phasing.

- Appendices A-E: Bicycle Facilities Project List, Design Guidelines, Public Participation Summary, and Funding Resources and Wayfinding Systems Guidelines.

<u>Bicycle Facilities</u>
The Plan identifies the following types of bicycle facilities: Class I Shared Paths and Trails, Class II Bicycle Lanes, Class II Buffered Bicycle Lanes, Class III Bicycle Routes, and Class II Neighborhood Greenways/Bicycle Boulevards. Class I facilities are paved, shared-use trail paths that accommodate all pedestrians, bicyclists, and all other modes of non-motorized transportation. Class II facilities are bike lanes located on roadways that are designated by striping, signage, and pavement markings for the exclusive use of bicyclists. Class II Buffered Bicycle Lanes are a variation on a Class II facility that provides a larger buffer zone for the cyclist with pavement striping. Class III facilities are on-street routes, shared with motorists that typically are designated by signs and pavement markings. Class III Neighborhood Greenways/Bicycle Boulevards are a variation of a shared roadway that includes traffic calming treatments.

<u>Pedestrian Facilities</u>
The main types of pedestrian facilities included in the Plan are Class I shared-use trail paths and sidewalks. Other pedestrian facilities identified in the Plan include mid-block crossings. The draft Plan addresses how adding appropriate markings, signage, lighting, and/or signals at street crossings can increase safety and encourage pedestrian activity.

Public Participation

Although the update of the Plan kicked off during the COVID-19 pandemic, City staff were determined to conduct extensive public outreach. Both in-person and online meetings occurred to maintain consideration of the guidance and recommendations from the Fresno County Department of Public Health. This approach provided all those who were interested in attending a chance to participate in a way they felt most comfortable with. City staff solicited public input through the hosting of an online survey, interactive map and webpage, stakeholder meetings, presentation and meeting with the Fresno Cycling Club, and hosting public meetings.

City staff managed the City's website providing information and updates regarding the Plan. Toole Design Group designed an online survey and interactive web map that was available to the public from the City's website. The online survey and map were available to the public during the summer of 2021. The addition of more sidewalks and trails was identified as the most common factor that would encourage survey respondents to walk more frequently. Approximately 70 percent of respondents indicated that more sidewalks or trails in the community would encourage them to walk and bike more.

Four stakeholder meetings were held in July of 2021. These meetings included agency and non-profit partners, as well as Caltrans and City staff. The stakeholder focus groups were held in a hybrid meeting format, which allowed participants to attend the meeting in person or online through a video platform. Also, during this time a community meeting was held after hours specifically geared for residents to attend and comment.

One meeting was held with the Fresno Cycling Club in September 2021 as an online pop-in webinar-style presentation and an in-person presentation. Additionally, a virtual meeting was held on February 10, 2022, for the stakeholders and the community at large to present the draft plan and solicit comments. Opportunities for additional public comment were also made available with the public release of the draft Plan in early 2022 and in the summer of 2023.

Consistency with the 2014 City of Clovis General Plan

The updated Plan is consistent with the City's adopted 2014 General Plan, specifically key Goals and Policies from the Circulation Element that are related to bicycle and pedestrian travel, as follows:

- Context-sensitive and "complete streets" transportation network that prioritizes effective connectivity and accommodates a comprehensive range of mobility needs.
- A roadway network that is well-planned, funded, and maintained.
- A multimodal transportation network that is safe and comfortable in the context of adjacent neighborhoods.
- A bicycle and transit system that serves as a functional alternative to commuting by car.
- A complete system of trails and pathways accessible to all residents.
- Safe and efficient goods movement with minimal impacts on local roads and neighborhoods.
- A regional transportation system that connects Clovis to the San Joaquin Valley region.

The ATP Plan Update is also consistent with several other state, regional, and local plans, such as:

- Fresno Council of Governments Regional Active Transportation Plan (2018)
- Central Clovis Specific Plan (2016)
- Loma Vista Specific Plan (2003, revised 2015)
- Heritage Grove Master Plan (2016)
- Clovis Standard Specifications (2020)

The updated Active Transportation Plan is a city-wide document that contains various programs, policies, and recommendations that pertain to alternative transportation modes such as walking, cycling, and/or rolling. The Plan's proposed networks are designed to fulfill the vision for what alternative transportation looks like for the City. The proposals laid out within the document build upon the City's current infrastructure and therefore further enhance users' experience by connecting them to key destinations throughout the City.

<u>California Environmental Quality Act (CEQA)</u>
Toole Design Group contracted with Crawford & Bowen Planning to prepare an Initial Study / Negative Declaration for the proposed adoption of the Plan. Crawford & Bowen prepared the Initial Study / Negative Declaration pursuant to the California Environmental Quality Act (CEQA) to determine the potential environmental effects of the adoption of the Plan on the environment. (See **Attachment 3** for a complete project description, location, and potential environmental effects as identified in the Negative Declaration.)

The Plan contains various programs, policies, and recommendations that pertain to the development of bicycle and pedestrian facilities in Clovis. The Plan is a program/policy-level document, meaning it does not provide project-specific construction details that allow for project-level CEQA analysis. Specific development is not being proposed under the Plan and adoption of the CEQA document would not authorize any development or construction.

Under CEQA, a programmatic document is prepared on a series of actions that can be characterized as one large project and /or for a project that will be implemented over a long period of time. Implementation of the physical improvements will occur over several years as funding and/or approval happens. Many of the proposed improvements identified in the Plan will be subject to various CEQA exemptions, and others may likely require a Mitigated Negative Declaration or additional National Environmental Policy Act (NEPA) documentation (depending on the funding source).

Based on the results of the Initial Study, staff has determined that adoption of the Plan will not have a significant effect on the environment and therefore has prepared a Negative Declaration.

REASON FOR RECOMMENDATION
A current Active Transportation Plan helps guide the development of pedestrian and bicycle facilities and increases the City's opportunities to receive regional, state, and federal grant funds. As such, staff recommends that the Planning Commission approve the attached resolutions recommending the City Council approve the Plan and related CEQA finding (**Attachments 1 and 2**).

ACTIONS FOLLOWING APPROVAL
This project will continue to the City Council for final consideration.

NOTICE OF HEARING
A public notification regarding this item was published in *The Business Journal* on Wednesday, September 20, 2023.

Prepared by: Tatiana Partain, Management Analyst

Reviewed by: ______________________
Dave Merchen
City Planner

RESOLUTION 23-___

RESOLUTION OF THE PLANNING COMMISSION OF THE CITY OF CLOVIS APPROVING AN ENVIRONMENTAL FINDING OF A NEGATIVE DECLARATION FOR THE UPDATED CITY OF CLOVIS ACTIVE TRANSPORTATION PLAN PURSUANT TO CEQA GUIDELINES

WHEREAS, the City of Clovis ("City") has prepared a comprehensive update to its Active Transportation Plan (Plan) that outlines the future of walking and bicycling in Clovis; and

WHEREAS, in September 2023, the City caused to be prepared an initial study for the Plan to evaluate potential environmental impacts, which is hereby incorporated by this reference; and

WHEREAS, on the basis of that study, it was determined that no significant environmental impacts would result from this Project; and

WHEREAS, on the basis of the initial study, a negative declaration prepared, circulated, and made available for public comment between February 2, 2022 and March 11, 2022 pursuant to the California Environmental Quality Act ("CEQA"), Public Resources Code, section 21000, et seq., and CEQA Guidelines, 14 California Code of Regulations, sections 15000, et seq.; and

WHEREAS, minor changes were made to the Plan and the initial study and negative declaration were updated to include the changes and have been recirculated in accordance with CEQA Guidelines Section 15073.5; and

WHEREAS, a public notice was published in The Business Journal on Wednesday, September 20, 2023, more than 30 days prior to said hearing; and

WHEREAS, on the basis of the initial study, negative declaration prepared, recirculated, and made available for public comment pursuant to the California Environmental Quality Act ("CEQA"), Public Resources Code, section 21000, et seq., and CEQA Guidelines, 14 California Code of Regulations, sections 15000, et seq.; and

WHEREAS, the Planning Commission has independently reviewed, evaluated, and considered the CEQA analysis outlined in the staff report, initial study, negative declaration and all comments, written and oral, received from persons who reviewed the negative declaration, or otherwise commented on the Project ("Administrative Record").

NOW, THEREFORE, BASED UPON THE ENTIRE RECORD OF THE PROCEEDINGS, THE PLANNING COMMISSION RESOLVES AND FINDS AS FOLLOWS:

1. The foregoing recitals are true and correct.

2. The initial study and negative declaration for the Project are adequate, reflect the City's independent judgment and analysis, and have been completed in compliance with CEQA and the CEQA Guidelines.

3. The initial study and negative declaration were presented to the Planning Commission and the Planning Commission has independently reviewed, evaluated, and considered the Administrative Record prior to approving the Project.

4. On the basis of the whole record, there is no substantial evidence that the Project will have a significant effect on the environment.

5. The negative declaration is approved and no mitigation efforts are required.

6. The record of these proceedings shall be contained in the Department of Planning and Development Services located at 1033 Fifth Street, Clovis, California 93612, and the custodian of the record shall be the City Planner or other person designated by the Planning and Development Services Director.

7. The Planning and Development Services Director, or his/her designee, is authorized to file a notice of determination for the Project in accordance with CEQA and to pay any fees required for such filing.

8. The basis for the findings is detailed in the October 26, 2023 staff report, which is hereby incorporated by reference, the entire Administrative Record, as well as evidence and comments presented in connection with the mitigated negative declaration.

* * * * * * * * *

The foregoing resolution was adopted by the Clovis Planning Commission at its regular meeting on October 26, 2023, upon a motion by Commissioner __________, seconded by Commissioner _____, and passed by the following vote, to wit:

AYES:
NOES:
ABSENT:
ABSTAIN:

PLANNING COMMISSION RESOLUTION NO. 23-___
DATE: October 26, 2023

____
Alma Antuna, Chairperson

ATTEST: ______________________________
Renee Mathis, Secretary

RESOLUTION 23-___

RESOLUTION OF THE PLANNING COMMISSION OF THE CITY OF CLOVIS RECOMMENDING APPROVAL OF THE UPDATED CITY OF CLOVIS ACTIVE TRANSPORTATION PLAN

WHEREAS, the City of Clovis ("City") has prepared a comprehensive update to its Active Transportation Plan (Plan) that outlines the future of walking and bicycling in Clovis; and

WHEREAS, the Plan complies with the California Transportation Commission Active Transportation Program Guidelines, and

WHEREAS, Plan is in compliance with the 2018 Regional Transportation Plan and Sustainable Communities Strategy; and

WHEREAS, the Plan is an implementation tool to the Clovis General Plan Circulation Element; and

WHEREAS, the Plan promotes walking, cycling, rolling and other non-motorized modes of transportation and recreation by all members of the community by creating a connected and completed network of trails, pathways, and bikeways that provides safe, convenient, and enjoyable connections to key destinations and neighborhoods in Clovis; and

WHEREAS, the Plan promotes pedestrian and bicyclist safety and collision reduction; and

WHEREAS, the approval of the Plan will improve the accessibility for funding for pedestrian, bicycle and safe routes to school replated improvements in Clovis; and

WHEREAS, the Plan meets eligibility requirements for Active Transportation Program funding, and

WHEREAS, the City caused to be prepared an Initial Study in September 2023, for the Project to evaluate potentially significant adverse environmental impacts and the on the basis of that study it was determining that no significant environmental impacts would result from this Project. On the basis of this Initial Study, a Negative Declaration has been prepared, circulated, and made available for public comment pursuant to the California Environmental Quality Act (CEQA), Public Resources Code, section 21000, et seq., and Guidelines for implementation of CEQA, 14 California Code of Regulations, sections 15000, et seq.; and

WHEREAS, a duly noticed hearing was held on October 26, 2023; and

WHEREAS, the Planning Commission has had an opportunity to review and consider the entire Administrative Record relating to the Project, which is on file with the Department, and reviewed and considered those portions of the Administrative Record determined to be necessary to make an informed decision, including, but not limited to, the staff report, the written materials submitted with the request, and the verbal and written testimony and other evidence presented during the public hearing.

ATTACHMENT 2

NOW, THEREFORE, BASED UPON THE ENTIRE RECORD OF THE PROCEEDINGS, THE PLANNING COMMISSION RESOLVES AND FINDS AS FOLLOWS:

1. The Planning Commission hereby recommends approval of updated City of Clovis Active Transportation Plan.

2. The Planning Commission finds that the Updated Active Transportation is consistent with the City of Clovis General Plan, 2018 Regional Transportation Plan and Sustainable Communities Strategy, and the California Transportation Commission Active Transportation Program.

3. The Planning Commission finds, based on the initial study prepared in conjunction with the Project, that no significant environmental impacts would result from this Project and a negative declaration has been prepared. The negative declaration has been circulated, and made available for public comment pursuant to the California Environmental Quality Act ("CEQA"), Public Resources Code, section 21000, et seq., and Guidelines for implementation of CEQA, 14 California Code of Regulations, sections 15000, et seq.

4. The basis for the findings is detailed in the October 26, 2023 staff report, which is hereby incorporated by reference, the entire Administrative Record, as well as the evidence and comments presented during the public hearing.

* * * * * * * * *

The foregoing resolution was adopted by the Clovis Planning Commission at its regular meeting on October 26, 2023, upon a motion by Commissioner __________, seconded by Commissioner _____, and passed by the following vote, to wit:

AYES:
NOES:
ABSENT:
ABSTAIN:

PLANNING COMMISSION RESOLUTION NO. 23-___
DATE: October 26, 2023

____
Alma Antuna, Chairperson

ATTEST: ______________________________
Renee Mathis, Secretary

RECIRCULATED NEGATIVE DECLARATION

City of Clovis
Active Transportation Plan Update

September 2023

PREPARED FOR:

City of Clovis
1033 Fifth Street
Clovis, CA 93612

PREPARED BY:

Crawford & Bowen Planning, Inc.
113 N. Church Street, Suite 302
Visalia, CA 93291

ATTACHMENT 3

Recirculated Initial Study/ Negative Declaration

City of Clovis – Active Transportation Plan Update

Prepared for:

City of Clovis
1033 Fifth Street
Clovis, CA 93612
(559) 324-2336
Contact: Ryan C. Burnett, AICP

Prepared by:

Crawford & Bowen Planning, Inc.
113 N. Church Street, Suite 302
Visalia, CA 93291
(559) 840-4414
Contact: Travis Crawford, AICP

September 2023

Project Reference No. 046 - 2101

Chapter 1

INTRODUCTION

INTRODUCTION

Recirculation Overview

A Notice of Availability / Intent to Adopt a Negative Declaration was previously released for the City's proposed Active Transportation Plan (Plan) for a required minimum 30-day public review period (State Clearinghouse Number 2022020040, February 2, 2022 – March 11, 2022). Following the public review period and prior to project approval, minor changes were made to the Plan. Therefore, the CEQA document has been updated to include the changes to the Plan and is being recirculated in accordance with CEQA Guidelines Section 15073.5.

Summary of Changes to the Project Description

The project description in the Negative Declaration (Chapter Two) has been updated to reflect the updates to the Plan. Specifically, the following information has been revised/updated:

- Table 2-1 (Existing and Proposed Bicycle Network Mileage by Facility Type)
- Table 2-2 (Top 10 Recommended Bicycle Projects)
- Figure 2-2 (Recommended Bike Network)
- Figure 2-3 (Existing and Missing Sidewalks)
- Figure 2-4 (Existing and Planned Trails and Paseos)

Summary of Changes to the CEQA Environmental Analysis

All CEQA environmental findings remained the same between the original and the recirculated CEQA documents. The project will not result in any significant and unavoidable environmental impacts. See Chapter 3 for the full environmental analysis.

1.1 Project Summary

This document is the Initial Study / Negative Declaration (IS/ND) on the potential environmental effects of the adoption of the City of Clovis's (City) Active Transportation Plan Update (Plan). The Plan is a comprehensive document outlining the future of walking and bicycling in Clovis. The proposed Project is more fully described in Chapter Two – Project Description.

The City of Clovis will act as the Lead Agency for this project pursuant to the *California Environmental Quality Act (CEQA)* and the *CEQA Guidelines*.

1.2 Document Format

This IS/ND contains four chapters, and appendices. Section 1, Introduction, provides an overview of the project and the CEQA environmental documentation process. Chapter 2, Project Description, provides a detailed description of project objectives and components. Chapter 3, Initial Study Checklist, presents the CEQA checklist and environmental analysis for all impact areas, mandatory findings of significance, and feasible mitigation measures. If the proposed project does not have the potential to significantly impact a given issue area, the relevant section provides a brief discussion of the reasons why no impacts are expected. If the project could have a potentially significant impact on a resource, the issue area discussion provides a description of potential impacts, and appropriate mitigation measures and/or permit requirements that would reduce those impacts to a less than significant level. Chapter 4, List of Preparers, provides a list of key personnel involved in the preparation of the IS/ND.

Environmental impacts are separated into the following categories:

Potentially Significant Impact. This category is applicable if there is substantial evidence that an effect may be significant, and no feasible mitigation measures can be identified to reduce impacts to a less than significant level. If there are one or more "Potentially Significant Impact" entries when the determination is made, an EIR is required.

Less Than Significant After Mitigation Incorporated. This category applies where the incorporation of mitigation measures would reduce an effect from a "Potentially Significant Impact" to a "Less Than Significant Impact." The lead agency must describe the mitigation measure(s), and briefly explain how they would reduce the effect to a less than significant level (mitigation measures from earlier analyses may be cross-referenced).

Less Than Significant Impact. This category is identified when the project would result in impacts below the threshold of significance, and no mitigation measures are required.

No Impact. This category applies when a project would not create an impact in the specific environmental issue area. "No Impact" answers do not require a detailed explanation if they are adequately supported by the information sources cited by the lead agency, which show that the impact does not apply to the specific project (e.g., the project falls outside a fault rupture zone). A "No Impact" answer should be explained where it is based on project-specific factors as well as general standards (e.g., the project will not expose sensitive receptors to pollutants, based on a project-specific screening analysis.)

Regardless of the type of CEQA document that must be prepared, the basic purpose of the CEQA process as set forth in the CEQA Guidelines Section 15002(a) is to:

(1) Inform governmental decision makers and the public about the potential, significant environmental effects of proposed activities.
(2) Identify ways that environmental damage can be avoided or significantly reduced.
(3) Prevent significant, avoidable damage to the environment by requiring changes in projects through the use of alternatives or mitigation measures when the governmental agency finds the changes to be feasible.
(4) Disclose to the public the reasons why a governmental agency approved the project in the manner the agency chose if significant environmental effects are involved.

According to Section 15070(b), a Mitigated Negative Declaration is appropriate if it is determined that:

(1) Revisions in the project plans or proposals made by or agreed to by the applicant before a proposed mitigated negative declaration and initial study are released for public review would avoid the effects or mitigate the effects to a point where clearly no significant effects would occur, and
(2) There is no substantial evidence, in light of the whole record before the agency, that the project as revised may have a significant effect on the environment.

The Initial Study contained in Section Three of this document has determined that the environmental impacts are less than significant and therefore a Negative Declaration will be adopted.

Chapter 2

PROJECT DESCRIPTION

Project Description

2.1 Project Background

The City of Clovis, in conjunction with Toole Design Group, has developed the Clovis Active Transportation Plan Update (Plan) with the intent of providing a comprehensive document outlining projects and programs that support walking and bicycling for a variety of trip purposes in the City. The Plan is included in this document as Appendix A.

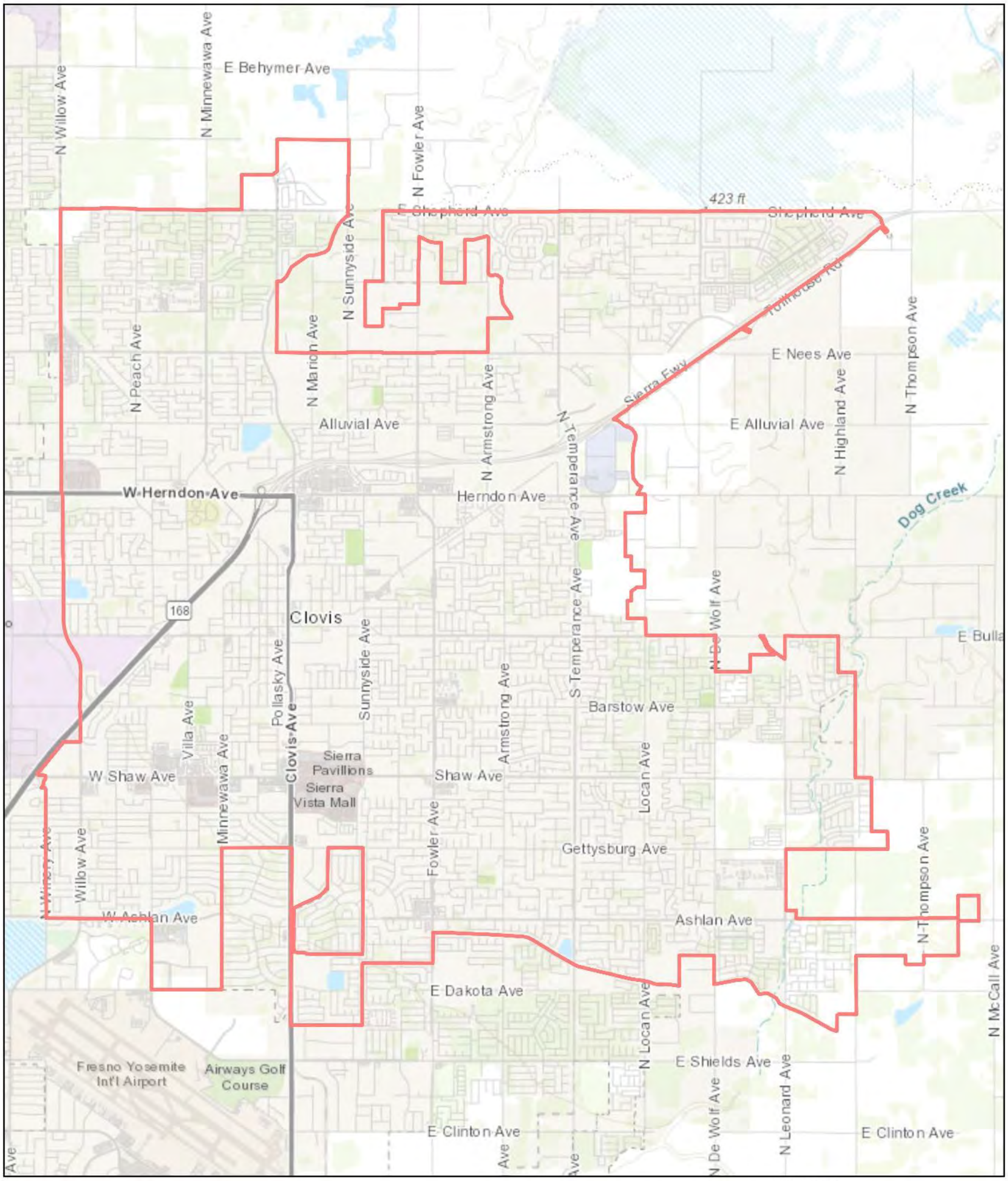
The Plan identifies strategies to improve safety and accessibility for active forms of travel and supplements previous plans of the City of Clovis General Plan (2014) and the City of Clovis Active Transportation Plan (2016). The Plan meets all of the Active Transportation Program Guidelines specified by the California Transportation Commission.

As discussed in greater detail in Section 2.7 (Program vs Project Level CEQA Analysis), specific development is not being proposed under the Plan and adoption of this CEQA document would not authorize any development. The City's Plan is a programmatic document that proposes goals and policies pertaining to the future of active modes of transportation, such as walking and bicycling, in the City of Clovis. It is intended as a guidance document with the ultimate vision of a connected and complete network of trails, walkways, and bikeways that provides convenient and intuitive connections to key destinations, supports travel within and between neighborhoods, and encourages walking and bicycling for transportation and recreation around the City.

2.2 Project Location

The various components/improvements recommended by the Plan are located throughout the City limits of Clovis. Figure 2-1 shows the City limits of Clovis. Refer to Section 2.6 – Project Description for more specific information pertaining to potential locations of the Plan's components.

Figure 2-1
City of Clovis – City Limits



1/28/2022, 12:39:39 PM

City Limits

1:75,000
0 0.5 1 2 mi
0 0.75 1.5 3 km

Fresno County Dept. PWP, Bureau of Land Management, Esri, HERE, Garmin, INCREMENT P, USGS, METI/NASA, NGA, EPA, USDA, City of Clovis

2.3 Review of Existing Plans and Policy Documents/Guidelines

Existing Plans and Policy Documents

As part of the Plan, existing local and regional plans and policies were reviewed to ensure consistency with these efforts. These include the following:

City of Clovis Active Transportation Plan (2016)

The 2016 Clovis Active Transportation Plan is a comprehensive document outlining the future of walking and bicycling in Clovis.

City of Clovis General Plan (2014)

The City of Clovis General Plan is a long-range plan which identifies the goals, policies, and implementation actions to preserve and expand the City's existing community while orienting growth towards three urban centers. The Circulation Element of the 2014 General Plan presents the goals, policies, and implementation actions that will guide transportation decisions in Clovis for the next 25 years. The City is updating the Circulation Element to comply with Senate Bill 743 requirements regarding Vehicle Miles Traveled (VMT).

Fresno Council of Governments Regional Active Transportation Plan (2018)

This Regional Active Transportation Plan is a comprehensive guide outlining the vision for biking, walking, and other human-powered transportation in Fresno County. While this particular plan focuses on the unincorporated areas of Fresno County, active transportation plans for the County's four cities, that have active transportation plans, were integrated into the Plan to ensure consistency between jurisdictions.

Central Clovis Specific Plan (2016)

The Central Clovis Specific Plan reflects on the history of the central core of Clovis and outlines land uses and design guidelines that aim to maintain the character and quality of downtown Clovis. The Specific Plan includes active transportation improvements as a goal in downtown Clovis, including lane reconfigurations, strategies for increasing pedestrian access, encouraging and identifying areas for bicycle facilities, creating a wayfinding program, and encouraging community events that encourage walking and bicycling.

Existing Design Guidelines

The following local design guidelines were reviewed as part of the development of the Plan to ensure consistency between existing design guidelines and the recommendations included in the Plan:

Loma Vista Specific Plan (2003, revised 2015)

Loma Vista is one of three Urban Centers identified by the City of Clovis General Plan (1993). This Specific Plan provides design guidance for landscaping and streetscaping along streets and trails. It also provides design guidelines for different land uses, such as residential, commercial, community centers, open spaces, and commercial and business campuses.

Heritage Grove Master Plan (2016)

Heritage Grove is one of three Urban Centers identified by the City of Clovis General Plan (1993). This Master Plan provides design guidance for internal circulation and mobility, access to Clovis' existing active transportation network, and street cross-section concepts.

Fresno-Clovis Class IV Bikeway Design Guide (2017)

This design guide provides guidance on determining the appropriate bikeway type, a comparison of institutional guidance on facility design, and feasibility of Class IV segments in Fresno and Clovis. Corridors recommended for Class IV facilities as part of this study will be assessed for the ATP Update.

Standard Specifications (2020)

This document details the process for designing, contracting, and constructing projects within the city of Clovis. It includes design and material specifications for improvements in the public right-of-way, including utilities, sewer and stormwater facilities, sidewalks, curbs, pavement markings, and other surface improvements.

2.4 Plan Vision & Goals

Vision

The Plan is guided by the following vision:

> A city with a complete and connected network of trails, walkways, and bikeways that provides convenient and intuitive connections to key destinations and supports travel within and between neighborhoods. The network improves quality of life by encouraging walking and bicycling for transportation and recreation.

Goals

Through implementation of the Plan, the City seeks to achieve the following goals:

- Safety and Comfort: Improve the safety of people walking and bicycling.
- Connectivity: Develop a well-connected network of trails, walkways, and bikeways.
- Equity: Create a network that allows people of all socioeconomic circumstances the ability to travel safely throughout the city without a car.
- Recreation: Increase access to recreation by providing access to trails, walkways, and bikeways.
- Mode Shift: Increase the share of people who walk or ride a bicycle to get to work, school, shopping, and other activities.

2.5 Environmental Setting and Existing Facilities

Environmental Setting

Clovis is in the central portion of Fresno County, approximately 6.5 miles northeast of the City of Fresno downtown area. The City is in the San Joaquin Valley, and the foothills of the Sierra Nevada begin several miles northeast of the City. Clovis is in the northeast part of the Fresno Metropolitan Area and is one of two incorporated cities – the other being Fresno – in the metropolitan area. The City is surrounded by portions of unincorporated Fresno County to the north, east and south, and by the City of Fresno to the west and southwest.

The majority of the City is urbanized, with residential and nonresidential development, mobility, and public facilities all contributing to Clovis' existing built environment. The City's incorporated boundaries encompass approximately 14,859 acres (23 square miles) of which approximately half is occupied by residential land uses. Other land uses include commercial, educational, park / open space, industrial and public / right-of-way uses.

Description of Bikeway Classifications

Caltrans provides the following descriptions of the types of bikeway facilities:

- **Class I Bikeway (Bike Path):** Class I bikeways, also known as bike paths or shared-use paths, are facilities with exclusive right of way for bicyclists and pedestrians, away from the roadway and with cross flows by motor traffic minimized. Some systems provide separate pedestrian facilities. Class I facilities support both recreational and commuting opportunities. Common applications include along rivers, shorelines, canals, utility rights-of-way, railroad rights-of-way, within school campuses, or within and between parks.
- **Class II Bikeway (Bike Lane):** Class II bikeways are bike lanes established along streets and are defined by pavement striping and signage to delineate a portion of a roadway for bicycle travel. Bike lanes are one-way facilities, typically striped adjacent to motor traffic travelling in the same direction. Contraflow bike lanes can be provided on one-way streets for bicyclists travelling in the opposite direction.
- **Class III Bikeway (Bike Route):** Class III bikeways, or bike routes, designate a preferred route for bicyclists on streets shared with motor traffic not served by dedicated bikeways to provide continuity to the bikeway network. Bike routes are generally not appropriate for roadways with higher motor traffic speeds or volumes. Bike routes are established by placing bike route signs and optional shared roadway markings (sharrow) along roadways.
- **Class IV Bikeway (Separated Bikeways):** A Class IV separated bikeway, often referred to as a cycle track or protected bike lane, is for the exclusive use of bicycles, physically separated from motor traffic with a vertical feature. The separation may include, but is not limited to, grade separation, flexible posts, inflexible barriers, or on-street parking. Separated bikeways can provide for one-way or two-way travel. By providing physical separation from motor traffic, Class IV bikeways can reduce the level of stress, improve comfort for more types of bicyclists, and contribute to an increase in bicycle volumes and mode share.

Existing Conditions

Existing Conditions Summary

Clovis provides an extensive network of walking and bicycling infrastructure. However, the City has potential to improve existing facilities and build new facilities in such a way that bicycle and pedestrian users are more prominently considered in the design. Roadway conditions for arterials and collector streets consist largely of wide, multilane roadways. These conditions tend to encourage faster vehicular speeds which generally tend to make walking and biking adjacent to such routes less attractive options for getting around. Because they must efficiently move large volumes of vehicular traffic, these streets may also have limited pedestrian crossing opportunities. An analysis of crash data confirms some of these trends and indicates that severe injuries or fatalities can disproportionately impact pedestrians and bicyclists, compared to other road users.

On-street bicycle facilities consist of Class II bicycle lanes, located in most areas of the City. Off-street bicycle facilities include trails, paseos and sidewalks. The City boasts 24 miles of off-street trails and many more miles of paseos that provide protected spaces for people of all ages to walk and ride a bicycle. Also, most streets have sidewalks on both sides of the street; however, there are some areas that lack a continuous sidewalk network. Within residential areas, the prevalence of dead-ends and cul-de-sacs can create barriers to walking and biking, even if destinations are nearby.

Existing Facilities to Support Bicycling

Clovis has approximately 55 miles of Class II bike lanes, which includes the total lane mileage of streets with bike lanes on at least one side of the street. Class II Bike Lanes are located on major arterials and collectors. Many of these facilities have high traffic volumes and posted speeds greater than 40 mph and thus may not provide comfortable riding conditions for most people. The network of bicycle facilities is supported by trails and paseos, which provide off-street, concrete and asphalt paths for bicycling and walking. See Appendix A (Map 2) for a map of existing bikeways.

Existing Trail and Paseo Facilities

Clovis has a network of paseos in the southeast part of the city, as well as planned connections between existing paseos in the northeast and northwest areas. Community members can walk or bike along paseos in Clovis. Major Class I Trails include Dry Creek Trail, Old Town Trail (Figure 3 of Appendix A), Enterprise Trail, and the Sierra Gateway Trail. See Appendix A (Table 2) for the 2020 total user counts for these trails. From 2017 to 2020, annual trail use increased by 72 percent. This demonstrates a growing interest in off-street trail facilities. See Appendix A (Map 2) for a map of existing trails.

Existing Facilities to Support Walking

Clovis has an extensive network of pedestrian facilities and growing network of paseos, as discussed previously. Most streets have sidewalks on both sides of the street. However, there are still some areas missing sidewalks, particularly among the recently incorporated areas of Clovis, which had previously been developed under unincorporated County area design guidelines. Along many major arterials, people walking must travel a quarter mile or more to cross the street at a marked crosswalk.

Many arterials have multiple lanes, which elongates crossing times for pedestrians and, at unsignalized crossings, can increase exposure to traffic. At some crossings, there is also a lack of infrastructure, such as high-visibility crosswalks, advance stop bars for motor vehicles, and median refuge islands that can make crossings safer and more comfortable for people walking.

Some parts of Clovis have a disconnected local street network, which can make walking and bicycling less direct and convenient for accessing destinations. Streets that provide key connections between neighborhoods and to frequented destinations are often arterial streets with high volumes of automobile traffic and high posted speeds.

2.6 Project Description

The proposed project is the adoption of the City's Active Transportation Plan Update. The Plan itself contains various programs, policies, and recommendations pertaining to the development of facilities for pedestrians, bicycle, transit, and other emerging modes of personal transport as alternatives to driving. The Plan is included in its entirety in this document as Appendix A.

Bicycle Network

The proposed bicycle network prioritizes connectivity improvements that will help the City of Clovis achieve the vision and goals set forth by the Plan. The network was developed using input from City staff, community feedback on the online map, focus groups, and a community open house. For more information on community involvement, see Appendix A.

The network presented below aligns with the recommendations in the Multi-jurisdictional Local Road Safety Plan which identified the following recommendations for Clovis:

- Install bike lanes,
- Install bike lane extensions through intersections, and
- Install bike boxes.

Table 2-1 below presents the mileage of bicycle facility types for existing and proposed bikeways. For a detailed list of prioritized bicycle projects, see Appendix A.

Table 2-1
Existing and Proposed Bicycle Network Mileage by Facility Type

Facility Type	Existing (miles)	Proposed (miles)	Total (miles)
Trail (Class I)	23	27	50
Paseos	14	8	22
Bicycle Lane (Class II)	59	58	117
Buffered Bicycle Lane (Class II)	0	27	27
Neighborhood Greenway (Class III)	0	4	4
Bicycle Route (Class III)	0	7	7
Total	96	131	227

Note: Bikeway mileage in terms of lane mileage by street and does not differentiate streets with facilities on both sides of the street.
Source: Appendix A [Clovis Active Transportation Plan Update]

When planning and designing bikeways, it is important to recognize that not all people bicycling feel comfortable on every type of bikeway. A bicycle network that addresses the needs of all types of bicyclists is comprised of low-stress bikeways that are connected, comfortable, and appealing to both new and experienced bicyclists of all ages.

Long-Term Vision for Bicycling in Clovis

The recommended bicycle network presented in Figure 2-2 presents a network the City can reasonably achieve in the short term. In the long term, the City will work to revise this network and consider roadway and bikeway changes that include facilities suitable for all types of bicyclists, including “Interested but concerned” riders. This may include upgrading existing or recommended Class II Bike Lanes and Class II Buffered Bike Lanes to Class IV Separated Bike

Lanes, where appropriate. Industry standard design guidelines can provide details to assist the City with design of Class II Buffered Bike Lanes, Class IV Separated Bike Lanes, and other bicycle facilities to improve safety and comfort for all types of bicyclists. The City will review all bike recommendations presented in Figure 2-2 to assess feasibility prior to funding and construction recommendation.

Pedestrian Network

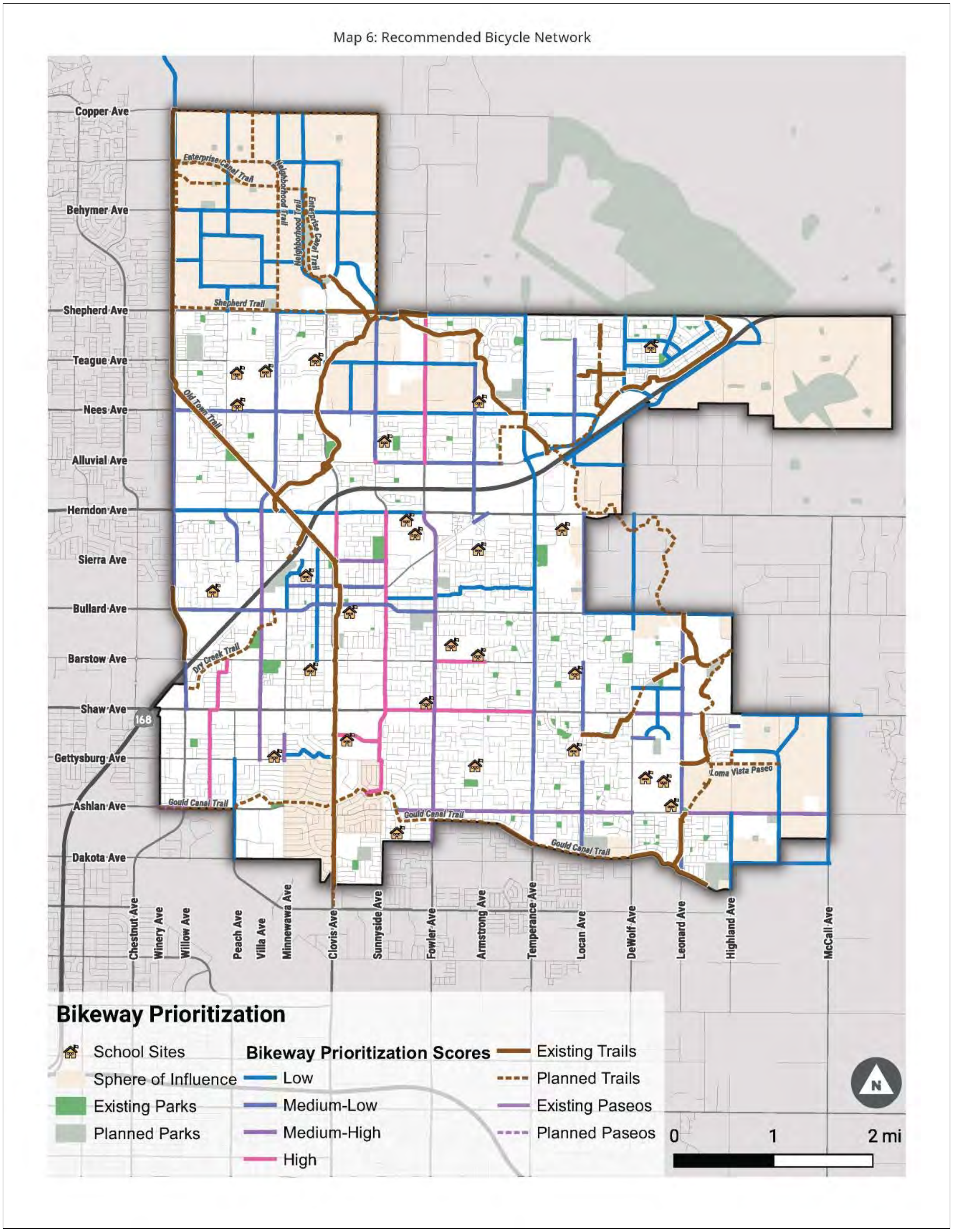
Recommended improvements to the Clovis pedestrian network were identified using a Citywide sidewalk network gap analysis. This analysis identifies locations of existing sidewalks and sidewalk gaps within the city boundary.

The sidewalk network presented below aligns with the recommendations in the Multi-jurisdictional Local Road Safety Plan which identified the following recommendations for Clovis:

- Install sidewalks or other pathways
- Install and upgrade pedestrian crossings with enhanced features
- Install pedestrian countdown signal heads
- Install raised medians and pedestrian refuge islands

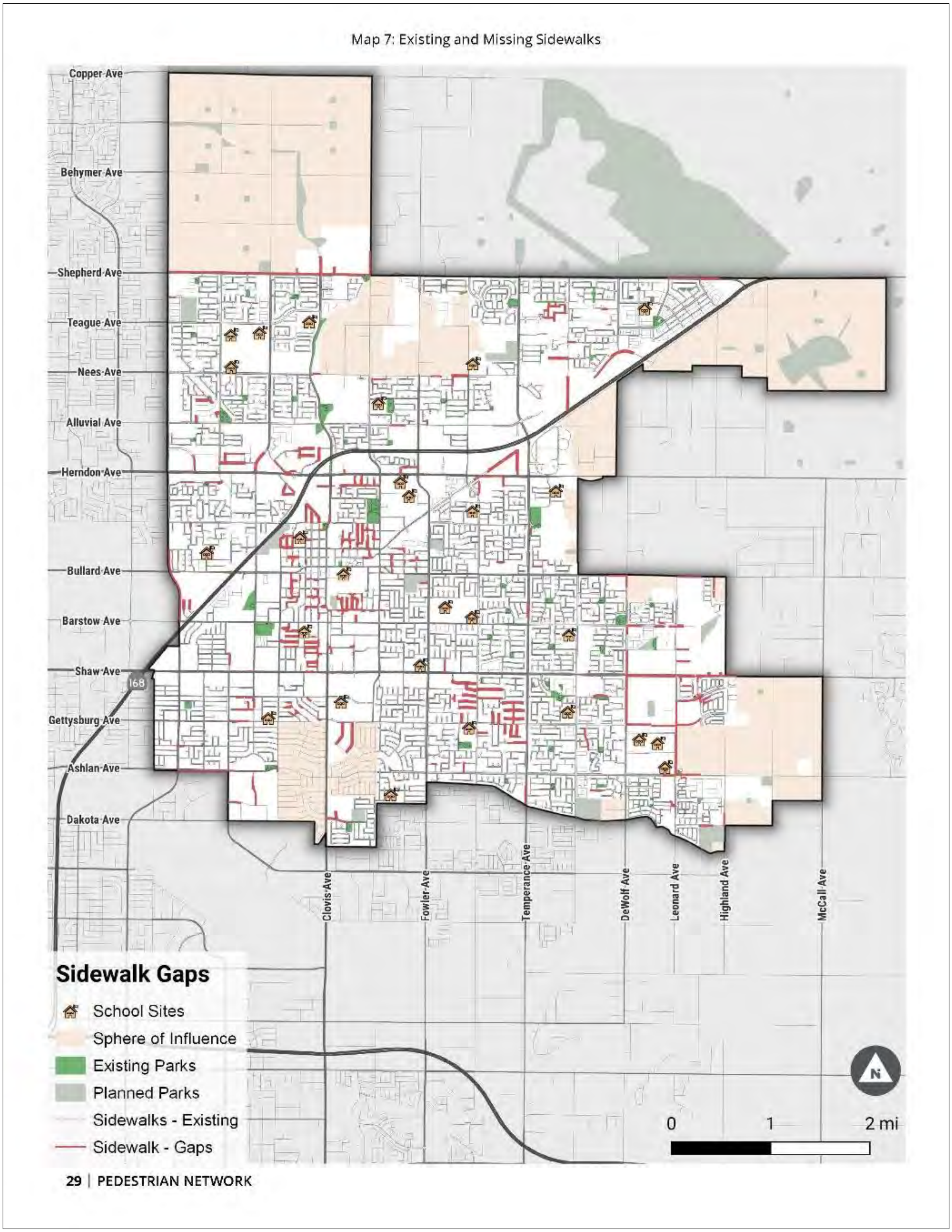
Figure 2-3 shows the locations of existing sidewalks and missing sidewalks. This analysis excluded identifying existing and missing sidewalks on industrial land, large apartment complexes, and private developments. Locations in the city where sidewalk infill is needed are primarily located in southwest and southeast Clovis. No sidewalk data was available for areas in the Spheres of Influence or county islands adjacent to the City of Clovis. See Appendix A for a complete list of sidewalk infill projects.

Figure 2-2
Recommended Bike Network



AGENDA ITEM NO. 2.

Figure 2-3
Existing and Missing Sidewalks



Trails and Paseos

Trails and paseos are important to both the bicycle and pedestrian networks, since they provide an off-street travel option through tree-lined linear parks. The City is dedicated to expanding its trail and paseo networks to provide more opportunities for the public to enjoy. To do this, the City is partnering with the Fresno Irrigation District to allow people to walk along irrigation canals. Figure 2-4 shows existing and planned trails.

The City of Clovis has identified several potential locations to install mid-block crossings to increase trail connectivity throughout Clovis. These locations will be further reviewed by City staff in the future to determine if a mid-block crossing is feasible. The City will also identify the type of crossing that should be installed based on the City's guidelines for mid-block crossings in place at that time.

Support Programs

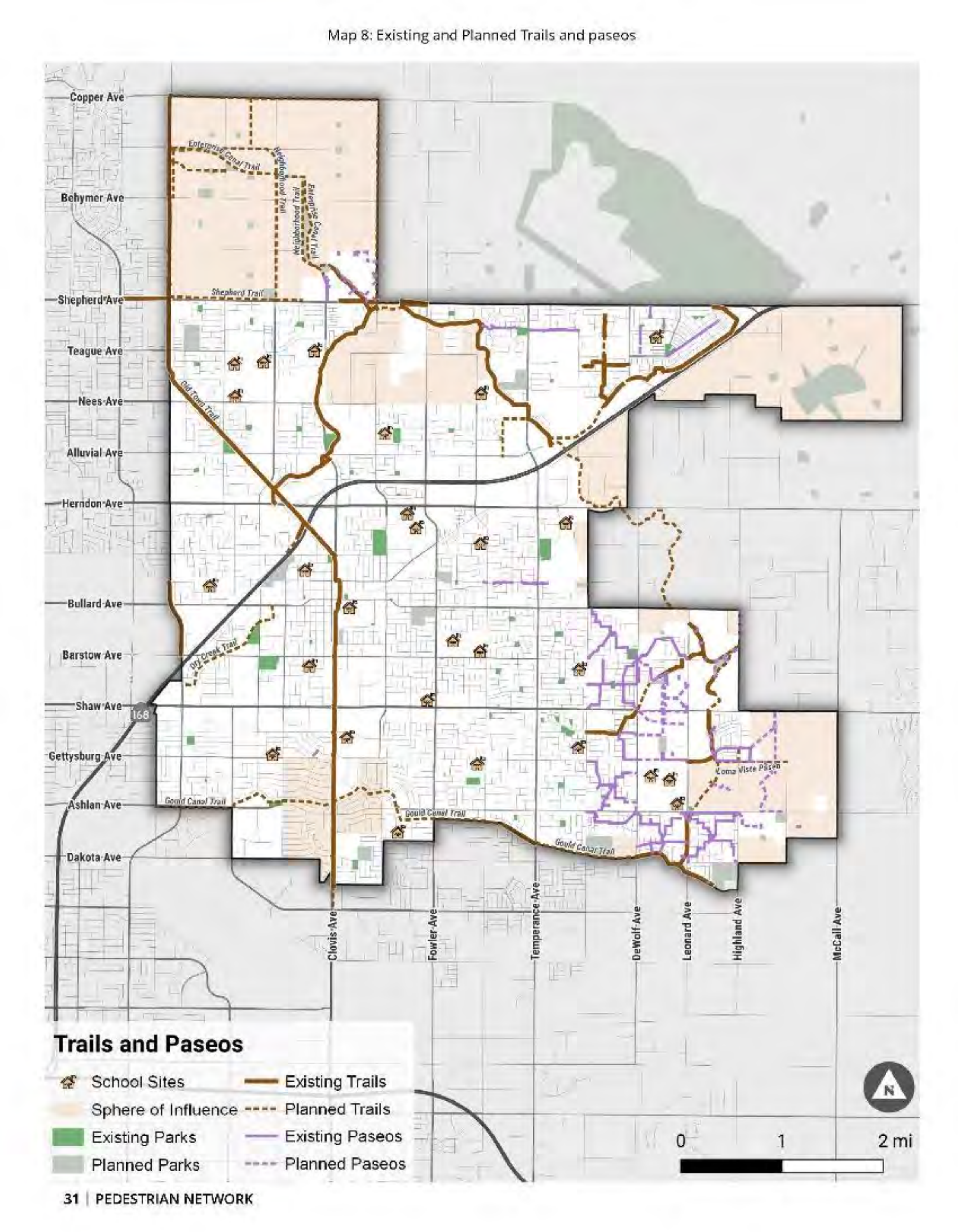
Programs that focus on safe travel behaviors and provide amenities that make it easier and more comfortable for people to walk and bike will help the City achieve the vision and goals presented in the Plan. This section describes a variety of programs that should be explored and implemented by the City of Clovis and partner agencies and organizations. These programs will help increase the utility of the network recommendations presented in Appendix A (Chapters Three and Four). The City can partner with adjacent jurisdictions, and local and regional organizations and businesses to help implement the programs discussed below. For example, local organizations and business are important partners to implementing bike parking programs, and school districts and adjacent jurisdictions could partner with the City to implement educational programs or promote encouragement events. The City will explore local, regional, state, and federal funding opportunities for these programs.

Bicycle Parking

The City of Clovis should develop a bicycle parking program to increase the supply of bicycle parking on public and private property throughout Clovis. Providing bike parking at popular destinations and at transit facilities is a critical component to increasing bike trips. The City of Clovis may partner with local organizations and agencies to increase the number and quality of bicycle parking in the public right-of-way by providing guidance and potentially funding. Ensuring there is safe and convenient bike parking within the public right-of-way will encourage people to ride a bike with an increased level of comfort and assurance that there is a secure place to store their bicycle when they reach their destination. Bike parking provided within the public right-of-way is typically intended for short-term use.

AGENDA ITEM NO. 2.

Figure 2-4
Existing and Planned Trails and Paseos



Typical rack placement for short-term parking in the public right-of-way may be placed on sidewalks or on-street by repurposing vehicle parking spots. Racks placed on sidewalks should minimize obstruction to people walking and they should be placed in the sidewalk amenity zone. On-street bicycle parking spots are ideally bicycle corrals, and have space at both ends of the corral to allow for bicyclist dismount. The City should consider placing on-street bicycle corrals near intersections as a strategy to improve visibility at intersections (also called daylighting).

Conducting a citywide bike parking inventory could determine baseline conditions to identify areas where additional bike parking is needed. Information such as type of rack, bike rack capacity, condition, obstructions (such as racks installed too close to a fence or building), protection from weather elements, and overall security is helpful to know when selecting and installing public bicycle parking.

E-Bicycle Policy

Electric bicycles, or e-bikes, are becoming an increasingly popular option for bicycling. They provide a way for people to take longer trips by bike, appeal to a wider audience of riders, and can help make bicycling more accessible to community members who are interested in bicycling. E-bikes, with the right policies in place, can encourage bicycling as both a recreational and utilitarian mode of transportation. With their increased popularity, state regulations and local policy are critical to supporting the use of the growing bicycle network in Clovis. E-Bicycle regulations and policies are listed below:

> ***State Regulations:*** In 2015, California passed legislation to create a three-class system to categorize electric bicycles and properly regulate them based on their maximum assisted speed. State law permits most low-speed e-bikes (Class 1 and Class 2, less than 20mph) and restricts higher-speed e-bikes (Class 3 and all other e-bikes).
>
> ***Opportunities for Local Policy*:** Current City of Clovis policies for e-bikes restricts "motor-driven cycle[s]" on freeways, canal banks, on private property, and on Sierra Vista Mall roadways and parking facilities (Policy 4.5.880, 4.5.890, 4.5.891, 4.5.892, and 4.5.893). Additionally, Chapter 10 of the city code prohibits the use of "cycle[s]" to any part of public parks aside from the roads (10.3.01.4). The City of Clovis has the opportunity to change policy to regulate e-bike use on trails and paseos. A policy could be developed to regulate e-bike user speed to under 20 mph on trails via signage at trailheads and other key access points. This policy could be accompanied by a map displaying which trails allow e-bikes, and which do not. An additional policy could create speed limits that apply to all trails. A design-focused policy could regulate path width to ensure that users are

comfortable with a variety of other trail users on a wider path. With any policy change, it is important to note the value of a public education campaign to promote the policy.

Encouragement Programs

Encouragement programs complement active transportation and can support mode shift by encouraging behavior change and promoting new infrastructure. The City can partner with community organizations to spark interest and excitement by creating special events that motivate community members to try new modes of transportation. Encouragement programs often include, but are not limited to, open street events, and Safe Routes to School.

Open Streets

Open street events are popular methods to encourage people to walk or get on their bikes and have fun with their friends, family, and community members. Open street events are essentially a block party that closes a roadway to motor vehicle traffic and only allows people to access the roadway using active transportation modes (e.g., walking, biking, skateboarding, scooters, etc.). Hosting open street events can demonstrate to communities that the City supports and encourages bicycling and other forms of active transportation.

Events to encourage people to walk, bike, or skate for recreation and transportation can be included in branded/marketed events created by communities or events that already exist. Marketing weeks or months for walking or bicycling while hosting events can generate a buzz within communities to encourage people to walk or bike instead of drive.

Safe Routes to School

The City should partner with the school district to pursue funding to support the coordination of resources to ensure consistent funding for Safe Routes to School programming at schools throughout Clovis.

Safe Routes to School (SRTS) programs are intended to create safe, fun, and social opportunities for children to bike and walk to and from school. SRTS support healthier children by encouraging them to use active modes of transportation to commute to school rather than be driven in a car. Furthermore, SRTS can lead to children using active modes of transportation into adulthood because they see these modes as a normal everyday activity.

Walk or bike audits near schools can identify infrastructure improvements needed, and partnerships with school districts can leverage funding and lead to more grant opportunities and applications.

The National Center for Safe Routes to School programs (http://guide.saferoutesinfo.org/steps/ and the Safe Routes Partnership (http://www.saferoutespartnership.org/ have created guides and conducted research to help people interested in creating and improving SRTS programs. Proximity to schools is included as part of the prioritization framework used in the Plan. Refer to Appendix A (Chapter Six) for more information about how proximity to schools was incorporated into the project prioritization process for bicycle recommendations and sidewalk infill projects.

Education Campaigns

Education campaigns can help encourage safe road user behavior and complement infrastructure improvements. Campaigns can be broad, or they can be more specific by targeting a certain mode of transportation or a certain travel behavior.

Driver-Oriented Materials

The City of Clovis can implement educational campaigns directed towards educating the general public on safe travel behaviors and the impacts of reckless or inconsiderate behaviors. Education can be conducted through advertising campaigns, roadside or trailside events, or one- or two-day training courses in classrooms. Successful events include large signage, paper handouts, issuance of verbal warnings, praising good behavior with prizes, and in-depth conversations about the importance of safe travel behaviors. Topics could include yielding to other road users, traveling at safe speeds, and clarifying the bicycle rules of the road.

Bicycle- and Pedestrian-Oriented Materials

Education materials oriented to people who walk or ride a bicycle can be implemented using a variety of strategies and messaging. One strategy includes using a bicycling ambassador program, which can be an effective way to educate the public on traffic safety for all roadway users. Some of the services that the bicycle ambassadors could provide include bike mentorship, event attendance, community bicycling workshops, safe cycling rewards, organized rides, commuter pit stops, and bike lane stewardship.

The program could be implemented in partnership with other transportation or health-focused organizations, such as Fresno County Department of Public Health, to host outreach events aimed at encouraging people to make trips by bicycle, follow safe travel behaviors, and develop a relationship with the community to foster an engaged community of bicyclists. A similar pedestrian ambassador program could be developed to educate the public on trail etiquette, and promote social walking events, local walking tours, and more.

Both the bicycle and pedestrian ambassador program could partner with local schools as part of a Safe Routes to School program to deliver workshops and events tailored to elementary, middle, and high school students. Posting educational materials on the City's website can also increase awareness.

Implementation Strategy

All projects identified in the Plan are important to improving local pedestrian and bicycle network connectivity, safety, and access. However, due to the realities of finite financial and staffing resources, it will likely be necessary to implement projects gradually over time. Prioritizing projects helps guide investments toward projects that provide the greatest benefits. In addition, the prioritization process can help identify projects and their applicability to different grant and funding opportunities.

As part of the Plan, bikeway and sidewalk recommendations presented earlier in this Chapter were prioritized using the criteria as shown in Chapter 6 of Appendix A. These criteria were developed to align with the Plan's vision and goals and City objectives. The scores reflect a relative ranking of each criteria. The top ten recommended bicycle projects are shown in Table 2-2 and the recommended sidewalk infill projects are shown in Table 2-3.

Table 2-2
Top 10 Recommended Bicycle Projects

Rank	Corridor	From	To	Recommended Facility	Length (mi)
1	Santa Ana Ave	Clovis Ave	Sierra Vista Ave	Class III Bike Route	0.48
2	Shaw Ave	Sunnyside Ave	Temperance Ave	Class II Bike Lane	1.50
3	Clovis Ave	Sierra Ave	Herndon Ave	Class II Bike Lane	0.48
4	Barstow Ave	Armstrong Ave	Fowler Ave	Class III Bike Route	0.50
5	Helm Ave	W. Barstow Ave	E. Ashlan Ave	Class III Neighborhood Greenway	1.65
6	Sunnyside Ave	Herndon Ave	Tarpey Drive	Class II Bike Lane Class III Neighborhood Greenway	2.51 0.47
7	Fowler Ave	Shepherd Ave	Alluvial Ave	Class II Bike Lane Class II Buffered Bike Lane	1.00 0.51
8	Shaw Ave	DeWolf Ave	460 ft. east of Leonard Ave	Class II Bike Lane	0.59
9	Fowler Ave	Herndon Ave	City Limits near Griffith Ave	Class II Bike Lane Class II Buffered Bike Lane	0.50 2.86
10	Ashlan Ave	Leonard Ave	McCall Ave	Class II Bike Lane	1.48

*All Class II Buffered Bicycle Lanes will require further study to assess feasibility.

Table 2-3
Recommended Sidewalk Infill Projects

Rank	Corridor	From	To	Length (mi)
1	Ashlan Ave.	Willow Ave.	Helm Ave.	0.49
2	Willow Ave.*	W. Escalon Ave.	W. Barstow Ave.	0.72
3	Gettysburg Ave.*	Peach Ave.	Homsy Ave.	0.17
4	Villa Ave.	300 ft. south of W. Ashlan Ave.	W. Pontiac Way	0.30
5	Temperance Ave.	Griffith Ave.	Bellaire Way	0.17
6	Villa Ave.	Fresno Clovis Trail	W. Herndon Ave.	0.34
7	Nees Ave.*	N. Whittier Ave.	Armstrong Ave.	0.25
8	Alluvial Ave.*	N. Fordham Ave.	West of N. Renn Ave.	0.14

* Indicates a project within one-half mile of a school.

Implementation Phasing

Each project recommended in the Plan could be implemented one at a time; however, to build a complete network, it is beneficial to combine recommendations with the aim of building connected bikeways or sidewalks, or to fill a gap. For example, implementing connected Class II Bicycle Lanes along a single route would be advantageous for bicycle connectivity. The means by which bicycle infrastructure is implemented varies depending on the bikeway type. Pedestrian recommendations are primarily focused on filling in gaps in the sidewalk network.

Short-Term

The recommended bicycle and pedestrian facilities presented in the Plan are intended to create a connected network for people walking and bicycling. In many cases, short-term projects may consist of simple restriping of roadways to install or upgrade bike lanes. All planned street resurfacing and reconstruction projects should be reviewed in conjunction with the bicycle and pedestrian project recommendations to identify potential opportunities to incorporate projects recommended in the Plan in the near future.

Long-Term

Some proposed projects, such as Class I Trails or future Class IV Separated Bike Lanes, may require a longer-term effort for the project to come to fruition. While it may take longer to implement these projects, City departments should start considering what steps are needed to construct these projects either through capital projects or as part of future development. This will allow the City of Clovis to be better situated to take advantage of implementation and grant opportunities as they arise.

2.7 Program vs Project Level CEQA Analysis

As discussed previously, the project (under CEQA), is the adoption of the proposed Plan. The Plan is a program/policy-level document, which means it does not provide project-specific construction details that would allow for project-level CEQA analysis. Furthermore, specific development is not being proposed under the Plan and adoption of this CEQA document would not authorize any development. Information such as precise project locations, project timing, funding mechanisms, material types, types of equipment and ultimately construction drawings will be required in order for future "project-level" CEQA analysis to occur. Therefore, this CEQA document has been prepared at a "program-level." Under CEQA, a programmatic document is prepared on a series of actions that can be characterized as one large project and/or for a project that will be implemented over a long period of time. This CEQA document, prepared at a program level, is therefore adequate for adoption of the Plan by the City of Clovis.

Implementation of the physical components of the Plan will occur over several years as funding and/or approval occur. Many of the individual projects contained in the Plan will be subject to various CEQA Exemptions, while others may likely be analyzed using a Mitigated Negative Declaration, or additional National Environmental Policy Act (NEPA) documentation depending on funding source.

2.8 Other Required Approvals

The proposed Plan would include, but not be limited to, the following regulatory requirements:

- The adoption of this Negative Declaration by the City of Clovis.
- Compliance with other federal, state, and local requirements.
- The Plan is also intended to improve the City's access to funding through the State's Active Transportation Program and the regional funding programs.

Chapter 3

IMPACT ANALYSIS

Initial Study Checklist

3.1 Environmental Checklist Form

Project title:

City of Clovis - Active Transportation Plan Update

Lead agency name and address:

City of Clovis
1033 Fifth Street
Clovis, CA 93612

Contact person and phone number:

Ryan C. Burnett, AICP
City of Clovis
(559) 324-2336

Project location:

The various component/improvements recommended by the Plan are located throughout the City limits of Clovis. Figure 2-1 shows the approximate City limits of Clovis. The Plan (Appendix A) provides location maps of potential project components.

Project sponsor's name/address:

City of Clovis
1033 Fifth Street
Clovis, CA 93612

General plan designation:

Various – located throughout the City

Zoning:

Various – located throughout the City

Description of project:

The proposed project is the adoption of the City's Active Transportation Plan Update. The Plan itself contains various programs, policies, and recommendations pertaining to the future development of walking, bicycling, transit, and other emerging modes of personal transport as alternatives to driving.

The City's Plan proposes expansion of and improvements to the City's existing shared-use paths, bike lanes and routes, sidewalks. The proposed networks are designed to build upon existing shared-use paths and paseos, to connect to Clovis' neighborhoods, to improve safety and accessibility for active forms of travel. See Chapter Two – Project Description for details.

Surrounding land uses/setting:

Various – located throughout the City

Other public agencies whose approval or consultation is required (e.g., permits, financing approval, participation agreements):

- California State Clearinghouse

3.2 Environmental Factors Potentially Affected

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact" as indicated by the checklist on the following pages.

☐ Aesthetics	☐ Agriculture Resources and Forest Resources	☐ Air Quality
☐ Biological Resources	☐ Cultural Resources	☐ Energy
☐ Geology / Soils	☐ Greenhouse Gas Emissions	☐ Hazards & Hazardous Materials
☐ Hydrology / Water Quality	☐ Land Use / Planning	☐ Mineral Resources
☐ Noise	☐ Population / Housing	☐ Public Services
☐ Recreation	☐ Transportation	☐ Tribal Cultural Resources
☐ Utilities / Service Systems	☐ Wildfire	☐ Mandatory Findings of Significance

3.3 Determination

On the basis of this initial evaluation:

☒ I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

☐ I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.

☐ I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

☐ I find that the proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.

☐ I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

Ryan C. Burnett, AICP | Date

City of Clovis

I. AESTHETICS

Would the project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
a. Have a substantial adverse effect on a scenic vista?	☐	☐	☐	☒
b. Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☐	☐	☒
c. In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point). If the project is in an urbanized area, would the project conflict with applicable zoning and regulations governing scenic quality?	☐	☐	☐	☒
d. Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☐	☐	☐	☒

ENVIRONMENTAL SETTING

The City of Clovis features a flat landscape and is largely suburban in character. It is surrounded by rural/agricultural land on three sides along the City's northeastern, eastern, southeastern and southern edges. The City of Fresno lies generally to the northwest, west and southwest. The Sierra Nevada Mountains and associated foothills begin just beyond the northeast boundary of the City and views of the mountains are visible on clear days. The City itself contains no substantial, undeveloped natural resources other than grasslands. However, Clovis features numerous parks and green space areas as well as irrigation canals that lend a scenic water quality to the rural character of the area. There are no officially designated scenic highways in the area, however, the City's General Plan discusses scenic "Landscape features" in its Open Space and Conservation Element.[1]

RESPONSES

a. Have a substantial adverse effect on a scenic vista?

b. Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?

c. Substantially degrade the existing visual character or quality of the site and its surroundings?

d. Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?

No Impact. Construction and operation of project components contained in the Plan could potentially impact scenic resources and vistas; degrade the existing visual character of the area; and/or create a new source of light or glare. Although most of the project components are at ground level and would not impose a significant visual impact, there are components such as signage, trail lighting, bicycle racks, pedestrian bridges etc. that could potentially impact visual resources. Individual projects would be subject to site-specific environmental review, at which time the City would identify the potential impacts to aesthetic resources.

The City's Plan is a programmatic document that proposes goals and policies pertaining to the future of walking and bicycling in the City of Clovis. It is intended as a guidance document with the ultimate vision of a connected and complete network of trails, walkways and bikeways that provides safe convenient and enjoyable connections to key destinations around the City. Individual project details such as precise project locations, project timing, funding mechanisms, material types, types of equipment and ultimately construction drawings are currently not available. At such time that specific individual projects are implemented, the City will conduct site-specific CEQA analysis as necessary. Furthermore, implementation of the Plan would be required to comply with the goals and policies under the City's General Plan, Development Code, and other relevant regulatory documents.

Adoption of the Plan alone would not create any aesthetic impacts because specific development is not being proposed under this Plan and it would not authorize any development. Therefore, there is ***no impact***.

Mitigation Measures: None are required.

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[1] Clovis General Plan EIR, pages 5.1- (3-4)

II. AGRICULTURE AND FOREST RESOURCES

Would the project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
a. Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☐	☒
b. Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	☒
c. Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?	☐	☐	☐	☒
d. Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☒
e. Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?	☐	☐	☐	☒

ENVIRONMENTAL SETTING

Clovis is located in Fresno County, which is a nationally-leading agricultural producer. There are currently 10,199 acres designated Agriculture within the City of Clovis General Plan Area. Of this, only 389 acres are located within the City's Sphere of Influence.[2] There are no agricultural lands within the City limits.

RESPONSES

a. Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?

b. Conflict with existing zoning for agricultural use, or a Williamson Act contract?

c. Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?

d. Result in the loss of forest land or conversion of forest land to non-forest use?

e. Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?

No Impact. The City is bordered by agricultural lands on three sides, however, no lands within the City limits are designated agriculture.[3] In addition, there are no forest lands within or adjacent to the City.

The City's Plan is a programmatic document that proposes goals and policies pertaining to the future of walking and bicycling in the City of Clovis. It is intended as a guidance document with the ultimate vision of a connected and complete network of trails, walkways and bikeways that provides safe convenient and enjoyable connections to key destinations around the City. Individual project details such as precise project locations, project timing, funding mechanisms, material types, types of equipment and

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[2] Clovis General Plan EIR, page 5.2-2

[3] Ibid.

ultimately construction drawings are currently not available. At such time that specific individual projects are implemented, the City will conduct site-specific CEQA analysis as necessary. Furthermore, implementation of the Plan would be required to comply with the goals and policies under the City's General Plan, Development Code, and other relevant regulatory documents.

Adoption of the Plan alone would not create any agricultural impacts because specific development is not being proposed under this Plan and it would not authorize any development. In addition, there are no lands within the City that are designated as Agriculture or Forest. Therefore, there is ***no impact***.

Mitigation Measures: None are required.

III. AIR QUALITY

Would the project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
a. Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☐	☒
b. Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard?	☐	☐	☐	☒
c. Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☐	☒
d. Result in other emissions (such as those leading to odors or adversely affecting a substantial number of people)?	☐	☐	☐	☒

ENVIRONMENTAL SETTING

The climate of the City of Clovis and the San Joaquin Valley is characterized by long, hot summers and stagnant, foggy winters. Precipitation is low and temperature inversions are common. These characteristics are conducive to the formation and retention of air pollutants and are in part influenced by the surrounding mountains which intercept precipitation and act as a barrier to the passage of cold air and air pollutants.

The proposed Project lies within the San Joaquin Valley Air Basin, which is managed by the San Joaquin Valley Air Pollution Control District (SJVAPCD or Air District). National Ambient Air Quality Standards (NAAQS) and California Ambient Air Quality Standards (CAAQS) have been established for the following criteria pollutants: carbon monoxide (CO), ozone (O_3), sulfur dioxide (SO_2), nitrogen dioxide (NO_2), particulate matter (PM_{10} and $PM_{2.5}$), and lead (Pb). The CAAQS also set standards for sulfates, hydrogen sulfide, and visibility.

Air quality plans or attainment plans are used to bring the applicable air basin into attainment with all state and federal ambient air quality standards designed to protect the health and safety of residents within that air basin. Areas are classified under the Federal Clean Air Act as either "attainment", "non-attainment", or "extreme non-attainment" areas for each criteria pollutant based on whether the NAAQS have been achieved or not. Attainment relative to the State standards is determined by the California Air Resources Board (CARB). The San Joaquin Valley is designated as a State and Federal extreme non-attainment area for O_3, a State and Federal non-attainment area for $PM_{2.5}$, a State non-attainment area for PM_{10}, and Federal and State attainment area for CO, SO_2, NO_2, and Pb.

Standards and attainment status for listed pollutants in the Air District can be found in Table 1. Note that both state and federal standards are presented.

Table 1
Standards and Attainment Status for Listed Pollutants in the Air District

	Federal Standard	California Standard
Ozone	0.075 ppm (8-hr avg)	0.07 ppm (8-hr avg) 0.09 ppm (1-hr avg)
Carbon Monoxide	9.0 ppm (8-hr avg) 35.0 ppm (1-hr avg)	9.0 ppm (8-hr avg) 20.0 ppm (1-hr avg)
Nitrogen Dioxide	0.053 ppm (annual avg)	0.30 ppm (annual avg) 0.18 ppm (1-hr avg)
Sulfur Dioxide	0.03 ppm (annual avg) 0.14 ppm (24-hr avg) 0.5 ppm (3-hr avg)	0.04 ppm (24-hr avg) 0.25 ppm (1hr avg)
Lead	1.5 µg/m3 (calendar quarter) 0.15 µg/m3 (rolling 3-month avg)	1.5 µg/m3 (30-day avg)
Particulate Matter (PM10)	150 µg/m3 (24-hr avg)	20 µg/m3 (annual avg) 50 µg/m3 (24-hr avg)
Particulate Matter (PM2.5)	15 µg/m3 (annual avg)	35 µg/m3 (24-hr avg) 12 µg/m3 (annual avg)

µg/m3 = micrograms per cubic meter

Additional State regulations include:

CARB Portable Equipment Registration Program – This program was designed to allow owners and operators of portable engines and other common construction or farming equipment to register their equipment under a statewide program so they may operate it statewide without the need to obtain a permit from the local air district.

U.S. EPA/CARB Off-Road Mobile Sources Emission Reduction Program – The California Clean Air Act (CCAA) requires CARB to achieve a maximum degree of emissions reductions from off-road mobile sources to attain State Ambient Air Quality Standards (SAAQS); off- road mobile sources include most construction equipment. Tier 1 standards for large compression-ignition engines used in off-road mobile sources went into effect in California in 1996. These standards, along with ongoing rulemaking, address emissions of nitrogen oxides (NOX) and toxic particulate matter from diesel engines. CARB is currently developing a control measure to reduce diesel PM and NOX emissions from existing off-road diesel equipment throughout the state.

California Global Warming Solutions Act – Established in 2006, Assembly Bill 32 (AB 32) requires that California's GHG emissions be reduced to 1990 levels by the year 2020. This will be implemented through a statewide cap on GHG emissions, which will be phased in beginning in 2012. AB 32 requires CARB to develop regulations and a mandatory reporting system to monitor global warming emissions levels.

RESPONSES

a. Conflict with or obstruct implementation of the applicable air quality plan?

b. Violate any air quality standard or contribute substantially to an existing or projected air quality violation?

c. Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?

d. Expose sensitive receptors to substantial pollutant concentrations?

e. Create objectionable odors affecting a substantial number of people?

No Impact. The State Legislature and SB99 specified that one of the main goals of the Active Transportation Program is to:

> "Advance the active transportation efforts of regional agencies to achieve greenhouse gas reduction goals as established pursuant to Senate Bill 375 (Chapter 728, Statutes of 2008) and Senate Bill 391 (Chapter 585, Statutes of 2009)."

By definition, the City's Plan would potentially reduce vehicle trips and therefore have a beneficial impact by helping to reduce emissions of greenhouse gas, particulate matter, and other pollutants. In addition, adoption of the Plan would not affect population or employment growth and as a result would not result in growth that exceeds growth estimates of the City's General Plan nor would it generate emissions beyond what have been accounted for in regional air quality plans.

Construction of some components of the Plan, however, has the potential to produce short-term emissions and odors through the use of construction equipment, movement of dirt, etc. Individual projects would be subject to site-specific environmental review, at which time the City would identify the potential air quality impacts. As previously discussed, the City's Plan is a programmatic document that proposes goals and policies pertaining to the future of walking and bicycling in the City of Clovis. It is intended as a guidance document with the ultimate vision of a connected and complete network of trails, walkways and bikeways that provides safe convenient and enjoyable connections to key destinations around the City. Individual project details such as precise project locations, project timing, funding mechanisms, material types, types of equipment and ultimately construction drawings are currently not available. At such time that specific individual projects are implemented, the City will conduct site-specific CEQA analysis as necessary. Furthermore, implementation of the Plan would be required to comply with the goals and policies under the City's General Plan, Development Code, and other relevant regulatory documents.

Adoption of the Plan alone would not create any air quality impacts because specific development is not being proposed under this Plan and it would not authorize any development. In addition, one of the goals of the Plan is to reduce vehicle miles traveled. Therefore, there is ***no impact***.

Mitigation Measures: None are required.

IV. BIOLOGICAL RESOURCES

Would the project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
a. Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☐	☐	☒
b. Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☐	☐	☒
c. Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☐	☐	☒
d. Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☐	☐	☒

IV. BIOLOGICAL RESOURCES **Would the project:**	Potentially Significant Impact	Less than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
e. Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☐	☒
f. Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☐	☒

ENVIRONMENTAL SETTING

The proposed Project site is located in a portion of the central San Joaquin Valley that has, for decades, experienced intensive agricultural and urban disturbances. Current agricultural endeavors in the region include dairies, groves, and row crops.

Like most of California, Clovis and the Central San Joaquin Valley experiences a Mediterranean climate. Warm dry summers are followed by cool moist winters. Summer temperatures usually exceed 90 degrees Fahrenheit, and the relative humidity is generally very low. Winter temperatures rarely raise much above 70 degrees Fahrenheit, with daytime highs often below 60 degrees Fahrenheit. Annual precipitation within the proposed Project site is about 10 inches, almost 85% of which falls between the months of October and March. Nearly all precipitation falls in the form of rain and storm-water readily infiltrates the soils of the surrounding the sites.

Native plant and animal species once abundant in the region have become locally extirpated or have experienced large reductions in their populations due to conversion of upland, riparian, and aquatic habitats to agricultural and urban uses. Remaining native habitats are particularly valuable to native wildlife species including special status species that still persist in the region.

Over the years, the Clovis area has been substantially disturbed by agricultural and residential activities, with lands within the City itself having primarily been converted to urban development. However, remnant natural habitats remain in the City, such as relatively undisturbed grasslands and associated drainages and wetlands, including vernal pools.[4]

RESPONSES

a. Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?

b. Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?

c. Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?

d. Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?

e. Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

f. Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?

No Impact. The proposed adoption of the Plan would not result in direct physical changes, but future development of project components contained in the Plan could potentially affect protected biological species and/or habitats. Construction and operation of trails, paths, signage, etc. may occur in biologically sensitive areas. Individual projects would be subject to site-specific environmental review, at which time the City would identify the potential presence of endangered or listed species.

As previously discussed, the City's Plan is a programmatic document that proposes goals and policies pertaining to the future of walking and bicycling in the City of Clovis. It is intended as a guidance document with the ultimate vision of a connected and complete network of trails, walkways and bikeways that provides safe convenient and enjoyable connections to key destinations around the City.

[4] Clovis General Plan EIR, page 5.4-3

Individual project details such as precise project locations, project timing, funding mechanisms, material types, types of equipment and ultimately construction drawings are currently not available. At such time that specific individual projects are implemented, the City will conduct site-specific CEQA analysis as necessary. Furthermore, implementation of the Plan would be required to comply with the goals and policies under the City's General Plan, Development Code, and other relevant regulatory documents.

Adoption of the Plan alone would not create any biological impacts because specific development is not being proposed under this Plan and it would not authorize any development. Therefore, there is ***no impact***.

Mitigation Measures: None are required.

V. CULTURAL RESOURCES

Would the project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
a. Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?	☐	☐	☐	☒
b. Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	☐	☐	☐	☒
c. Disturb any human remains, including those interred outside of formal cemeteries?	☐	☐	☐	☒

ENVIRONMENTAL SETTING

Archaeological resources are places where human activity has measurably altered the earth or left deposits of physical remains. Archaeological resources may be either prehistoric (before the introduction of writing in a particular area) or historic (after the introduction of writing). The majority of such places in this region are associated with either Native American or Euroamerican occupation of the area. The most frequently encountered prehistoric and early historic Native American archaeological sites are village settlements with residential areas and sometimes cemeteries; temporary camps where food and raw materials were collected; smaller, briefly occupied sites where tools were manufactured or repaired; and special-use areas like caves, rock shelters, and sites of rock art. Historic archaeological sites may include foundations or features such as privies, corrals, and trash dumps.

RESPONSES

a. <u>Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?</u>

b. <u>Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?</u>

c. <u>Disturb any human remains, including those interred outside of formal cemeteries?</u>

No Impact. The proposed adoption of the Plan would not result in direct physical changes, but future development of project components contained in the Plan could potentially affect protected cultural resources. Construction and operation of trails, paths, signage, etc. may occur in culturally sensitive areas. Individual projects would be subject to site-specific environmental review, at which time the City would identify the potential presence of cultural or historical resources.

As previously discussed, the City's Plan is a programmatic document that proposes goals and policies pertaining to the future of walking and bicycling in the City of Clovis. It is intended as a guidance document with the ultimate vision of a connected and complete network of trails, walkways and bikeways that provides safe convenient and enjoyable connections to key destinations around the City. Individual project details such as precise project locations, project timing, funding mechanisms, material types, types of equipment and ultimately construction drawings are currently not available. At such time that specific individual projects are implemented, the City will conduct site-specific CEQA analysis as necessary. Furthermore, implementation of the Plan would be required to comply with the goals and policies under the City's General Plan, Development Code, and other relevant regulatory documents.

Adoption of the Plan alone would not create any cultural or historical impacts because specific development is not being proposed under this Plan and it would not authorize any development. Therefore, there is ***no impact***.

Mitigation Measures: None are required.

VI. ENERGY

Would the project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
a. Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?	☐	☐	☐	☒
b. Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	☐	☐	☐	☒

ENVIRONMENTAL SETTING

California's total energy consumption is second-highest in the nation, but in 2018 the state's per capita energy consumption ranked the fourth-lowest, due in part to its mild climate and its energy efficiency programs.[5] In 2018, California was the top-ranking producer of electricity from solar, geothermal and biomass energy, and second in the nation in conventional hydroelectric power generation.

Energy usage is typically quantified using the British thermal unit (BTU)[7]. As a point of reference, the approximately amounts of energy contained in common energy sources are as follows:

Energy Source	BTUs[6]
Gasoline	120,286 per gallon
Natural Gas	1,037 per cubic foot
Electricity	3,412 per kilowatt-hour

[5] U.S. Energy Information Administration. Independent Statistics and Analysis. California Profile Overview. https://www.eia.gov/state/?sid=CA#tabs-1. Accessed January 2022.
[6] U.S. Energy Information Administration. Energy Units and Calculators Explained. https://www.eia.gov/energyexplained/units-and-calculators/british-thermal-units.php. Accessed January 2022.

California electrical consumption in 2020 was 853.6 trillion BTU[7], as provided below, while total electrical consumption by Fresno County in 2020 was 8017.83 GWh.[8]

Electricity Consumption Estimates 2020[9]

End User	BTU of energy consumed (in trillions)	Percentage of total consumption
Residential	323.9	37.94
Commercial	365.1	42.77
Industrial	162.5	19.04
Transportation	2.1	0.25
Total	853.6	--

The California Department of Transportation (Caltrans) reports that approximately 36.42 million vehicles were registered in the state in 2019, while in 2018 a total estimated 347.2 billion vehicles miles were traveled (VMT).[10]

RESPONSES

a. Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?

b. Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?

No Impact. The proposed adoption of the Plan would not result in direct physical changes, but future development of project components contained in the Plan could potentially affect protected energy use. Construction and operation of trails, paths, signage, etc. may affect short-term and long-term energy demand. Individual projects would be subject to site-specific environmental review, at which time the City would identify the potential energy requirements.

As previously discussed, the City's Plan is a programmatic document that proposes goals and policies pertaining to the future of walking and bicycling in the City of Clovis. It is intended as a guidance document with the ultimate vision of a connected and complete network of trails, walkways and bikeways that provides safe convenient and enjoyable connections to key destinations around the City.

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[7] U.S. Energy Information Administration. Electricity Consumption Estimates. https://www.eia.gov/state/seds/sep_fuel/html/pdf/fuel_use_es.pdf. Accessed January 2022.

[8] California Energy Commission. Electricity Consumption by County. http://ecdms.energy.ca.gov/elecbycounty.aspx. Accessed January 2022.

[9] Ibid.

[10] Caltrans. 2020. California Transportation Fact Booklet. https://dot.ca.gov/-/media/dot-media/programs/research-innovation-system-information/documents/caltrans-fact-booklets/2020-cfb-v2-a11y.pdf. Accessed January 2022.

Individual project details such as precise project locations, project timing, funding mechanisms, material types, types of equipment and ultimately construction drawings are currently not available. At such time that specific individual projects are implemented, the City will conduct site-specific CEQA analysis as necessary. Furthermore, implementation of the Plan would be required to comply with the goals and policies under the City's General Plan, Development Code, and other relevant regulatory documents.

Adoption of the Plan alone would not create any energy resource impacts because specific development is not being proposed under this Plan and it would not authorize any development. Therefore, there is ***no impact***.

Mitigation Measures: None are required.

VII. GEOLOGY AND SOILS

Would the project:

	Potentially Significant Impact	Less than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
a. Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving::				
i. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	☐	☐	☐	☒
ii. Strong seismic ground shaking?	☐	☐	☐	☒
iii. Seismic-related ground failure, including liquefaction?	☐	☐	☐	☒
iv. Landslides?	☐	☐	☐	☒
b. Result in substantial soil erosion or the loss of topsoil?	☐	☐	☐	☒
c. Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	☐	☐	☐	☒
d. Be located on expansive soil, as defined in Table 18-1-B of the most recently	☐	☐	☐	☒

VII. GEOLOGY AND SOILS

Would the project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
adopted Uniform Building Code creating substantial risks to life or property?				
e. Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	☐	☐	☐	☒
f. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☐	☐	☒

ENVIRONMENTAL SETTING

The City of Clovis is underlain by Quaternary alluvial fan sedimentary deposits and Pleistocene nonmarine sedimentary deposits (CGS 2012). The Quaternary Period extends from the present to 1.8 million years before the present (mybp), and the Pleistocene Epoch extends from 11,500 years before present to 1.8 mybp. The area is on a very slight southwest slope of about 0.2 percent grade; elevations in the incorporated portion of the City range from about 335 feet above mean sea level (amsl) at the southwest corner of the City to 435 feet amsl at the northeast corner. The Clovis Fault extends northwest-southeast from just north of the City, across the northeastern corner, to just east of the southeast boundary. The Fault is not mapped as active.[11]

RESPONSES

a-i. <u>Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving rupture of a known earthquake fault, as delineated on the most recent</u>

[11] Clovis General Plan EIR, page 5.6-3

Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.

a-ii. Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving strong seismic ground shaking?

a-iii. Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving seismic-related ground failure, including liquefaction?

a-iv. Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving landslides?

b. Result in substantial soil erosion or the loss of topsoil?

c. Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?

d. Be located on expansive soil, as defined in Table 18-1-B of the most recently adopted Uniform Building Code creating substantial risks to life or property?

e. Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?

f. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

No Impact. The proposed adoption of the Plan would not result in direct physical changes, however future development of project components contained in the Plan (trails, bridges, small structures, etc.) would be subject to existing building codes, the Alquist-Priolo Earthquake Zoning Act, and other state and federal regulations related to seismic and geological hazards. Implementation of General Plan policies and Best Management Practices (BMPs) would further minimize such potential impacts. Examples of BMPs include hydroseeding, erosion control blankets, installing silt fences, etc.

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Adoption of the Plan alone would not create any geological or seismic hazards because specific development is not being proposed under this Plan and it would not authorize any development. Therefore, there is ***no impact***.

Mitigation Measures: None are required.

VIII. GREENHOUSE GAS EMISSIONS

Would the project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
a. Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☐	☐	☐	☒
b. Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☐	☐	☒

ENVIRONMENTAL SETTING

The City of Clovis prepared a 2012 Greenhouse Gas Emission Inventory as part of their General Plan Update process. The inventory was composed of the following sources:

- Transportation
- Areas Sources
- Energy
- Solid Waste Disposal
- Water/Wastewater
- Permitted Sources

Various gases in the earth's atmosphere play an important role in moderating the earth's surface temperature. Solar radiation enters earth's atmosphere from space and a portion of the radiation is absorbed by the earth's surface. The earth emits this radiation back toward space, but the properties of the radiation change from high-frequency solar radiation to lower-frequency infrared radiation. GHGs are transparent to solar radiation, but are effective in absorbing infrared radiation. Consequently, radiation that would otherwise escape back into space is retained, resulting in a warming of the earth's atmosphere. This phenomenon is known as the greenhouse effect. Scientific research to date indicates that some of the observed climate change is a result of increased GHG emissions associated with human activity. Among the GHGs contributing to the greenhouse effect are water vapor, carbon dioxide (CO_2), methane (CH_4), ozone, Nitrous Oxide (NO_x), and chlorofluorocarbons. Human-caused emissions of these GHGs in excess of natural ambient concentrations are considered responsible for enhancing the greenhouse effect. GHG emissions contributing to global climate change are attributable, in large part, to human activities associated with the industrial/manufacturing, utility, transportation, residential, and agricultural sectors.

In California, the transportation sector is the largest emitter of GHGs, followed by electricity generation. Global climate change is, indeed, a global issue. GHGs are global pollutants, unlike criteria pollutants and TACs (which are pollutants of regional and/or local concern). Global climate change, if it occurs, could potentially affect water resources in California. Rising temperatures could be anticipated to result in sea-level rise (as polar ice caps melt) and possibly change the timing and amount of precipitation, which could alter water quality. According to some, climate change could result in more extreme weather patterns; both heavier precipitation that could lead to flooding, as well as more extended drought periods. There is uncertainty regarding the timing, magnitude, and nature of the potential changes to water resources as a result of climate change; however, several trends are evident.

Snowpack and snowmelt may also be affected by climate change. Much of California's precipitation falls as snow in the Sierra Nevada and southern Cascades, and snowpack represents approximately 35 percent of the state's useable annual water supply. The snowmelt typically occurs from April through July; it provides natural water flow to streams and reservoirs after the annual rainy season has ended. As air temperatures increase due to climate change, the water stored in California's snowpack could be affected by increasing temperatures resulting in: (1) decreased snowfall, and (2) earlier snowmelt.

RESPONSES

a. Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?

b. Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

No Impact. The State Legislature and SB99 specified that one of the main goals of the Active Transportation Program is to:

"Advance the active transportation efforts of regional agencies to achieve greenhouse gas reduction goals as established pursuant to Senate Bill 375 (Chapter 728, Statutes of 2008) and Senate Bill 391 (Chapter 585, Statutes of 2009)."

By definition, the City's Plan would potentially reduce vehicle trips and therefore have a beneficial impact by helping to reduce emissions of greenhouse gas, particulate matter, and other pollutants. In addition, adoption of the Plan would not affect population or employment growth and as a result would not result in growth that exceeds growth estimates of the City's General Plan nor would it generate emissions beyond what have been accounted for in regional air quality plans.

Construction of some components of the Plan, however, has the potential to produce short-term emissions and odors through the use of construction equipment, movement of dirt, etc. Individual projects would be subject to site-specific environmental review, at which time the City would identify the potential GHG impacts.

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Adoption of the Plan alone would not create any greenhouse gas impacts because specific development is not being proposed under this Plan and it would not authorize any development. In addition, one of the goals of the Plan is to reduce greenhouse gases. Therefore, there is ***no impact***.

Mitigation Measures: None are required.

IX. HAZARDS AND HAZARDOUS MATERIALS

Would the project:

	Potentially Significant Impact	Less than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
a. Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☐	☒
b. Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☐	☐	☒
c. Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☐	☒
d. Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☐	☒
e. For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒

IX. HAZARDS AND HAZARDOUS MATERIALS

Would the project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
f. Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☒
g. Expose people or structures either directly or indirectly to a significant risk of loss, injury or death involving wildland fires?	☐	☐	☐	☒

ENVIRONMENTAL SETTING

Hazardous materials refer generally to hazardous substances that exhibit corrosive, poisonous, flammable, and/or reactive properties and have the potential to harm human health and/or the environment. Accidental releases of hazardous materials can occur from a variety of causes including roadway accidents, fires, train derailments, shipping accidents and industrial accidents.

The various project components contained in the Plan are proposed to be located throughout the City and are likely to be near places such as airports, schools, residential neighborhoods and commercial areas.

RESPONSES

a. Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?

b. Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?

c. Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?

d. Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?

e. <u>For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?</u>

f. <u>Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?</u>

g. Expose people or structures either directly or indirectly to a significant risk of loss, injury or death involving wildland fires?

No Impact. The proposed adoption of the Plan would not result in direct physical changes, however future development of project components contained in the Plan (trails, sidewalks, bike lanes, etc.) could potentially involve the use and/or transport of hazardous materials that could be located near sensitive areas such as airports, schools, residential or commercial areas. This could occur during the construction stage and may include items such as petroleum, natural gas, cleaners, solvents, paint, pesticides, etc. No on-going use or transport of hazardous materials is anticipated once construction is complete. Use and transport of such materials would be subject to existing state and federal regulations related to hazards and hazardous materials. Implementation of General Plan policies and Best Management Practices (BMPs) would further minimize such potential impacts. Individual projects would be subject to site-specific environmental review, at which time the City would identify the potential hazard-related impacts.

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Adoption of the Plan alone would not create any hazard-related impacts because specific development is not being proposed under this Plan and it would not authorize any development. Therefore, there is ***no impact***.

Mitigation Measures: None are required.

X. HYDROLOGY AND WATER QUALITY

Would the project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
a. Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality?	☐	☐	☐	☒
b. Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?	☐	☐	☐	☒
c. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or through the addition of impervious surfaces, in a manner which would i) result in substantial erosion or siltation on- or off-site;	☐	☐	☐	☒
ii) substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite;	☐	☐	☐	☒
iii) create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or	☐	☐	☐	☒
iv) impede or redirect flood flows?	☐	☐	☐	☒

X. HYDROLOGY AND WATER QUALITY

Would the project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
d. In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?	☐	☐	☐	☒
e. Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	☐	☐	☐	☒

ENVIRONMENTAL SETTING

The City of Clovis is underlain by the Kings Groundwater Basin that spans 1,530 square miles of central Fresno County and small areas of northern Kings and Tulare counties. The City is located in three hydrologic areas, all of which are parts of the South Valley Floor hydrologic unit. Generally, the southwest half of the area is in the Fresno hydrologic area, most of the remainder of the area is in the Academy hydrologic area and parts of the northernmost area in in the Humphreys Station hydrologic area.[12] The Clovis area is also within the drainages of three streams: Dry Creek, Dog Creek, and Redbank Slough. A network of storm-drains in the City and surrounding area discharges into 31 retention basins.

The City's Public Utilities Department delivers water to approximately 106,000 residents and in 2013, supplied 20,160 acre-feet of groundwater and 6,963 acre-feet of surface water. The City relies upon groundwater, surface water and recycled water for its water supply.[13]

RESPONSES

a. Violate any water quality standards or waste discharge requirements?

b. Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater

[12] Clovis General Plan EIR, page 5.9-10

[13] Ibid, page 5.17-3

table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?

c. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:

   i. result in substantial erosion or siltation on- or offsite;

   ii. substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite;

   iii. create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or

   iv. impede or redirect flood flows?

d. In flood hazard, tsunami or seiche zones, risk release of pollutants due to project inundation?

e. Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?

No Impact. The proposed adoption of the Plan would not result in direct physical changes, however future development of project components contained in the Plan (bikeways, trails, bridges, small structures, etc.) could potentially increase the impervious surface areas and utilize water supply during construction and for potential landscaping. Individual future projects would be required to comply with the National Pollutant Discharge Elimination System (NPDES) Permit and implementation of the construction Storm Water Pollution Prevention Plan (SWPPP) that require the incorporation of BMPS. In addition, construction water usage will be minimal and temporary; and any proposed landscaping will be installed pursuant to the City's guidance and regulations, thereby minimizing water use. Individual projects would be subject to site-specific environmental review, at which time the City would identify the potential hydrological impacts.

As previously discussed, the City's Plan is a programmatic document that proposes goals and policies pertaining to the future of walking and bicycling in the City of Clovis. It is intended as a guidance document with the ultimate vision of a connected and complete network of trails, walkways and bikeways that provides safe convenient and enjoyable connections to key destinations around the City. Individual project details such as precise project locations, project timing, funding mechanisms, material types, types of equipment and ultimately construction drawings are currently not available. At such time that specific individual projects are implemented, the City will conduct site-specific CEQA analysis as necessary. Furthermore, implementation of the Plan would be required to comply with the goals and policies under the City's General Plan, Development Code, and other relevant regulatory documents.

Adoption of the Plan alone would not create any hydrology-related impacts because specific development is not being proposed under this Plan and it would not authorize any development. Therefore, there is ***no impact***.

Mitigation Measures: None are required.

XI. LAND USE AND PLANNING

Would the project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
a. Physically divide an established community?	☐	☐	☐	☒
b. Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☐	☒

ENVIRONMENTAL SETTING

The City's General Plan Area encompasses approximately 47,804 acres (75 square miles) and comprises a number of land uses including commercial, industrial, and single-family residential. Zoning designations within the City's incorporated boundaries include residential, commercial, industrial, office and public facilities. By far the largest zoning designation within the City boundaries is single-family residential, with commercial occupying the second largest. The majority of the commercial designations are generally concentrated along Shaw and Clovis Avenues.[14]

RESPONSES

a. <u>Physically divide an established community?</u>

b. <u>Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the General Plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?</u>

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[14] Clovis General Plan EIR, page 5.10-5

No Impact. The proposed adoption of the Plan would not result in direct physical changes, however future development of project components contained in the Plan (bikeways, trails, bridges, small structures, etc.) could occur at various places throughout the City. None of the proposed projects would physically divide an established community, nor would they conflict with any applicable land use plans or habitat conservation plans.

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Adoption of the Plan alone would not create any land use impacts because specific development is not being proposed under this Plan and it would not authorize any development. In addition, all of the proposed development is consistent with approved land use documents. Therefore, there is ***no impact***.

Mitigation Measures: None are required.

XII. MINERAL RESOURCES

Would the project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
a. Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	☒
b. Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	☐	☐	☐	☒

ENVIRONMENTAL SETTING

The entire City of Clovis boundary is mapped as MRZ-3 by the California Geological Survey, which means the significance of mineral deposits cannot be determined from available data. The nearest potential significant mineral resource areas are the San Joaquin River and Kings River, each located several miles from the City.[15]

RESPONSES

a. <u>Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?</u>

b. <u>Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?</u>

No Impact. The proposed adoption of the Plan would not result in direct physical changes, however future development of project components contained in the Plan (bikeways, trails, bridges, small structures, etc.) could occur at various places throughout the City. According to the City's General Plan

[15] Clovis General Plan EIR, page 5.11-2

EIR, there are no known mineral resource sectors in or adjacent to the City.[16] Therefore, it is unlikely that any of the projects listed in the Plan will impact mineral resources.

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Adoption of the Plan alone would not create any mineral resource impacts because specific development is not being proposed under this Plan and it would not authorize any development. Therefore, there is ***no impact***.

Mitigation Measures: None are required.

[16] Ibid.

XIII. NOISE

Would the project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
a. Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☐	☐	☒
b. Generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☐	☒
c. For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒

ENVIRONMENTAL SETTING

Noise is most often described as unwanted sound. Although sound can be easily measured, the perception of noise and the physical response to sound complicate the analysis of its impact on people. The City of Clovis is impacted by a multitude of noise sources. Mobile sources of noise, especially cars and trucks, are the most common and significant sources of noise in most communities, and they are predominant sources of noise in the City. The Fresno-Yosemite International Airport also generates noise from general aviation and commercial aircraft activity. In addition, commercial, industrial, and institutional land uses throughout the City (i.e., schools, fire stations, utilities) generate stationary-source noise.[17]

RESPONSES

a. Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies

b. Generation of excessive groundborne vibration or groundborne noise levels?

c. For a project located within the vicinity of a private airstrip or an airport land use plan, or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?

No Impact. The proposed adoption of the Plan would not result in direct physical changes, however future development of project components contained in the Plan (bikeways, trails, bridges, small structures, etc.) could potentially increase noise due to construction (temporary impact) and possibly operation (due to increased use or establishment of a new trail). Noise from these sources is not expected to be substantial, particularly with regard to on-going use, because there is little noise generated from walking and bicycling. Individual projects would be subject to site-specific environmental review, at which time the City would identify the potential noise-related impacts.

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[17] Clovis General Plan EIR, page 5.12-10

Adoption of the Plan alone would not create any noise-related impacts because specific development is not being proposed under this Plan and it would not authorize any development. Therefore, there is ***no impact***.

Mitigation Measures: None are required.

XIV. POPULATION AND HOUSING

Would the project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
a. Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☐	☐	☐	☒
b. Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒

ENVIRONMENTAL SETTING

The population of Clovis steadily increased from 2000-2004, but after 2004 continued to increase but at a lower rate. Between the 2000 and 2010 Census, the City experienced a population increase of 39.7 percent. Since the 2010 Census, the Department of Finance estimates the City's population to be 100,091. Following the population growth, the City's housing rate also increased, as Clovis gained 11,324 dwelling units between 2000 and 2013. The total number of housing units (single and multi-family) was 36,589 by 2013.[18]

RESPONSES

a. Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?

b. Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?

[18] Clovis General Plan EIR, pages 5.13-(4-5)

No Impact. Adoption of the Plan would not affect population or employment growth and as a result would not result in growth that exceeds growth estimates of the City's General Plan nor would it result in the displacement or relocation of people or housing.

As previously discussed, the City's Plan is a programmatic document that proposes goals and policies pertaining to the future of walking and bicycling in the City of Clovis. It is intended as a guidance document with the ultimate vision of a connected and complete network of trails, walkways and bikeways that provides safe convenient and enjoyable connections to key destinations around the City. Individual project details such as precise project locations, project timing, funding mechanisms, material types, types of equipment and ultimately construction drawings are currently not available. At such time that specific individual projects are implemented, the City will conduct site-specific CEQA analysis as necessary. Furthermore, implementation of the Plan would be required to comply with the goals and policies under the City's General Plan, Development Code, and other relevant regulatory documents.

Adoption of the Plan alone would not create any population or housing impacts because specific development is not being proposed under this Plan and it would not authorize any development. Therefore, there is ***no impact***.

Mitigation Measures: None are required.

XV. PUBLIC SERVICES

Would the project:

	Potentially Significant Impact	Less than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
a. Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:				
Fire protection?	☐	☐	☐	☒
Police protection?	☐	☐	☐	☒
Schools?	☐	☐	☐	☒
Parks?	☐	☐	☐	☒
Other public facilities?	☐	☐	☐	☒

ENVIRONMENTAL SETTING

The City of Clovis provides full service police and fire protection services. There are numerous schools, parks, libraries and other public facilities located throughout the City.

RESPONSES

a. Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:

Fire protection?

Police Protection?

Schools?

Parks?

Other public facilities?

No Impact. Adoption of the Plan would not affect population or employment growth and as a result would not result in growth that would require the assemblage of additional fire or police resources, or the expansion of any schools or other public facilities. The proposed adoption of the Plan would not result in direct physical changes, however future development of project components contained in the ATP (trails, bridges, small structures, etc.) could potentially increase the need for security for pedestrians and bicyclists utilizing these facilities.

As previously discussed, the City's Plan is a programmatic document that proposes goals and policies pertaining to the future of walking and bicycling in the City of Clovis. It is intended as a guidance document with the ultimate vision of a connected and complete network of trails, walkways and bikeways that provides safe convenient and enjoyable connections to key destinations around the City. Individual project details such as precise project locations, project timing, funding mechanisms, material types, types of equipment and ultimately construction drawings are currently not available. At such time that specific individual projects are implemented, the City will conduct site-specific CEQA analysis as necessary. Furthermore, implementation of the Plan would be required to comply with the goals and policies under the City's General Plan, Development Code, and other relevant regulatory documents.

Adoption of the Plan alone would not create any public service impacts because specific development is not being proposed under this Plan and it would not authorize any development. Therefore, there is ***no impact***.

Mitigation Measures: None are required.

XVI. RECREATION

Would the project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
a. Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☐	☒
b. Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	☐	☐	☐	☒

ENVIRONMENTAL SETTING

The City of Clovis Public Utilities Department builds and maintains public parks. Currently, approximately 160 acres are developed as park space. The parks in the City range from 0.06 acres to 17.9 acres, and each provides varied amenities and facilities, such as playgrounds, shelters, picnic tables, sports fields, drinking fountains, restrooms, and parking.[19]

RESPONSES

a. Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?

b. Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?

No Impact. Adoption of the Plan would not affect population or employment growth and as a result would not result in growth that would require expansion of existing recreational facilities. More so, the

[19] Clovis General Plan EIR, page 5.15-2

Plan is intended to increase the pedestrian and bicycle recreational opportunities for the residents of the City.

As previously discussed, the City's Plan is a programmatic document that proposes goals and policies pertaining to the future of walking and bicycling in the City of Clovis. It is intended as a guidance document with the ultimate vision of a connected and complete network of trails, walkways and bikeways that provides safe convenient and enjoyable connections to key destinations around the City. Individual project details such as precise project locations, project timing, funding mechanisms, material types, types of equipment and ultimately construction drawings are currently not available. At such time that specific individual projects are implemented, the City will conduct site-specific CEQA analysis as necessary. Furthermore, implementation of the Plan would be required to comply with the goals and policies under the City's General Plan, Development Code, and other relevant regulatory documents.

Adoption of the Plan alone would not create any recreational impacts because specific development is not being proposed under this Plan and it would not authorize any development. Therefore, there is ***no impact***.

Mitigation Measures: None are required.

XVII. TRANSPORTATION/ TRAFFIC

Would the project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
a. Conflict with a program plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?	☐	☐	☐	☒
b. Would the project conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)?	☐	☐	☐	☒
c. Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☐	☒
d. Result in inadequate emergency access?	☐	☐	☐	☒

ENVIRONMENTAL SETTING

Roadways in the City of Clovis are categorized according to the type of service they provide. Functional classifications in Clovis include Freeways, State Routes, Expressways, Arterials, Collectors, and Local Streets. Two major functions of roadways are to provide mobility for through-traffic and provide direct access to adjacent properties. Roadways also provide bicycle and pedestrian access and allow for the circulation of non-vehicular traffic.

RESPONSES

a. <u>Conflict with a program plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?</u>

b. <u>Would the project conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)?</u>

No Impact. The proposed adoption of the Plan would not result in direct physical changes, however future development of project components contained in the Plan (bikeways, trails, bridges, small structures, etc.) could potentially impact existing roadways and intersections. For instance, if new crosswalks or bicycle lanes are proposed, these projects could require additional analysis to determine their impacts to (and safety from) roadway and vehicular activity. Additionally, construction activities will require various vehicular trips to and from the various project sites. However, these will be minimal and temporary. In the event that partial or full road closure is necessary during project construction, the contractor will be required to adhere to any and all regulations from the City, Caltrans and/or other regulatory agency. Individual projects would be subject to site-specific environmental review, at which time the City would identify the potential transportation-related impacts.

As previously discussed, the City's Plan is a programmatic document that proposes goals and policies pertaining to the future of walking and bicycling in the City of Clovis. It is intended as a guidance document with the ultimate vision of a connected and complete network of trails, walkways and bikeways that provides safe convenient and enjoyable connections to key destinations around the City. Individual project details such as precise project locations, project timing, funding mechanisms, material types, types of equipment and ultimately construction drawings are currently not available. At such time that specific individual projects are implemented, the City will conduct site-specific CEQA analysis as necessary. Furthermore, implementation of the Plan would be required to comply with the goals and policies under the City's General Plan, Development Code, and other relevant regulatory documents.

Adoption of the Plan alone would not create any transportation-related impacts because specific development is not being proposed under this Plan and it would not authorize any development. Therefore, there is ***no impact***.

Mitigation Measures: None are required.

XVIII. TRIBAL CULTURAL RESOURCES

Would the project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
a. Cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:				
i. Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k), or	☐	☐	☒	☐
ii. A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code section 5024.1. In applying the criteria set forth in subdivision (c) of the Public Resources Code section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.	☐	☐	☒	☐

ENVIRONMENTAL SETTING

A Tribal Cultural Resource (TCR) is defined under Public Resources Code section 21074 as a site, feature, place, cultural landscape that is geographically defined in terms of size and scope, sacred place, and object with cultural value to a California Native American tribe that are either included and that is listed or eligible for inclusion in the California Register of Historic Resources or in a local register of historical resources, or if the City of Clovis, acting as the Lead Agency, supported by substantial evidence, chooses at its discretion to treat the resource as a TCR.

RESPONSES

a. <u>Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:</u>

   i) <u>Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k), or</u>

   ii) <u>A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.</u>

No Impact. The proposed adoption of the Plan would not result in direct physical changes, however future development of project components contained in the Plan (bikeways, trails, bridges, small structures, etc.) could potentially impact tribal cultural resources. Individual projects would be subject to site-specific environmental review, at which time the City would identify the potential tribal cultural resource-related impacts.

As previously discussed, the City's Plan is a programmatic document that proposes goals and policies pertaining to the future of walking and bicycling in the City of Clovis. It is intended as a guidance document with the ultimate vision of a connected and complete network of trails, walkways and bikeways that provides safe convenient and enjoyable connections to key destinations around the City. Individual project details such as precise project locations, project timing, funding mechanisms, material types, types of equipment and ultimately construction drawings are currently not available. At such time that specific individual projects are implemented, the City will conduct site-specific CEQA analysis as necessary. Furthermore, implementation of the Plan would be required to comply with the goals and policies under the City's General Plan, Development Code, and other relevant regulatory documents.

However, the Native American Heritage Commission (NAHC) provided a consultation list of tribal governments with traditional lands or cultural places located within the project area. An opportunity has been provided to Native American tribes listed by the Native American Heritage Commission during the CEQA process as required by AB 52. No responses were received by the City in response to the consultation request within the mandatory response timeframes; therefore, this Initial Study has been completed consistent and compliant with AB 52. Adoption of the Plan alone would not create any tribal cultural resource-related impacts because specific development is not being proposed under this Plan and it would not authorize any development. Therefore, there is ***no impact***.

Mitigation Measures: None are required.

XIX. UTILITIES AND SERVICE SYSTEMS

Would the project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
a. Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?	☐	☐	☐	☒
b. Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?	☐	☐	☐	☒
c. Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☐	☐	☒
d. Generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?	☐	☐	☐	☒
e. Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?	☐	☐	☐	☒

ENVIRONMENTAL SETTING

The City's Public Utilities Department delivers water to approximately 106,000 residents and in 2013, supplied 20,160 acre-feet of groundwater and 6,963 acre-feet of surface water. The City relies upon groundwater, surface water and recycled water for its water supply.[20]

The City constructed a wastewater treatment plant that began service in 2009. The facility produces a disinfected, tertiary-treated water supply, which is used for both landscaping and agricultural uses. In 2010, this facility produced 1,784 acre feet of treated water for use within the City service area. Production at this facility is expected to grow to 6,273 acre feet per year by 2025.[21]

RESPONSES

a. Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?

b. Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?

c. Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?

d. Generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?

e. Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?

No Impact. The proposed adoption of the Plan would not result in direct physical changes, however future development of project components contained in the Plan (bikeways, trails, bridges, small structures, etc.) could potentially utilize water supply during construction and for potential landscaping. Once the various project components are in operation, no wastewater generation is expected and solid waste generation will be limited mostly to construction activity. Individual projects would be subject to

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[20] Clovis General Plan EIR, page 5.17-3

[21] Ibid, page 5.17-7

site-specific environmental review, at which time the City would identify the potential utility-related impacts.

As previously discussed, the City's Plan is a programmatic document that proposes goals and policies pertaining to the future of walking and bicycling in the City of Clovis. It is intended as a guidance document with the ultimate vision of a connected and complete network of trails, walkways and bikeways that provides safe convenient and enjoyable connections to key destinations around the City. Individual project details such as precise project locations, project timing, funding mechanisms, material types, types of equipment and ultimately construction drawings are currently not available. At such time that specific individual projects are implemented, the City will conduct site-specific CEQA analysis as necessary. Furthermore, implementation of the ATP would be required to comply with the goals and policies under the City's General Plan, Development Code, and other relevant regulatory documents.

Adoption of the Plan alone would not create any utility-related impacts because specific development is not being proposed under this Plan and it would not authorize any development. Therefore, there is ***no impact***.

Mitigation Measures: None are required.

XX. WILDFIRE

If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
a. Substantially impair an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☒
b. Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?	☐	☐	☐	☒
c. Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?	☐	☐	☐	☒
d. Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?	☐	☐	☐	☒

ENVIRONMENTAL SETTING

Human activities such as smoking, debris burning, and equipment operation are the major causes of wildland fires.

RESPONSES

a. <u>Substantially impair an adopted emergency response plan or emergency evacuation plan?</u>

b. Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?

c. Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?

d. Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?

No Impact. The proposed adoption of the Plan would not result in direct physical changes, however future development of project components contained in the Plan (bikeways, trails, bridges, small structures, etc.) could potentially require installation or maintenance of associated infrastructure. Individual projects would be subject to site-specific environmental review, at which time the City would identify the potential utility-related impacts.

As previously discussed, the City's Plan is a programmatic document that proposes goals and policies pertaining to the future of walking and bicycling in the City of Clovis. It is intended as a guidance document with the ultimate vision of a connected and complete network of trails, walkways and bikeways that provides safe convenient and enjoyable connections to key destinations around the City. Individual project details such as precise project locations, project timing, funding mechanisms, material types, types of equipment and ultimately construction drawings are currently not available. At such time that specific individual projects are implemented, the City will conduct site-specific CEQA analysis as necessary. Furthermore, implementation of the ATP would be required to comply with the goals and policies under the City's General Plan, Development Code, and other relevant regulatory documents.

Adoption of the Plan alone would not create any wildfire-related impacts because specific development is not being proposed under this Plan and it would not authorize any development. Therefore, there is ***no impact***.

Mitigation Measures: None are required.

XXI. MANDATORY FINDINGS OF SIGNIFICANCE

Would the project:

	Potentially Significant Impact	Less than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
a. Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	☐	☐	☐	☒
b. Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?	☐	☐	☐	☒
c. Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☐	☐	☒

RESPONSES

a. Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?

b. Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?

c. Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?

No Impact. The City's Plan is a programmatic document that proposes goals and policies pertaining to the future of walking and bicycling in the City of Clovis. It is intended as a guidance document with the ultimate vision of a connected and complete network of trails, walkways and bikeways that provides safe convenient and enjoyable connections to key destinations around the City. Individual project details such as precise project locations, project timing, funding mechanisms, material types, types of equipment and ultimately construction drawings are currently not available. At such time that specific individual projects are implemented, the City will conduct site-specific CEQA analysis as necessary. Furthermore, implementation of the Plan would be required to comply with the goals and policies under the City's General Plan, Development Code, and other relevant regulatory documents.

Adoption of the Plan alone would not create any impacts because specific development is not being proposed under this Plan and it would not authorize any development. Therefore, there is ***no impact***.

Chapter 4

List of Preparers

LIST OF PREPARERS AND CONSULTATIONS

List of Preparers

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Toole Design Group

- Michael Hintze, AICP

Appendices

Appendix A

Clovis Active Transportation Plan Update

City of Clovis
Active Transportation Plan

September 2023

CLOVIS
ACTIVE TRANSPORTATION PLAN

CITY of CLOVIS CALIFORNIA

Acknowledgments

The City of Clovis thanks the residents of Clovis, local and regional agencies, our non-profit partners, stakeholders, and all others who participated in the development and review of the Active Transportation Plan Update.

Table of Contents

01
PLAN PURPOSE

The **Clovis Active Transportation Plan Update** (the Plan) supports walking, bicycling, transit, and use of other emerging modes of personal transport as alternatives to driving within Clovis, to neighboring cities, and regional destinations. The Plan defines a clear vision for the city's active transportation network and proposes a framework for implementing projects, programs, and policies to turn the vision into a reality.

The Plan identifies strategies to improve safety and accessibility for active forms of travel such as walking, bicycling, and rolling (including using assisted mobility devices, e-scooters, skateboards, and other wheeled modes, etc.). It supplements the City of Clovis General Plan (2014) and supersedes the City of Clovis Active Transportation Plan (2016) and will help the City create a sustainable and multi-modal transportation network. This network is intended to serve not only Clovis residents but it will also plays a crucial role in maintaining convenient accessibility between Clovis and neighboring jurisdictions for the purposes of work, education, and reaching recreational destinations.

How Was This Plan Developed?

The Plan was developed over a two-year period, beginning in Spring 2021. The process was guided by City of Clovis staff, stakeholders, and members of the community.

The City of Clovis used community input to develop:

- A vision and suite of goals to encourage walking and bicycling
- An assessment of existing conditions
- Bicycle and pedestrian network and facility recommendations
- Programmatic recommendations
- An implementation and funding strategy

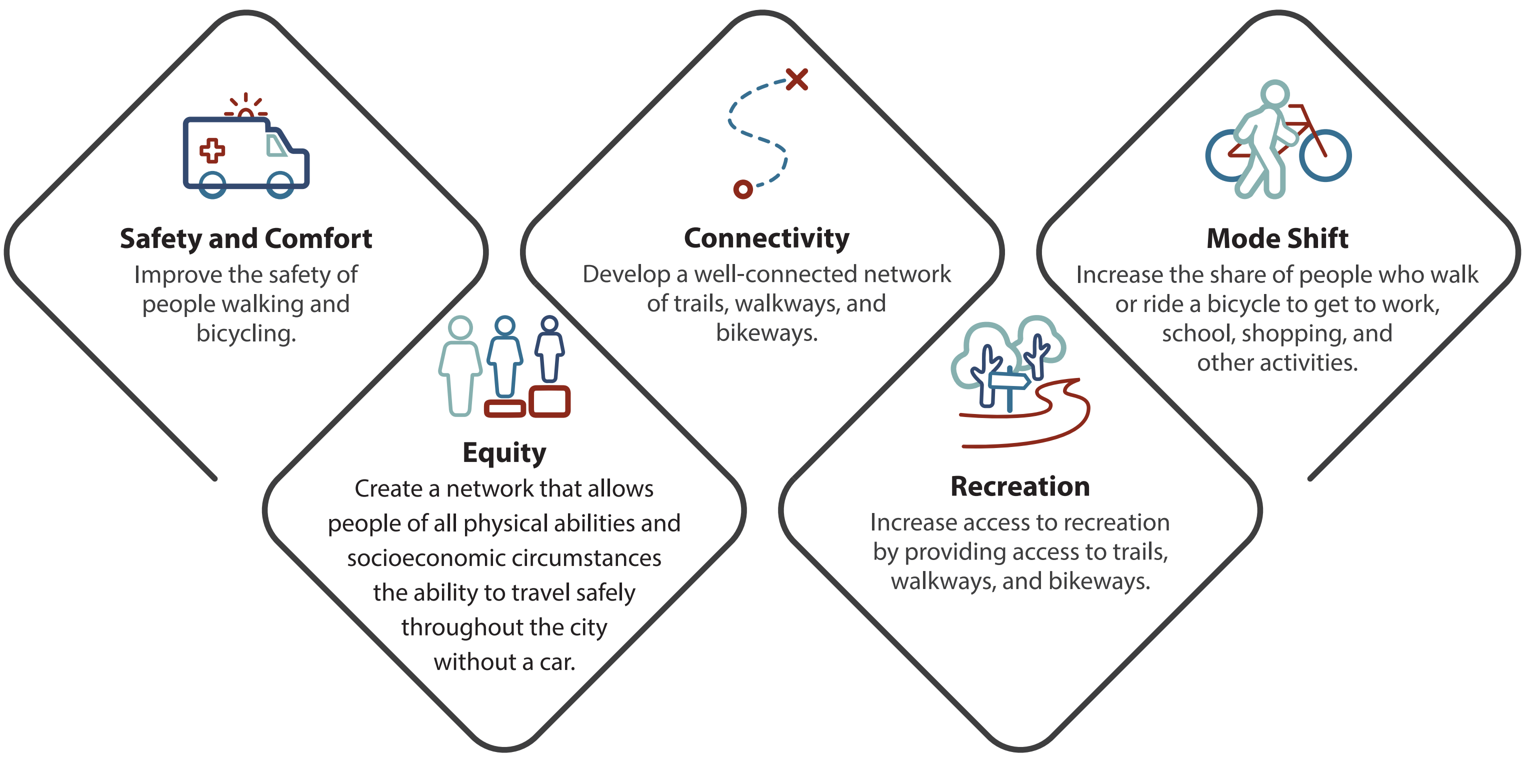
Vision

A city with a **complete and connected network of trails, walkways, and bikeways** that provides **convenient and intuitive connections to key destinations** and supports travel within and between neighborhoods. The network **improves quality of life by encouraging walking and bicycling for transportation and recreation**.

Goals

The following goals guide the recommendations presented in this Plan and define City priorities (see Figure 1). The goals can also be used to measure the City's progress towards implementation of the Plan over time.

Figure 1: Clovis Active Transportation Plan Update Goals



Building Upon Current and Past Plans

As part of the **City of Clovis Active Transportation Plan Update**, the project team reviewed local and regional plans and policies to ensure consistency with these efforts.

City of Clovis Plans

City of Clovis General Plan (2014)

Summary: This long-range plan identifies the goals, policies, and implementation actions to preserve and expand the City's existing community while orienting growth toward three urban centers.

Relevance: The Circulation Element presents goals, policies, and implementation actions to guide transportation decisions in Clovis.

Circulation Element Goals:

- A context-sensitive and "complete streets" transportation network that prioritizes effective connectivity and accommodates a comprehensive range of mobility needs.
- A roadway network that is well planned, funded, and maintained.
- A multimodal transportation network that is safe and comfortable in the context of adjacent neighborhoods.

- A bicycle and transit system that serves as a functional alternative to commuting by car.
- A complete system of trails and pathways accessible to all residents.
- Safe and efficient goods movement with minimal impacts on local roads and neighborhoods.
- A regional transportation system that connects Clovis to the San Joaquin Valley region.

City of Clovis Active Transportation Plan (2016)

Summary: The 2016 Clovis Active Transportation Plan is a comprehensive document outlining the future of walking and bicycling in Clovis.

Relevance: This Plan builds off the vision, goals, and strategies outlined in the 2016 plan.

Goals:

- Increase the number of residents who use walking and bicycling to get to work, school, shopping, and other activities.
- Reduce the number of collisions within the city involving pedestrians and bicyclists.
- Close gaps within the bicycle and pedestrian networks.

Central Clovis Specific Plan (2016)

Summary: The Central Clovis Specific Plan reflects on the history of the central core of Clovis and outlines land uses and design guidelines that aim to maintain the character and quality of downtown Clovis.

Relevance: The Specific Plan includes active transportation improvements as a goal in downtown Clovis, including lane reconfigurations, strategies for increasing pedestrian access, encouraging and identifying areas for bicycle facilities, creating a wayfinding program, and encouraging community events that encourage walking and bicycling.

Goals:

- A thriving local economy enriched with successful businesses.
- A pedestrian and bicycle friendly downtown that connects to regional assets and all transportation modes.
- An entertainment, art and cultural center for the region that preserves, promotes and celebrates the historic heritage of Clovis.
- A place with distinctive gateways and thematic elements.
- An authentic heart of the Clovis Community that offers employment, housing and lifestyle opportunities for all ages and incomes.

Master Plans and Design Guidelines

The following local design guidelines were reviewed as part of the development of this Plan to ensure consistency between existing design guidelines and the recommendations included in this Plan:

- **Central Clovis Specific Plan** (2016). Provides development standards, acceptable land uses, and design standards for central, “Old Town Clovis”. This includes street and trail design concepts such as gateways and multimodal street sections that include bikeways and “Pedestrian Residential Tiny Streets”.
- **Loma Vista Specific Plan** (2003, revised 2015). Loma Vista is one of three Urban Centers identified by the **City of Clovis General Plan** (1993). This Specific Plan provides design guidance for landscaping and streetscaping along streets and trails. It also provides design guidelines for different land uses, such as residential, commercial, community centers, open spaces, and commercial and business campuses. The guidance from the Loma Vista Specific Plan is reflected in the **Loma Vista Community Centers Master Plan** (2019) and the **Home Place Master Plan** (2022), which include new trails and bike lanes as part of Master Planned Communities in southeast Clovis.
- **Guidance for Uncontrolled Crosswalk Treatments** (2016). Based on research, other cities' policies and guidelines, and City of Clovis staff input, this guidance provides a process for determining the appropriate level of treatments for pedestrian crossings based on roadway characteristics, such as number of lanes, posted speed, sight distance, and demand. Guidance applies to intersection crossings, midblock crosswalks, and trail crossings. Potential crossing treatments include crosswalks, signs, pavement markings, and signals.

- **Heritage Grove Design Guidelines** (2016). Heritage Grove is one of three Urban Centers identified by the **City of Clovis General Plan** (1993). This Master Plan provides design guidance for internal circulation and mobility, access to Clovis' existing active transportation network, and street cross-section concepts.
- **Fresno-Clovis Class IV Bikeway Design Guide** (2017). This design guide provides guidance on determining the appropriate bikeway type, a comparison of institutional guidance on facility design, and feasibility of Class IV segments in Fresno and Clovis. Corridors recommended for Class IV facilities as part of this study will be assessed for the ATP Update.
- **Clovis Standard Specifications** (2020). This document details the process for designing, contracting, and constructing projects within the city of Clovis. It includes design and material specifications for improvements in the public right-of-way, including utilities, sewer and stormwater facilities, sidewalks, curbs, pavement markings, and other surface improvements.

Regional Plans

Fresno Council of Governments Multijurisdictional Local Road Safety Plan (MLRSP) (2022)

Summary: Using crash data analysis and stakeholder input, the MLRSP identifies key roadway safety issues, priority locations, and strategies within each of the participating jurisdictions.

Relevance: Includes a plan for Clovis that analyzes road safety issues for pedestrians and bicyclists. Identifies high crash locations throughout the City and strategies to improve safety.

Key Findings Goals:

- The plan emphasizes that pedestrians and bicyclists in Clovis are overrepresented in fatal and severe injury crashes (i.e. pedestrians are involved in 3 percent of reported crashes but 27 percent of fatal and severe injury crashes).
- Supports the installation of road diets, bike lanes, sidewalks, refuge islands, and other measures proposed in this Plan.

Fresno Council of Governments Regional Transportation Plan (2022)

Summary: The 2022 Regional Transportation Plan is a comprehensive, regional look at transportation options for people and for moving goods.

Relevance: The Plan sets direction for regional transportation values and improvements to pursue, including in Clovis. This plan aligns with the goal to improve community access sustainable transportation options and to have a multimodal transportation network.

Goals:

- Improve mobility and accessibility for all.
- Support vibrant communities that are accessible by sustainable transportation options.
- Create safe, well-maintained, efficient, and climate-resilient multimodal transportation network.
- Build a transportation network that supports a sustainable and vibrant economy.
- Become a region embracing clean transportation, technology, and innovation.

Fresno Council of Governments Regional Active Transportation Plan (2018)

Summary: This Regional Active Transportation Plan is a comprehensive guide outlining the vision for biking, walking, and other human-powered transportation in Fresno County.

Relevance: While this particular plan focuses on the unincorporated areas of Fresno County, active transportation plans for the County's four cities that have active transportation plans were integrated into this plan to ensure consistency between jurisdictions.

Goals:

- Create a network of safe and attractive trails, sidewalks, and bikeways that connect residents to key destinations, especially local schools and parks.
- Create a network of regional bikeways that allows bicyclists to safely ride between cities and other regional destinations.
- Increase walking and bicycling trips in the region by creating user-friendly facilities.
- Increase safety by creating bicycle facilities and improving crosswalks and sidewalks for pedestrians.

Existing Conditions Review

The project team assembled and analyzed data about who is walking and biking in Clovis today and whether there are specific demographic population groups in Clovis that might be particularly reliant on walking, bicycling, or transit, or may have specific needs associated with using these types of modes. In addition to reviewing quantitative data, public input was collected to develop a deeper contextual understanding of walking and biking conditions in Clovis. The team also mapped existing walking and bicycling facilities, such as the Clovis Old Town Trail shown in Figure 2. See Appendix B: Existing Conditions Summary Report for more information.

Public Outreach

To develop the Plan, the City of Clovis used a variety of outreach and engagement strategies to publicize the planning process and gather input from the community. Throughout the Plan development process, the City provided the following opportunities for input:

- Developed and published a Plan accessible on the City's website for public comment
- Hosted two community open houses
- Published an online map and survey
- Facilitated three focus group meetings
- Organized a community meeting

See Appendix C: Public Participation Summary Report for more information.

Network and Facility Recommendations

The existing conditions review and public input were used to develop a list of recommended improvements for walking and bicycling infrastructure throughout Clovis. These recommendations will help the City achieve the goals stated in this Plan. See Appendix A: Prioritized Bicycle Facilities Project List for a complete list of bicycle project recommendations.

Program Recommendations

To support the development of physical infrastructure for people walking and bicycling, the Plan presents a set of complementary program recommendations. These programmatic recommendations focus on end-of-trip facilities, active transportation policies, educational programs, and encouragement events.

Implementation Strategy

This implementation strategy, found in Chapter 6, will assist the City in focusing financial and staff resources on Plan implementation and building the recommended projects. It will help City staff to build upon the momentum of this Plan and swiftly move from Plan adoption to implementation. To view the prioritized project list, see Appendix A: Prioritized Bicycle Facilities Project List and for more information about opportunities to fund projects, refer to Appendix D: Funding Sources.

Figure 2: Clovis Old Town Trail

02

WALKING AND BICYCLING IN CLOVIS TODAY

Existing Conditions

The climate and geography in Clovis are well-suited for walking, bicycling, and rolling (using assisted mobility devices, e-scooters, skateboards, and other wheeled modes). Paseos and canal banks present opportunities for separated connections and high trail use suggests that many are already walking and bicycling for recreation. However, commute patterns and crash data point to a need for safer, more comfortable facilities to encourage widespread adoption of these modes for transportation.

While Clovis already provides an extensive network of bicycle and pedestrian infrastructure, this Plan identifies opportunities to improve existing facilities and build new facilities in such a way that bicycle and pedestrian users are more prominently considered in the design. Arterials and collector streets consist largely of wide, multilane roadways. These conditions tend to encourage faster vehicular speeds which make walking and biking less secure and appealing options. Because they are designed to efficiently move large volumes of vehicular traffic, many of these streets also have limited pedestrian crossing opportunities. An analysis of crash data confirms some of these trends and indicates that severe injuries or fatalities disproportionately impact pedestrians and bicyclists, compared to other road users.

Active Transportation and Public Transit

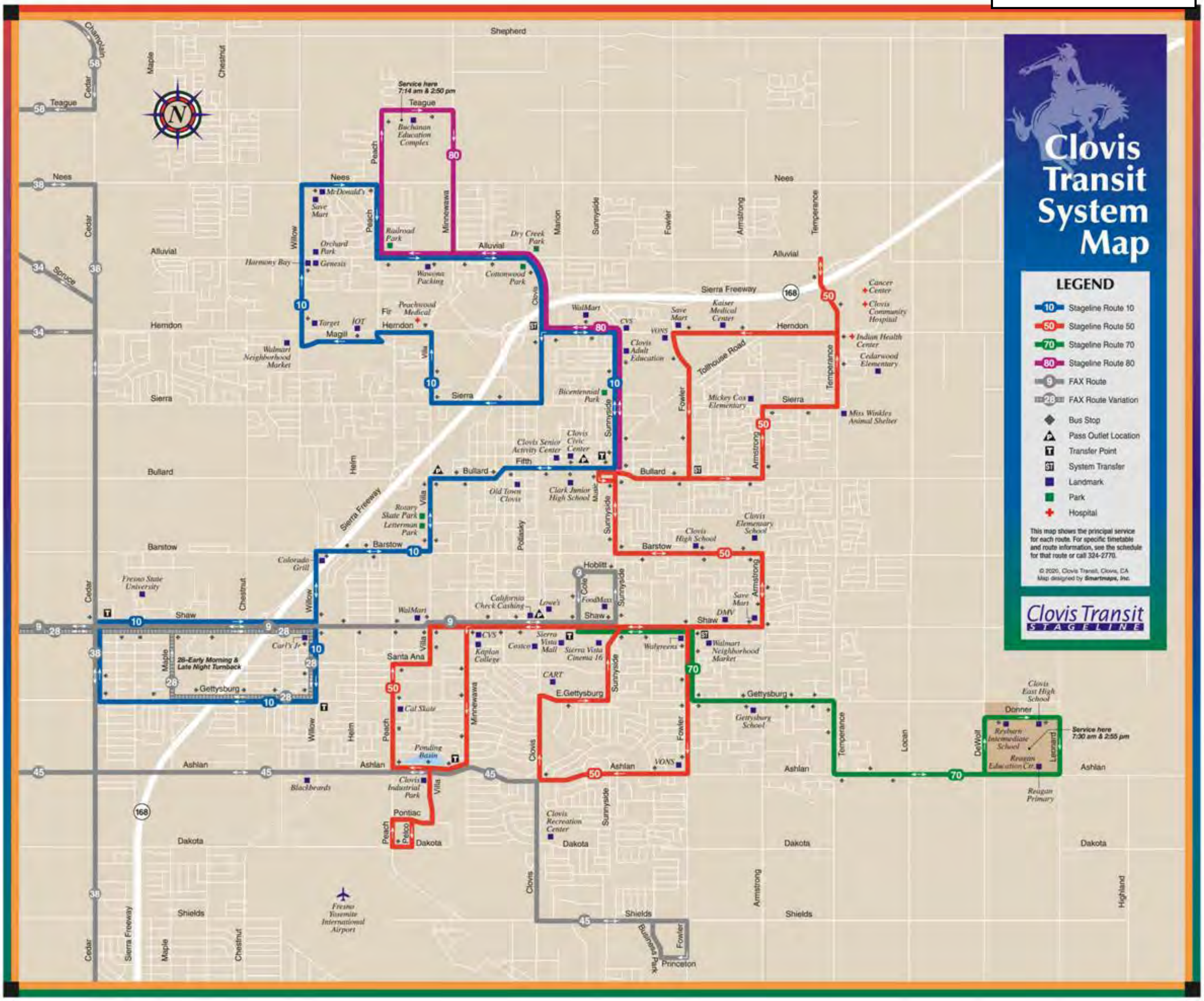
Transit and active transportation mutually reinforce each other. Buses provide convenient transportation options that can be combined with walking and biking trips, while active transportation facilitates first and last-mile connections, enhancing the efficiency and sustainability of the overall system. Public transportation boosts the geographic reach of walking and bicycling.

On-street bicycle facilities consist primarily of Class II bicycle lanes, located in most areas of the City. Off-street bicycle facilities include trails, paseos[1], and sidewalks. The City has 12.5 miles of off-street trails and many more miles of paseos that provide protected spaces for people of all ages to walk and ride a bicycle. Most streets have sidewalks on both sides of the street, but there are some areas that lack a continuous sidewalk network. Within residential areas, the prevalence of dead-ends and cul-de-sacs create barriers to walking and biking, even if destinations are nearby.

The population of Clovis is projected to grow by 14 percent in the the next five years, nearly double the projected growth for Fresno County or California. 41 percent of the population is either under 18 or over 65, representing populations less likely to have access to a

[1] Paseos are trails that provide connections for walking, bicycling, and rolling within neighborhoods.

Map 1: Transit Routes and Stops



vehicle and are more likely to rely on walking, bicycling, or public transit to travel around town.

There are four fixed-service bus routes in Clovis and the City also operates an on-demand paratransit service (refer to Map 1). In the 2019-2020 Fiscal Year the fixed-route service provided 112,478 rides and the paratransit service provided 50,384 rides. Fixed-service bus routes are free to passengers and can accommodate two bicycles at a time.

Existing Facilities to Support Bicycling

Clovis has approximately 55 miles of Class II Bike Lanes.[2] Class II Bike Lanes are located on major arterials and collectors, like the example shown in Figure 3. While the City has made substantial progress in expanding its bike network, many of these facilities are on roads with high vehicular traffic volumes and posted speeds greater than 40 mph and thus may not provide comfortable riding conditions for most people. The network of bicycle facilities is supported by trails and paseos, which provide off-street, concrete and asphalt paths for bicycling, walking, and rolling.

Existing Trails and Paseos

Clovis trails provide a comfortable, low-traffic, low-speed bicycling facility for people who may feel uncomfortable bicycling on the street in mixed traffic, or on bike lanes without physical separation between people bicycling and people driving. Trails also serve

Figure 3: An existing Class II Bike Lane on Gettysburg Avenue

pedestrian needs as off-street walking facilities. The City has the opportunity to enhance its trail network by upgrading infrastructure at major road crossings.

Clovis has a network of paseos in the southeast part of the city, as well as planned connections between existing paseos in the northeast and northwest areas. Community members can walk or bike along paseos in Clovis. See Map 2 on the next page for existing trails and bicycle lanes.

Major Class I Trails include Dry Creek Trail, Old Town Trail, Enterprise Trail, and the Sierra Gateway Trail. See Table 1 for the 2020 total user counts for these trails. Off-street trail facilities are well used in Clovis. From 2017 to 2020, annual trail use increased by 72 percent.[3]

Table 1: Trail/Paseo User Counts

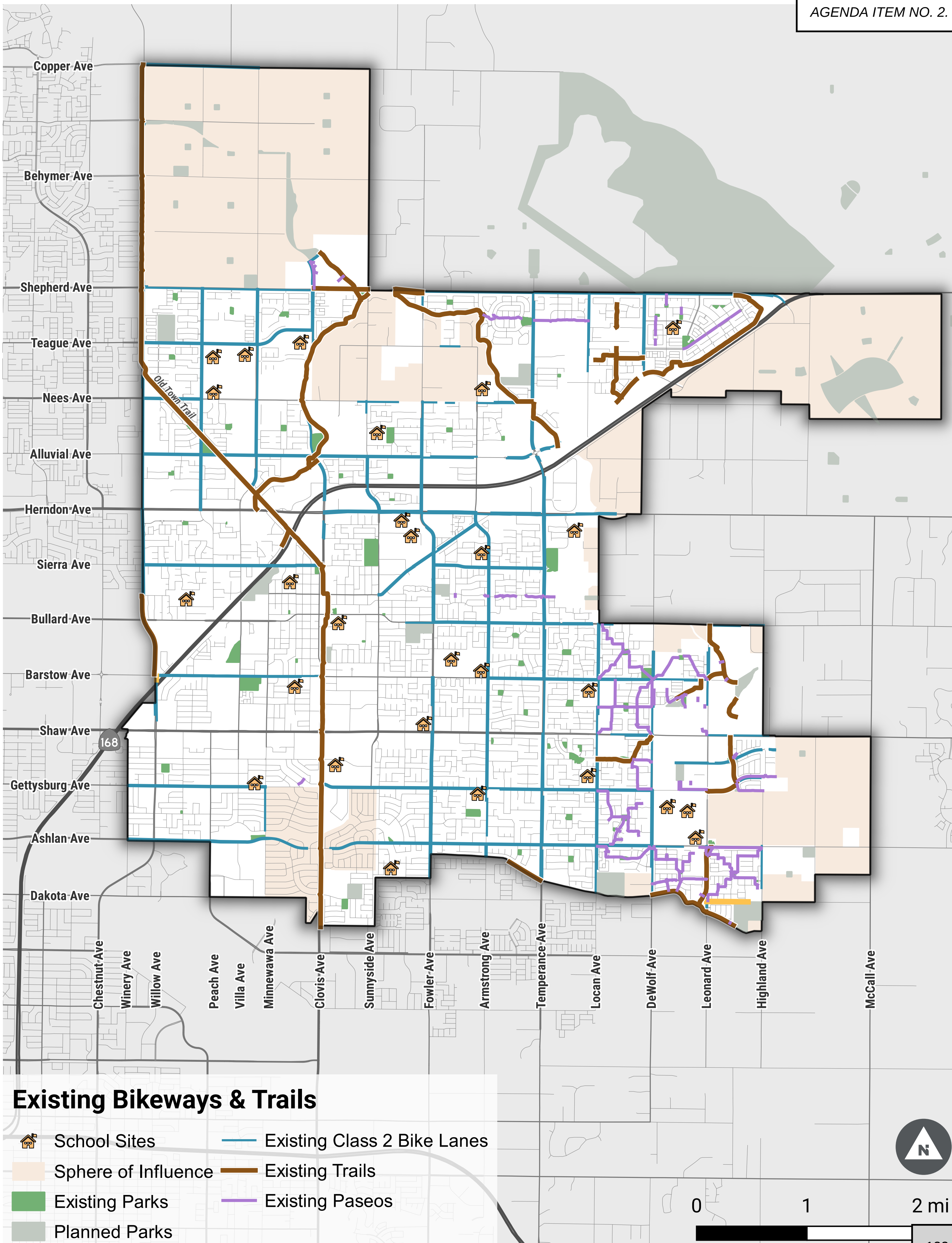
Trail	2020 Average Daily Use	2020 Average Annual Use
Old Town Trail, at Willow/Nees	668	787,014
Dry Creek Trail, at Trailhead	858	1,283,655
Enterprise Trail, at Basin	410	403,372
Sierra Gateway Trail, at Sanders and Muse	339	315,783
Total	**2,275**	**3,004,607**

Source: City of Clovis

2 55 miles represents the total lane mileage of streets with bike lanes on at least one side of the street. This means that there may be up to 110 miles of bike lanes in Clovis when counting facilities on each side of the street as separate facilities. However, it is important to note that not all streets have bike lanes on both sides of the street.

3 Source: City of Clovis

Map 2: Existing Bicycle Facilities in Clovis



Existing Facilities to Support Walking

Clovis has an extensive existing network of pedestrian facilities, including the growing network of trails and paseos, as discussed previously. Most streets have sidewalks on both sides of the street. However, there are still some areas missing sidewalks (Figure 4), particularly among the recently incorporated areas of Clovis, which had previously been developed under unincorporated County area design guidelines. Pedestrian connectivity would also be improved by installing additional crossings on major roadways. Along many arterials, people walking must travel a quarter mile or more to cross the street at a marked crosswalk.

Many arterials have multiple lanes, which elongates crossing times for pedestrians and, at unsignalized crossings, can increase exposure to traffic. At some crossings, there is also a lack of infrastructure, such as high-visibility crosswalks, advance stop bars for motor vehicles, and median refuge islands that can make crossings safer and more comfortable for people walking.

Some parts of Clovis have a disconnected local street network (e.g. residential developments with lots of dead-ends and cul-de-sacs), which can make walking, bicycling, and rolling less direct and convenient for accessing destinations. Streets that provide key connections between neighborhoods and to frequented destinations are often arterial streets with high volumes of vehicular traffic and high posted speeds.

See Map 3 on the next page for existing sidewalks in Clovis.

Figure 4: There is a Gap in the Sidewalk Network on the South Side of East Herndon Avenue between North Willow Avenue and North Peach Avenue

Map 3: Existing Sidewalk Facilities on Public Streets

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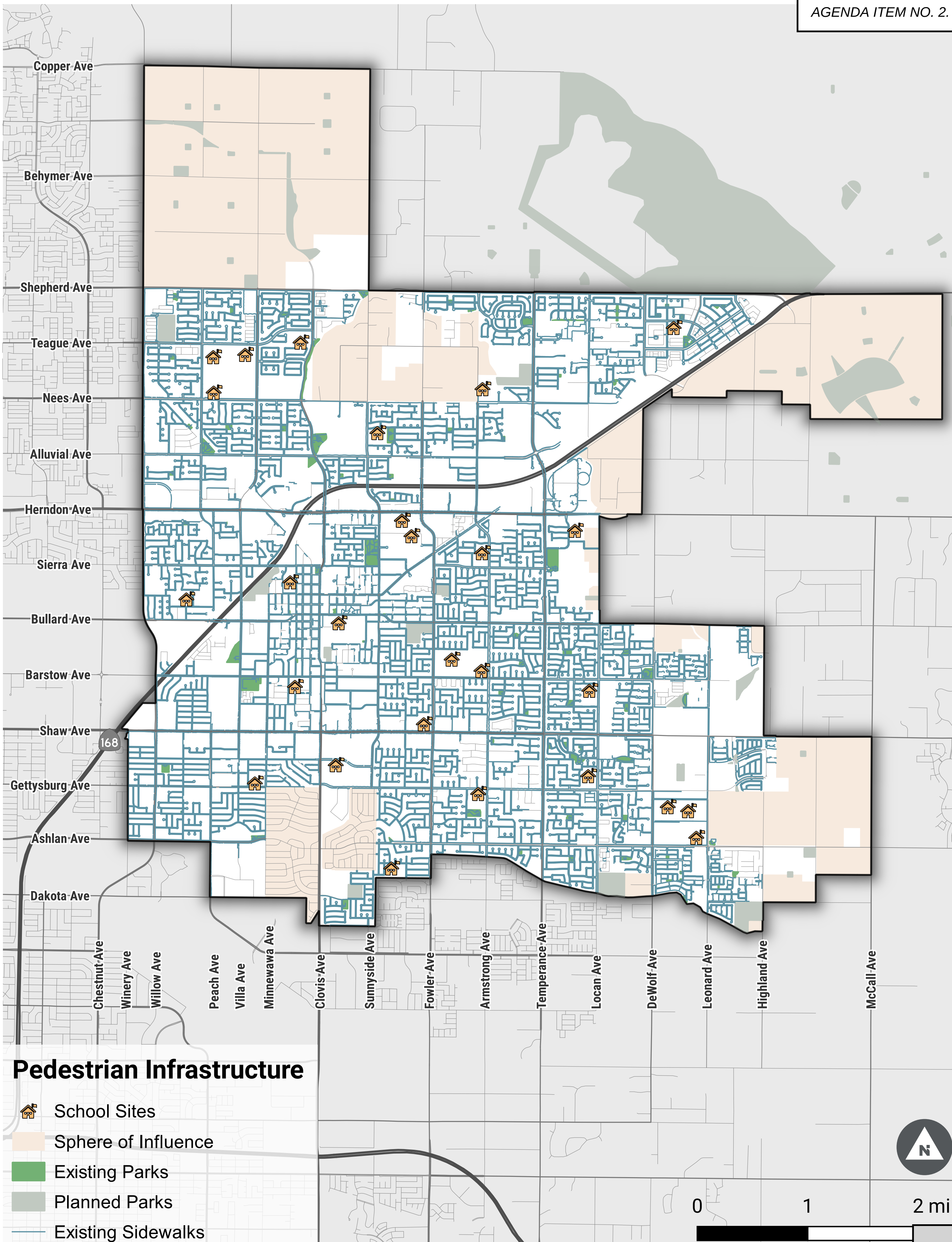
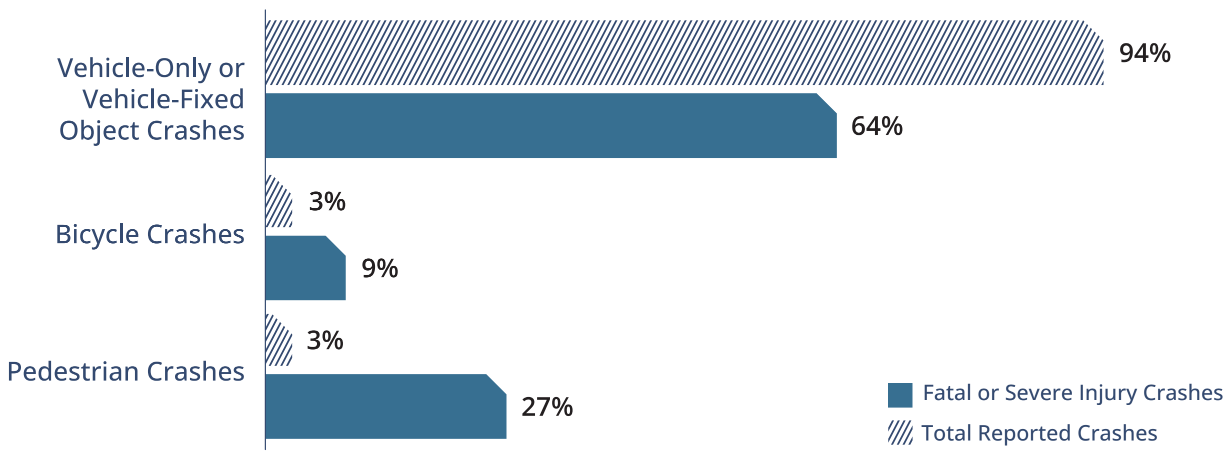


Safety Trends Among People Walking and Bicycling

This Plan analyzed road safety using data from police crash reports retrieved from the Statewide Integrated Traffic Records System (SWITRS). This data shows that, between 2015 and 2019, 3,507 crashes occurred in Clovis. Of those crashes, 6 percent involved people walking or biking. In total, there were 118 crashes involving people bicycling and 90 crashes involving people walking. Of the total number of fatal crashes (10), half involved people walking or bicycling. Among crashes that resulted in a severe injury, one third involved pedestrians (24 percent) or bicyclists (9 percent).

These statistics demonstrate that people walking and bicycling are overrepresented in fatal and severe injury crashes compared to people traveling in motor vehicles. See Figure 5 for a comparison of crash trends among pedestrian, bicycle, and vehicle crashes. Clovis also has a higher share of fatal or severe-injury crashes involving people walking or bicycling (24 percent) than the statewide average (36 percent), according to SWITRS.[4]

Figure 5: Crash Trends in Clovis, 2015 – 2019



Source: Statewide Integrated Traffic Records System, Transportation Injury Mapping System, Kittelson, 2021.

Table 2: Crash Severity by Road User Involved

Road Users Involved	Fatal (% of column)	Severe Injury (% of column)	Visible Injury (% of column)	Complaint of Pain (% of column)	Property Damage Only (% of column)	Total (% of column)
Pedestrian involved	4 (40%)	11 (24%)	25 (9%)	41 (4%)	9 (1%)	90 (3%)
Bicycle involved	1 (10%)	4 (9%)	31 (11%)	59 (6%)	23 (1%)	118 (3%)
Vehicle only or vehicle-fixed object	5 (50%)	31 (67%)	221 (80%)	941 (90%)	2,101 (98%)	3,299 (94%)
Total Reported Collisions	**10 (100%)**	**46 (100%)**	**277 (100%)**	**1,041 (100%)**	**2,133 (100%)**	**3,507 (100%)**

Source: Statewide Integrated Traffic Records System, Transportation Injury Mapping System, Kittelson, 2021.

[4] Fresno Council of Governments. (2022). Multijurisdictional Local Road Safety Plan.

Bicycle Crash Patterns

Between 2015 and 2019, there were 118 crashes involving people bicycling, including one fatality and four severe injuries. See Table 3 for a breakdown of crashes involving people bicycling. Bicyclists were involved in three percent of all reported crashes but nine percent of fatal or severe injury crashes. The most frequently cited primary collision factor was wrong-side-of-the-road driving/riding (36 percent of crashes), followed by drivers turning failing to yield right of way to oncoming traffic (21 percent of crashes), and running a red light or failure to stop at a stop sign (18 percent). Seventy-one percent of crashes involving people bicycling occurred in daylight and 29 percent occurred during dark conditions where streetlights were present. Most crashes involving people bicycling occurred on major streets in the southwest Clovis area. See Map 4 on the next page for the locations of crashes involving people bicycling.

Pedestrian Crash Patterns

Between 2015 and 2019, people walking were involved in three percent of reported crashes which constitutes 27 percent of fatal or severe injury crashes. Sixteen percent of crashes involving people walking resulted in a fatal or severe injury (see Table 4). Among crashes involving people walking, 41 percent occurred while pedestrians were crossing midblock (outside of a crosswalk), 28 percent occurred while pedestrians crossed in a crosswalk at an intersection, and 14 percent occurred while pedestrians were walking along the road (includes shoulders). Approximately 42 percent of crashes involving people walking occurred in the daylight and 30 percent occurred during dark conditions where streetlights were present. Most crashes involving people walking occurred on major streets in southwest Clovis. This suggests the need for improved walking infrastructure along major roadways. See Map 4 on the next page for the locations of crashes involving people walking.

Table 3: Crashes Involving Bicyclists

Type of Crash	Count	Percentage
Fatal	1	1%
Severe Injury	4	3%
Visible Injury	31	26%
Complaint of Pain	59	50%
Property Damage Only	23	19%
Total	**118**	**100%**

Source: Statewide Integrated Traffic Records System, 2015-2019, Kittelson, 2021.

Table 4: Crashes Involving Pedestrians

Type of Crash	Count	Percentage
Fatal	4	*4%*
Severe Injury	11	*12%*
Visible Injury	25	*28%*
Complaint of Pain	41	*46%*
Property Damage Only	9	*10%*
Total	**90**	**100%**

Source: Statewide Integrated Traffic Records System, 2015-2019, Kittelson, 2021.

Map 4: Pedestrian and Bicycle Crashes, 2015-2019

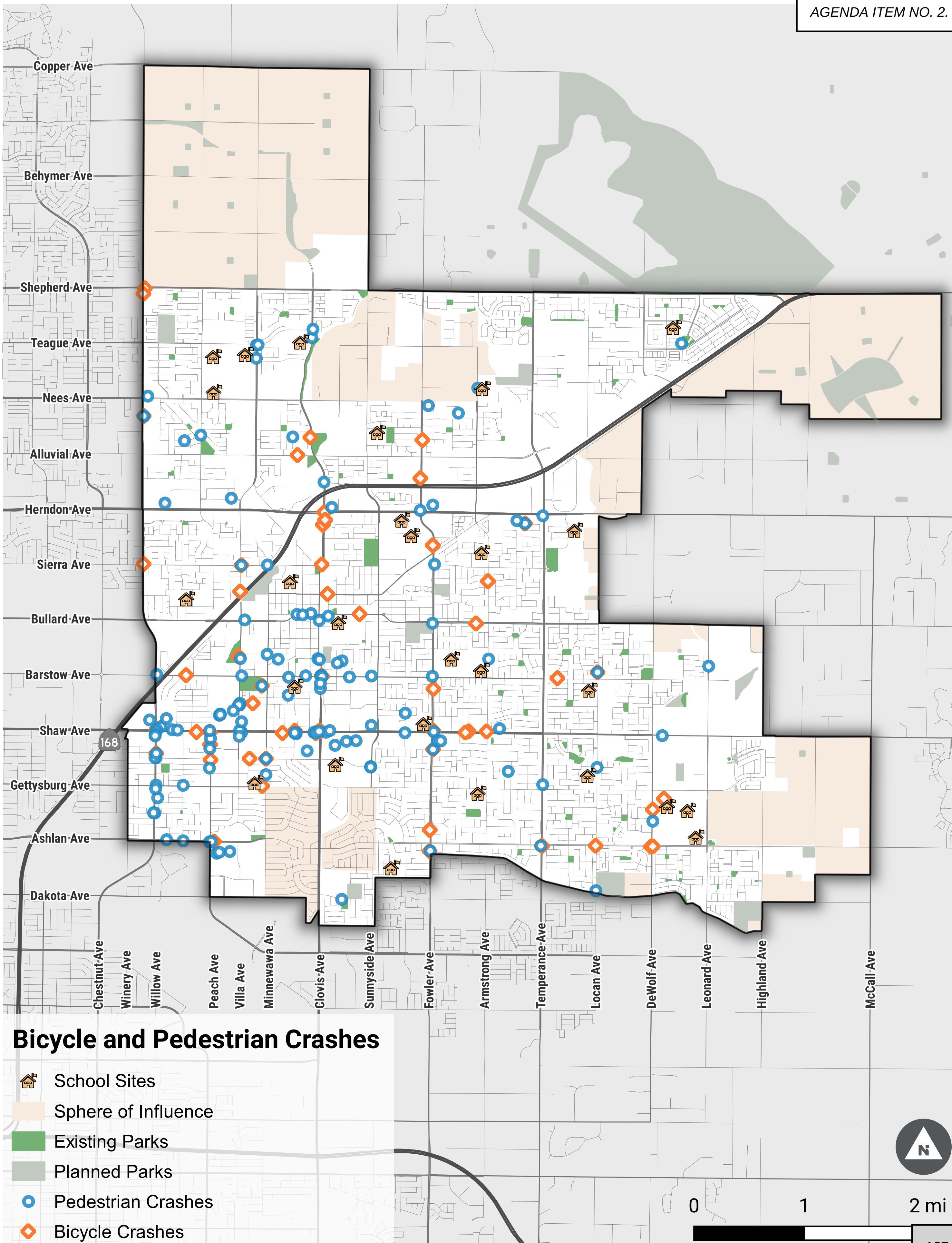


Figure 6: The relationship between vehicle speed and the risk of fatality or severe injury for a pedestrian

Source: Tefft, Brian. (2013). Impact speed and a pedestrian's risk of severe injury or death. AAA Foundation for Traffic Safety.

Disclaimer: Vehicle weights have increased since the publication of this study, which means that they are likely more deadly today than they were in 2013.

Speed

Vehicle speeds have a major effect on the comfort and safety of people walking, bicycling, and rolling. As vehicle speed increases, the risk of a pedestrian or bicyclist experiencing a severe or fatal injury increases greatly. Figure 6 shows the relationship between motor vehicle impact speed and pedestrian risk of injury if involved in a crash. For this reason, addressing high speeds could have a significant impact on reducing the number of fatal or severe injuries for people walking, bicycling, and rolling.

Posted travel speeds in Clovis range from 25 miles per hour to 50 miles per hour. Most arterial and collector streets have posted speeds of 40 or 45 miles per hour. Among arterials, only four blocks within the City of Clovis have posted speeds below 30 miles per hour. Map 5 shows posted speeds along arterials in Clovis.

State and Regional Efforts to Improve Safety in Clovis

Local Road Safety Plans

The planning process for the Clovis Active Transportation Plan Update occurred in parallel to the Multijurisdictional Local Road Safety Plan (MLRSP) led by the Fresno Council of Governments. The MLRSP provides an evaluation of the safety performance of local roads, identifies high priority locations based on crash severity, and recommends a series of infrastructure and programmatic strategies to improve safety in Clovis and Fresno County. The recommendations in this Plan support local and regional efforts to improve safety for people walking or bicycling.

Findings from the MLRSP for the City of Clovis indicate that "unsafe speed"[5] was the primary collision factor for 26 percent of total reported crashes among crashes involving all road users. Among fatal/several injury crashes, unsafe speed accounted for 13 percent of the primary collision factor amongst all collisions, third behind pedestrian violations and driving or bicycling under the influence of alcohol or drugs. Even drivers traveling under the speed limit pose an elevated risk to people walking and biking where speed limits are higher, bicyclists and pedestrians lack adequate separation, and insufficient opportunities to safely cross the street (see Figure 6). Pedestrian and bicycle crashes were identified as an emphasis area in the MLRSP, along with broadside crashes, hit object crashes, unsafe speed, and driving under the influence.

Public outreach completed as part of the MLRSP identified the following top safety concerns from 93 community members who live or work in Clovis and provided input on an online map:

- Many unsafe places to walk, bike, or take the bus
- Lack of safe crossings

[5] Unsafe speed refers to drivers who travel above the speed limit.

Changes to California Speed Limit Legislation

Reducing motor vehicle speeds can be accomplished through physical infrastructure treatments that encourage people to travel slower and through changes to the posted speed limit. Posted speed limit changes can be implemented along a specific corridor or segment of a roadway, as a pilot program, or through citywide policy changes. The City will review other infrastructure treatments to slow motor vehicle speeds on a case-by-case basis, based on industry standards.

Beginning July 30, 2024, Assembly Bill 43 (AB-43) will take effect and provide municipalities in California with new opportunities to reduce posted speeds. This law grants local jurisdictions the flexibility to set speed limits based on the context and needs within their own communities. In doing so, cities will have the authority to quickly respond to traffic safety needs and create safer local conditions for people to walk, bike, ride transit, and travel. Prior to AB-43, city engineers could not lower the posted speed by more than five miles per hour as outlined in the Manual on Uniform Traffic Control Devices. AB-43 gives cities such as Clovis the authority to reduce speed limits by an additional five miles per hour without conducting a speed study. City engineers are allowed to reduce speeds along areas identified as "safety corridors", which include areas where engineers have found high incidents of traffic injuries or where high concentrations of people walking or bicycling are observed or anticipated. In addition, the law allows cities to set a standard speed limit of 20 or 25 miles per hour in business activity districts.

Los Angeles is an example of a city that took advantage of changes under AB-43 to align speed limits with safety goals. LADOT is in the process of reducing speeds by 5 miles per hour on over 177 miles of city streets where limits had previously been increased.

New Guidance on Speed Limits

Historically, guidance for setting speed limits has relied on the 85th percentile speed, or setting speed based on how fast 85 percent of vehicles travel on a road. This approach does not factor in people walking and bicycling, and therefore may not be applicable on many streets. New national guidance provides local jurisdictions with alternative methods for determining speed limits.

The Federal Highway Administration's USLIMITS2 is a free tool that helps local jurisdictions determine appropriate speeds on a variety of road types (not including streets within school zones or construction zones). USLIMITS2 considers factors such as the presence of walking and bicycling activity, operating speed (50th and 85th percentile), traffic volumes, roadway characteristics and topography, the land use, crashes and injuries, and the presence of on-street parking.

The National Association of City Transportation Officials (NACTO) guide, City Limits, provides guidance for setting speed limits on urban streets based on Conflict Density and Activity Level. It also provides details on three separate approaches for setting context-appropriate speed limits:

- Setting Default Speed Limits to apply to an entire defined area
- Designating Slow Zones in sensitive areas, such as near schools or parks
- Setting Corridor Speed Limits specifically applicable to major roads or high-crash corridors

Promoting safer speeds is also a fundamental element of USDOT's Safe Systems Approach. The agency identified Appropriate Speed Limits for All Road Users as one of its Proven Safety Countermeasures.

Map 5: Traffic Signals and Speed Limits along Arterial and Collector Streets in Clovis

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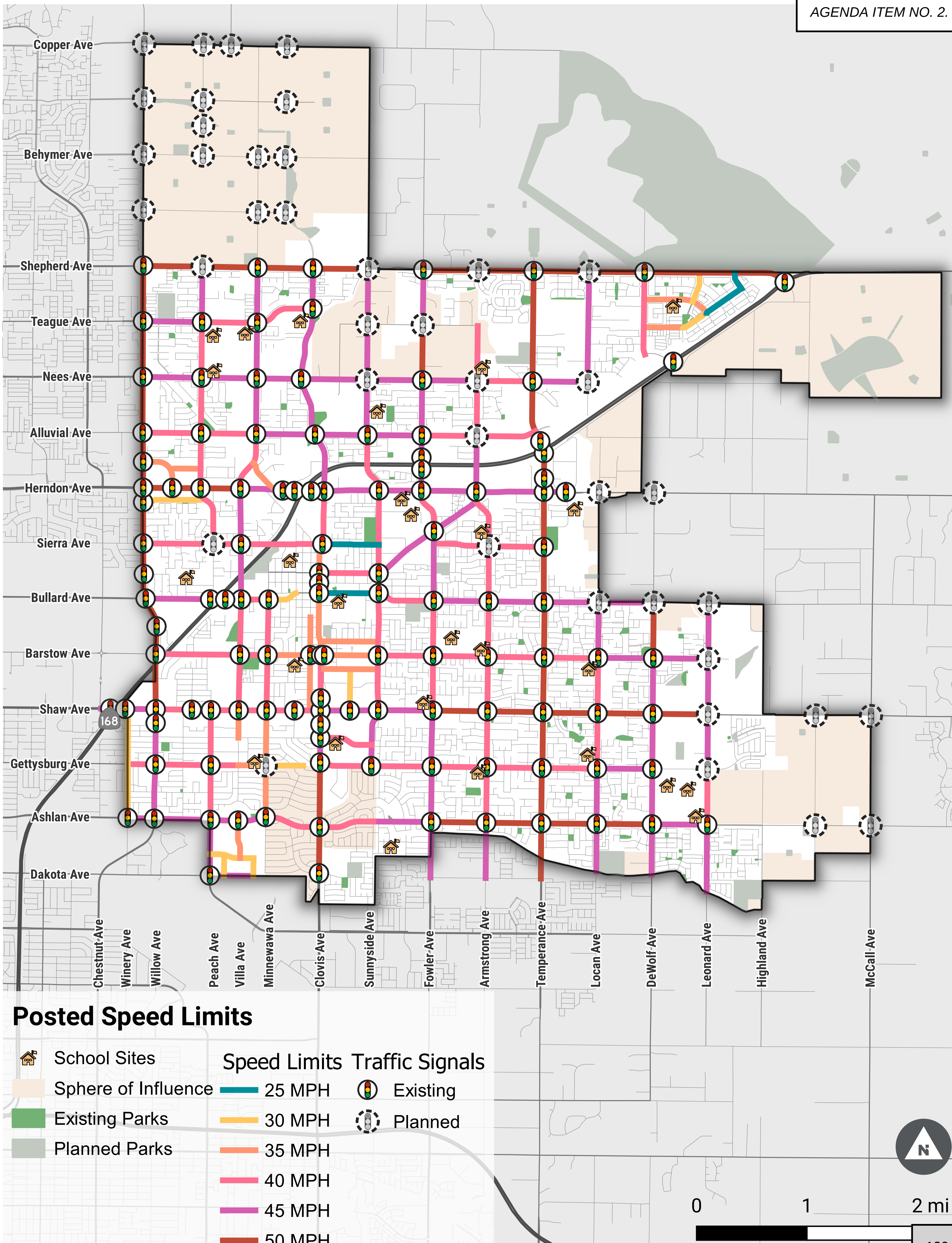

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03

BICYCLE NETWORK

Recommendations Overview

The proposed bicycle network prioritizes connectivity improvements that will help the City of Clovis achieve the vision and goals set forth by the Clovis Active Transportation Plan Update (Plan). The network was developed using input from City staff, community feedback on the online map, focus groups, and a community open house. For more information about community feedback, see Appendix C.

The network presented below aligns with the recommendations in the Multi-jurisdictional Local Road Safety Plan which identified the following recommendations for Clovis:

- Install bike lanes,
- Install bike lane extensions through intersections, and
- Install bike boxes.[6]

Table 6 below presents the mileage of bicycle facility types for existing and proposed bikeways. Map 6 presents existing and proposed bike facilities. Bike facility recommendations presented in Map 6 include facilities in the City of Clovis and Fresno County, where applicable. Facilities in County islands—areas of unincorporated Fresno County surrounded by the City of Clovis—will need to be built to provide a connected network for people bicycling in Clovis. These projects will require partnerships with Fresno County to develop, and are not included in the bicycle project list identified for this Plan. Some of the projects identified in County Islands are not identified in Fresno Council of Government's Regional Active Transportation Plan (2018), however, these projects would improve network connectivity for people living in, or traveling through, Clovis.

The City of Clovis will also work in collaboration with the City and County of Fresno to pinpoint opportunities for connectivity between systems, including bike lanes and Class I trails. These connection points will play a critical role for users of the system, ensuring they can safely and efficently access destinations within Clovis and surrounding areas.

Figure 7: Dedicated Bicycle Facilities Can Improve Safety and Comfort for People Riding

[6] Bike boxes will only be used in specific situations where analysis determines they are appropriate.

The City will review all bike recommendations presented in Map 6 to assess feasibility prior to construction consideration. This is particularly important for recommendations such as Class II Buffered Bicycle Lanes which require additional roadway width but provide more separation between people bicycling and people driving. Installing Class II Buffered Bicycle Lanes may also require additional studies to determine whether parking or lane removal, if required, is feasible.

Additional studies may include speed studies, corridor studies, crash analyses, stormwater management studies, or others. Speed studies analyze the actual vehicular travel speeds and compare it to the posted speed. Corridor studies evaluate how a roadway is used in its relation to the surrounding land use. Crash analyses focus on crashes in a certain intersections, corridors, or citywide, to identify needed safety improvements. Stormwater management studies evaluate multiple aspects of stormwater, including the impact of impervious surface area, such as roadway changes, on the flow and filtration of stormwater as it seeps back into the water system.

In addition to Bicycle Lanes and Trails, the proposed network also includes a new typology of bikeway for the City of Clovis: Neighborhood Greenways. Neighborhood Greenways, sometimes referred to as "Bicycle Boulevards", are local streets designated and designed to prioritize bicycle use. They use signs, pavement markings, traffic calming, and other design elements to discourage through trips by motor vehicles while still enabling access for local users. Streets designated as Neighborhood Greenways should have fewer than 3,000 motor vehicles per day and an 85th percentile speed of 25 miles per hour or less. Traffic calming measures such as speed humps, traffic circles, or curb extensions may be used to control speeds and reduce cut-through traffic. Where Neighborhood Greenways cross major streets, crossing treatments may be needed to create a safe and comfortable experience. These may include supplemental signs and markings (e.g. crosswalks and advance stop bars), median refuge islands, flashing beacons, or hybrid beacons.

Table 5: Mileage of the Existing and Proposed Bicycle Network by Facility Type

Facility Type	Existing (miles)	Proposed (miles)	Total (miles)
Trail (Class I)	23	27	50
Paseos	14	8	22
Bicycle Lane (Class II)	59	58	117
Buffered Bicycle Lane (Class II)	0	27	27
Neighborhood Greenway (Class III)	0	4	4
Bicycle Route (Class III)	0	7	7
Total	**96**	**131**	**227**

Note: Bikeway mileage in terms of street centerline mileage; does not differentiate between streets with bikeways on one or both sides.

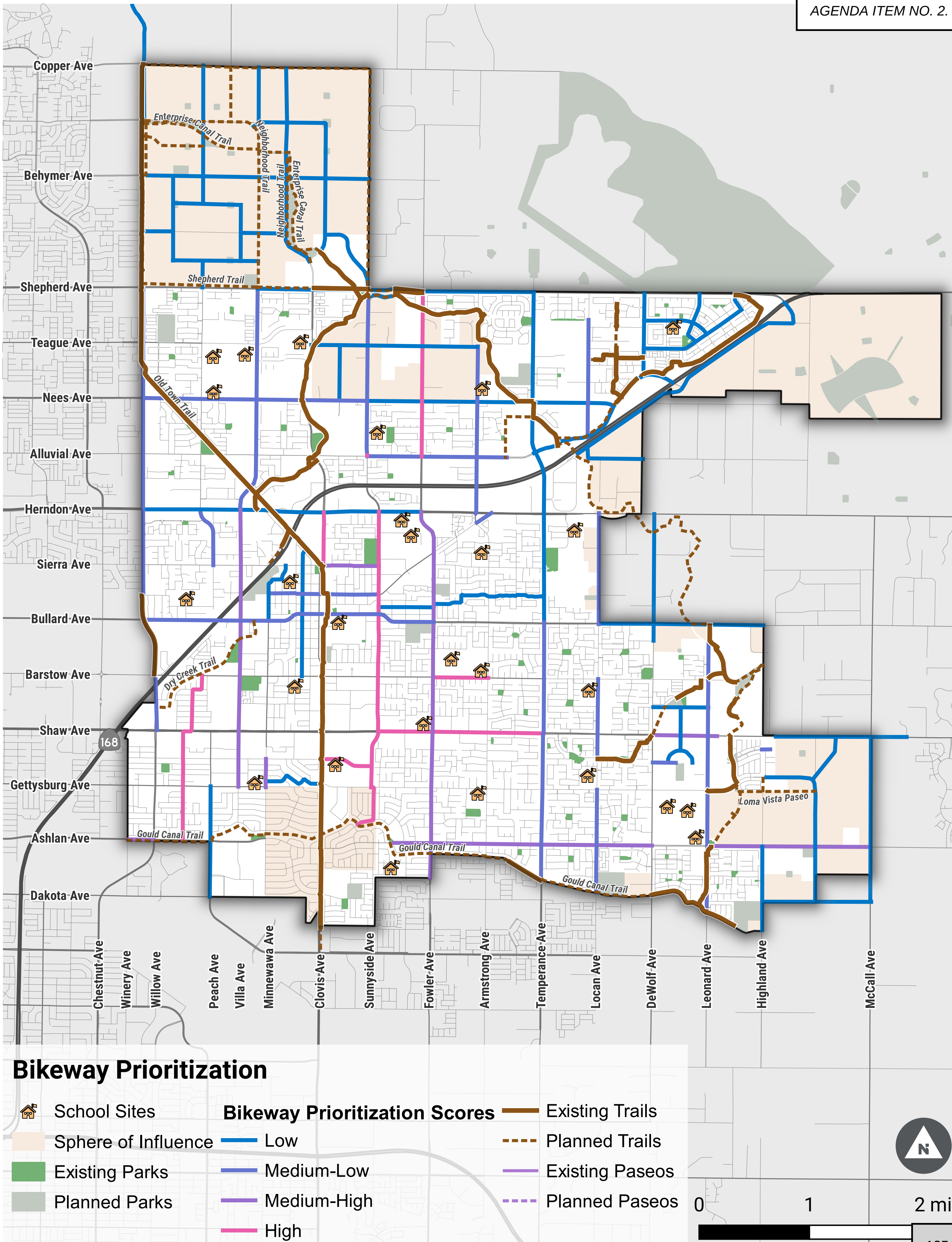
For recommended and existing bicycle facilities, maintenance is vital to encourage continued use. Maintenance tasks, such as addressing foliage infringement, debris removal, and re-striping where needed, can signal from the City the value of bicycling and the bicycle network.

Refer to Appendix A for a detailed list of prioritized bicycle facilities projects.

Figure 8: Neighborhood Greenway, Emeryville, CA

Figure 9: Neighborhood Greenway, Portland, OR

Map 6: Recommended Bicycle Network



Comfort Levels Among Different Types of Bicyclists

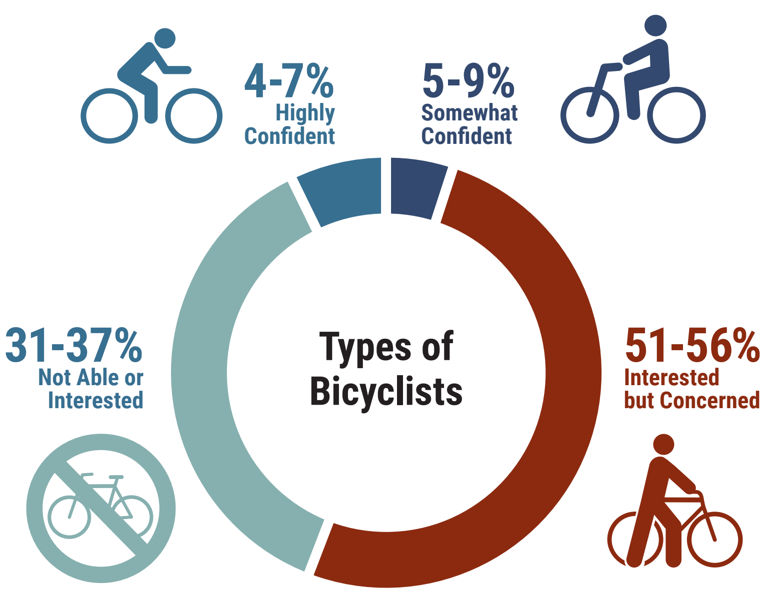
When planning and designing bikeways, it is important to recognize that not all people bicycling feel comfortable on every type of bikeway. A bicycle network that addresses the needs of all types of bicyclists is comprised of low-stress bikeways that are connected, comfortable, and appealing to both new and experienced bicyclists of all ages.

Four Types of Bicyclists

National research indicates that bicyclists are better understood as being part of a spectrum (see Figure 10).[7] On one end of the spectrum are people who are comfortable riding with traffic in almost any condition; on the other end are people who might not bike at all if bikeways are not comfortable enough for them. In Figure 10, the four types of bicyclists are defined as follows:

- **Highly confident** bicyclists will ride in any road conditions or environment. These types of bicyclists include adults who regularly commute by bicycle and bicyclists who are willing to ride on roads with little to no dedicated bicycle infrastructure.
- **Somewhat confident** bicyclists will ride comfortably on most types of streets, but may be uncomfortable in certain situations or some road conditions.
- **Interested but concerned** bicyclists require physical bicycle infrastructure improvements before they will want to ride. They typically do not feel comfortable sharing the lane with motor vehicles or riding adjacent to high-speed and high-volume traffic. This group represents the largest share of the population and typically includes children, the elderly, and non-regular adult bicyclists. These riders prefer off-street bicycle facilities or bicycling on low-speed, low-volume streets.
- **Not able or interested**, refers to be people who will not (or cannot) ride a bicycle, no matter the circumstance.

Figure 10: The Four Types of Bicyclists



Highly Confident bicyclist will ride in any road conditions or environment. These types of bicyclists include adults who regularly commute by bicycle and bicyclists who are willing to ride on roads with little to no dedicated bicycle infrastructure.

Somewhat Confident bicyclists will ride comfortably on most types of streets, but may be uncomfortable in certain situations or road conditions.

Interested but Concerned bicyclists require physical bicyle infrastructure improvements before they will want to ride. They typically do not feel comfortable sharing the lane with motor vehicles or riding adjacent to high-speed and high-volume traffic. This group represent the largest segment of the population and typically includes children, the elderly, and non-regular adult bicyclists. These types of riders prefer off-street bicycle facilities or bicycling on low-speed low-volume streets.

People who identify as **Not Able or Interested** will not (or cannot) ride a bicycle. No matter the circumstances.

[7] Dill, Jennifer and Nathan McNeil. Revisiting the Four Types of Cyclists: Findings from a National Survey. In Transportation Research Record: Journal of the Transportation Research Board, Issue 2587, Washington, DC, 2016.

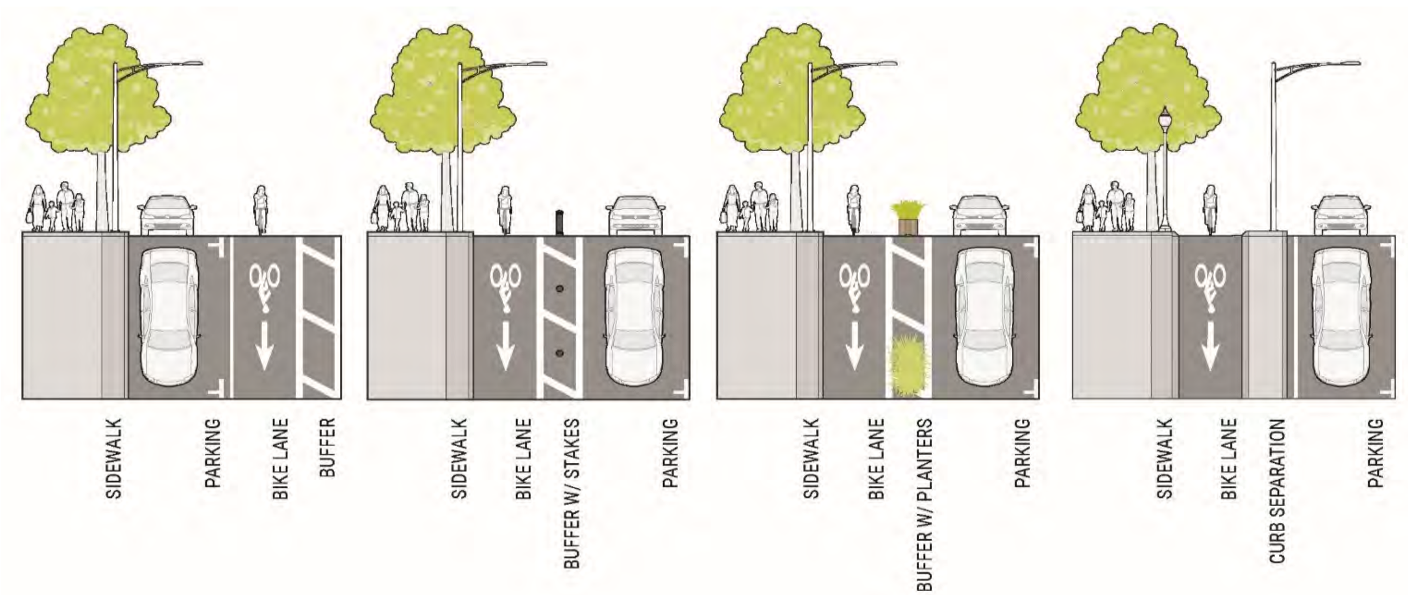
Long-Term Vision for Bicycling in Clovis

In the long term[8], the City will work to revise the recommended bicycle network and consider roadway and bikeway changes that include facilities suitable for all types of bicyclists, including "Interested but concerned" riders. This may include upgrading existing or recommended Class II Bike Lanes and Class II Buffered Bike Lanes to Class IV Separated Bike Lanes, where appropriate. Industry standard design guidelines can provide details to assist the City with installing Class II Buffered Bike Lanes, Class IV Separated Bike Lanes, and other bicycle facilities to improve safety and comfort for all types of bicyclists.

Figure 11 shows the progression of a bike lane from a Class II Buffered Bike Lane to a Class IV Separated Bike Lane. Cities often install Class IV Separated Bike Lanes as low-cost retrofit projects (e.g., using flex posts and paint within the existing right-of-way). More permanent forms of separation, such as curb-protected bike lanes, cost more and are less flexible once implemented. A phased implementation approach, where "pilot" projects transition to permanent separated bike lanes may be a useful approach for Clovis. A pilot approach will allow the City to implement these new facilities slowly and provide time to troubleshoot before permanent materials and high costs are necessary.

The City will also continue to develop its extensive network of Class I Trails, which provide a high comfort facility for users of all ages and abilities. These trails will also be further improved through the installation of mid-block crossings, which provide safe and convenient connectivity for trail users.

Figure 11: Evolution of a Class II Buffered Bicycle Lane to a Class IV Separated Bicycle Lane



8 Generally, "long term" refers to a length of time that is five to twenty years. "Short term" refers to under five years.

04

PEDESTRIAN NETWORK

Figure 12: High-visibility Crossings help Create a Safer and More Comfortable Pedestrian Network

Recommendations Overview

Recommended improvements to the Clovis pedestrian network were identified using a citywide sidewalk network gap analysis. This analysis identifies locations of existing sidewalks and sidewalk gaps within the city boundary.

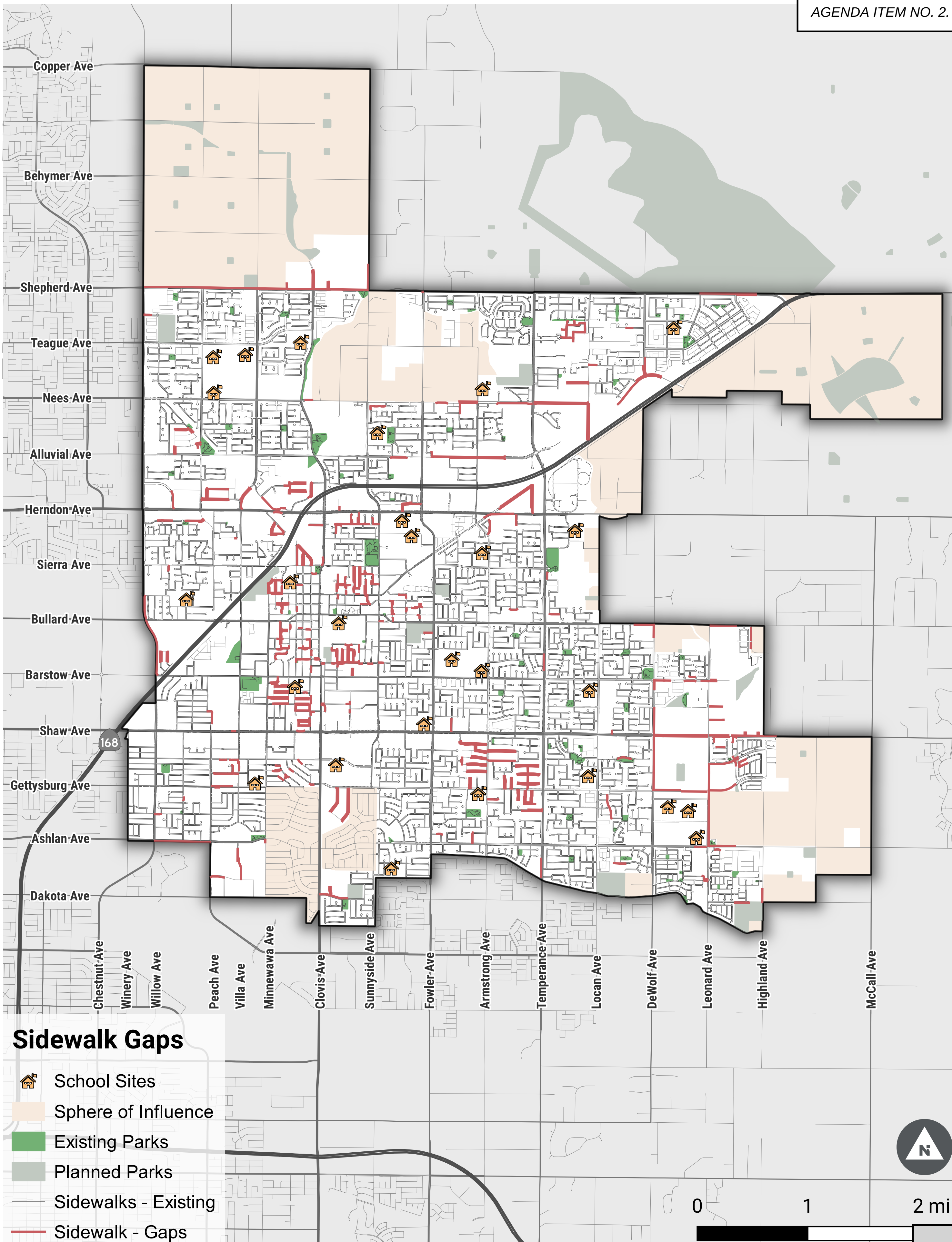
The sidewalk network presented below aligns with the recommendations in the Multi-jurisdictional Local Road Safety Plan (2022) which identified the following recommendations for Clovis:

- Install sidewalks or other pathways,
- Install and upgrade pedestrian crossings with enhanced features (such as in Figure 12),
- Install pedestrian countdown signal heads,
- Install pedestrian crossings, and
- Install raised medians and pedestrian refuge islands.

Map 7 shows the locations of existing and missing sidewalks. This analysis excluded identifying existing and missing sidewalks (called “gaps”) on industrial land, large apartment complexes, and private developments, where sidewalks are typically the responsiblity of the developer or not required. Locations in the city where sidewalk infill is needed are primarily located in southwest and southeast Clovis. No sidewalk data was available for areas in the Spheres of Influence or County Islands adjacent to the City of Clovis.

With recommended projects, as well as existing pedestrian facilities, maintaining the network is vital to encourage continued use. Maintenance tasks, such as vegetation management and debris removal, demonstrate the City’s commitment to walkability and an accessible pedestrian network.

Map 7: Existing and Missing Sidewalks



Trails and Paseos

Trails and paseos are important to both the bicycle and pedestrian networks, since they provide an off-street travel option through tree-lined linear parks. The City is dedicated to expanding its trail and paseo networks to provide more opportunities for the public to enjoy. To do this, the City is partnering with the Fresno Irrigation District to allow people to walk along irrigation canals. Map 7 on the following page shows existing and planned trails.

Mid-block Trail Crossings

The City of Clovis has identified several potential locations to install mid-block crossings to increase trail connectivity throughout Clovis. These locations will be further reviewed by City staff, in the future, to determine if a mid-block crossing is feasible. The City will also identify the type of crossing that should be installed based on the City's Guidance for Uncontrolled Crosswalk Treatments in place at that time.

Figure 13: Paseo connecting through Pasa Tiempo Park

Map 8: Existing and Planned Trails and paseos

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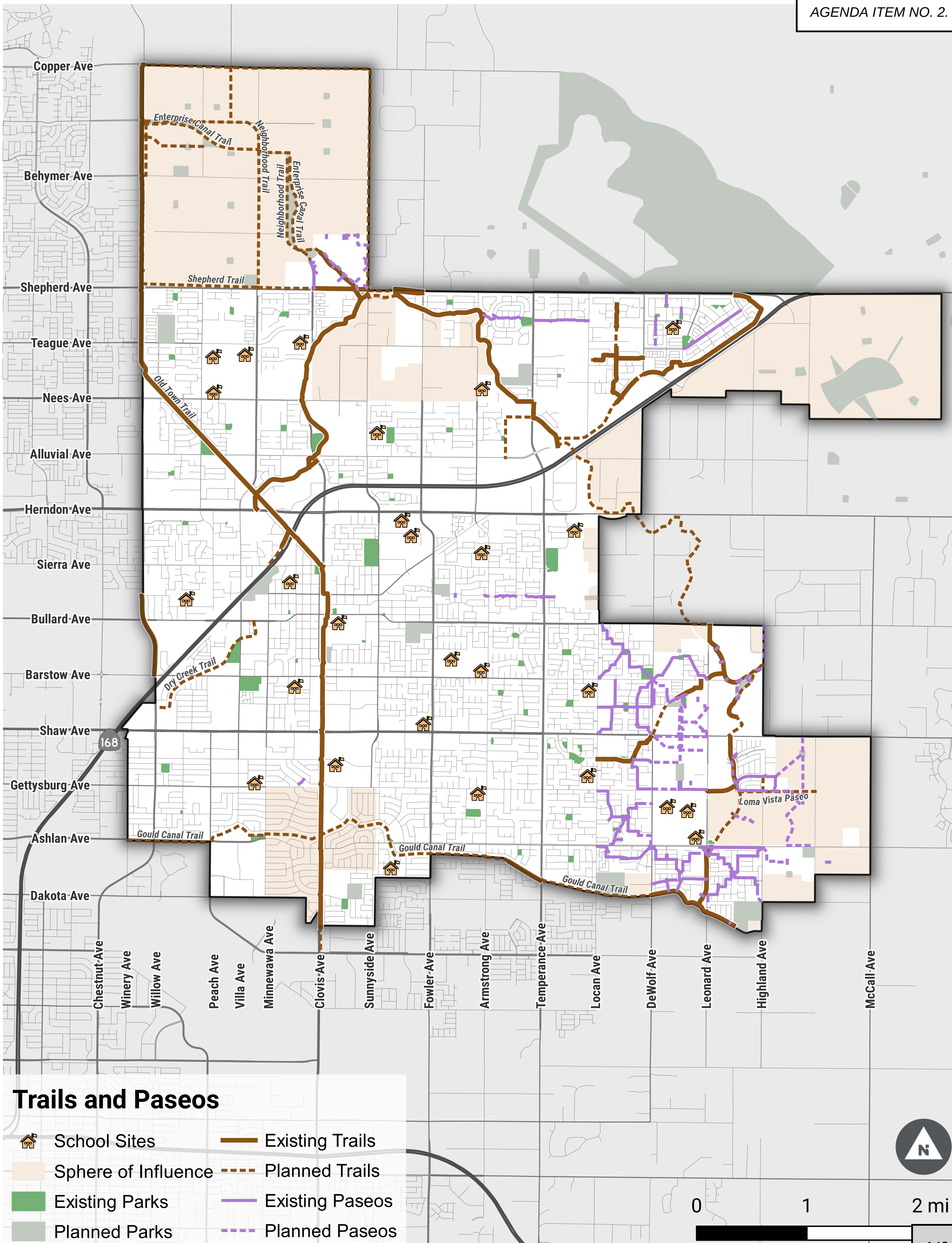
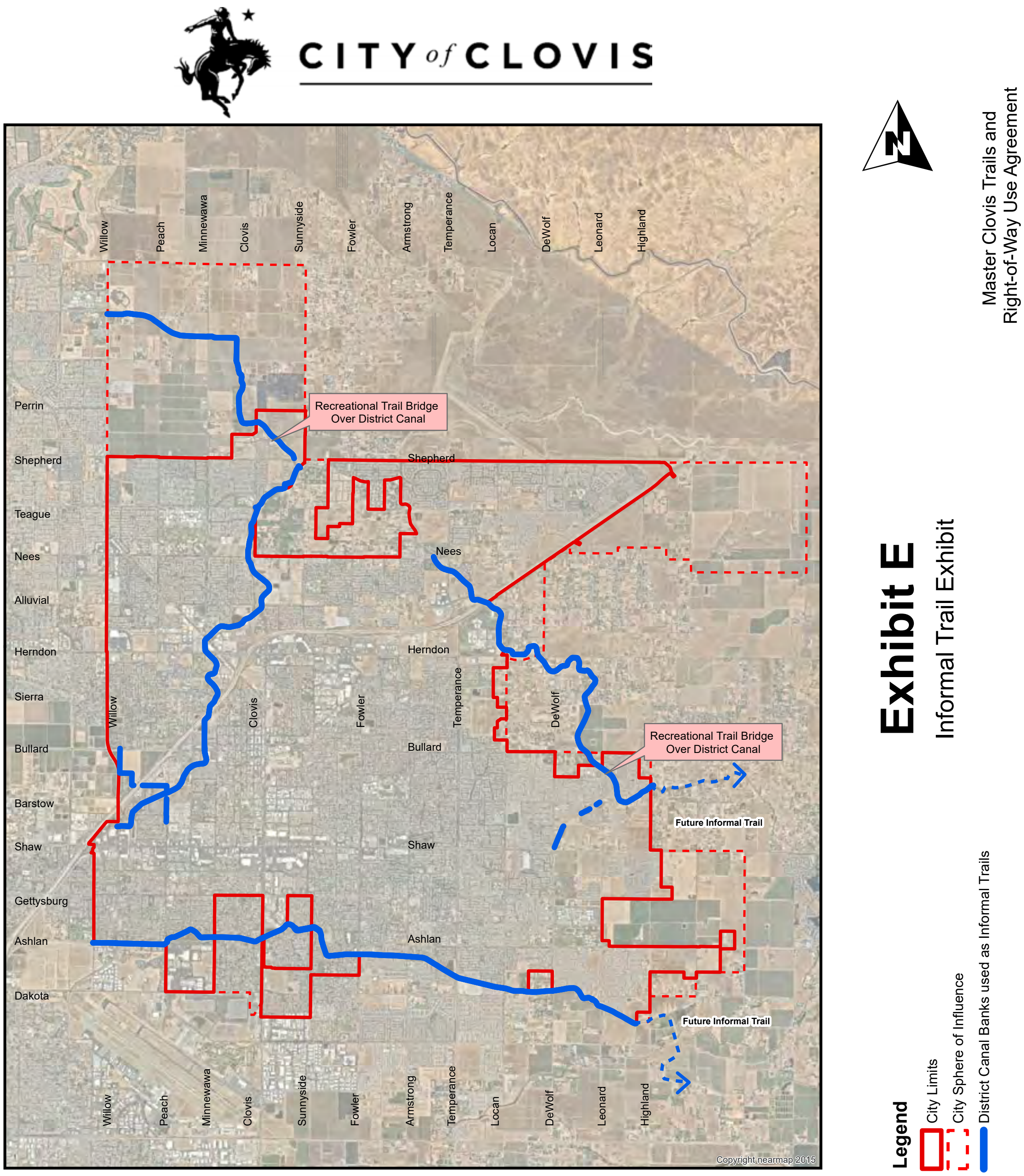


Trails and the Fresno Irrigation District

In 2022, the City of Clovis and the Fresno Irrigation District (FID) entered into an agreement to allow the embankments along FID canals to be used as informal trails.[9] This successful agreement has opened doors to growing Clovis' trail network by building relationships with agency partners. It will be particularly helpful in addressing trail network gaps in areas of Clovis that are already developed. Map 9 shows the canals under the jurisdiction of the FID to be used as informal trails.

Map 9: Map of canals under the jurisdiction of the Fresno Irrigation District



[9] Source: Master Trails Agreement with the Fresno Irrigation District.

05

SUPPORT PROGRAMS

Figure 14: Public Off-street Bicycle Parking (top) and On-street Bicycle Corral (bottom)

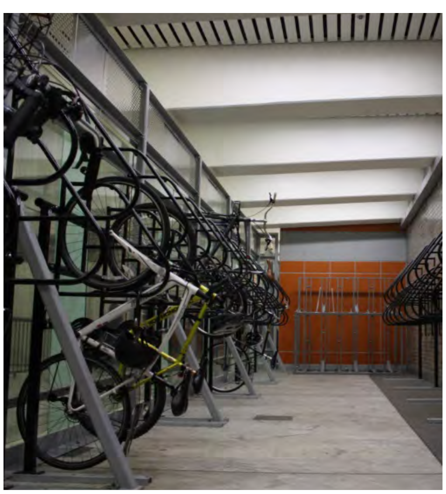
Programs that focus on safe travel behaviors and provide amenities that make it easier and more comfortable for people to walk and bike will help the City achieve the vision and goals presented in this Plan. This chapter describes a variety of programs that should be explored and implemented by the City of Clovis and partner agencies and organizations. These programs will help increase the utility of the network recommendations presented in Chapters 3 and 4. The City can partner with adjacent jurisdictions, and local and regional organizations and businesses to help implement the programs discussed below. For example, local organizations and businesses are important partners for implementing bike parking programs, and school districts and adjacent jurisdictions could partner with the City to implement educational programs or promote encouragement events. The City will explore local, regional, state, and federal funding opportunities for these programs. The City's Planning and Development Services Department will also work with the Clovis Police Department on safety programs and opportunities for promoting current facilities.

Bicycle Parking

The City of Clovis should develop a bicycle parking program to increase the supply of bicycle parking on public and private property throughout Clovis. Providing bike parking at popular destinations and at transit facilities is a critical component to increasing bike trips. Efforts to provide bike parking should coordinate with efforts to implement the Fresno County Regional Long-Range Transit Plan. The City of Clovis may partner with local organizations and agencies to increase the number and quality of bicycle parking in the public right-of-way by providing guidance and potentially funding. Ensuring there is safe and convenient bike parking within the public right-of-way will encourage people to ride bikes with an increased level of comfort and assurance that there is a secure place to store their bicycle when they reach their destination. Bike parking, such as in Figure 14, provided within the public right-of-way is typically intended for short-term use.

Mitigating bicycle theft is critical to encouraging new or experienced riders to use their bikes for a variety of trip purposes. Nationwide, bicycle parking manufacturers, such as Oonee and BikeLink, are creating higher-quality parking facilities. Some of these facilities include key-card access and security cameras. Bicycle parking security can be further enhanced with a partnership with the Clovis Police Department to track and retrieve stolen bikes with the help of Bike Index, a bicycle registration program. Additional strategies to prevent theft include proper design and placement and parking, education on proper locking methods, anti-bike theft signage, and a bait bike program (equipping bait bikes with GPS tracking devices and tracking stolen bikes to the offender).[10]

Figure 15: Long-term Bicycle Parking Facility in San Francisco, CA



Typical rack placement for short-term parking in the public right-of-way may be placed on sidewalks or on-street by repurposing vehicle parking spots. Racks placed on sidewalks should minimize obstruction to people walking, and they should be placed in the sidewalk amenity zone. On-street bicycle parking spots are ideally bicycle corrals, and also have space at both ends of the corral to allow for bicyclist dismount. The City should consider placing on-street bicycle corrals near intersections as a strategy to improve visibility at intersections (also called daylighting).

Conducting a citywide bike parking inventory could determine baseline conditions to identify areas where additional bike parking is needed. Information such as type of rack, bike rack capacity, condition, obstructions (such as racks installed too close to a fence or building), protection from weather elements, and overall security is helpful to know when selecting and installing public bicycle parking.

Types of Bicycle Parking

Although bicycle parking provided within the public right-of-way is typically intended for short-term use, the City can still consider providing both short-term and long-term parking options. Short-term parking is typically designed for people visiting businesses or at locations where the duration of their visit is less than four hours. Typical racks used for short-term parking include inverted U, post and ring, and bike corrals.

Bike corrals have a growing popularity throughout the U.S. Bike corrals typically replace one on-street vehicle parking space with eight to twelve bicycle parking spaces while preserving sidewalk space.

Long-term bicycle parking, like the example shown in Figure 15, is designed toward employees, residents, public transit users, and similar users who need to store their bike for more than four hours. Long-term parking facilities need to have increased security and weather protection to provide assurance that their bike will not be stolen or damaged. Long-term parking facilities include bike lockers and sheltered and secured enclosures.

Section 5.106.4 of the California Green Building Standards Code outlines the bicycle parking minimum requirements for short-term and long-term bicycle parking. Jurisdictions within the State of California must comply with the bicycle parking ordinance unless the jurisdiction has a stricter bicycle parking ordinance (i.e., high bike parking minimum).

The Association of Pedestrian and Bicycle Professional (APBP) has developed the Essentials of Bike Parking: Selecting and Installing Bicycle Parking that Works (2015) and the Bicycle Parking Guidelines, 2nd Edition (2010)[11] that provide widely accepted recommendations and examples of bicycle parking best practices and example policies. City of Clovis staff can also review sample policies, codes, and programs within California in the Bike Parking Sourcebook developed by the Humboldt County Association of Governments (HCAOG)[12].

[10] Equity consideration should be given to the value of the bait bikes; in California, stolen property valued over $950 may result in a felony charge.

[11] APBP Publications: http://www.apbp.org/?page=publications

[12] HCOAG. Bike Parking Sourcebook: http://hcaog.net/sites/default/files/bike_parking_sourcebook_final.pdf

Ways to Provide Bike Parking

There are multiple ways to provide bicycle parking, including:

- A bicycle rack request program,
- A bicycle parking sponsorship program,
- Directing fees from new development to bicycle parking, and
- Developing a regional or municipal-level program,
- Explore public private partnerships to implement bike parking,

Developing a Bicycle Parking program at the municipal level would help to increase the amount of high-quality bicycle parking by improving coordination between public requests, property owners and businesses, city departments and other agencies. The program could also address questions or concerns from developers and ensure bicycle racks are replaced by developers if they are removed during the construction process.

Wayfinding

Wayfinding encompasses all the ways in which people orient themselves in physical space and navigate from place to place. A wayfinding system designed specifically for bicyclists and pedestrians can help these roadway and trail users easily and successfully navigate through a network of on-street facilities or trails. The main purpose of a wayfinding system is to connect people to the places they want to go. Wayfinding can take the form of directional signage, mile markers, trail heads, informational signs, map kiosks, and pavement markings to reinforce signage. Wayfinding signage is a cost-effective way to improve conditions for people bicycling, walking and rolling, create a sense of place, and promote community development. Consistency across jurisdictional boundaries is key to a positive user experience. The City will consider neighboring jurisdiction's wayfinding guides when moving forward in developing their system. See Appendix E for guidelines on designing and implementing wayfinding in Clovis, including destination and route selection, signage and pavement marking selection, branding, and installation.

Figure 16: Clovis Wayfinding Branding Options (top) and Sign Assembly Typologies (bottom)

E-Bicycles

Electric bicycles, or e-bikes, are becoming an increasingly popular option for bicycling. They provide a way for people to take longer trips by bike, appeal to a wider audience of riders, and can help make bicycling more accessible to community members who are interested in bicycling. E-bikes, such as in Figure 17, with the right policies in place, can encourage bicycling as both a recreational and utilitarian mode of transportation. With their increased popularity, state regulations and local policy are critical to supporting the use of the growing bicycle network in Clovis, as well as public education and signage.

State Regulations

In 2015, California passed legislation to create a three-class system to categorize electric bicycles and properly regulate them based on their maximum assisted speed.[13] All three classes of electric bicycles include fully operable pedals and an electric motor of less than 750 watts.

- A "Class 1 electric bicycle" is a bicycle equipped with a motor that provides assistance only when the rider is pedaling, and that ceases to provide assistance when the bicycle reaches the speed of 20 miles per hour.
- A "Class 2 electric bicycle" is a bicycle equipped with a motor that may be used exclusively to propel the bicycle, and that is not capable of providing assistance when the bicycle reaches the speed of 20 miles per hour.
- A "Class 3 electric bicycle" is a bicycle equipped with a motor that provides assistance only when the rider is pedaling, and that ceases to provide assistance when the bicycle reaches the speed of 28 miles per hour, and is equipped with a speedometer.[14] As of January 2023, Class 3 electric bikes are permitted on bicycle paths, trails, and lanes. Local jurisdictions are authorized to prohibit the operation of any electric bicycle or any class of electric bike.

State law permits most low-speed e-bikes (Class 1 and Class 2, less than 20 miles per hour) and restricts higher-speed e-bikes (Class 3 and all other e-bikes). Forthcoming e-bike policies may focus on youth safety using e-bikes.

Figure 17: Example of an E-

Opportunities for Local Policy

Current City of Clovis policies for e-bikes restricts "motor-driven cycle[s]" on freeways, canal banks, on private property, and on Sierra Vista Mall roadways and parking facilities (Policy 4.5.880, 4.5.890, 4.5.891, 4.5.892, and 4.5.893)[15]. Additionally, Chapter 10 of the city code prohibits the use of "cycle[s]" to any part of public parks aside from the roads (10.3.01.4)[16].

The City of Clovis has the opportunity to change policy to regulate e-bike use on trails and paseos. A policy could be developed to regulate e-bike user speed to under 20 miles per hour on trails via signage at trailheads and other key access points. This would address safety regarding speed differentials between e-bike users and other trail users. This policy could be accompanied by a map displaying which trails allow e-bikes, and which do not. An additional policy could create speed limits that apply to all trails. A design-focused policy could regulate path width to ensure that users are comfortable with a variety of other trail users on a wider path.

Additional resources for e-bike policies can be found at PeopleForBikes.org:

- National Electric Bicycle Law and Policy Overview: https://www.peopleforbikes.org/electric-bikes/policies-and-laws
- Electric Bicycles: Public Perceptions & Policy: https://prismic-io.s3.amazonaws.com/peopleforbikes/69085e0f-5cc3-4988-9427-7b98795c18ee_E_bikes_mini_report.pdf

[13] AB-1096 Vehicles: electric bicycles: https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201520160AB1096
[14] For more information, see: https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=202120220AB1909
[15] Clovis Municipal Code, Ch. 4.5 Traffic: https://www.codepublishing.com/CA/Clovis/#!/html/Clovis04/Clovis0405.html
[16] Clovis Municipal Code, Ch. 10.3 Prohibited Acts in City Parks: https://www.codepublishing.com/CA/Clovis/#!/html/Clovis10/Clovis1003.html

National resources for motorized scooters and other e-mobility devices are not as developed as e-bikes. However, state law does set provisions on how to operate motorized scooters, namely setting a maximum speed of 15 mph (CVC 22411) and requires motorized scooters to operate in Class II Bicycle Lanes whenever available (with minor exceptions) (CVC 21229) .

Additional E-Bicycle Support

With any policy change, it is important to note the value of a public education campaign to promote the policy. In addition to state regulation and local policies, public education can help integrate e-bikes as a form of active transportation. Focusing an educational campaign about user interactions on trails and paseos can mitigate potential user conflicts. E-bikes can operate at higher speeds than people walking or bicycling without an electric assist. However, public educational campaigns and instructional signage on trails regarding user behavior and proper etiquette can help address concerns about e-bikes.

Additional design policy can inform the design of separated bikeways. With speed differentials, separated bikeways may need wider space for e-bike users to safely pass other non-electric assist bicyclists.

Figure 18: Open Street Event in Minneapolis, MN

Figure 19: Safe Routes to School Programs Educate Children About How to Safely Ride a Bicycle

Encouragement Programs

Encouragement programs support mode shift by encouraging behavior change and promoting new infrastructure. The City can partner with community organizations to spark interest and excitement by creating special events that motivate community members to try new modes of transportation. Encouragement programs often include, but are not limited to, open street events, and Safe Routes to School.

Open Streets

Open street events are popular methods to encourage people to walk or get on their bikes and have fun with their friends, family, and community members. Open street events, such as the one pictured in Figure 18, are essentially a block party that closes a roadway to motor vehicle traffic and only allows people to access the roadway using active transportation modes (e.g., walking, biking, skateboarding, scooters, etc.). Hosting open street events can demonstrate to communities that the City supports and encourages bicycling and other forms of active transportation.

Events to encourage people to walk, bike, or skate for recreation and transportation can be included in branded/marketed events created by communities or events that already exist. Marketing weeks or months for walking or bicycling while hosting events can generate a buzz within communities to encourage people to walk or bike instead of drive.

Safe Routes to School

Safe Routes to School (SRTS) programs are intended to create safe, fun, and social opportunities for children to bike and walk to and from school (see Figure 19). SRTS support healthier children by encouraging them to use active modes of transportation to commute to school rather than be driven in a car. Furthermore, SRTS can lead to children using active modes of transportation into adulthood because they see these modes as a normal everyday activity. The City should partner with the school district to pursue funding to support the coordination of resources to ensure consistent funding for Safe Routes to School programming at schools throughout

Clovis. The City will also work with the Caltrans Office of Traffic Safety on SRTS to identify future opportunities for partnerships.

Walk or bike audits near schools can identify infrastructure improvements needed, and partnerships with school districts can leverage funding and lead to more grant opportunities and applications.

The National Center for Safe Routes to School programs (http://guide.saferoutesinfo.org/steps/) and the Safe Routes Partnership (http://www.saferoutespartnership.org/) have created guides and conducted research to help people interested in creating and improving SRTS programs. Proximity to schools is included as part of the prioritization framework used in this Plan. Refer to Chapter 6 for more information about how promixity to schools was incorporated in to the project prioritization process for bicycle recommendations and sidewalk infill projects.

Education Campaigns

Education campaigns can help encourage safe road user behavior and complement infrastructure improvements. Campaigns can be broad, or they can be more specific by targeting a certain mode of transportation or a certain travel behavior.

Driver-Oriented Materials

The City of Clovis can implement educational campaigns directed towards educating the general public on safe travel behaviors and the impacts of reckless or inconsiderate behaviors. Education can be conducted through advertising campaigns, roadside or trailside events, or one- or two-day training courses in classrooms. Successful events include large signage, paper handouts, issuance of verbal warnings, praising good behavior with prizes, and in-depth conversations about the importance of safe travel behaviors. Topics could include yielding to other road users, traveling at safe speeds, and clarifying the bicycle rules of the road.

Bicycle- and Pedestrian-Oriented Materials

Education materials oriented to people who walk or ride a bicycle can be implemented using a variety of strategies and messaging.

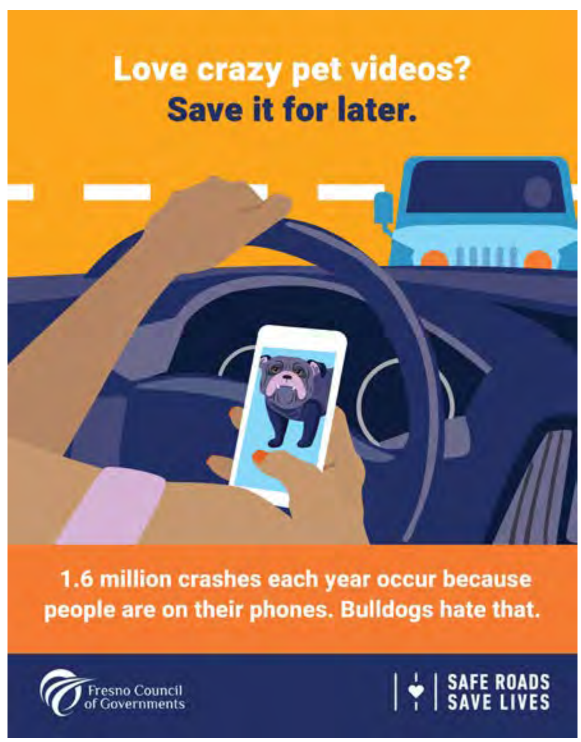
One strategy includes using a bicycling ambassador program, which can be an effective way to educate the public on traffic safety for all roadway users. Some of the services that the bicycle ambassadors could provide include bike mentorship, event attendance, community bicycling workshops, safe cycling rewards, organized rides, commuter pit stops, bike lane stewardship, and e-bike riding etiquette.

The program could be implemented in partnership with other transportation or health-focused organizations, such as Fresno County Department of Public Health, to host outreach events aimed at encouraging people to make trips by bicycle, follow safe travel behaviors, and develop a relationship with the community to foster an engaged community of bicyclists. A similar pedestrian ambassador program could be developed to educate the public on trail etiquette, and promote social walking events, local walking tours, and more.

Both the bicycle and pedestrian ambassador program could partner with local schools as part of a Safe Routes to School program to deliver workshops and events tailored to elementary, middle, and high school students.

Sharing educational resources on the City's website can enhance awareness as well. Collaboratively, City staff will harness the City's social media channels to further the promotion of education and awareness.

Figure 20: Example of a educational campaign targeted at distracted driving



Credit: Fresno Council of Governments

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06

IMPLEMENTATION STRATEGY

Project Prioritization

All projects identified in this Plan are important to improving connectivity and safety for people biking, walking, and rolling. However, due to the realities of finite funding and staffing resources, the City will need to implement projects gradually over time. Prioritizing projects helps guide investments toward projects that provide the greatest benefits. In addition, the prioritization process can help identify projects and their applicability to different grant and funding opportunities. The resulting prioritized project should not be viewed as a mandate to complete projects in a particular order, but rather a measure of which projects best meet the overall goals of this Plan. Project sequencing will be determined by a variety of factors such as budget/cost, local funds and state/federal grant funding availability, active development, and other implementation opportunities. Also, it is important to note that as the City performs reconstruction on its roadways, improvements will be considered at that time, no matter the placement on the prioritization list.

Bikeways and Sidewalk Gaps

As part of this Plan, bikeway recommendations are presented in Chapter 3 and sidewalk gaps identified in Chapter 4 were prioritized using the criteria shown in Table 6. These criteria were developed to align with the Plan's vision and goals and City objectives. The scores reflect a relative ranking of each criterion. For a complete list of prioritized projects and cost estimates, see Appendix A.

Tables 7 and 8 show the highest priority bicycle facility and sidewalk infill projects based on the results of the prioritization analysis. For more information about the cost estimates, refer to Funding and Cost Estimates on page 52.

In addition to the eight sidewalk infill projects presented in Table 8, a series of small, sidewalk infill spot improvements were identified at the locations listed below. All spot improvements are less than 500 feet in length.

- Herndon Avenue, between the Clovis Old Town Trail and Dewitt Avenue
- Clovis Avenue, between the Mariott Driveway and Sierra Avenue
- Shaw Avenue, between 425 Shaw Avenue and 505 Shaw Avenue
- Gettysburg Avenue (south side), between Peach Avenue and 332 Gettysburg Avenue

Table 6: Bikeway and Sidewalk Project Prioritization Criteria

Plan Goal	Criteria	Measure	Notes	Points
Improve safety		**Highest Number of Points Possible**		**40**
Safety	Collision History[17]	Weighted crashes per mile	*Prioritizes segments that have a high concentration of crashes*	40
Increase connectivity and active transportation trip potential		**Highest Number of Points Possible**		**15**
Connectivity and Mode Shift	# of Schools, Colleges, and Universities	Ped: ½ mile Bike: 1 mile	*Prioritizes projects that connect to key destinations*	5
	# of Commercial Areas	Ped: ½ mile Bike: 1 mile		5
	# of Transit stops	Ped: ¼ mile Bike: ½ mile		5
Improve transportation options for all people		**Highest Number of Points Possible**		**15**
Equity	Age	% of the population that is under 18 or 65 or older	*Prioritizes projects in areas with a higher percentage of youth or older adults*	5
	Race/Ethnicity	% of population that is non-white	*Prioritizes projects in areas with a higher percentage of BIPOC population*	5
	Income	Median Household Income	*Prioritizes projects in areas with lower income populations*	5
Increase access to recreation		**Highest Number of Points Possible**		**20**
Recreation	Park	Ped: ½ mile Bike: 1 mile	*Prioritizes projects that connect to recreation areas*	10
	Trail	Ped: ½ mile Bike: 1 mile		10

[17] A weighted crash total of bicycle crashes that occurred between 2015 and 2019 along each project was calculated. Crashes were weighted based on the severity of the most severe injury resulting from the crash: fatal and serious injury crashes at 5 points, all other injury crashes at 3 points.

Table 7: Top 10 Recommended Bicycle Projects

Rank	Corridor	From	To	Recommended Facility	Length (mi)	Total Length (mi)	Estimated Cost
1	Santa Ana Ave	Clovis Ave	Sierra Vista Ave	Class III Bike Route	0.48	0.48	$6,602
2	Shaw Ave	Sunnyside Ave	Temperance Ave	Class II Bike Lane	1.50	1.50	$67,489
3	Clovis Ave	Herndon Ave	Sierra Ave	Class II Bike Lane	0.48	0.48	$21,539
4	Barstow Ave	Fowler Ave	Armstrong Ave	Class III Bike Route	0.50	0.50	$6,881
5	Helm Avenue	West Barstow Avenue	East Ashlan Ave	Class III Neighborhood Greenway	1.65	1.65	$123,697
6	Sunnyside Ave	Herndon Ave	Tarpey Drive	Class II Bike Lane	2.51	2.99	$148,566
				Class III Neighborhood Greenway	0.47		
7	Fowler Ave	Shepherd Ave	Alluvial Ave	Class II Bike Lane	1.00	1.50	$95,790
				Class II Buffered Bike Lane	0.51		
8	Shaw Ave	DeWolf Ave	460ft East of Leonard Ave	Class II Bike Lane	0.59	0.59	$26,328
9	Fowler Ave	Herndon Ave	City Limits near Griffith Ave	Class II Bike Lane	0.50	3.36	$313,966
				Class II Buffered Bike Lane	2.86		
10	Ashlan Ave	Leonard Ave	McCall Ave	Class II Bike Lane	1.48	1.48	$66,537

*All Class II Buffered Bicycle Lanes will require further study to assess feasibility.

Table 8: Recommended Sidewalk Infill Projects

Rank	Corridor	From	To	Length (mi)	Estimated Cost
1	Ashlan Ave	Willow Ave	Helm Ave	0.49	$321,930
2	Willow Ave*	W Escalon Ave	W Barstow Ave	0.72	$473,040
3	Gettysburg Ave*	Peach Ave	Homsy Ave	0.17	$111,690
4	Villa Ave	300 ft south of W Ashlan Ave	W Pontiac Way	0.30	$197,100
5	Temperance St	Griffith Ave	Bellaire Way	0.17	$111,690
6	Villa Ave	Clovis Old Town Trail	W Herndon Ave	0.34	$223,380
7	Nees Ave*	N Whittier Ave	Armstrong Ave	0.25	$164,250
8	Alluvial Ave*	N Fordham Ave	West of N Renn Ave	0.14	$91,980

*Indicates a project within one-half mile of a school

Map 10: Prioritized Bikeway Projects

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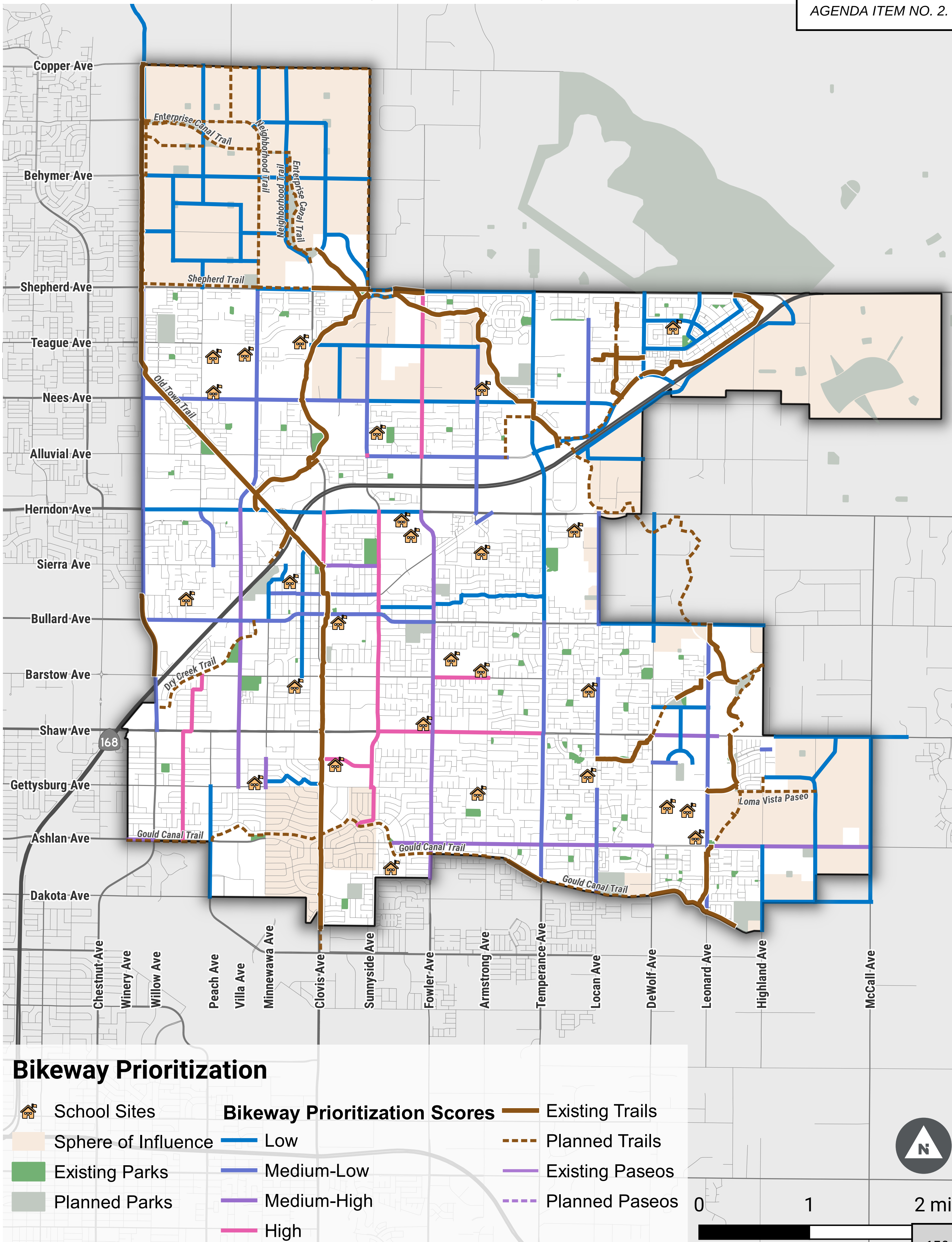

Map 11: Prioritized Sidewalk Projects

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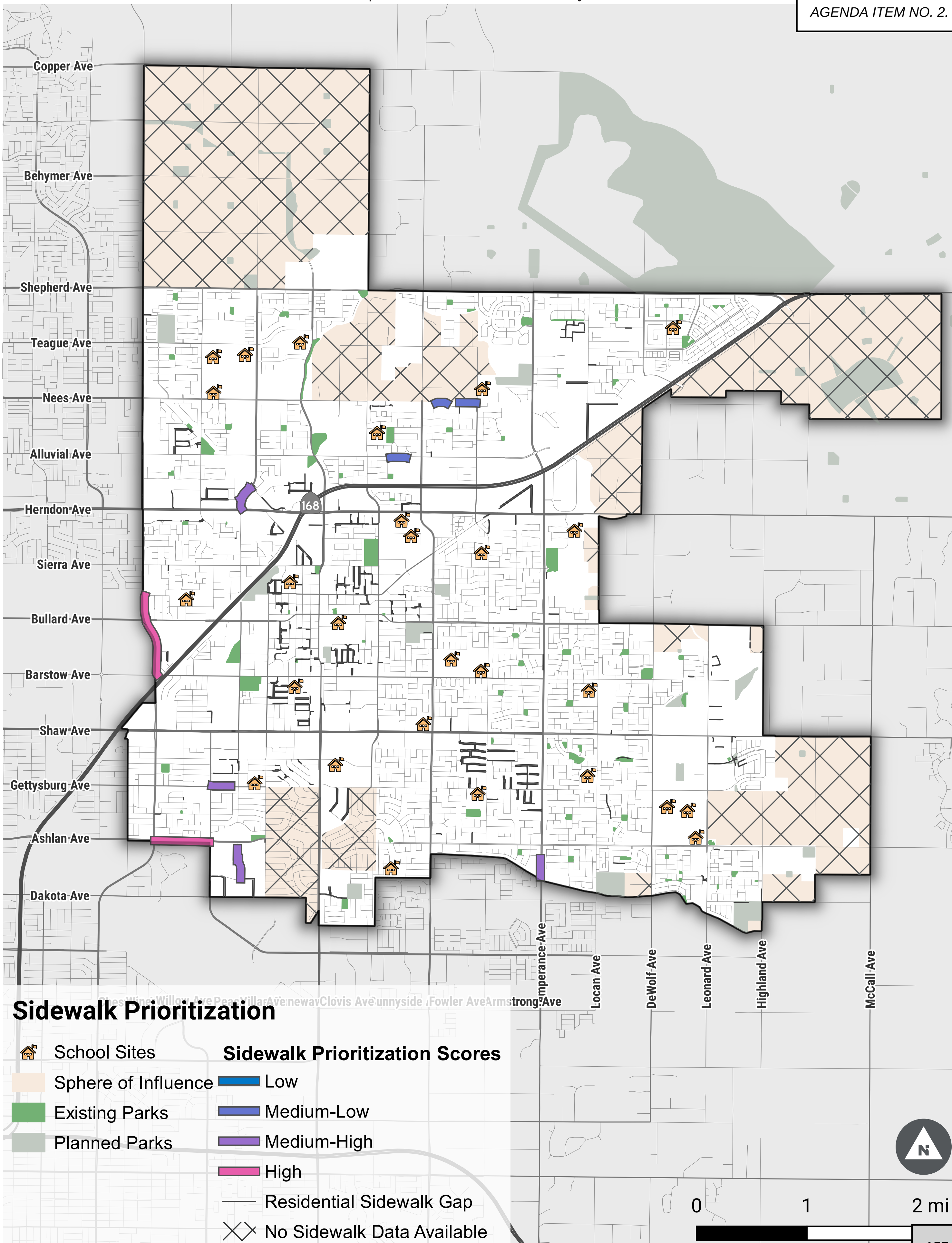

Trails

The trails prioritization follows a similar approach as the on-street bicycle facilities, with some modifications. Prioritization is still based on a project's alignment with Plan and City goals. Table 9 below outlines the prioritization approach for trails. Map 12 shows trails and paseos by prioritization scores. Table 10 displays trail projects that were selected for prioritized implementation based on their potential to improve network connectivity and expand access to key destinations. Paseos were not included in this prioritization as they are typically built by private developers. Some trails are also built by private developers, which is why the City will focus on filling in network gaps.

Table 9: Trail Prioritization Criteria

Plan Goal	Criteria	Measure	Notes	Points
Increase connectivity and active transportation trip potential		**Highest Number of Points Possible**		**15**
Connectivity and Mode Shift	# of Schools, Colleges, and Universities	1 mile	*Prioritizes projects that connect to key destinations*	5
	# of Commercial Areas	1 mile		5
	# of Transit stops	1/2 mile		5
Improve transportation options for all people		**Highest Number of Points Possible**		**10**
Equity	Race/Ethnicity	% of population that is non-white	*Prioritizes projects in areas with a higher percentage of BIPOC population*	5
	Income	Median Household Income	*Prioritizes projects in areas with lower income populations*	5
Increase access to recreation		**Highest Number of Points Possible**		**20**
Recreation	Park	1 mile	*Prioritizes projects that connect to recreation areas*	10
	Trail	1 mile		10

Table 10: Top Trail Projects

Corridor	From	To	Length (mi)	Estimated Cost
Dry Creek Trail	Clovis Old Town Trail North	Sierra Ave	0.22	$48,840
Miscellaneous Trail	Northern Enterprise Segment	Southern Enterprise Segment	0.023	$5,106
Greenbelt Path	Locan Ave	330ft east of Locan Ave	0.061	$13,542
Enterprise Canal Trail	Temperance Ave	Herndon Ave	0.11	$24,420
Gould Canal Trail	Armstrong Ave	Joshua Ave	0.21	$46,620
Gould Canal Trail	Minnewawa Ave	Gould Trail East	0.48	$106,560
Sierra Gateway Regional Trail	Shepherd Ave	Enterprise Trail	0.08	$17,760
Dog Creek Trail	Gettysburg Ave	1000ft south of Gettysburg Ave	0.17	$37,740
Enterprise Canal Trail	Temperance Ave	Herndon Ave	0.10	$22,200
Enterprise Canal Trail	Alluvial Ave	Sierra Fwy	0.25	$55,500

Map 12: Prioritized Trail Projects

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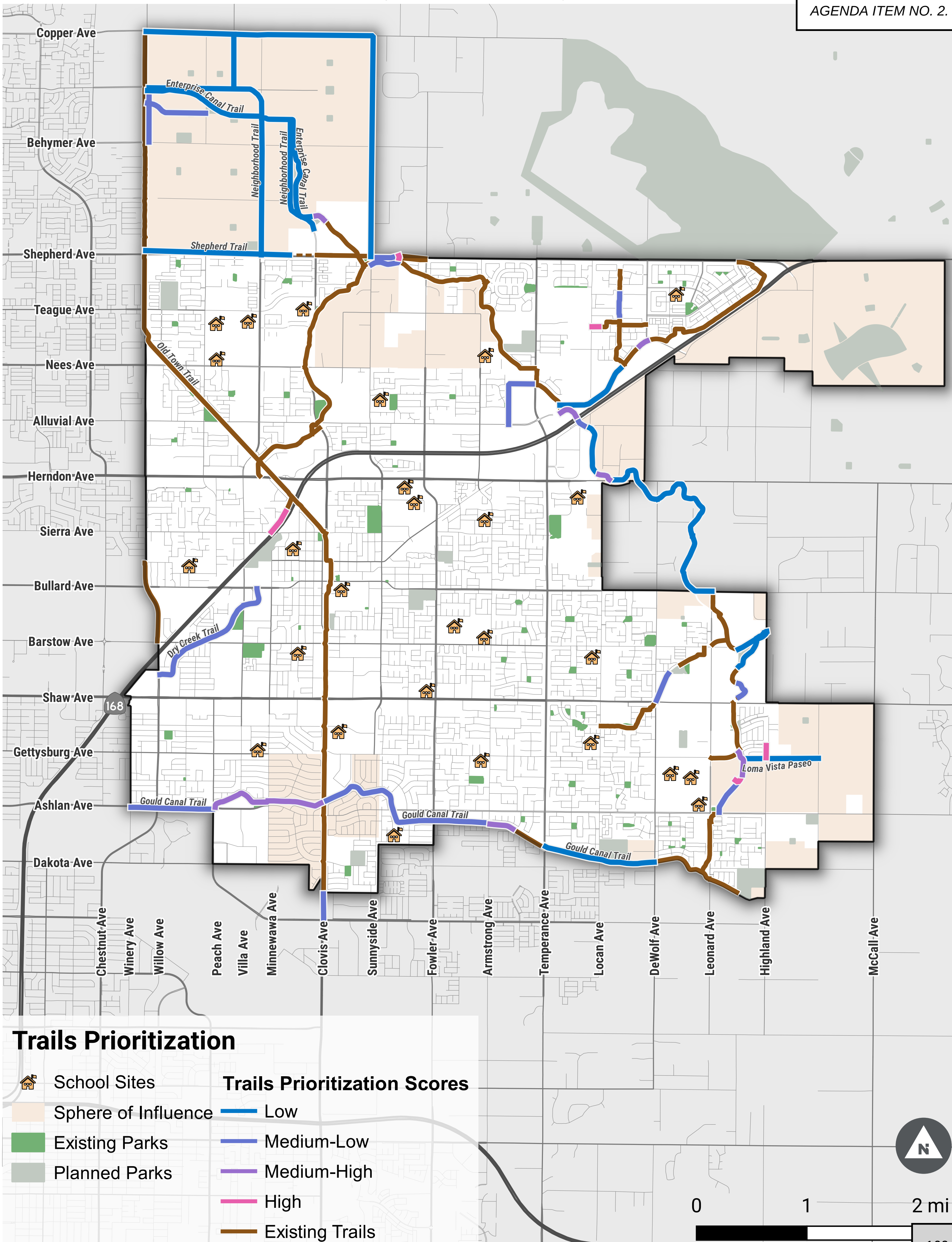


Mid-block Trail Crossings

The City of Clovis identified potential locations to install mid-block crossings to improve safety and connectivity within the trail network. The dots on Map 13 show locations where the City is considering installing mid-block trail crossings, symbolized by prioritization score. Prioritized mid-block trail crossings are suggestions for where trail crossings would be most effective, not a mandate to implement improvements in a particular order. City staff determine mid-block crossing feasibility and signalization based on City guidelines and the Manual on Uniform Traffic Control Devices (MUTCD).

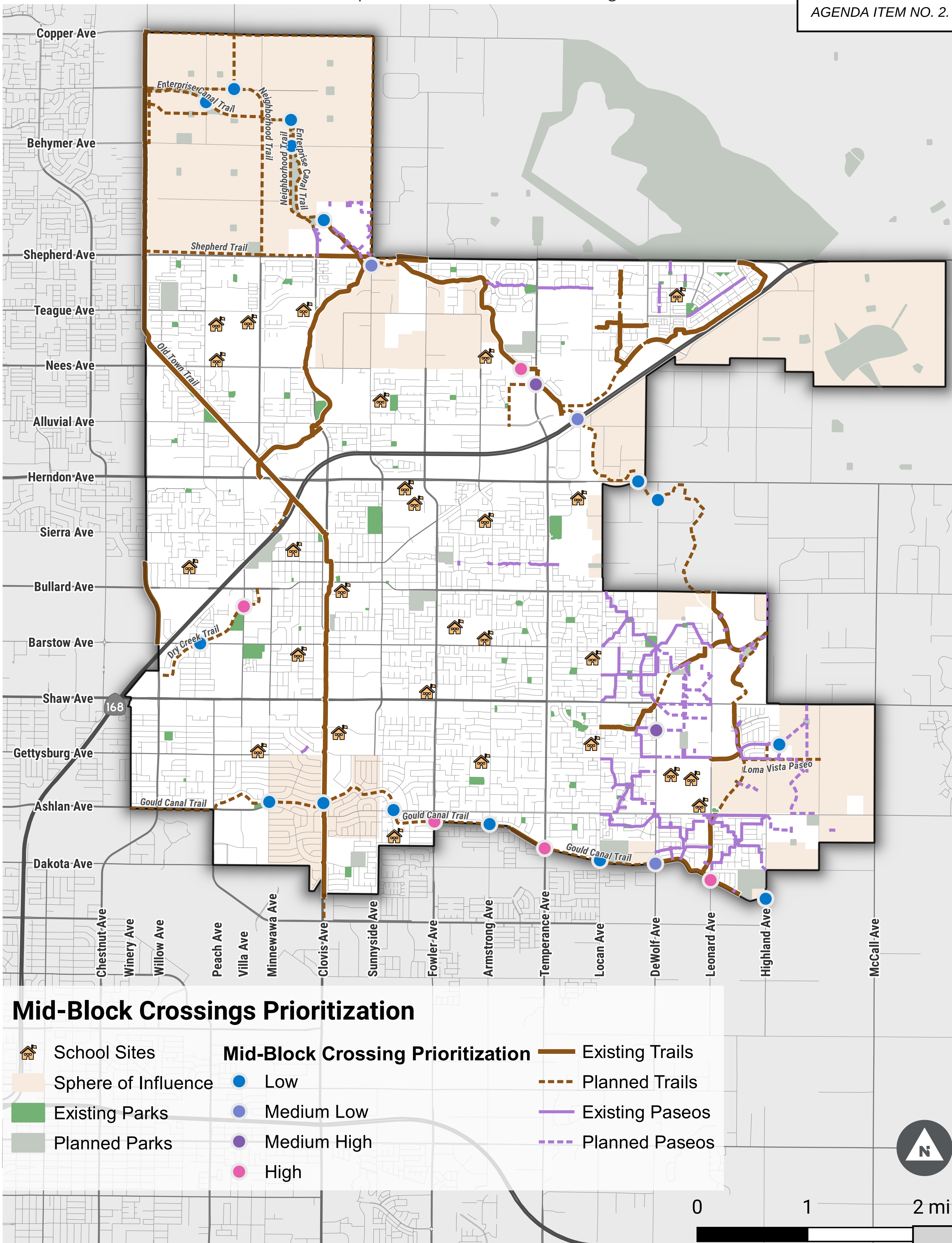
Table 11 below outlines the prioritization methodology for mid-block crossings. This prioritization methodology places higher priority on mid-block crossings where trails or paseos already exist and intersections where trail users may experience a high level of traffic stress[18]. In turn, this ensures that city resources and capital will be efficiently allocated where need is highest. All mid-block crossings will be evaluated further.

Table 11: Mid-block crossing prioritization criteria

Plan Goal	Criteria	Measure	Notes	Points
Increase connectivity		**Highest Number of Points Possible**		**40**
Connectivity and Mode Shift	Connection to trails or paseos	**Existing Facility:** Mid-block crossing would link existing trail or paseo network	Prioritizes midblock crossings where trails exist currently	40
		Partially Completed Link: Mid-block crossing would connect an existing facility to a planned one		20
		Proposed Facility: Mid-block crossing would link proposed trail or paseo network		10
Improve safety and trip potential		**Highest Number of Points Possible**		**60**
Safety	Level of Pedestrian Stress	**High Stress:** Pedestrian level of traffic stress score of 3,4	Prioritizes projects that reduce crossing barriers at trails	60
		Low Stress: Pedestrian level of traffic stress score of 1,2		10

[18] Level of Traffic Stress (LTS) is a rating given to a road segment or crossing indicating the traffic stress it imposes on pedestrians or bicyclists. Levels of traffic stress range from 1 to 4, with 1 being suitable for users of all ages and abilities and 4 being acceptable for only the most experienced and intrepid users. Crossing Level of Traffic Stress is determined based on traffic speeds, the number of lanes being crossed, and the presence or absence of a crossing island.

Map 13: Prioritized Mid-Block Crossings



Funding and Cost Estimates

The cost of implementing the active transportation network varies based on the type of bikeway that is planned, and the degree to which existing infrastructure needs to be modified or enhanced. Planning-level cost estimates were developed for the proposed bicycle network's full buildout. Table 12 shows a summary of the cost estimates for the bicycle and pedestrian facilities recommended in this Plan. These reflect typical costs but do not consider project-specific costs such as right-of-way acquisition, landscaping, or other location-specific costs that may increase actual costs. For some projects, costs may be significantly higher. Appendix D: Funding Sources provides a list of funding sources and applicable project types to help the City fund the recommendations identified in this Plan.

For example, the Caltrans' Active Transportation Program funds can be used for infrastructure projects, quick-build pilot projects, planning documents such as this one, and non-infrastructure projects, like the programs recommended in this Plan. The prioritization process presented in Table 10 overlaps with some of the screening criteria Caltrans uses for the Active Transportation Program infrastructure projects. Projects recommended in this Plan that scored well for proximity to schools, trails, and disadvantaged communities are well suited to Caltrans Active Transportation Program funds[19].

Table 12: Summary of Bikeway and Sidewalk Infill Project Cost Estimates

Facility Type	Construction Cost Subtotal per Mile	35% Construction Contingency & Traffic Control	15% Design Costs	Total Cost Per Mile (Rounded)
Sidewalk Infill*	$437,712	$153,199	$65,657	$657,000
Class I Shared Use Trail**	$147,774	$51,721	$22,166	$222,000
Class II Bicycle Lane	$30,000	$10,500	$4,500	$45,000
Class II Buffered Bicycle Lane	$68,000	$23,800	$10,200	$102,000
Class III Neighborhood Greenway***	$50,000	$17,500	$7,500	$75,000
Class III Bicycle Route	$9,200	$3,220	$1,380	$13,800

* Includes concrete curb and gutter.

** Assumes 12-ft x 3-in asphalt concrete trail without landscaping, irrigation, or security lighting. Asphalt concrete may be Type B 1/2-inch medium HMA with PG70-10 (or PG 64-10 min.) asphalt binder with 10% shrinkage from compaction. The unit price of AC with labor and materials is estimated to be $105 per ton. The unit price of 4-inch white thermoplastic center line is $2 per linear foot.

*** Planning level cost estimate based on planning level cost estimates from the Berkeley Bicycle Plan as a recent example from a smaller California city.

[19] Refer to Caltrans' Active Transportation Program guidelines for more information about project eligibility criteria. https://dot.ca.gov/programs/local-assistance/fed-and-state-programs/active-transportation-program/general-and-technical-information

Implementation Phasing

Each project recommended in this Plan could be implemented one at a time; however, to build a complete network, it is beneficial to combine recommendations with the aim of building connected bikeways or sidewalks, or to fill a gap. For example, implementing connected Class II Bicycle Lanes along a single route would be advantageous for bicycle connectivity. The means by which bicycle infrastructure is implemented varies depending on the bikeway type. Pedestrian recommendations are primarily focused on filling in gaps in the sidewalk network.

Short-Term

The recommended bicycle and pedestrian facilities presented in this Plan are intended to create a connected network for people walking, bicycling, and rolling. In many cases, short-term projects (projects that can be achieved during the life of this plan) may consist of simple restriping of roadways to install or upgrade bike lanes. All planned street resurfacing and reconstruction projects should be reviewed in conjunction with the bicycle and pedestrian project recommendations to identify potential opportunities to incorporate projects recommended in this Plan in the near future.

Long-Term

Some proposed projects, such as Class I Trails or future Class IV Separated Bike Lanes, may require a longer-term effort for the project to come to fruition. Longer-term efforts are ones that will likely be achieved over time, likely beyond the life of this plan. While it may take longer to implement these projects, City departments should start considering what steps are needed to construct these projects either through capital projects or as part of future development. This will allow the City of Clovis to be better situated to take advantage of implementation and grant opportunities as they arise.

Design Guidance

This Plan aims to enhance opportunities for walking, bicycling and using other forms of active transportation. To achieve the goals set forth in this Plan, bicycle and pedestrian facilities must connect to destinations people want to go, and these facilities must feel safe and comfortable. Below are a few general design guidelines City staff should consider as they implement the projects recommended in this Plan:

- **Minimize conflicts**. Conflict points often occur where pedestrians, bicyclists, and motorists cross paths, such as at intersections and driveways. The potential for conflict may be mitigated by combining conflict points (e.g., reducing the number of driveways or reducing the number of travel lanes) or separating modes at conflict points (e.g., through signal phasing). Other solutions include providing signs and pavement markings that clearly conveys interactions between modes and designing facilities that are intuitive and lead to predictable behavior patterns.
- **Provide safe and convenient crossings**. Safe crossings should be provided at or near transit stops, where bike routes cross major streets, and near parks, schools, and other community destinations. To be considered safe, crossings should be clearly marked and provide enough time for non-motorized users to cross the street at a comfortable pace.
- **Reduce vehicle speeds**. Reducing vehicle speeds is key to decreasing collisions among roadway users and minimizing the severity of injuries if a collision occurs. This is especially true for people walking and biking, as they travel slower and are more vulnerable than motorists. This speed differential can negatively affect a person's perception of safety, particularly where there is a lack of separation between vehicles and active transportation users.
- **Provide consistency**. Infrastructure designed with a level of consistency in terms of aesthetics and function improves safety by promoting predictable behaviors and helps road users feel more comfortable following a route.

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PRIORITIZED BICYCLE FACILITIES PROJECT LIST

Bicycle Recommendations Project List

Rank	Plan ID	Corridor	From	To	Recommended Facility	Length (mi)	Total Length (mi)	Estimated Cost
1	24	Santa Ana Ave	Clovis Ave	Sierra Vista Pkwy	Class III Bike Route	0.48	0.48	$6,602
2	23	Shaw Ave	Sunnyside Ave	Temperance Ave	Class II Bike Lane	1.50	1.50	$67,489
3	36	Clovis Ave	Herndon Ave	Sierra Ave	Class II Bike Lane	0.48	0.48	$21,539
4	6	Barstow Ave	Fowler Ave	Armstrong Ave	Class III Bike Route	0.50	0.50	$6,881
5	28	Helm Avenue	West Barstow Avenue	East Ashlan Ave	Class III Neighborhood Greenway	1.65	1.65	$123,697
6	68	Sunnyside Ave	Herndon Ave	Tarpey Drive	Class II Bike Lane	2.51	2.99	$148,566
					Class III Neighborhood Greenway	0.47		
7	69***	Fowler Ave	Shepherd Ave	Alluvial Ave	Class II Bike Lane	1.00	1.50	$95,790
					Class II Buffered Bike Lane	0.51		
8	4	Shaw Ave	DeWolf Ave	460ft East of Leonard Ave	Class II Bike Lane	0.59	0.59	$26,328
9	70***	Fowler Ave	Herndon Ave	City Limits near Griffith Ave	Class II Bike Lane	0.50	3.36	$313,966
					Class II Buffered Bike Lane	2.86		
10	51 *	Ashlan Ave	Leonard Ave	McCall Ave	Class II Bike Lane	1.48	1.48	$66,537
11	19	Ashlan Ave	Fordham Ave	De Wolf Ave	Class II Buffered Bike Lane	2.34	2.34	$238,789
12	16	Sierra Ave	Clovis Ave	Sunnyside Ave	Class III Bike Lane	0.51	0.51	$23,100
13	65	Villa Ave	Herndon Ave	Gettysburg Ave	Class II Bike Lane	1.25	2.51	$73,720
					Class III Bike Route	1.26		
14	11	Minnewawa Ave	Santa Ana Ave	Gettysburg Ave	Class III Bike Route	0.26	0.26	$3,546
15	26***	Ashlan Ave	Winery Ave	Willow Ave	Class II Buffered Bike Lane	0.24	0.24	$23,993
16	64***	Willow Ave	Shepherd Ave	Herndon Ave	Class II Buffered Bike Lane	2.01	2.01	$204,736
17	73***	Nees Ave	Willow Ave	Sunnyside Ave	Class III Bike Route	0.50	2.03	$163,396
					Class II Buffered Bike Lane	1.53		
18	12***	Minnewawa Ave	Shepherd Ave	Herndon Ave	Class II Buffered Bike Lane	2.05	2.05	$208,669
19	63** ***	Willow Ave	Herndon Ave	Shaw Ave	Class II Bike Lane	1.03	2.03	$148,117
					Class II Buffered Bike Lane	1.00		
20	5	3rd Street	Minnewawa Ave	Sunnyside Ave	Class III Bike Route	1.00	1.00	$13,820

Rank	Plan ID	Corridor	From	To	Recommended Facility	Length (mi)	Total Length (mi)	Estimated Cost
21	50	Planned Road 470ft North of San Gabriel Ave	DeWolf Ave	1000ft East of DeWolf Ave	Class II Bike Lane	0.21	0.21	$9,353
22	34	Locan Ave	Herndon Ave	Bullard Ave	Class II Bike Lane	1.01	1.01	$45,226
23	62	Tollhouse Road	Armstrong Ave	Herndon Ave	Class II Bike Lane	0.16	0.16	$7,154
24	60	Loma Visa Parkway	350ft East of San Marino Dr	223ft of Highland Ave	Class II Bike Lane	0.08	0.08	$3,383
25	17	Leonard Ave	Bullard Ave	City Limits Near Amenecer Ave	Class II Bike Lane	2.61	2.61	$117,413
26	74	Bullard Ave	Willow Ave	Fowler Ave	Class III Bike Route	2.65	2.65	$63,756
27	67	Sunnyside Ave	Shepherd Ave	Alluvial Ave	Class II Bike Lane	1.50	1.50	$67,675
28	35	Locan Ave	Powers Ave	Sierra Fwy	Class II Bike Lane	2.71	2.71	$122,000
29	2	Alluvial Ave	Sunnyside Ave	Proposed Trail Connection	Class II Bike Lane	1.26	1.26	$56,885
30	15	Peach Ave	Herndon Ave	Sierra Ave	Class II Bike Lane	0.54	0.54	$24,493
31	72***	Temperance Ave	Bullard Ave	City Limits near Griffith Ave	Class II Buffered Bike Lane	2.33	2.33	$238,141
32	14	Armstrong Ave	Teague Ave	Herndon Ave	Class II Bike Lane	1.51	1.51	$68,163
33	20***	Herndon Ave	Willow Ave	Fowler Ave	Class II Buffered Bike Lane	2.52	2.52	$257,201
34	49	U-Shaped Road between DeWolf and Leonard Aves	Loma Vista Pkwy	Loma Vista Pkwy	Class II Bike Lane	0.35	0.35	$15,717
35	43	Peach Ave	Planned Road 1281ft North of Shepherd Ave	Shepherd Ave	Class II Bike Lane	0.24	0.24	$10,886
36	59	Planned Road 1360ft East of DeWolf Ave	San Jose Ave	Planned Road 578ft North of Loma Vista Pkwy	Class II Bike Lane	0.39	0.39	$17,478
37	1	Pico Ave	Minnewawa Ave	Clovis Ave	Class III Neighborhood Greenway	0.58	0.58	$43,280

Rank	Plan ID	Corridor	From	To	Recommended Facility	Length (mi)	Total Length (mi)	Estimated Cost
38	58	San Jose Ave	DeWolf Ave	Leonard Ave	Class II Bike Lane	0.50	0.50	$22,422
39	40	Perrin Ave	Willow Ave	Planned Road 1370ft East of Willow Ave	Class II Bike Lane	0.26	0.26	$11,805
40	30	Marion Ave	Teague Ave	Nees Ave	Class II Bike Lane	0.49	0.49	$22,231
41	66	Woodworth Ave	Pollasky Ave	Barstow Ave	Class III Bike Route	0.12	1.12	$1,601
					Class II Bike Lane	1.01		
42	27	Enterprise Canal Channel	Sunnyside Ave	Existing Enterprise Canal Trail	Class I Trail	0.26	0.26	$57,483
43	61	Alluvial Ave	Locan Ave	DeWolf Ave	Class II Bike Lane	0.60	0.60	$27,066
44	25	2nd Street/ Minnewawa Ave	Sierra Ave	Bullard Ave	Class III Neighborhood Greenway	0.61	0.61	$45,653
45	33	DeWolf Ave	Herndon Ave	Roberts Ave	Class II Bike Lane	1.15	1.15	$51,589
46	76***	Bullard Ave	Locan Ave	Highland Ave	Class II Bike Lane	0.99	1.49	$95,617
					Class II Buffered Bike Lane	0.50		
47	10	Leonard Ave	Shepherd Ave	Harlan Ranch Blvd	Class III Bike Route	0.48	0.48	$6,693
48	8	Planned Road Parallel to Enterprise Canal Trail	Planned Road 2090ft West of Sunnyside Ave	Shepherd Ave	Class II Bike Lane	0.70	0.70	$31,305
49	29	Powers Ave	De Wolf Ave	Harlan Ranch Blvd	Class III Neighborhood Greenway	0.61	0.61	$8,361
50	46	Planned Road 814ft West of Minnewawa Ave	Planned Road 1300ft North of Perrin Rd	Planned Road 1300ft South of Perrin Ave	Class II Bike Lane	0.51	0.51	$22,843
51	13***	DeWolf Ave	Shepherd Ave	Owens Mt Pkway	Class II Buffered Bike Lane	0.75	0.75	$76,365
52	52	Highland Ave	Ashlan Ave	Southern City Limits Near Gould Canal	Class II Bike Lane	0.76	0.76	$34,035
53	3	Peach Ave	Gettysburg Ave	Dakota Ave	Class II Bike Lane	1.00	1.00	$44,967
54	47	Planned Road 1350ft North of Perrin Ave	Planned Road 1380ft East of Willow Ave	Planned Road 815ft West of Minnewawa Ave	Class II Bike Lane	0.61	0.61	$27,568

Rank	Plan ID	Corridor	From	To	Recommended Facility	Length (mi)	Total Length (mi)	Estimated Cost
55	7	Gibson St	Sunnyside Ave	Temperance Ave	Class III Neighborhood Greenway	1.63	1.63	$122,225
56	75	Harlan Ranch Boulevard	DeWolf Ave	Shepherd Ave	Class II Bike Lane	1.15	1.15	$51,964
57	39	Perrin Rd	Planned Road 815ft West of Minnewawa Ave	Clovis Ave	Class II Bike Lane	0.40	0.40	$18,169
58	31	Willow Ave	1200ft south of Via Monte Verdi Ave	International Ave	Class II Bike Lane	1.80	1.80	$81,033
59	45	Planned Road 1440ft East of Minnewawa Ave	Behymer Ave	Planned Road 1385ft South of Perrin Rd	Class II Bike Lane	0.77	0.77	$34,494
59	53	Dakota Ave	Highland Ave	Shockley Ave	Class II Bike Lane	0.98	0.98	$44,307
60	44	Planned Road 1350ft North of Perrin Ave	Planned Road 1380ft East of Willow Ave	Minnewawa Ave	Class II Bike Lane	0.77	0.77	$34,726
61	57	Planned Road 950ft East of Thompson Ave	Shaw Ave	Thompson Ave	Class II Bike Lane	0.45	0.45	$20,243
62	32	Tollhouse Road	Enterprise Canal Trail	Shepherd Ave	Class II Bike Lane	2.56	2.56	$115,251
63	55	Thompson Ave	Gettysyburg Ave	Dakota Ave	Class II Bike Lane	1.53	1.53	$92,151
63	37	Behymer Ave	Willow Ave	Sunnyside Ave	Class II Bike Lane	2.05	2.05	$68,964
64	48	Owens Mountain Pkwy	Temperance Ave	Sierra Fwy	Class II Bike Lane	1.56	1.56	$70,339
65	9	Minnewawa Ave	Copper Ave	International Ave	Class II Bike Lane	0.56	0.56	$25,081
65	41	Peach Ave	Copper Ave	Planned Road 1300ft South of Behymer Ave	Class II Bike Lane	1.25	1.25	$56,264

Rank	Plan ID	Corridor	From	To	Recommended Facility	Length (mi)	Total Length (mi)	Estimated Cost
66	54	McCall Ave	Shaw Ave	Dakota Ave	Class II Bike Lane	1.49	1.49	$66,958
67	56	Shaw Ave	Highland Ave	McCall Ave	Class II Bike Lane	1.19	1.19	$53,352
68	18	Teague Ave	Clovis Ave	Armstrong Ave	Class II Bike Lane	1.50	1.50	$67,715
69	42	International Ave/Planned Road 3210ft East of Minnewawa Ave	International Ave	Enterprise Canal Trail	Class II Bike Lane	1.79	1.79	$80,550
70	38	Clovis Ave	Copper Ave	Neighborhood Trail	Class II Bike Lane	1.85	1.85	$83,395
71	22	Nees Ave	Sunnyside Ave	Locan Ave	Class II Bike Lane	2.24	2.24	$100,818
72	21***	Shepherd Ave	Minnewawa Ave	Temperance Ave	Class II Buffered Bike Lane	2.50	2.50	$255,494
73	71***	Temperance Ave	Shepherd Ave	Bullard Ave	Class II Buffered Bike Lane	3.01	3.01	$307,257

*Project has a bike lane only on one side of the street.

**This project will require further study to determine the appropriate facility type. Parking removal would be required to convert this facility to a Class II Bike Lane.

***All Class II Buffered Bicycle Lanes will require further study to assess feasibility.

B

DESIGN GUIDELINES

Glossary

There are many terms used to describe different components of the transportation system, treatments, and bikeway facility types. To promote consistency and ease of understanding, the following terms are used throughout this guide. For glossary resources, see the end of glossary section.

Accessible Pedestrian Signal – Device that communicates information about the WALK and DON'T WALK intervals at signalized intersections in non-visual formats to pedestrians who are blind or have low vision.**8**

Amenities – Elements such as benches, kiosks, bicycle parking, points of interest displays, or trash receptacles that are placed on a sidewalk, pedestrian mall, or at transit stops in order to improve the convenience and attractiveness of the facility.**1**

Arterial Road – Roadway designed for high-speed, high-volume travel between major points in both urban and rural areas.**1**

Average Daily Traffic (ADT) – The total volume of traffic on a street during a given time period divided by the number of days in that time period.**1**

Bicycle Boulevard – Bicycle boulevards are streets with low motorized traffic volumes and speeds, designated and designed to give bicycle travel priority. Bicycle boulevards use signs, pavement markings, and speed and volume management measures to discourage through trips by motor vehicles and create safe, convenient bicycle crossings of busy arterial streets.**6**

Bicycle Box – Designated area on the approach to a signalized intersection consisting of an advanced stop line and bicycle symbols. Bicycle boxes should be primarily considered to mitigate conflicts between through bicyclists and right-turning motorists and to reduce conflicts between motorists and bicyclists at the beginning of the green signal phase.**6**

Bicycle Detection – A system of hardware and software that detects the presence of bicyclists at a traffic signal and calls the green signal for the activated approach. Bicycle detection may consist of inductive loops, microwave, magnetometers, or pushbutton technologies.**1**

Bicycle Pockets - Bicycle pockets are bicycle through lanes in between vehicle travel lanes and vehicle right-turn lanes at the approach to an intersection. A bicycle pocket carves out space for bicyclists to improve rider visibility and mitigate conflicts with motorists, primarily to prevent right-turn collisions between riders and motorists.**6**

Bicycle Signal – Traffic control device used to improve intersection safety and operations for bicyclists. Bicycle signal heads can be installed at signalized intersections to indicate bicycle signal phases and other bicycle-specific timing strategies.**3, 6**

Bicycle Signal Head – An assembly of one or more signal faces that is provided for controlling bicycle traffic movements on one or more intersection approaches.**3**

Bike Lane – A portion of a roadway that has been designated for preferential or exclusive use by bicyclists by pavement markings and, if used, signs.**4**

Bike Route – A signed route that is preferred for bicycling due to low traffic or access to destinations. Does not necessarily have a delineated or dedicated space for bicycling.**1**

Bikeway – Generally, any type of bicycle facility, including paths in separate rights-of-way and on-street bikeways. Includes bike lanes, paved shoulders, signed bike routes, and sidepaths.**12**

Centerline – Line dividing the roadway from opposite moving traffic. Also the survey line with continuous stationing for the length of the project.**9**

Cone of Vision – A transportation safety concept pertaining to the visual acuity of the human eye and the area of focus by a motorist or other roadway user. Motorists tend to focus on the roadway at a distance three to four times the stopping sight distance. Because of this tendency, as motorists drive at higher speeds, they are less likely to notice objects, pedestrians, or bicyclists in the area of their peripheral vision.**3**

Conflict Areas – A two-dimensional zone within which potential travel paths cross and crashes could occur between users of the same mode or users of differing modes. Typical conflict areas include approaches to intersections, intersections, and driveways.**1, 6**

Contra-Flow Bikeway – A bikeway (usually a bike lane) in the opposite direction of motor vehicle traffic on a one-way street. Contra-flow bikeways require careful consideration of traffic control and conflicts with motor vehicle traffic.**6**

Crossing Island – Raised islands placed on a street at intersections or midblock locations to separate crossing pedestrians from motor vehicles. Also known as refuge areas, refuge islands, center islands, pedestrian islands, or median slow points.[3]

Crosswalk – Legal crosswalks exist at all intersections, whether marked or unmarked. Midblock crosswalks must be marked in order for pedestrians to legally have the right-of-way.[6]

Curb Extension – Treatment or application designed to visually and physically narrow the roadway in order to create safer and shorter crossing distances for pedestrians while increasing the available space for street furniture, benches, plantings, and trees.[6]

Curb Radius – The radius of the arc formed where two intersecting curbs meet. Smaller curb radii encourage slower turning speeds at intersections.[1]

Curb Ramp – The transition for pedestrians from the sidewalk to the street. ADA Standards require all pedestrian crossings to be accessible to people with disabilities by providing curb ramps at intersections and mid-block crossings as well as other locations where pedestrians can be expected to enter the street.[3]

Design Speed – Design speed is a selected speed used to determine various geometric design features of the roadway. The assumed design speed should be logical with respect to the topography, anticipated operating speed, adjacent land uses, and the functional classification of the roadway.[1]

Detectable Warning – Standardized feature usually comprised of truncated domes of a contrasting color, which are built into, or applied to, walking surfaces. Detectable warnings alert people with vision impairments that they have reached a location where caution should be exercised. At these locations, visually- impaired pedestrians typically stop and determine their position relative to the roadway before proceeding further.[1]

Flexible Delineator Posts – Flexible delineator posts, also called flex posts or flex stakes, are used to provide vertical demarcation of a roadway feature, including some bike lanes. These posts are typically made of plastic with an internal spring mechanism mounted to a base plate. Flexible delineator posts can be secured to the pavement using bolts, epoxy, or other techniques. The color of the plastic post should match the color of the pavement marking or striping with which it is associated.[1, 6]

Grade (site) – The grade of a site is de[illegible] slope of the ground surface. The slope is calculated by the vertical difference divided by the horizontal difference. For example, if a 1-foot vertical elevation change is present over a 50-foot distance, the resulting grade is 1/50 = .02 . This equates to a 2 percent site grade.[11]

Horizontal Deflection Treatment – Traffic calming techniques that compel motorists to reduce their travel speed by changing the width or directionality of travel lanes at defined locations along a street. Examples include narrow lanes, chicanes, neckdowns, traffic circles, and curb extensions.[9]

Landing Area – A level area at a curb ramp or raised crossing with less than 2 percent grade or cross slope, designed for wheelchair users to wait, maneuver into or out of a curb ramp, or to bypass a ramp altogether.[1]

Lane Diet – See Lane Narrowing.

Lane Narrowing – A design strategy used for traffic calming effects and for reallocating existing pavement width to create designated space for other uses, including bicycle lanes.[3]

Leading Pedestrian Interval (LPI) – At intersections with high pedestrian volumes and high conflicting turning vehicle volumes, a brief leading pedestrian interval may be used, during which an advance WALKING PERSON (symbolizing WALK) indication is displayed for the crosswalk while red indications continue to be displayed to parallel through and/or turning traffic. The LPI may be used to reduce conflicts between pedestrians and turning vehicles. If a leading pedestrian interval is used, it should be timed to allow pedestrians to cross at least one lane of traffic or to travel far enough for pedestrians to establish their position ahead of the turning traffic before the turning traffic is released. Chapter 4E of the MUTCD provides specifications regarding pedestrian signals.[4]

Local Road – Locally classified roads account for the largest percentage of all roadways in terms of mileage. Local roads are not intended for long-distance travel, instead providing direct access to abutting land on the origin and/or destination end of a trip. Local roads are often designed to discourage through traffic.[3]

Mast Arm – A structure, also referred to as a cantilevered signal structure, that is rigidly attached to a vertical pole and is used to provide overhead support of traffic signal faces or grade crossing signal units. Traffic control signs may also be mounted to a mast arm.[4]

Mid-Block Crossing – Designated crosswalks away from an established intersection provided to facilitate crossings at places where there is a significant pedestrian desire line such as bus stops, parks, and building entrances.6

Mixing Zone – A mixing zone requires turning motorists to merge across a separated bike lane at a defined location in advance of an intersection. Unlike a standard bike lane, where a motorist can merge across at any point, a mixing zone design limits bicyclists' exposure to motor vehicles by defining a limited merge area for the turning motorist. Mixing zones are compatible only with one-way separated bike lanes.3

Mountable Curb/Truck Apron – Mountable curbs with curb aprons deter passenger vehicles from making higher-speed turns but accommodate the occasional large vehicle without encroachment or off-tracking into pedestrian areas.3

MUTCD – The Manual on Uniform Traffic Control Devices is a compilation of national standards for all traffic control devices, including traffic signals.4

Neighborhood Traffic Circles – Raised islands typically built at the intersections of local residential streets to reduce motor vehicle speeds. They may be operated without stop control, or as two-way or all-way stop-controlled intersections. Neighborhood traffic circles frequently do not include raised channelization to guide approaching traffic into the circulatory roadway.3, 7

Offset Intersection – Offset intersections are locations where two segments of a street connection do not directly align where they meet another street. These configurations are most challenging for bicyclists when offset local streets serving as bike routes or bike boulevards intersect with larger collector or arterial streets.6

Parking T – A short vertical white line to mark the side of a parking space, coupled with a short horizontal white line crossing it to mark each end of the space.4

Path – Short for "shared use path" and often synonymous with the word "trail," a path is a separated facility, typically in an independent right-of-way such as a greenbelt or abandoned railroad. See Shared Use Path.

Paved Shoulder – Paved area at the edges of rural roadways. A paved shoulder is suitable for bicyclists if it is at least 4 feet in width.3

Pavement Markings – Pavement ma to convey messages to roadway (or shared use path) users. They indicate which part of the road to use, provide information about conditions ahead, and indicate where passing is allowed. Yellow lines separate traffic flowing in opposite directions. White lines separate lanes in which travel is in the same direction. Symbols are used to indicate permitted lane uses. The MUTCD provides specifications regarding pavement markings.4

Pedestrian Change Interval – A pedestrian change interval consists of a flashing UPRAISED HAND (symbolizing DON'T WALK) signal indication, and begins immediately following the WALKING PERSON (symbolizing WALK) signal indication. Chapter 4E of the MUTCD provides specifications regarding pedestrian signals.4

Pedestrian Hybrid Beacon – The pedestrian hybrid beacon (also known as the High-Intensity Activated crosswalk, or HAWK) is a pedestrian-activated warning device located on the roadside or on mast arms over midblock pedestrian crossings. The beacon head consists of two red lenses above a single yellow lens. Chapter 4F of the MUTCD includes information on the pedestrian hybrid beacon and how it should be used.4

Pedestrian Signal Head – Provide special types of traffic signal indications exclusively intended for controlling pedestrian traffic. These signal indications consist of the illuminated symbols of a WALKING PERSON (symbolizing WALK) and an UPRAISED HAND (symbolizing DON'T WALK). Chapter 4E of the MUTCD provides specifications regarding pedestrian signals.4

Raised Crosswalk – Traffic calming device at a pedestrian crossing or crosswalk that raises the entire wheelbase of a vehicle to encourage motorists to reduce speed.6

Rectangular Rapid Flashing Beacon (RRFB) – User-actuated amber light-emitting diodes (LEDs) that supplement warning signs at unsignalized intersections or mid-block crosswalks. They can be activated by pedestrians manually by a push button or passively by a pedestrian detection system.3

Restroom, Plumbed or Vault – A plumbed restroom is a toilet facility that is fully plumbed with running water. It is connected to a public water line and sanitary sewer line. A vault restroom is a toilet that does not have any running water and typically has a large tank below ground. A vault toilet requires regular maintenance to clear out the vault.2

Right(s)-of-Way – Land or property that is used for public purposes including streets, sidewalks, utilities, etc.

Road Diet – A short-hand term referring to reconfiguring a roadway to remove lanes in order to provide more space for pedestrians and bicyclists. Road diets are most typically performed on roadways where traffic volumes do not necessitate the existing number of lanes.3

Roadway – The paved portion of a street, from curb to curb, designed to convey motor vehicle, bicycle, transit, and/or freight traffic.3

Separated Bike Lane – One- or two-way bikeway that combines the user experience of a sidepath with the on-street infrastructure of a conventional bike lane. They are physically separated from both motor vehicle and pedestrian traffic.3

Shared Lane Marking – Shared lane markings (or “sharrows”) are pavement markings that denote shared bicycle and motor vehicle travel lanes. The markings are two chevrons positioned above a bicycle symbol, placed where the bicyclist is anticipated to operate.6

Shared Roadway – Roadway that is open to both bicycle and motor vehicle travel.1

Shared Use Path – Shared use paths, also commonly referred to as trails or greenways, are paths designed for and generally used by bicyclists, pedestrians, and other non-motorized users. Shared use paths are generally the preferred type of infrastructure for the majority of bicyclists in the “interested but concerned” category, due to their separation from the roadway and vehicular traffic. In many states, the term “trail” refers to an unimproved recreational facility intended for uses such as walking, hiking, and mountain biking. Care should be taken when using this term, as in some parts of the country, trails have distinctly different design guidelines.1

Shoulder – The portion of the roadway contiguous with the traveled way that accommodates stopped vehicles, emergency use, and lateral support of the subbase, base, and surface courses. Shoulders, where paved, are often used by bicyclists.1

Sidepath – A separated path along a roadway that serves people bicycling and walking within the street right-of-way. Compared to paths in independent rights-of-way, sidepaths have a higher likelihood of interactions with motor vehicles at driveways and intersections.1

Sidewalk Buffer – The space between the sidewalk and the adjacent roadway designed to improve pedestrian safety and to enhance the overall walking experience. Sidewalk buffers also provide an area for snow storage and splash protection for pedestrians, as well as space for curb ramps, light poles and traffic signs.1

Sight Distance – Sight distance is the visually unobstructed distance required to execute a stopping maneuver (stopping sight distance), pass another vehicle (passing sight distance), perform an unexpected maneuver (decision sight distance), or execute a movement at an intersection (intersection sight distance). Sight distances depend on roadway geometry, travel speeds, deceleration rates, and reaction times.1

Signal Timing – The process of selecting appropriate values for timing parameters implemented in traffic signal controllers and associated system software.8

Signal Warrant – Traffic control signal warrants define the minimum conditions under which installing traffic control signals might be justified. An engineering study of traffic conditions, pedestrian characteristics, and physical characteristics of the location shall be performed to determine whether installation of a traffic control signal is justified at a particular location. The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal. Chapter 4C of the MUTCD provides specifications regarding traffic control signal warrants. Warrants for installation of multi-way stop sign control are provided in Chapter 2B of the MUTCD.4

Signalized Intersection – Intersection between two traveled ways (roadway/roadway or roadway/shared use path) where user movements are regulated by a traffic control signal.3

Speed Cushion – Speed cushions are either speed humps or speed tables that include wheel cutouts to allow large vehicles to pass unaffected, while reducing passenger car speeds. Speed cushions extend across one direction of travel from the centerline, with a longitudinal gap provided to allow vehicles with wide wheel bases to straddle the hump.6

Speed Hump – Parabolic vertical traffic calming devices intended to slow traffic speeds on low-volume, low-speed streets.6

Steep Grade – Steep grades in landscaped areas are grades exceeding a slope of 4 (horizontal) to 1 (vertical) or 25 percent. Steep grades along a trail are typically 5 percent or greater. Refer to ADA and AASHTO for steep grade recommendations.11

Stop Bar – Solid white pavement marking line extending across approach lanes to indicate the point at which a stop is intended or required to be made.4

Street – A public corridor designed to provide access to businesses, housing, parks, and civic buildings within a city. The entire right-of-way, including sidewalks, the roadway, vegetated buffers, etc. is considered part of the street.

Street Buffer – The portion of a separated bike lane design that divides the bike lane from motor vehicle traffic.5

Traffic Calming – A strategy and toolkit to slow the speeds of motor vehicle traffic to a “desired speed” by incorporating physical features, such as chicanes, mini traffic circles, speed humps, and curb extensions.3

Traffic Control – Devices such as traffic signals, warning signs, stop signs, yield signs, and other regulatory signs.4

Traffic Volume – The number of vehicles passing a given point over a specific period of time.

Transit Stop– Location where public transportation vehicles (bus or rail) will stop to allow passengers to board or alight the transit vehicle.10

Transit Stop Wheelchair Landing Pad – The wheelchair landing is a portion of the waiting pad at a paved bus stop. This landing provides a location with a curb-height solid surface for buses to “kneel” and deploy the bus wheelchair ramp. Wheelchair landings must comply with ADA guidelines.10

Truncated Dome – See Detectable Warning.

Two-Stage Turn Queue Box – Two-stage turn queue boxes are areas set aside for bicyclists to queue to turn at signalized intersections outside of the traveled path of motor vehicles and other bicycles. In addition to mitigating conflicts inherent in merging across traffic to turn, two-stage bicycle turn boxes reduce conflicts between bicycles and pedestrians and separate queued bicyclists waiting to turn from through bicyclists moving on the green signal.4

Underpass – Grade-separated facility designed to convey vehicular, bicycle, and/or pedestrian traffic under an intersecting roadway or railroad.8

Vertical Deflection Treatment – Traffic calming techniques that compel motorists to reduce their travel speed by changing the elevation of the roadway at defined locations along a street. Examples include speed humps, speed tables, and raised crosswalks.1

Walk Interval – The walk interval is the portion of the signal timing intended for pedestrians to start their crossing of the roadway. The walk interval should be at least 7 seconds in duration so that pedestrians will have adequate opportunity to leave the curb or shoulder before the pedestrian clearance time begins, unless pedestrian volumes and characteristics do not require a 7-second walk interval, in which case walk intervals as short as 4 seconds may be used. Chapter 4E of the MUTCD provides specifications regarding pedestrian signals.4

Wayfinding – A system of directional signs along streets or paths that assist people in finding major destinations. Wayfinding can be designed specifically for drivers, bicyclists, or pedestrians.3

Glossary Resources

1 American Association of State Highway Transportation Officials (AASHTO)

2 California State Water Resources Control Board

3 Federal Highway Administration (FHWA)

4 Manual on Uniform Traffic Control Devices (MUTCD)

5 Massachusetts Department of Transportation (MassDOT)

6 National Association of City Transportation Officials (NACTO)

7 National Center for Safe Routes to School

8 National Cooperative Highway Research Program (NCHRP)

9 Texas Department of Transportation (TxDOT)

10 Transit Cooperative Research Program (TCRP)

11 United States Access Board

12 Caltrans Streets and Highway Manual

National Standards and Resources

The publications listed here are excellent resources for planning and design guidance in implementing safe, comfortable accommodations for pedestrians and bicyclists in a variety of environments. Many of these resources are available on-line at no cost.

American Association of State Highway and Transportation Officials (AASHTO)

- Guide for the Development of Bicycle Facilities (2012) (Update anticipated in 2024)
- Guide for the Planning, Design, and Operation of Pedestrian Facilities (2004)
- A Policy on Geometric Design of Highways and Streets, 6th Edition (2011)

Federal Highway Administration (FHWA)

- Bikeway Selection Guide (2019)

Caltrans

- Manual on Uniform Traffic Control Devices (2014)
- Complete Streets Elements Toolbox
- National Association of City Transportation Officials (NACTO)
- Urban Street Design Guide (2013)
- Transit Street Design Guide (2016)
- Urban Bikeway Design Guide (2014)

Pedestrian Crossing Treatments

Marked Crosswalks

Legal crosswalks exist at all locations where sidewalks meet the roadway, regardless of whether pavement markings are present. Drivers are legally required to yield to pedestrians at intersections, even when there are no pavement markings. Providing marked crosswalks communicates to drivers that pedestrians may be present, and helps guide pedestrians to locations where they should cross the street. In addition to pavement markings, crosswalks may include signals/beacons, warning signs, and raised platforms. To help evaluate marked crosswalk candidates refer to the City of Clovis Memorandum on Guidance for Uncontrolled Crosswalk Treatments (2016).

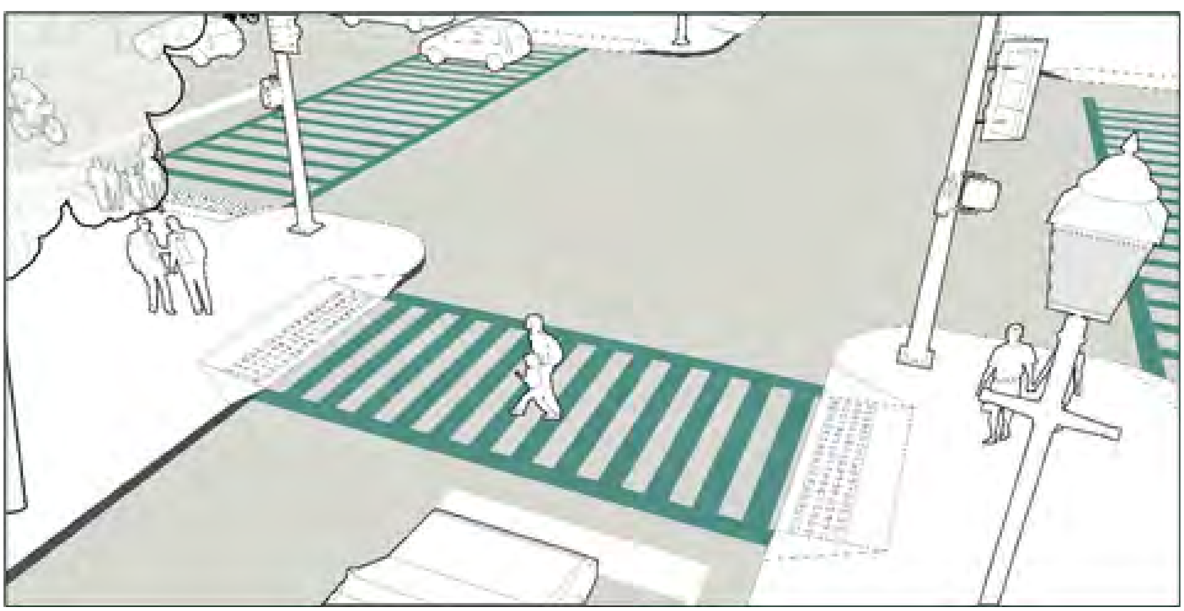
Considerations

- There are many different styles of crosswalk striping and some are more effective than others. Ladder and continental striping patterns are more visible to drivers.
- Signal phasing is very important. Pedestrian signal phases must be timed based on the length of the crossing. If pedestrians are forced to wait longer than 30 seconds, non- compliance is more likely.
- Raised crossings can calm traffic and increase the visibility of pedestrians.
- Curb extensions, also known as bulb-outs and bump-outs, reduce the distance pedestrians have to cross and calm traffic.

Guidance

- Place crosswalks on all legs of signalized intersections, in school zones, and across streets with more than minimal levels of traffic.
- Crosswalks should be at least 10 feet wide or the width of the approaching sidewalk if it is greater. In areas of heavy pedestrian volumes (such as Transit Station Areas, School Zones, and Main Streets) crosswalks can be up to 25 feet wide.
- Stop lines at stop-controlled and signalized intersection approaches should be striped no less than 4 feet and no more than 30 feet from the edge of crosswalks.
- For enhanced crossing treatments, refer to the section of this guide addressing Rectangular Rapid Flashing Beacons and Pedestrian Hybrid Beacons.
- Crosswalks should be oriented perpendicular to streets, minimizing crossing distances and therefore limiting the time that pedestrians are exposed to motor vehicles and other roadway users.

Figure 21: Crosswalks with ladder striping pattern



References

NACTO Urban Street Design Guide (2013)

ADA Accessibility Guidelines (2004)

Manual on Uniform Traffic Control Devices (2009)

Proposed Accessibility Guidelines for Pedestrian Facilities in the Public Right-of-Way (PROWAG) (2011)

Guide for Improving Pedestrian Safety at Uncontrolled Crossing Locations (2018)

Curb Extensions

Curb extensions, also known as neck downs, bulb-outs, or bump-outs, are created by extending the sidewalk at corners or mid-block. Curb extensions are intended to increase safety, calm traffic, and provide extra space along sidewalks for users and amenities. In addition to shortening crossing distances, curb extensions can be used to change the geometry of intersections resulting in smaller corner radii and slowing turning motor vehicles.

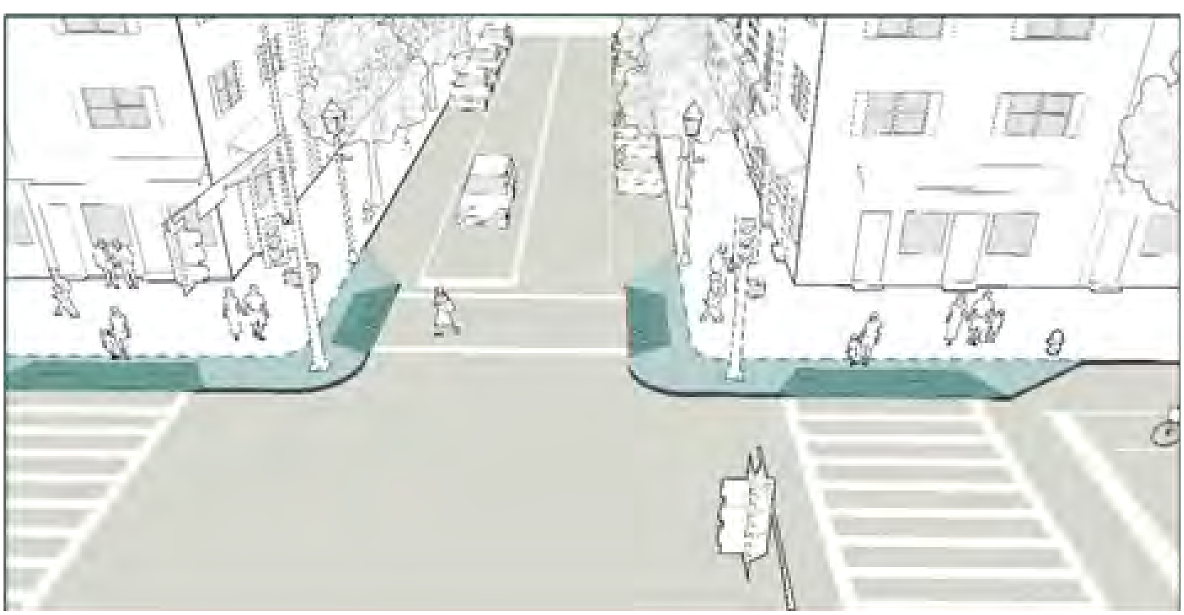
Considerations

- The turning needs of emergency and larger vehicles should be considered in curb extension design.
- Care should be taken to maintain direct routes across intersections by aligning pedestrian desire lines on either side of the sidewalk. Curb extensions often make this possible as they provide extra space for grade transitions.
- Consider providing a 20 feet long curb extension to restrict parking within 20 feet of an intersection to enhance visibility.
- When curb extensions conflict with turning movements, reducing the width and/or length of the curb extension should be prioritized over elimination.
- Emergency access is often improved through the use of curb extensions because intersections are kept clear of parked cars.

Guidance

- Curb extensions should be considered only where parking is present or where motor vehicle traffic deflection is provided through other curbside uses such as bikeshare stations or parklets.
- Curb extensions are particularly valuable in locations with high volumes of pedestrian traffic, near schools, at unsignalized pedestrian crossings, or where there are demonstrated pedestrian safety issues.
- A typical curb extension extends approximately the width of a parked car (or about 6 feet from the curb).
- The minimum length of a curb extension is the width of the crosswalk, allowing the curvature of the curb extension to start after the crosswalk, which should deter parking; NO STOPPING signs should also be used to discourage parking. The length of a curb extension can vary depending on the intended use (i.e., stormwater management, transit stop waiting areas, parking restrictions).
- Curb extensions should not reduce a travel lane or a bicycle lane to an unsafe width.

Figure 22: Curbs extensions



References

AASHTO Guide for the Development of Bicycle Facilities (2012)

NACTO Urban Street Design Guide (2013) - Curb Extensions

Median Refuge Islands

Median refuge or crossing islands are raised islands that provide a pedestrian refuge and allow multi-stage crossings of wide streets. They can be located mid-block or at intersections and along the centerline of a street, as roundabout splitter islands, or as "pork chop" islands where right-turn slip lanes are present.

Considerations

- There are two primary types of median refuge islands. The first type provides a cut-through of the island, keeping pedestrians at street-grade. The second type ramps pedestrians up above street grade and may present challenges to constructing accessible curb ramps unless they are more than 17 feet wide (accommodating for ramp width and landing area).
- Crossing islands should be considered where crossing distances are greater than 50 feet. For long distances, islands can allow multi-stage crossings, which in turn allow shorter signal phases.
- Crossing islands can be coupled with other traffic calming features, such as partial diverters and curb extensions at mid-block and intersection locations.
- At mid-block crossings where width is available, islands should be designed with a stagger, or in a "Z" pattern, encouraging pedestrians within the median to face oncoming traffic before crossing.

Guidance

- Minimum width: 6 feet
- Preferred Width: 10 feet (to accommodate bicyclists with trailers and wheelchair users)
- Cut-through openings should equal the width of the crosswalk. Cut-throughs may be wider in order to allow the clearing of debris but should not encourage motor vehicles to use the space for U-turns.
- Curb ramps with truncated dome detectable warnings and 5-foot by 5-foot landing areas are required when the pedestrians are taken above the street level.
- A "nose" that extends past the crosswalk is not required, but is recommended to protect people waiting on the crossing island and to slow turning drivers.
- Vegetation and other aesthetic treatments may be incorporated, but must not obscure visibility.

Figure 23: Intersection Crossing Islands

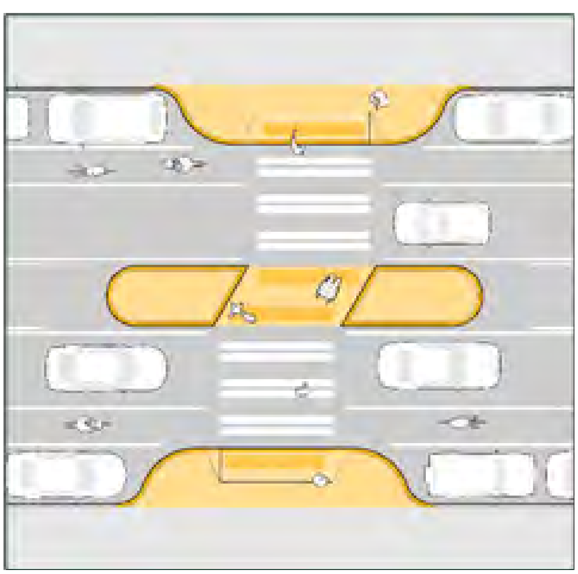
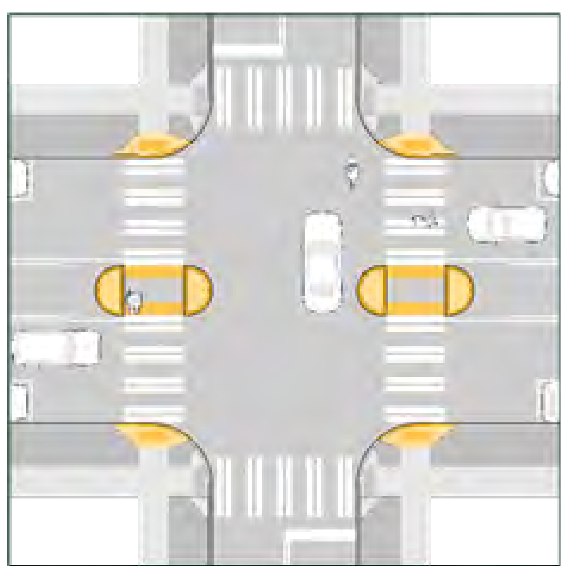


Figure 24: Mid-block Crossing Island with Curb Extensions



References

NACTO Urban Street Design Guide (2013)

Manual on Uniform Traffic Control Devices (2009)

Pedestrian Signals and Leading Pedestrian Intervals

Pedestrian signal heads display the three intervals of the pedestrian phase: (1) The Walk Interval, signified by the WALK indication (or the walking person symbol) alerts pedestrians to begin crossing the street. (2) The Pedestrian Change Interval, signified by the flashing DON'T WALK indication (or the flashing hand symbol and countdown display) alerts pedestrians approaching the crosswalk that they should not begin crossing the street. (3) The Don't Walk Interval, signified by a steady DON'T WALK indication (or the steady upraised hand symbol) alerts pedestrians that they should not cross the street.

Considerations

A primary challenge for traffic signal design is minimizing conflicts between motor vehicle and pedestrian movements. Intersection geometry and traffic controls should encourage turning vehicles to yield the right-of-way to pedestrians. Traffic movements should be analyzed to implement WALK intervals during non-conflicting phases.

Signal design should also minimize the time that pedestrians must wait. Requiring pedestrians to wait for extended periods can encourage crossing against the signal. The 2010 Highway Capacity Manual states that pedestrians have an increased likelihood of risk-taking behavior (crossing against the signal) after waiting longer than 30 seconds.

Free-flowing right-turn lanes are discouraged at signalized intersections. Where they are present and unsignalized, the pedestrian signal and pushbutton should be located on the channelization ("pork chop") island and a yield or crosswalk warning sign should be placed in advance of the crosswalk.

Guidance: Timing and Activation

- Pedestrian signals should allocate enough time for pedestrians of all abilities to safely cross the roadway. The MUTCD specifies a pedestrian walking speed of 3.5 feet per second to account for an aging population.
- Countdown pedestrian displays inform pedestrians of the amount of time in seconds that is available to safely cross during the flashing DON'T WALK (or upraised hand) interval. All pedestrian signal heads should contain a countdown display provided with the DON'T WALK (or upraised hand) indication.
- In areas with higher pedestrian activity, such as near transit stations, Main Streets, and school zones, push button actuators may not be appropriate. People should expect to get a pedestrian cycle at every signal phase, rather than having to push a button to call for a pedestrian phase.

Figure 25: Pedestrian signal

References

FHWA. Manual on Uniform Traffic Control Devices. 2009.

NACTO. Urban Street Design Guide. 2013.

Guidance: Leading Pedestrian Interval (LPI)

The Leading Pedestrian Interval initiates the pedestrian WALK indication three to seven seconds before motor vehicles traveling in the same direction are given the green indication. This signal timing technique allows pedestrians to enter the intersection prior to turning vehicles, increasing visibility between all roadway users.

- The LPI should be used at intersections with high volumes of pedestrians and conflicting turning vehicles, and at locations with a large population of elderly or school children who tend to walk slower.
- A lagging protected left arrow for vehicles should be provided to accommodate the LPI.
- If an intersection has particularly high pedestrian traffic, consider lengthening the leading pedestrian interval or adding an exclusive pedestrian phase instead of a leading pedestrian interval.
- If an intersection has such high pedestrian volumes that motorists are unable to turn across the crosswalk, the green interval for the parallel concurrent vehicle traffic can be set to extend beyond the pedestrian interval to provide turning drivers with sufficient green time to make their turns.
- The LPI should be accompanied by an audible noise to inform visually-impaired pedestrians that it is safe to cross.
- LPIs may be less effective when used at intersections without right-turn-on-red restrictions.

Guidance: Protected Signal Phasing

Protected phases at intersections provide a way to separate vehicular traffic from pedestrian and/or bicyclist movements, particularly for left-turns when concurrent phasing would result in a conflict with crossing pedestrians and left-turning vehicles and right-turns when concurrent phasing would result in a conflict with through bicyclists or crossing pedestrians and right-turning vehicles.

Signal timing decisions should consider the needs of pedestrians, bicyclists, trucks, buses, and other motor vehicles.

Protected signal phasing may be appropriate at the following locations:

- Urban areas, particularly downtown locations.
- Intersections with a history of left- or right-hook crashes with pedestrians (or bicyclists).
- Intersections with high volumes of pedestrians (or bicyclists) and turning vehicles.

Pedestrian Hybrid Beacons (PHB)

Pedestrian Hybrid Beacons, including the High-intensity Activated Crosswalk Beacon (HAWK), are a type of hybrid signal intended to allow pedestrians and bicyclists to stop traffic to cross high-volume arterial streets. This type of signal may be used in lieu of a full signal that meets any of the traffic signal control warrants in the MUTCD. To help evaluate marked crosswalk candidates with a PHB refer to the City of Clovis Memorandum on Guidance for Uncontrolled Crosswalk Treatments (2016). It may also be used at locations which do not meet traffic signal warrants but where assistance is needed for pedestrians or bicyclists to cross a high-volume arterial street.

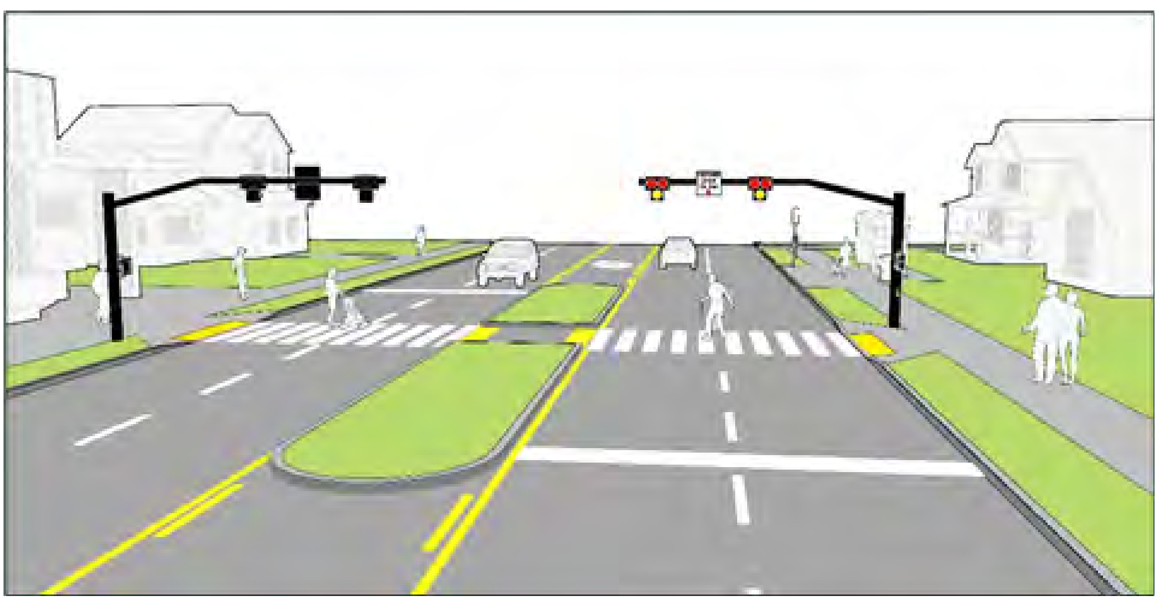
Considerations

- While this type of device is intended for pedestrians, it can be beneficial to retrofit it for bicyclists as several cities have done, using bicycle detection and bicycle signal heads on major cycling networks. Depending upon the detection design, the agency implementing these devices may have the option to provide different clearance intervals for bicyclists and pedestrians. The provision of bicycle signal heads would require permission to experiment from FHWA.

Guidance

- The MUTCD recommends minimum volumes of 20 pedestrians or bicyclists an hour for major arterial crossings (volumes exceeding 2,000 vehicles/hour).
- This type of device should be considered for all arterial crossings in a bicycle network and for path crossings if other engineering measures are found inadequate to create safe crossings.
- Pushbutton actuators should be “hot” (respond immediately when pressed), be placed in convenient locations for all users, and abide by other ADA standards. Passive signal activation, such as video or infrared detection, may also be considered.
- See FHWA’s Guide for Improving Pedestrian Safety at Uncontrolled Crossing Locations publication and the Manual of Uniform Traffic Control Devices to determine warrants for traffic control at midblock crossings.

Figure 26: Pedestrian Hybrid Beacon



References

NACTO Urban Street Design Guide (2013)

Manual on Uniform Traffic Control Devices (2009)

FHWA Guide for Improving Pedestrian Safety at Uncontrolled Crossing Locations (2018)

Rectangular Rapid Flashing Beacons (RRFB)

At some uncontrolled crossings, particularly those with four or more lanes, it can be difficult to achieve compliance with laws that require motorists to yield to pedestrians. Vehicle speeds and poor pedestrian visibility combine to create conditions in which very few drivers are compelled to yield. One type of device proven to be successful in improving yielding compliance at these locations is the Rectangular Rapid Flashing Beacon (RRFB). RRFBs combine a pedestrian crossing sign with a bright flashing beacon that is activated only when a pedestrian is present. To help evaluate marked crosswalk candidates with a RRFB refer to the City of Clovis Memorandum on Guidance for Uncontrolled Crosswalk Treatments (2016).

Considerations

RRFBs are considerably less expensive to install than mast arm-mounted signals. They can also be installed with solar power panels to eliminate the need for an external power source.

RRFBs should be limited to locations with critical safety concerns, and should not be installed in locations with sight distance constraints that limit the driver's ability to view pedestrians on the approach to the crosswalk.

RRFBs should be used in conjunction with advance stop bars and signs.

RRFBs are usually implemented at high-volume pedestrian crossings, but may also be considered for priority bicycle route crossings or locations where bike facilities cross roads at mid-block locations.

Guidance

- The design of RRFBs should be in accordance with FHWA's Interim Approval 11 (IA-11) for Optional Use of Rectangular Rapid Flashing Beacons issued July 16, 2008 and the Interpretation Letter 4(09)-41 (I) - Additional Flash Pattern for RRFBs issued July 25, 2014.
- RRFBs can be used when a signal is not warranted at an unsignalized crossing. They are not appropriate at intersections with signals or STOP signs.
- RRFBs are installed on both sides of the roadway at the edge of the crosswalk. If there is a pedestrian refuge or other type of median, an additional beacon should be installed in the median.
- See FHWA's Guide for Improving Pedestrian Safety at Uncontrolled Crossing Locations publication and the Manual of Uniform Traffic Control Devices to determine warrants for traffic control at midblock crossings.

Figure 27: Rectangular Rapid Flashing Beacon (RRFB)

References

NACTO Urban Street Design Guide (2013)

Manual on Uniform Traffic Control Devices (2009)

FHWA Guide for Improving Pedestrian Safety at Uncontrolled Crossing Locations (2018)

In-Street Pedestrian Crossing Signs

In-street pedestrian crossing signs (MUTCD R-16) are a low-cost sign treatment which can be used to encourage slower driving speeds and increase the likelihood that drivers will yield to pedestrians crossing the street. The sign may be placed on lane lines or in the gutter of the roadway by the curb. The placement of two or more signs at one crossing is referred to as a gateway treatment and requires motorists to drive between the signs. Gateway treatments have been shown to increase motorist awareness of the crossing, reduce approach speeds, and to improve yielding rates.

Considerations

- Recommended for use in combination with high-visibility crosswalk markings, and curb ramps. May also be combined with curb extensions, crossing islands, warning signs (MUTCD W11-1, W11-2, W11-15, or S1-1), and lighting.
- On multilane approaches, advance yield/stop lines and Stop Here for Pedestrians or Yield Here to Pedestrians signs (MUTCD R1-5 series) are recommended.
- The narrower the gap between the signs, the more effective the gateway treatment.
- A rubberized curb sign base may increase the longevity of the device.

Guidance

- Applicable at uncontrolled crossings on roads with speed limits of 30 miles per hour or less.
- Applicable at uncontrolled crossings on roads with speed limits of 35 miles per hour with average annual daily traffic levels below 12,000.
- The signs should be placed on both sides of all travel lanes.
- The signs may be located on a center line, a median or crossing island, on a lane line, within a gutter, or near the curb at the edge of the street to create the gateway effect.
- The signs should be placed at the crosswalk, but neither the sign nor the sign base should be within the crosswalk or on the crosswalk lines.

Figure 28: Crossing Sign

References

Transportation Research Board Guidance to Improve Pedestrian and Bicyclist Safety at Intersections (2020)

Raised Crossings

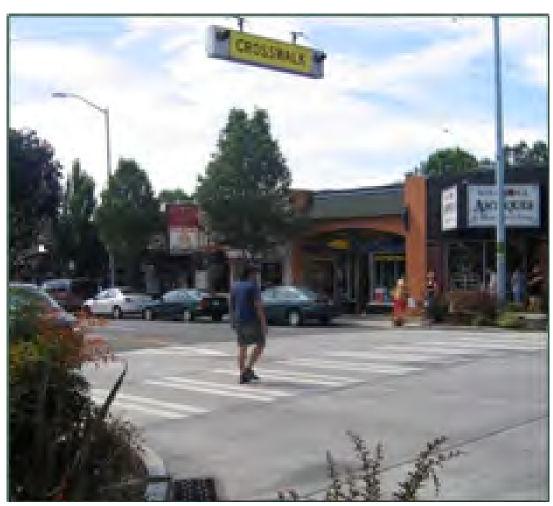
Vertical traffic calming treatments such as speed tables and raised crosswalks compel motorists to slow their speeds which improves safety and comfort for pedestrians and bicyclists. Raised crosswalks are created by raising the crossing to the level of the sidewalk. Raised crosswalks are speed tables, or trapezoid-shaped speed humps with a marked crosswalk across the top of the table. These treatments provide an array of benefits especially for people with mobility and visual impairments because there are no vertical transitions to navigate. The following is best practice guidance for raised crosswalks.

Considerations

- Consider using raised crosswalks and speed tables at intersections to slow traffic turning onto a traffic-calmed street from a major street.
- Raised crossings and speed tables are appropriate in areas of high pedestrian demand, including commercial and shopping districts, campuses, and school zones. They should also be considered at locations where pedestrian visibility and motorist yielding have been identified as issues.
- Raised crossings and speed tables are particularly valuable at unsignalized mid-block locations, where drivers are less likely to expect or yield to pedestrians.
- Raised crossings can be provided along side streets of major thoroughfares to slow traffic exiting the main street.
- Raised crossings should provide pavement markings for motorists and appropriate signage at crosswalks per the MUTCD.
- Raised crossings and speed tables may not be appropriate for high-speed roadways. Vehicle speeds, volumes, and the types of vehicles using the roadways are also factors to consider when implementing raised crossings.

Guidance

- Raised crossings require detectable warnings for the visually impaired at the curb line to indicate where the roadway begins.
- High-visibility or textured paving materials can be used to enhance the contrast between the raised crossing or intersection and the surrounding roadway.
- Raised crossings can be used as gateway treatments to signal to drivers when there are transitions to a slower speed environment that is more pedestrian-oriented.
- Designs should be carefully thought out to ensure proper drainage. Raised intersections can simplify drainage inlet placement by directing water away from the intersection. If the intersecting streets are sloped, catch basins should be placed on the high side of the intersection at the base of the ramp.
- Design speeds and emergency vehicle routes must be considered when designing approach ramps.



References

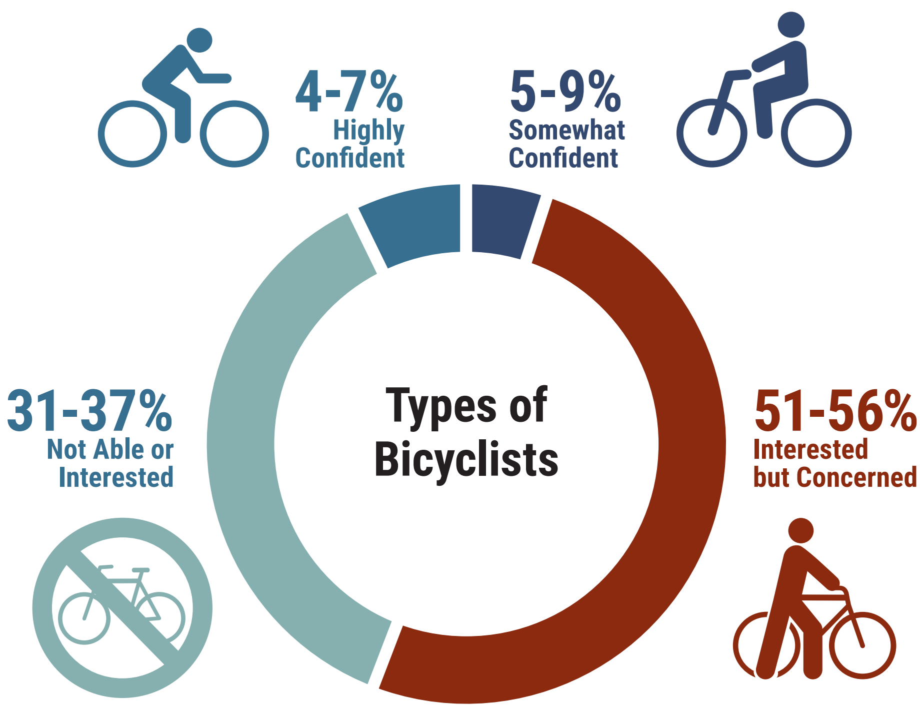
NACTO. Urban Bikeway Design Guide. 2014.

NACTO. Urban Street Design Guide. 2013.

Bicycle facility selection guidance

Potential Bicycle Users

The figure below illustrates a typical range of bicyclists. Estimates show the greatest percentage of the population—over half—fall into the "Interested but Concerned" category. The "Interested but Concerned" are most comfortable biking when separated from motorized vehicles. On the other end of the spectrum, "Highly Confident" people are comfortable sharing the road with motorized vehicles. In the middle, "Somewhat Confident" people are comfortable biking for short distances with motorized vehicles.



Highly Confident bicyclist will ride in any road conditions or environment. These types of bicyclists include adults who regularly commute by bicycle and bicyclists who are willing to ride on roads with little to no dedicated bicycle infrastructure.

Somewhat Confident bicyclists will ride comfortably on most types of streets, but may be uncomfortable in certain situations or road conditions.

People who identify as **Not Able or Interested** will not (or cannot) ride a bicycle. No matter the circumstances.

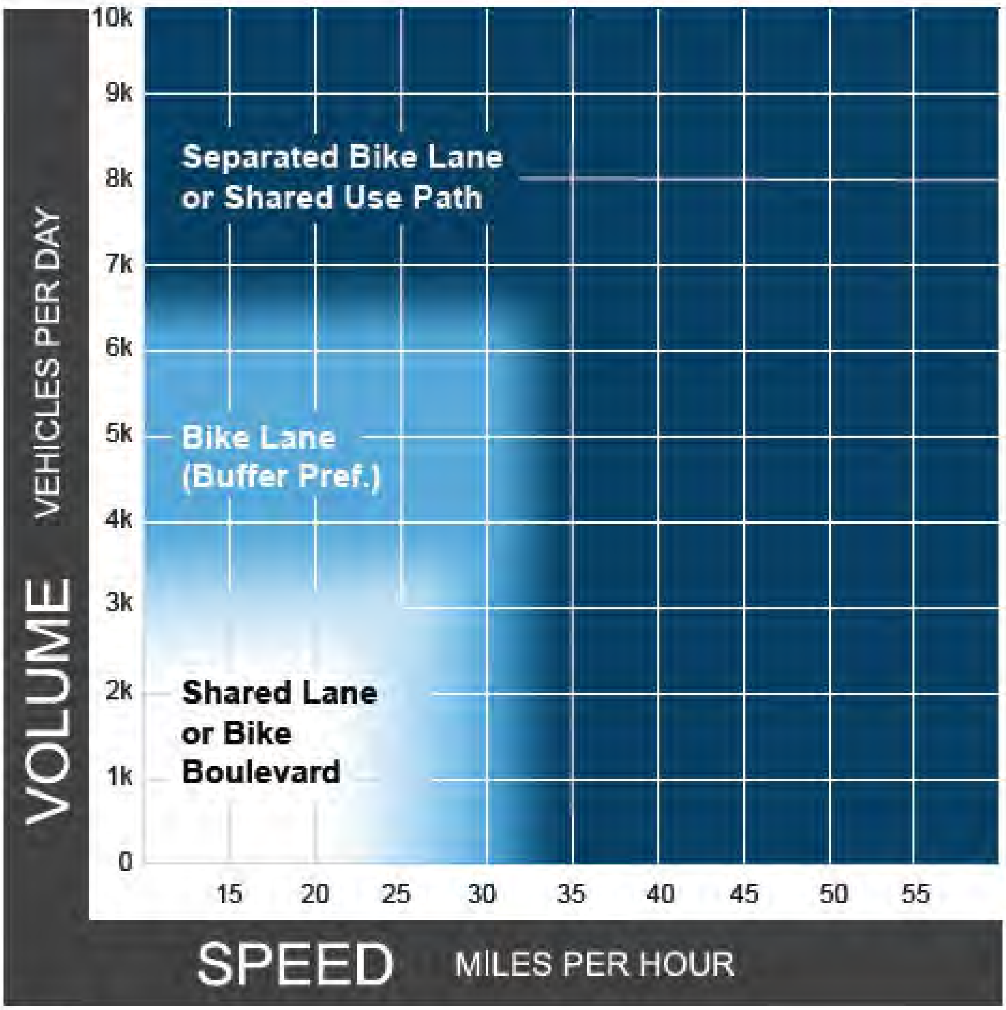
Interested but Concerned bicyclists require physical bicyle infrastructure improvements before they will want to ride. They typically do not feel comfortable sharing the lane with motor vehicles or riding adjacent to high-speed and high-volume traffic. This group represent the largest segment of the population and typically includes children, the elderly, and non-regular adult bicyclists. These types of riders prefer off-street bicycle facilities or bicycling on low-speed low-volume streets.

Source: Dill, Jennifer and McNeil, Nathan, Revisiting the Four Types of Cyclists: Findings from a National Survey, Transportation Research Record: Journal of the Transportation Research Board, January 12, 2016.

Facility Selection

The facility selection chart below can be used to guide decisions about which bikeway to install based on motor vehicle speed and traffic volumes. This chart is applicable for urban and suburban contexts. It was developed with the needs of "interested but concerned" bicyclists in mind.

"Interested but concerned" bicyclists prefer physical separation as traffic volumes and speeds increase. The bikeway facility selection chart below identifies bikeway facilities that improve operating environment for this bicyclist type at different roadway speeds and traffic volumes. Many "highly confident" bicyclists will also prefer bikeway treatments noted in this chart. Selecting facility types based on this chart is recommended in order to serve the largest share of the population and increase bicycling in the community.



Notes

1 *Chart assumes operating speeds are similar to posted speeds. If they differ, use operating speed rather than posted speed.*

2 *Advisory bike lanes may be an option where traffic volume is <3K ADT.*

Source: Bikeway Selection Guide, Federal Highway Administration, 2019

Bicycle facility overview

Shared-Use Paths and Trails (Class 1)

Shared-use paths can generally be considered on any road with one or more of the following characteristics:

- Total traffic lanes: 3 lanes or more
- Posted speed limit: 30 miles per hour or higher
- Average Daily Traffic: 9,000 vehicles or more
- Parking turnover: frequent
- Bike lane obstruction: likely to be frequent
- Streets that are designated as truck or bus routes

Shared-use paths may be preferable to separated bike lanes in low density areas where pedestrian volumes are anticipated to be fewer than 200 people per hour on the path.

Separated Bike Lane (Class 4)

Separated bike lanes can generally be considered on any road with one or more of the following characteristics:

- Total traffic lanes: 3 lanes or more
- Posted speed limit: 30 miles per hour or higher
- Average Daily Traffic: 9,000 vehicles or more
- Parking turnover: frequent
- Bike lane obstruction: likely to be frequent
- Streets that are designated as truck or bus routes

Preferred in higher density areas, adjacent to commercial and mixed-use development, and near major transit stations or locations where observed or anticipated pedestrian volumes will be higher.

Buffered Bike Lane (Class 2)

Buffered bike lanes can generally be considered on any road with one or more of the following characteristics:

- Total traffic lanes: 3 lanes or fewer
- Posted speed limit: 30 miles per hour or lower
- Average Daily Traffic: up to 9,000 vehicles
- Parking turnover: infrequent.
- Bike lane obstruction: likely to be infrequent
- Where a separated bike lane or shared-use path is infeasible or not desirable due to cost, lack of public support, etc.
- Buffer may be located on the parking lane side of the bike lane, the travel lane side of the bike lane, or on both sides of the bike lane.

Bike Lane (Class 2)

- Conventional bike lanes can generally be considered on any road with one or more of the following characteristics:
- Total traffic lanes: 3 lanes or fewer
- Posted speed limit: 30 miles per hour or lower
- Average Daily Traffic: up to 7,500 vehicles
- Parking turnover: infrequent
- Bike lane obstruction: likely to be infrequent
- Where a separated bike lane or shared-use path is infeasible or not desirable

Shoulder Bikeway (Class 3)

Shoulder bike lanes can generally be considered on any road without on-street parking and one or more of the following characteristics:

- Total traffic lanes: 3 lanes or fewer
- Average Daily Traffic: up to 7,500 vehicles
- Shoulder obstruction: likely to be infrequent
- Where a separated bike lane or shared-use path is infeasible or not desirable

The minimum width of a shoulder bikeway is 4 feet (exclusive of the gutter if one exists). Wider shoulders should be provided on streets or roads with average daily traffic higher than 3,500 vehicles. To increase comfort on Class III bike route shoulders, rumble strips should be placed between the shoulder and the adjacent travel lane, and minimum widths should follow the Federal Small Town and Rural Multimodal Networks guidance.[21]

Shared Roadway (Class 3)

Shared roadways can be considered on any road with one or more of the following characteristics:

- Total traffic lanes: 3 lanes or fewer
- Posted speed limit: 25 miles per hour or lower

[21] https://www.fhwa.dot.gov/environment/bicycle_pedestrian/publications/small_towns/fhwahep17024_lg.pdf

- Average Daily Traffic: Up to 3,000 vehicles
- Where a separated bike lane or shared-use path is infeasible or not desirable

Class 1: Shared-Use Paths and Trails

A shared use-path is a two-way facility that is physically separated from motor vehicle traffic and used by bicyclists, pedestrians, and other non-motorized users. Shared-use paths, also referred to as trails, are often located in an independent alignment, such as a greenbelt or abandoned railroad right-of-way. Shared-use paths may make up a network or system of routes designed specifically for off-street travel and are used for recreation, leisure, and commuting trips.

Considerations

- Shared-use paths should not be used to preclude on-street bicycle facilities, but rather to supplement a network of on-street bikeways. In some situations it may be appropriate to provide an on-street bikeway in addition to a shared-use path along the same roadway.
- Shared-use paths make up a network or system of routes designed specifically for off-street travel.
- These paths are located along waterways, within parks and open spaces, along roadways, and through easements and rights-of-way for utilities.
- Shared-use paths are appropriate when an on-street route may be too dangerous due to traffic volumes and speeds, to provide a direct route between points of interest, or when the majority of users are recreational or leisure users, ‘interested but concerned’ users, or users with a slower travel speed, such as children or older adults.

Guidance

- Shared-use paths typically have a lower design speed for bicyclists than on-street facilities and may not provide appropriate accommodation for more confident bicyclists who desire to travel at greater speeds. In addition, greater numbers of driveways or intersections along a sidepath corridor can decrease bicycle travel speeds and traffic signals can increase delay for bicyclists on shared-use paths compared to cyclists using in-street bicycle facilities such as bike lanes. Therefore, paths should not be considered a substitute to accommodating more confident bicyclists within the roadway.
- Conflicts between path users and motor vehicles at intersections and driveways can be reduced by minimizing the number of driveway and street crossings present along a path, selecting alignments with fewer crossings, and otherwise providing high-visibility crossing treatments. In areas with high concentrations of driveways and intersections, on-street accommodations (including bike lanes and separated bike lanes) are likely to be safer.
- Lighting should be provided at path/roadway intersections at a minimum and at other locations where personal security may be an issue or where nighttime use is likely to be high.

Figure 29: Shared-use path

References

AASHTO Guide for the Development of Bicycle Facilities (2012)

FHWA Shared Use Path Level of Service Calculator (2006)

Shared-Use Paths and Trails: Separation

Considerations

- Trails with high use may require pedestrians and bicyclists to be separated.
- Trails on steep grades (3 to 5 percent) should be wider to account for higher bicycle speed in the downhill direction and additional space for faster bicyclists to pass slower bicyclists and pedestrians in the uphill direction.
- On sections with long steep grades, provide periodic sections with a flat grade to permit users to stop and rest.
- Consider providing amenities such as restrooms, bike racks, and potable water at trailheads, and covered rest stops along the trail to ensure that paths are welcoming to a variety of user types, including families with children and older adults.
- Consider providing maps and signs to improve wayfinding for users, such as signs that show trail names, connections to nearby trails, and/or nearby destinations.

Minimizing user conflicts

- Vertical objects close to the path edge can endanger users and reduce the comfortable usable width of the path. Vertical objects should be set back at least 3 feet from the edge of the path, for a height of 8 feet.
- 3 foot wide (minimum) shoulders provide space for users who step off the path to rest or to allow users to pass one another.
- Include signage that dictates yielding responsibilities to reduce conflict between different types of trail users.
- The most applicable design guidance for shared-use path design at intersections is the Dutch CROW Manual. Its guidelines recommend 16-23 feet of setback from the curbline of the parallel road, with the path offset bend beginning at least 115 feet from the intersection with curve radii at least 39 feet (which serves to slow bicyclists). These recommendations are for intersections between arterial roads and collector/local roads. For intersections between two arterial roads, the crossings should be closer to the intersection and bicycle-specific signal heads should be used.

Figure 30: Two-way shared use path with mixed users

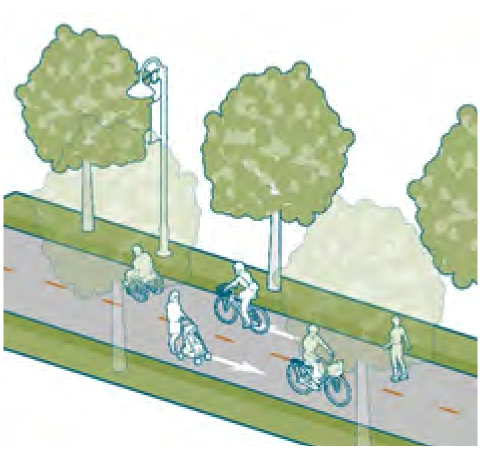
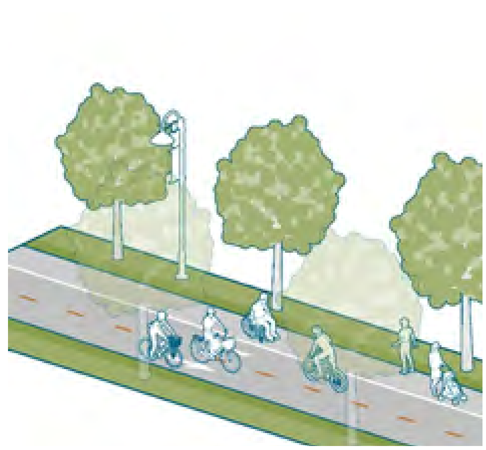


Figure 31: Two-way shared use path with separated users



References

FHWA Shared Use Path Level of Service Calculator (2006)

Manual on Uniform Traffic Control Devices (2009)

Class 2: Bicycle Lane

Bicycle lanes provide an exclusive space for bicyclists in the roadway. Bicycle lanes are established through the use of lines and symbols on the roadway surface. Bicycle lanes are for one-way travel and are normally provided in both directions on two-way streets and/or on one side of a one-way street. Bicyclists are not required to remain in a bicycle lane when traveling on a street and may leave the bicycle lane as necessary to make turns, pass other bicyclists, or to properly position themselves for other necessary movements. Bicycle lanes may only be used temporarily by vehicles accessing parking spaces and entering and exiting driveways and alleys.

Considerations

- Typically installed by reallocating existing street space.
- Can be used on one-way or two-way streets.
- Contra flow bicycle lanes may be used on short segments of streets that are designated for one-way motor vehicle travel to improve bicycle network connectivity. They are best suited on streets in more urban contexts with lower speeds and volumes.
- Stopping, standing, and parking in bike lanes is prohibited and may be problematic in areas of high parking demand and deliveries, especially in commercial areas.
- Wider bike lanes or buffered bike lanes are preferable at locations with high parking turnover.
- Bike lanes can be placed on the left side of one-way streets and some median-divided streets, resulting in fewer conflicts between bicyclists and motor vehicles, particularly on streets with heavy right-turn volumes, on-street parking, and/or frequent bus service.

Guidance

A The minimum width of a bike lane adjacent to a curb is 5 feet exclusive of a gutter (4 feet in highly constrained locations); a desirable width is 6 feet.

B The minimum width of a bike lane adjacent to parking is 5 feet; a desirable width is 6 feet.

C Optional parking T's or hatch marks can highlight the door zone on constrained corridors with high parking turnover to guide bicyclists away from motor vehicle doors.

Figure 34: Bike Lane Adjacent to a Curb

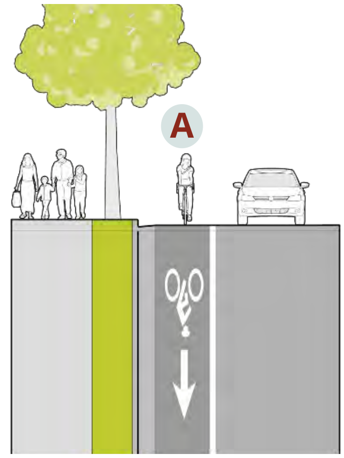


Figure 33: Bike Lane Adjacent to Parking

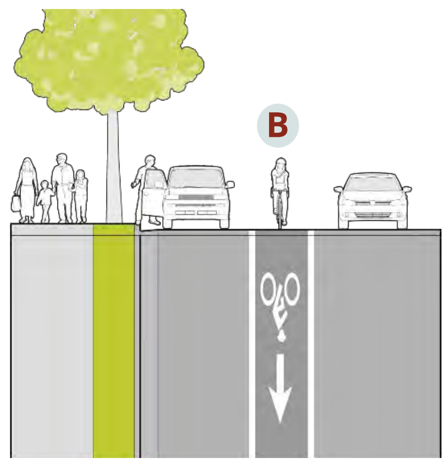
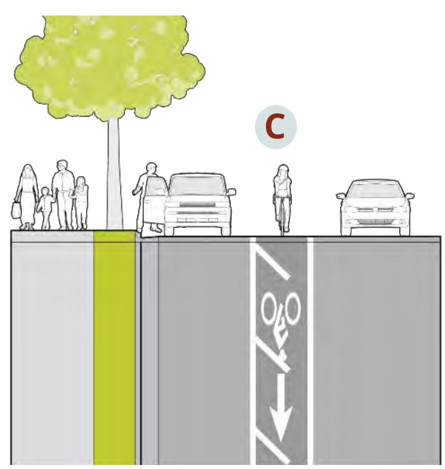


Figure 32: Bike Lane with Door Zone Marking



References

AASHTO Guide for the Development of Bicycle Facilities (2012)

NACTO Urban Bikeway Design Guide (2014)

Class 2: Buffered Bicycle Lane

Buffered bike lanes are created by painting or otherwise creating a flush buffer zone between a bicycle lane and the adjacent travel lane. While buffers are typically used between bicycle lanes and motor vehicle travel lanes to increase bicyclists' comfort, they can also be provided between bicycle lanes and parking lanes in locations with high parking turnover to discourage bicyclists from riding too close to parked vehicles.

Considerations

- Preferable to a conventional bicycle lanes when used as a contra-flow bike lane on one-way streets.
- Typically installed by reallocating existing street space.
- Can be used on one-way or two-way streets.
- Consider placing buffer next to parking lane where there is commercial or metered parking.
- Consider placing buffer next to travel lane where speeds are 30 miles per hour or greater or when traffic volume exceeds 6,000 vehicles per day.
- Where there is 7 feet of roadway width available for a bicycle lane, a buffered bike lane should be installed instead of a conventional bike lane. The preferred configuration is a 5-foot or wider bike lane. A and an 18-inch or wider buffer. Typical buffer widths are 3 to 5 feet. B
- Buffered bike lanes allow bicyclists to ride side by side or to pass slower moving bicyclists.
- Research has documented buffered bicycle lanes increase the perception of safety.

Guidance

A The minimum width of a buffered bike lane adjacent to parking or a curb is 4 feet exclusive of gutter (if present); a desirable width is 6 feet.

B The minimum buffer width is 18 inches. There is no maximum width. Diagonal cross hatching should be used for buffers <3 feet in width. Chevron cross hatching should be used for buffers >3 feet in width.

C Buffers are to be broken where curbside parking is present to allow cars to cross the bike lane.

Figure 35: Buffered Bike Lane Adjacent to Curb

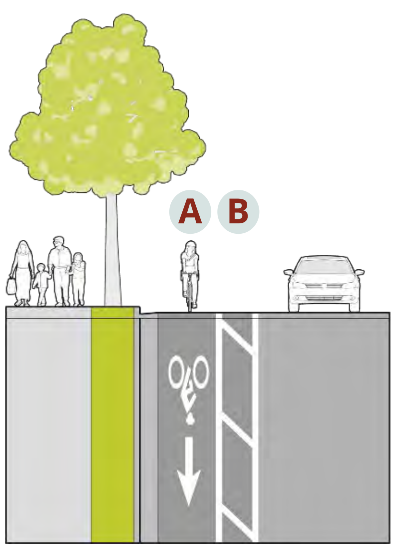
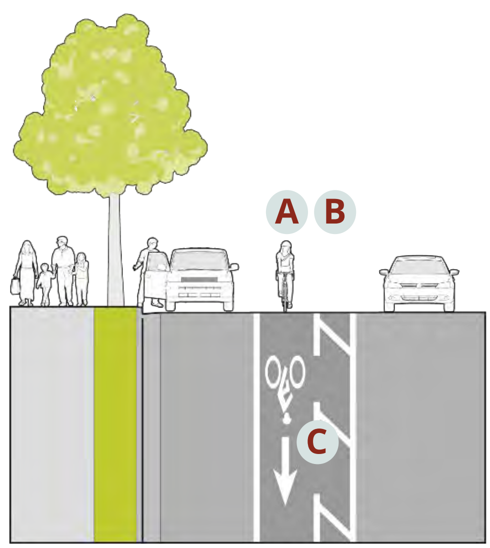


Figure 36: Buffered Bike Lane Adjacent to a Parking



References

AASHTO Guide for the Development of Bicycle Facilities (2012)

NACTO Urban Bikeway Design Guide (2014)

Evaluation of Innovative Bicycle Facilities: SW Broadway Cycle Track & SW Stark/Oak Street Buffered Bike Lanes. Final Report. (2011)

Class 3: Shared Roadway/ Bicycle Route

Shared lane markings (or "sharrows") are pavement markings that denote shared bicycle and motor vehicle travel lanes. These markings can be placed on streets to designate bike routes and to alert drivers to expect bicyclists in the travel lane. The markings are two chevrons positioned above a bicycle symbol, placed where the bicyclist is anticipated to operate. In general, this is a design solution that should only be used in locations with low traffic speeds and volumes as part of a signed route or bicycle boulevard. Bike Routes are sometimes used as a temporary solution on constrained, higher-traffic streets (up to 10,000 vehicles per day) until additional right-of-way can be acquired, but should not be considered a permanent solution in these contexts.

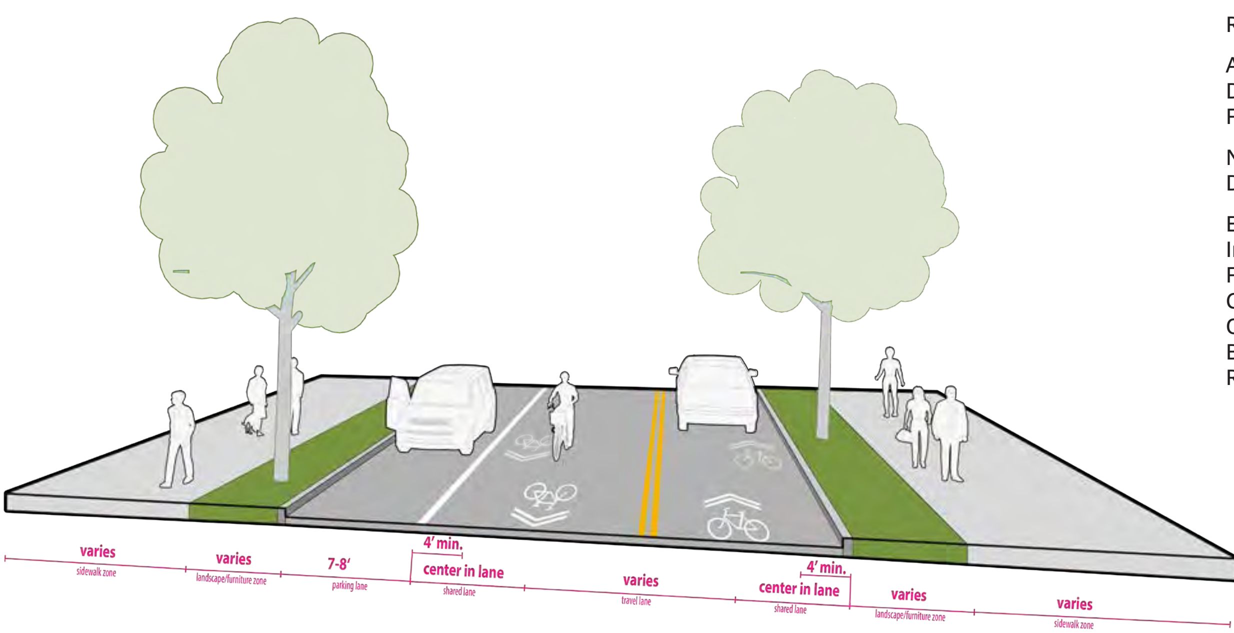
Considerations

- Typically used on local, collector, or minor arterial streets with low traffic volumes. Commonly used on bicycle boulevards to reinforce the priority for bicyclists.
- Typically feasible within existing right-of-way and pavement width even in constrained situations that preclude dedicated facilities.
- May be used as interim treatments to fill gaps between bike lanes or other dedicated facilities for short segments where there are space constraints.
- May be used for downhill bicycle travel in conjunction with climbing lanes intended for uphill travel.
- Typically supplemented by signs, especially Bikes May Use Full Lane (R4-11).

Guidance

- Intended for use only on streets with posted speed limits of up to 25 miles per hour and traffic volumes of less than 4,000 vehicles per day.
- May be used as a temporary solution on constrained streets with up to 10,000 vehicles per day until a more appropriate bikeway facility can be implemented.
- Intended for use on lanes up to 14 feet wide (up to 13 feet preferred). For lanes 15 feet wide or greater, stripe a 4-foot bike lane instead of using shared lane markings.
- The marking's centerline must be at least 4 feet from curb or edge of pavement where parking is prohibited.
- The marking's centerline must be at least 11 feet from curb where parking is permitted, so that it is outside the door zone of parked vehicles.
- For narrow lanes (11 feet or less), it may be desirable to center shared lane markings along the centerline of the outside travel lane.

Figure 37: Shared roadway



References

AASHTO Guide for the Development of Bicycle Facilities (2012)

NACTO Urban Bikeway Design Guide (2014)

Evaluation of Innovative Bicycle Facilities: SW Broadway Cycle Track & SW Stark/Oak Street Buffered Bike Lanes. Final Report. (2011)

Class 3: Bicycle Boulevard

Bicycle boulevards are a variation of a shared roadway that incorporate traffic calming treatments and facilitate crossings of major streets with the primary goal of prioritizing bicycle through-travel, while discouraging motor vehicle traffic and maintaining relatively low motor vehicle speeds. These treatments are typically applied on quiet streets, often through residential neighborhoods. Treatments vary depending on context, but often include traffic diverters, speed attenuators such as speed humps or chicanes, pavement markings, and signs. Bicycle boulevards are also known as neighborhood greenways and neighborhood bikeways, among other locally-preferred terms.

Considerations

Many cities already have signed bike routes along neighborhood streets that provide an alternative to traveling on high-volume, high-speed arterials. Applying bicycle boulevard treatments to these routes makes them more suitable for bicyclists of all ages and abilities and can reduce crashes as well.

Stop signs or traffic signals should be placed along the bicycle boulevard in a way that prioritizes the bicycle movement, minimizing stops for bicyclists whenever possible.

Bicycle boulevard treatments include traffic calming measures such as street trees, traffic circles, chicanes, and speed humps. Traffic management devices such as diverters or semi-diverters can redirect cut-through vehicle traffic and reduce traffic volume while still enabling local access to the street.

Communities can begin by implementing bicycle boulevard treatments on one pilot corridor to measure the impacts and gain community support. The pilot program should include before-and-after crash studies, motor vehicle counts, and bicyclist counts on both the bicycle boulevard and parallel streets. Findings from the pilot program can be used to justify bicycle boulevard treatments on other neighborhood streets.

Additional treatments for major street crossings may be needed, such as median refuge islands, rapid flashing beacons, bicycle signals, and pedestrian hybrid beacons or half signals.

Guidance

- Maximum Average Daily Traffic (ADT): 3,000
- Preferred ADT: Up to 1,000
- Target speeds for motor vehicle traffic are typically around 20 miles per hour; there should be a maximum 15 miles per hour speed differential between bicyclists and vehicles.

Figure 38: Bicycle boulevard

References

AASHTO Guide for the Development of Bicycle Facilities (2012)

NACTO Urban Bikeway Design Guide (2012)

Manual on Uniform Traffic Control Devices (2009)

Fundamentals of Bicycle Boulevard Planning & Design (2009)

Class 4: Separated Bike Lane

Separated Bike Lanes (also known as protected bike lanes or cycletracks) are an exclusive bikeway facility type that combines the user experience of a path with the on-street infrastructure of a conventional bike lane. They are physically separated from motor vehicle traffic and distinct from the sidewalk. Separated Bike Lanes are more attractive to a wider range of bicyclists than striped bikeways on higher volume and higher speed roads. They eliminate the risk of a bicyclist being hit by an opening car door and prevent motor vehicles from driving, stopping or waiting in the bikeway. They also provide greater comfort to pedestrians by separating them from bicyclists operating at higher speeds.

Considerations

Separated bike lanes can provide different levels of separation:

- Separated bike lanes with flexible delineator posts ("flex posts") alone offer the least separation from traffic and are appropriate as an interim solution.
- Separated bike lanes that are raised with a wider buffer from traffic provide the greatest level of separation from traffic, but will often require road reconstruction.
- Separated bike lanes that are protected from traffic by a row of on-street parking offer a high degree of separation.

In constrained environments, reductions should be made to the street and vehicle space before narrowing sidewalks and other spaces allocated to pedestrians. This reduction can include decreasing the number of travel lanes, narrowing existing lanes or adjusting on-street parking.

Sidewalk-level bike lanes:

- May encourage pedestrian and bicyclist encroachment unless discouraged with a continuous sidewalk buffer.
- Requires no transition for raised bicycle crossings at driveways, alleys or streets.
- May provide level landing areas for parking, loading or bus stops along the street buffer.
- May reduce maintenance needs by prohibiting debris build up from roadway runoff.

Figure 39: Two way separated bike lanes

References

AASHTO Guide for the Development of Bicycle Facilities (2012)

NACTO Urban Bikeway Design Guide (2014)

MassDOT Separated Bike Lane Planning and Design Guide (2015)

FHWA Separated Bike Lane Planning and Design Guide (2015)

Intermediate-level bike lanes:

- Preserve separation between bicyclists and pedestrians where sidewalk buffers are eliminated.
- Ensures a detectable edge is provided for people with vision disabilities.
- May reduce maintenance needs by prohibiting debris build up from roadway runoff.
- May require careful consideration of drainage design and in some cases may require catch basins to manage bike lane runoff.

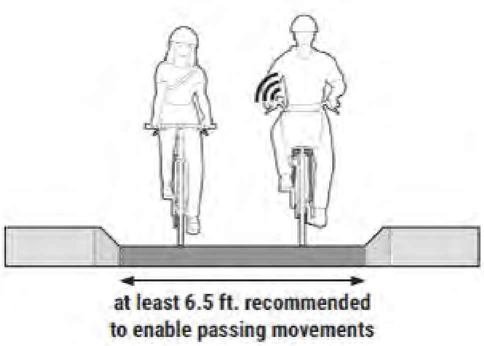
Street-level bike lanes:

- Preserve separation between bicyclists and pedestrians where sidewalk buffers are eliminated.
- Ensures a detectable edge is provided for people with vision disabilities.
- May increase maintenance needs to remove debris from roadway runoff unless street buffer is raised.
- May require careful consideration of drainage design and in some cases may require catch basins to manage bike lane runoff.

Guidance

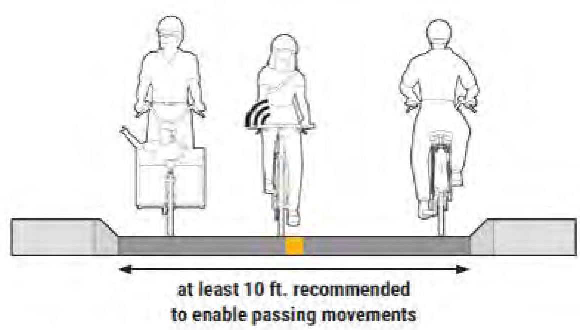
The recommended minimum width of a one-way separated bicycle lane is shown in Figure 41. A constrained bicycle lane width of 4 feet (one-way only) may be used for short distances to navigate around transit stops, accessible parking spaces, or other obstacles. The recommended minimum width of a two-way separated bicycle lane is shown in Figure 42.

Figure 40: One-way separated bicycle lane widths



Same Direction Bicyclists/ Peak Hour	Bike Lane Width (ft.)	
	Rec.	Min.*
<150	6.5	5.0
150-750	8.0	6.5
>750	10.0	8.0

Figure 41: Two-way separated bicycle lane widths



Bidirectional Bicyclists/ Peak Hour	Bike Lane Width (ft.)	
	Rec.	Min.*
<150	10.0	8.0
150-400	11.0	10.0
>400	14.0	11.0

Separated Bike Lanes at Driveways

Most bicycle facilities will need to cross streets, driveways, or alleys at multiple locations along a corridor. At these locations, the crossings should be designed to 1) delineate a preferred path for people bicycling through the intersection with the driveway and 2) to encourage driver yielding behavior, where applicable. Bicycle crossings may be supplemented with green pavement, yield lines, and/or regulatory signs.

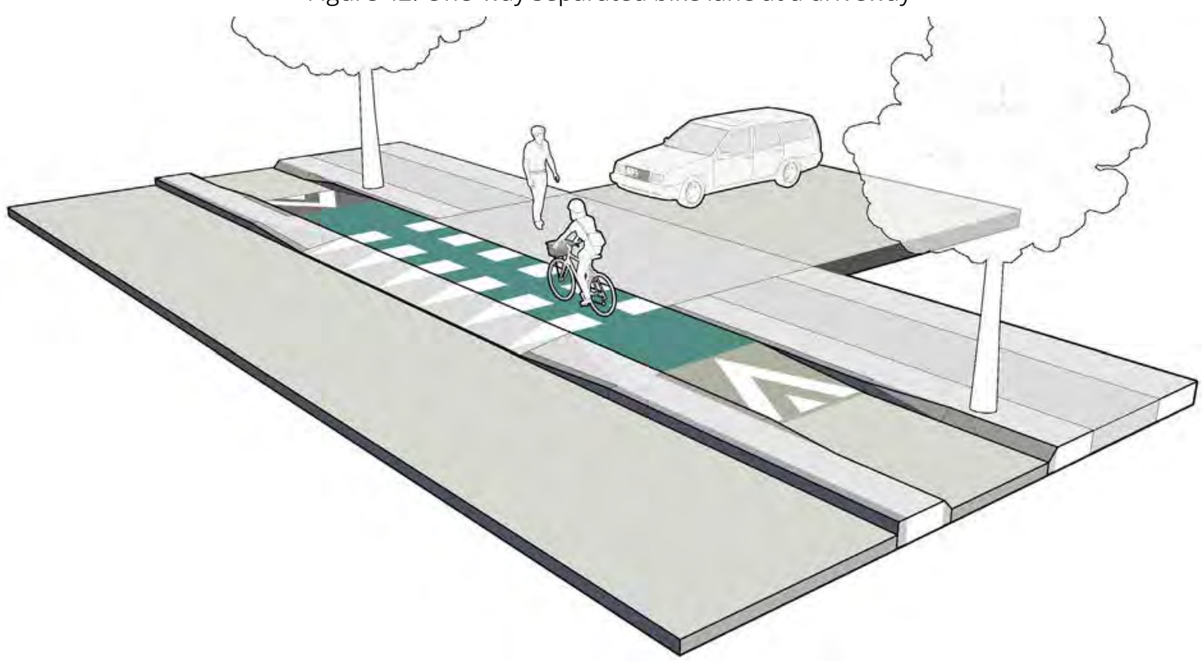
Considerations

- Supplemental yield lines, otherwise known as shark's teeth, can be used to indicate priority for people bicycling and may be used in advance of unsignalized crossings at driveways, at signalized intersections where motorists may turn across a bicycle crossing during a concurrent phase, and in advance of bicycle crossings located within roundabouts.
- Raised bicycle crossings further promote driver yielding behavior by slowing their speed before the crossing and increasing visibility of people bicycling.

Guidance

- The bicycle crossing may be bounded by 12-inch (perpendicular) and 24-inch (parallel) white pavement dashes, otherwise known as elephant's feet. Spacing for these markings should be coordinated with zebra, continental, or ladder striping of the adjacent crosswalk.
- The bicycle crossing should be at least 6 feet wide for one-way travel and at least 10 feet wide for two-way travel, as measured from the outer edge of the elephant's feet. Bicycle lane symbol markings should be avoided in bicycle crossings. Directional arrows are preferred within two-way bicycle crossings.
- Dashed green colored pavement may be utilized within the bicycle crossing to increase the conspicuity of the crossing where permitted conflicts occur. Green color may be desirable at crossings where concurrent vehicle crossing movements are allowed and where sight lines are constrained, or where motor vehicle turning speeds exceed 10 miles per hour.

Figure 42: One-way separated bike lane at a driveway



References

MassDOT Separated Bike Lane Planning and Design Guide (2015)

FHWA Separated Bike Lane Planning and Design Guide (2015)

Bicycle Intersection Design and Spot Treatments

Conflict Area Markings

Conflict area markings are intersection pavement markings designed to improve visibility, alert all roadway users of expected behaviors, and to reduce conflicts with turning vehicles.

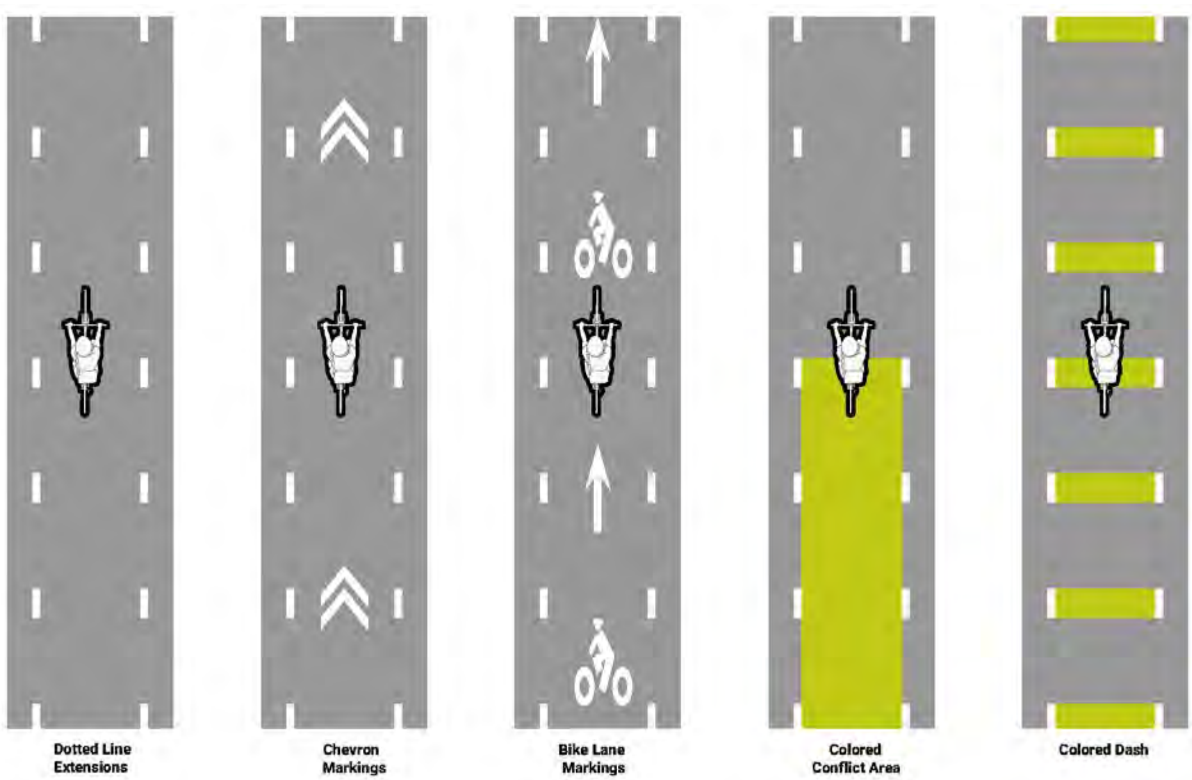
Considerations

- The appropriate treatment for conflict areas can depend on the desired emphasis and visibility. Dotted lane lines (with or without bike symbols) may be sufficient for guiding bicyclists through intersections; however, consider providing enhanced markings with green pavement and/or symbols at complex intersections or at intersections with safety concerns.
- Symbol placement within intersections should consider vehicle wheel paths and minimize maintenance needs associated with wheel wear.
- Driveways with higher volumes may require additional pavement markings such as the solid colored conflict area marking pictured above and signage.
- Consideration should be given to using intersection conflict markings as spot treatments or standard intersection treatments. A corridor-wide treatment can maintain consistency; however, spot treatments can be used to highlight conflict locations.

Guidance

- The width of conflict area markings should be as wide as the bike lanes on either side of the intersection.
- Dotted white lane lanes should conform to the latest edition of the MUTCD. These markings can be used through different types of intersections based on engineering judgment.
- A variety of pavement marking symbols can enhance intersection treatments to guide bicyclists and warn of potential conflicts.
- Green pavement markings can be used along the length of a corridor or in select conflict locations.

Figure 43: Conflict area markings



References

AASHTO Guide for the Development of Bicycle Facilities (2012)

NACTO Urban Bikeway Design Guide (2014)

Manual on Uniform Traffic Control Devices (2009)

Bike Box

A bicycle box provides dedicated space between the crosswalk and vehicle stop line where bicyclists can wait during the red light at signalized intersections. The bicycle box allows a bicyclist to take a position in front of motor vehicles at the intersection, which improves visibility and motorist awareness, and allows bicyclists to “claim the lane” if desired. Bike boxes aid bicyclists in making turning maneuvers at the intersection, and provide more queuing space for multiple bicyclists than that provided by a typical bicycle lane.

Considerations

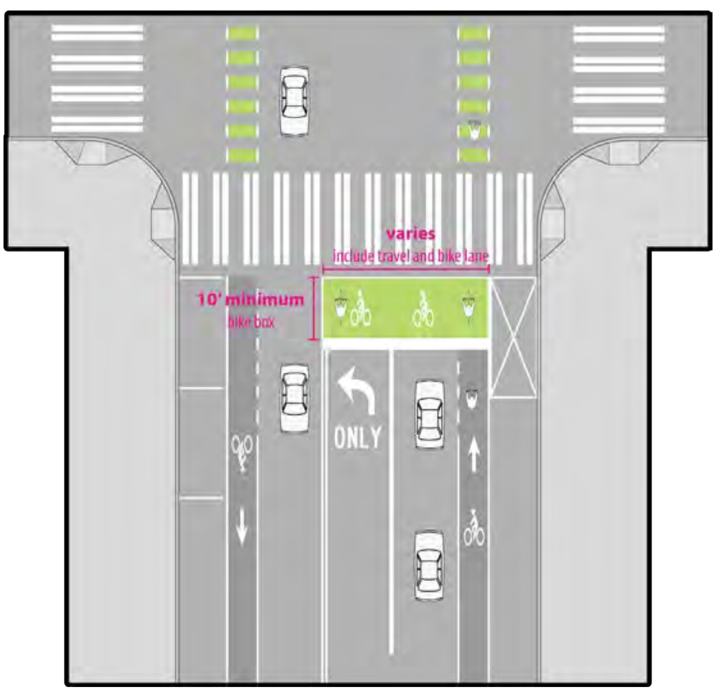
In locations with high volumes of turning movements by bicyclists, a bicycle box should be used to allow bicyclists to shift towards the desired side of the travel way. Depending on the position of the bicycle lane, bicyclists can shift sides of the street to align themselves with vehicles making the same movement through the intersection.

In locations where motor vehicles can continue straight or cross through a right-side bicycle lane while turning right, the bicycle box allows bicyclists to move to the front of the traffic queue and make their movement first, minimizing conflicts with the turning. When a bicycle box is implemented in front of a vehicle lane that previously allowed right turn on red, the right turn on red movement must be restricted using signage and enforcement following installation of the bike box.

Guidance

- Bicycle boxes are typically painted green and are a minimum of 10 feet in depth and are the width of the entire travel lane(s).
- Bicycle box design should be supplemented with appropriate signage according to the latest version of the MUTCD.
- Bicycle box design should include appropriate signalization adjustment in determining the minimum green time.
- Where right-turn lanes for motor vehicles exist, bicycle lanes should be designed to the left of the turn lane. If right turns on red are permitted, consider ending the bicycle box at the edge of the bicycle lane to allow motor vehicles to make this turning movement.

Figure 44: Bike box placement



References

NACTO Urban Bikeway Design Guide - Bike Boxes (2014)

FHWA Separated Bike Lane Planning and Design Guide (2015)

MassDOT Separated Bike Lane Planning & Design Guide (2015)

Bicycle Pockets

Bicycle pockets are bicycle through lanes in between vehicle travel lanes and vehicle right-turn lanes at the approach to an intersection. A bicycle pocket carves out space for bicyclists to improve rider visibility and mitigate conflicts with motorists, primarily to prevent right-turn collisions between riders and motorists. Bicycle pockets are something the City is evaluating and installing wherever right of way allows. It will be a standard treatment feature for newly installed roadways.

Considerations

Bicycle pockets should be used on streets with vehicle right-turn only lanes, where the right lane terminates into a turn lane, or where a parking lane transitions into a turn lane at an intersection.

Bicycle pockets should not be used on streets with double right-turn lanes since these lanes are more difficult to navigate. Instead, sharrows can be used in the outer right-turn lane to indicate that the lane should be shared between motorists and cyclists. The bicycle lane should not be terminated before the intersection. For a street that is not wide enough for a bicycle pocket, sharrows can be used to indicate a combined bicycle/turn lane.

Guidance

- The bicycle pocket should be placed in between the vehicle travel lane and the vehicle right-turn lane.
- The vehicle right-turn lane should be no less than 9 feet wide. Right-turn only lanes should be as short as possible to reduce the speed of traffic driving into the lane.
- Required signage is R3-7R Right Lane Must Turn Right and R4-4 Begin Right Turn Yield to Bikes.
- Dashed white lines that signify the merge area should begin no less than 50 feet before the intersection. If the intersection is at a high speed or high-volume roadway, the lines should start no less than 100 feet before the intersection. Dashed white lines should be 6 inches wide and 2 feet long with a 6-foot gap between the dashes.
- If the area for vehicles to merge into the right-turn lane occurs at an angle, additional treatments beyond dashed white lines should be provided, such as pavement coloring and increased signage.
- A dashed bicycle transition lane into the bicycle pocket is recommended to be 6 feet wide, with a minimum width of 4 feet.
- Bicycle detection loops to trigger green signals for bicyclists when no cars are present should be provided within the bicycle pocket.
- Maintenance of signage and street marking should be prioritized, as their effectiveness depends on visibility.

References

NACTO Urban Bikeway Design Guide

Two-Stage Turn Box

A two-stage turn queue box should be considered where bike lanes are continued up to an intersection and a protected intersection is not provided. The two-stage turn queue box designates a space for bicyclists to wait while performing a two-stage turn across a street at a location outside the path of traffic.

Considerations

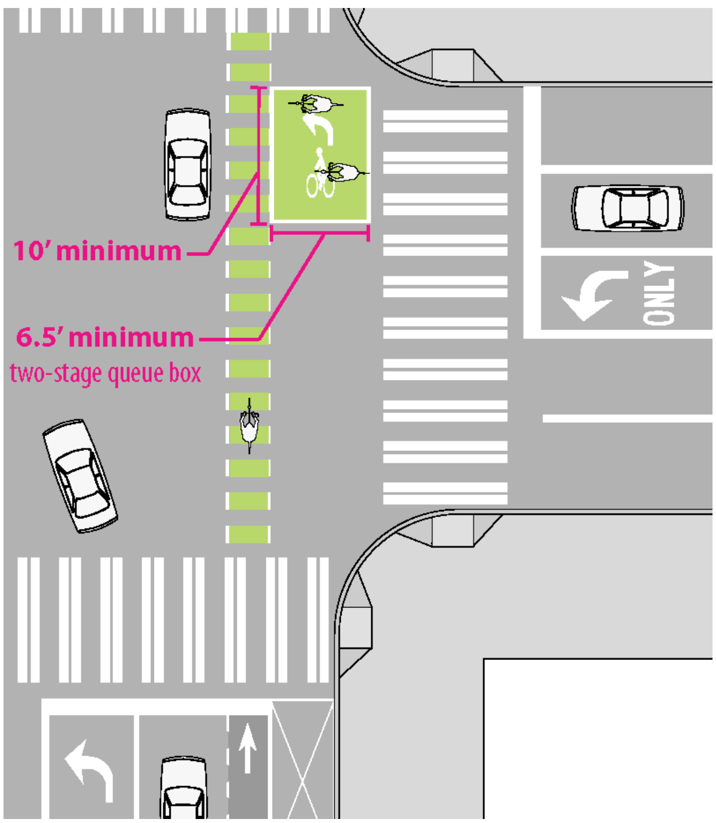
FHWA granted interim approval to two-stage turn queue boxes on July 13, 2017.

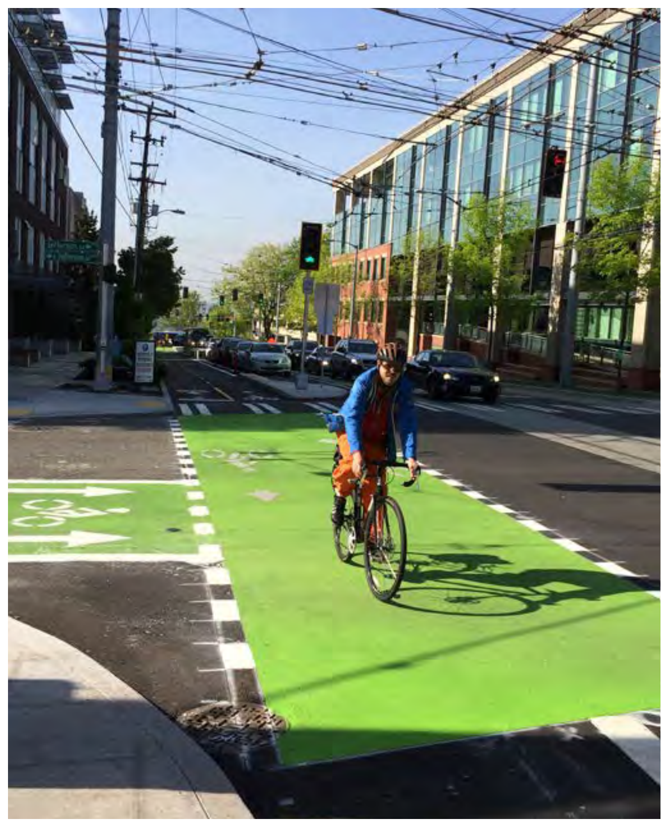
Two-stage turn queue box dimensions will vary based on the street operating conditions, the presence or absence of a parking lane, traffic volumes and speeds, and available street space. The turn box may be placed in a variety of locations including in front of the pedestrian crossing (the crosswalk location may need to be adjusted), in a 'jug-handle' configuration within a sidewalk, or at the tail end of a parking lane or a median island.

Guidance

- A minimum width of 10 feet is recommended.
- A minimum depth of 6.5 feet is recommended.
- Dashed bike lane extension markings may be used to indicate the path of travel across the intersection.
- NO TURN ON RED (R10-11) restrictions should be used to prevent vehicles from entering the queuing area.
- The use of a supplemental sign instructing bicyclists how to use the box is optional.
- The box should consist of a green box outlined with solid white lines supplemented with a bicycle symbol and a turn arrow to emphasize the crossing direction.

Figure 45: Two-stage turn box placement





References

NACTO Urban Bikeway Design Guide (2014)

MassDOT Separated Bike Lane Planning and Design Guide (2015)

FHWA Separated Bike Lane Planning and Design Guide (2015)

FHWA Bicycle Facilities and the Manual on Uniform Traffic Control Devices - Two-Stage Turn Box (2015)

Crossing Treatments

While the street segments of a bicycle boulevard or other traffic-calmed street may be generally comfortable for bicyclists without significant improvement, major street crossings must be addressed to provide safe, convenient and comfortable travel along the entire route. Treatments provide waiting space for bicyclists, control cross traffic, or ease bicyclist use by removing traffic control for travel along the bicycle boulevard route.

Considerations

- Adjustments to traffic control such as a Pedestrian Hybrid Beacon or stop sign adjustments may necessitate a traffic study.
- Median islands may be constructed to require right-in/right-out turns by motor vehicles while still allowing left turns by bicyclists at off-set intersections.
- Numerous treatments exist to accommodate offset intersection crossings for bicyclists, and the full range of design treatments should be considered in these situations. These treatments include left turn queue boxes, two-way center left turn lanes (optionally designed solely for bicyclists), median left turn pockets and short sidepath segments.

Guidance

Medians should be a minimum of 6 feet in width, though 8 feet is desirable to allow adequate space for a bicycle.

Intersections along a bicycle boulevard route may need treatment in the following situations:

- Unsignalized crossings of arterial or collector streets with high traffic volumes and speeds.
- Offset intersections where the greenway route makes two turns in short succession.

Figure 47: Median Diverter

Figure 46: Bicycle Box with Lead-In Bike Lane

Figure 48: Pedestrian Hybrid Beacon

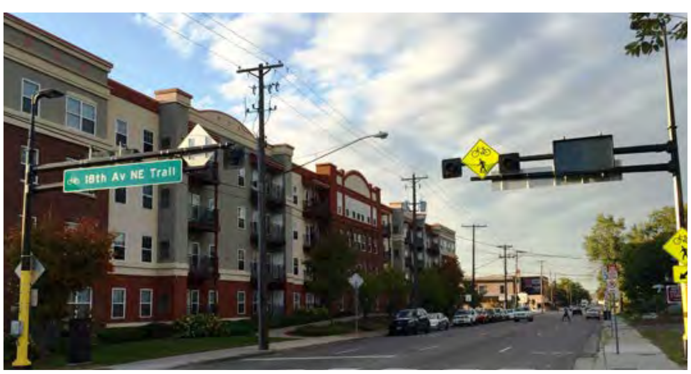
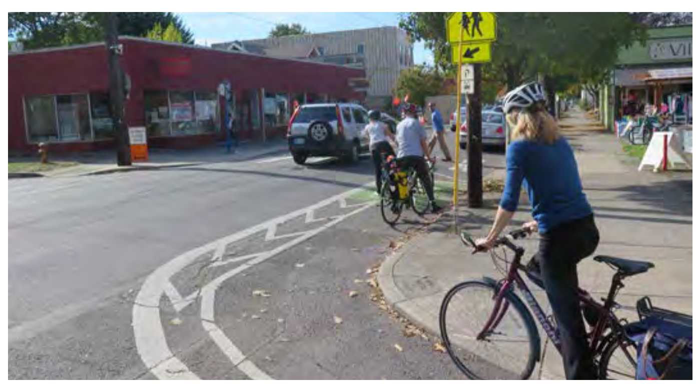


Figure 49: Offset Crossing Left Turn Box with Lead-In Bike Lane



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Fundamentals of Bicycle Boulevard Planning & Design (2009)

NACTO Urban Bikeway Design Guide (2014)

Portland's Neighborhood Greenway Assessment Report (2015)

Bicycle Signals, Detection, and Actuation

Bicyclists have unique needs at signalized intersections. Bicycle movements may be controlled by the same indications that control motor vehicle movements, by pedestrian signals, or by bicycle-specific traffic signals. The introduction of separated bike lanes creates situations that may require leading or protected phases for bicycle traffic, or place bicyclists outside the cone of vision of existing signal equipment. In these situations, provision of signals for bicycle traffic will be required.

Considerations

- Bicycle-specific signals may be appropriate to provide additional guidance or separate phasing for bicyclists per the 2012 AASHTO Guide for the Development of Bicycle Facilities.
- It may be desirable to install advanced bicycle detection on the intersection approach to extend the phase, or to prompt the phase and allow for continuous bicycle through movements.
- Video detection, microwave and infrared detection can be an alternative to loop detectors.
- Another strategy in signal timing is coordinating signals to provide a "green wave", such that bicycles will receive a green indication and not be required to stop. Several cities including Denver, CO, Portland, OR, and San Francisco, CA have implemented "green waves" for bicycles.

Guidance

- A stationary, or "standing", cyclist entering the intersection at the beginning of the green indication can typically be accommodated by increasing the minimum green time on an approach per the 2012 AASHTO Guide for the Development of Bicycle Facilities.
- A moving, or "rolling", bicyclist approaching the intersection towards the end of the phase can typically be accommodated by increases to the red times (change and clearance intervals) per the 2012 AASHTO Guide for the Development of Bicycle Facilities.
- Set loop detectors to the highest sensitivity level possible without detecting vehicles in adjacent lanes and field check. Type D and type Q loops are preferred for detecting bicyclists.
- Install bicycle detector pavement markings and signs per the MUTCD, 2012 AASHTO Guide for the Development of Bicycle Facilities, and the NACTO Urban Bikeway Design Guide.

Figure 50: Bicycle signal

References

AASHTO Guide for the Development of Bicycle Facilities (2012)

NACTO Urban Bikeway Design Guide (2014)

Manual on Uniform Traffic Control Devices (2009)

MassDOT Separated Bike Lane Planning and Design Guide (2015)

Mixing Zones

A mixing zone requires turning motorists to merge across a separated bike lane at a defined location in advance of an intersection. Unlike a standard bike lane, where a motorist can merge across at any point, a mixing zone design limits bicyclists' exposure to motor vehicles by defining a limited merge area for the turning motorist. Mixing zones are compatible only with one-way separated bike lanes.

Considerations

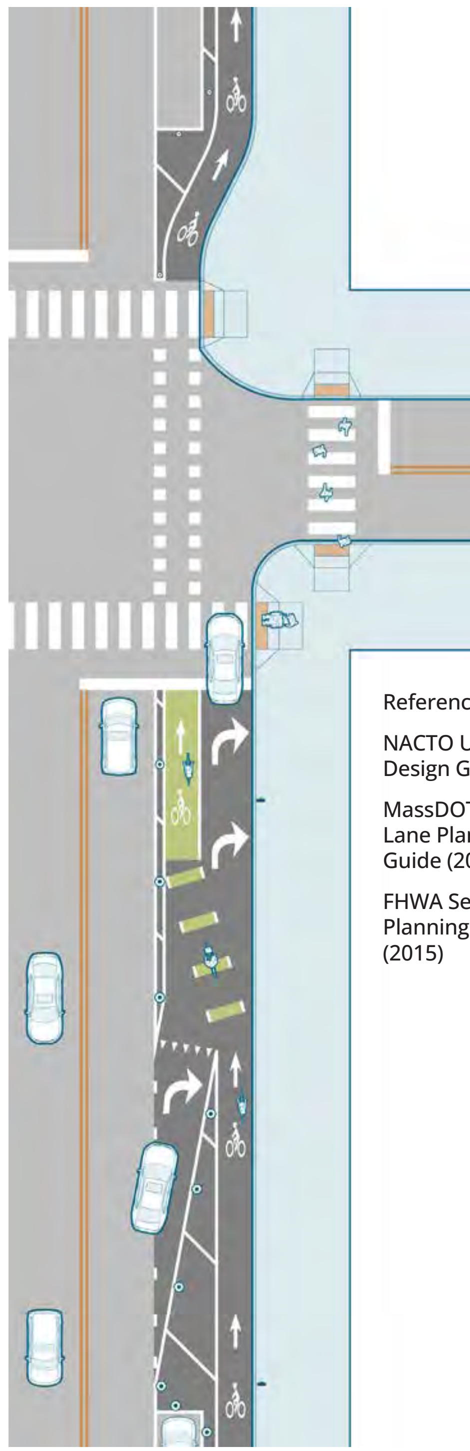
Protected intersections are preferable to mixing zones. Mixing zones are generally appropriate as an interim solution or in situations where severe right-of-way constraints make it infeasible to provide a protected intersection.

Mixing zones are only appropriate on street segments with one-way separated bike lanes. They are not appropriate for two-way separated bike lanes due to the contra-flow bicycle movement.

Guidance

- Locate merge points where the entering speeds of motor vehicles will be 20 miles per hour or less by (a) minimizing the length of the merge area and (b) locating the merge point as close as practical to the intersection.
- Minimize the length of the storage portion of the turn lane.
- Provide a buffer and physical separation (e.g. flexible delineator posts) from the adjacent through lane after the merge area, if feasible.
- Highlight the conflict area with green surface coloring and dashed bike lane markings, as necessary, or shared lane markings placed on a green box.
- Provide a BEGIN RIGHT (or LEFT) TURN LANE YIELD TO BIKES sign (R4-4) at the beginning of the merge area.
- Restrict parking within the merge area.
- At locations where raised separated bike lanes approach the intersection, the bike lane should transition to street elevation at the point where parking terminates.
- Where posted speeds are 35 miles per hour or higher, or at locations where it is necessary to provide storage for queued vehicles, it may be necessary to provide a deceleration/storage lane in advance of the merge point.

Figure 51: Mixing zone placement



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Additional Considerations

The Effect of Speed and Traffic Calming Treatments

Traffic calming aims to slow the speeds of motorists to a “desired speed” (usually 20 miles per hour or less for residential streets and 25 to 35 miles per hour for collectors and minor arterials). The greatest benefit of traffic calming is increased safety and comfort for all users on and crossing the street. Compared with conventionally-designed streets, traffic calmed streets typically have fewer collisions and far fewer injuries and fatalities. These safety benefits are the result of slower speeds for motorists that result in greater driver awareness, shorter stopping distances, and less kinetic energy during a collision.

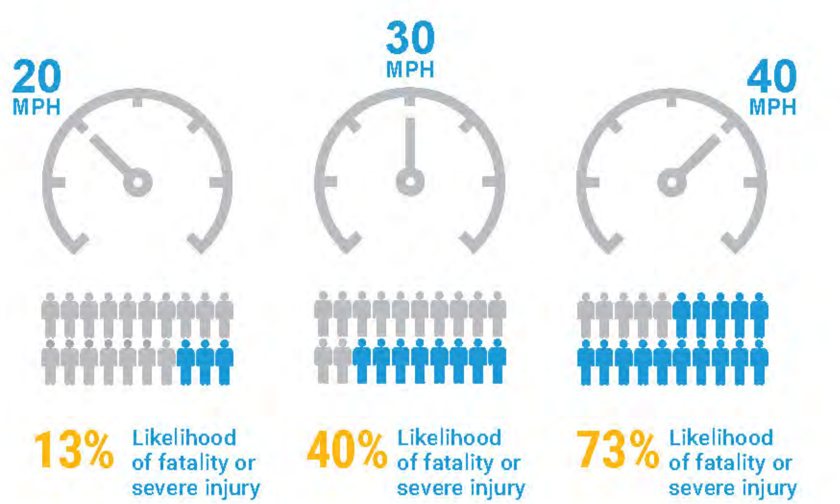
Considerations

Traffic calming is a program that incorporates a variety of vertical and horizontal treatments to reduce motor vehicle speeds. Vertical deflection treatments include speed cushions, speed humps, and raised crosswalks. Horizontal treatments include chicanes, neck downs, curb extensions, and traffic circles.

Prior to permanently implementing a traffic calming measure, it may be useful to introduce a temporary measure using paint, cones, or street furniture, as changes can easily be made to the design.

Guidance

- Vertical deflections such as speed humps and speed cushions should have a smooth leading edge and be engineered for a speed of 25 to 30 miles per hour. Speed humps should be clearly marked with reflective markings and signs.
- Where traffic calming must not slow an emergency vehicle, traffic calming should focus on horizontal treatments. If vertical deflection is desired, speed cushions should be used. Speed cushions provide gaps spaced for an emergency vehicle’s wheelbase to pass through without slowing.
- A typical curb radius of 20 feet should be used wherever possible, including locations with higher pedestrian volumes and fewer larger vehicles.



Source: Tefft, Brian C. Impact speed and a pedestrian’s risk of severe injury or death. Accident Analysis & Prevention. 50. 2013

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NACTO Urban Street Design Guide (2013)

NCHRP Research Report 966: Posted Speed Limit Setting Procedure and Tool (2021)

Traffic Calming – Vertical Deflection Treatments

Vertical traffic calming treatments compel motorists to slow speeds. By lowering the speed differential between bicyclists and motorists, safety and bicyclist comfort is increased. These treatments are typically used where other types of traffic controls are less frequent, for instance along a segment where stop signs may have been removed to ease bicyclist travel. The following is best practice guidance for vertical traffic calming.

Considerations

- Typically, speed humps are 12 to 22 feet in length (perpendicular to the roadway), with a rise of 4 to 6 inches above the roadway. They should extend the full width of the roadway and should be tapered to the gutter to accommodate drainage. Speed humps are not typically used on roads with rural cross-sections; however, if they are used on such roads, they should match the full pavement width (including paved shoulders).
- Speed humps and raised crosswalks impact bicyclist comfort. The approach profile should preferably be sinusoidal or flat.
- Speed humps or speed cushions are not typically used on collector or arterial streets.
- Consider using raised crosswalks at intersections to slow traffic turning onto the traffic-calmed street from a major street.

Guidance

Vertical traffic calming will not be necessary on all traffic-calmed streets but should be considered on any street with the following characteristic:

- Locations with measured or observed speeding issues, with 50th percentile of traffic exceeding the posted limit.

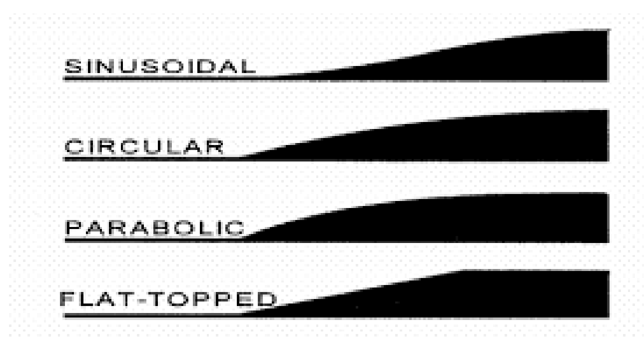
Devices that are continuous across the roadway, such as speed humps and raised crosswalks, are more effective for achieving slower speeds than speed cushions.

Figure 52: Speed hump

Figure 53: Speed cushion

Figure 54: Raised crosswalk

Figure 55: Curve profile options



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Portland's Neighborhood Greenway Assessment Report (2015)

Traffic Calming – Horizontal Treatments

Horizontal traffic calming reduces speeds by narrowing lanes, which creates a sense of enclosure and additional friction between passing vehicles. Narrower conditions require more careful maneuvering around fixed objects and when passing bicyclists or oncoming motor vehicle traffic. Some treatments may slow traffic by creating a yield situation where one driver must wait to pass.

Considerations

- Horizontal traffic calming treatments must be designed to deflect motor vehicle traffic without forcing the bicycle path of travel to be directed into a merging motorist.
- Neighborhood traffic circles should be considered at local street intersections to prioritize the through movement of bicyclists (by removing stop control or converting to yield control) without enabling an increase in motorist's speeds.
- Infrastructure costs will range dependent upon the complexity and permanence of design. Simple, interim treatments such as striping and flex posts are low-cost. Curbed, permanent treatments that integrate plantings or green infrastructure are higher-cost.

Guidance

Horizontal traffic calming treatments can be appropriate along street segments or at intersections where width contributes to higher motor vehicle speeds. It can be particularly effective at locations where:

- On-street parking is low-occupancy during most times of day.
- There is desire to remove or decrease stop control at a minor intersection.

Horizontal treatments are most effective if they deflect motorists midblock (with chicanes) or within intersections (with neighborhood traffic circles).

- The size of chicanes will vary based on the targeted design speed and roadway width, but must be 20 feet wide curb-to-curb at a minimum to accommodate emergency vehicles.

Figure 56: Chicane

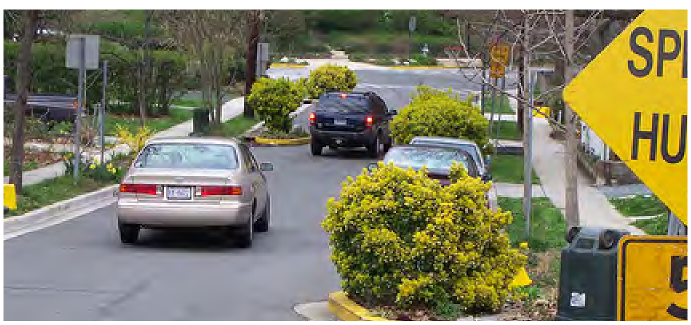


Figure 57: Neck down

Figure 58: Curb extension

Figure 59: Neighborhood traffic circle

References

Fundamentals of Bicycle Boulevard Planning & Design (2009)

NACTO Urban Bikeway Design Guide (2014)

Portland's Neighborhood Greenway Assessment Report (2015)

Lane Narrowing

Lane narrowing can improve comfort and safety for vulnerable road users. Narrowing lanes creates space that can be reallocated to other modes, in the form of wider sidewalks, bike lanes, and buffers between bicyclists, pedestrians and motor vehicles. Space can also be dedicated to plantings and amenity zones, and reduces crossing distances at intersections. The following is best practice guidance for lane narrowing.

Considerations

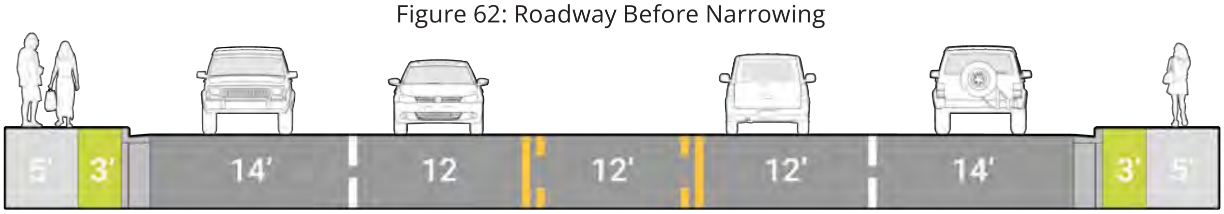
Narrowing existing motor vehicle lanes may result in enough space to create separated bicycle lanes, widened sidewalks and buffers, or a combination of on-street bike lanes and enhancements to the pedestrian corridor.

Narrower lanes can contribute to lower operating speeds along the roadway, which may be appropriate in dense, walkable corridors.

Guidance

- Motor vehicle travel lanes as narrow as 10 feet are allowed in low-speed environments (45 miles per hour or less) according to the AASHTO Green Book.
- 10-foot travel lanes are not appropriate on 4-lane undivided arterial roadways.
- Along bus routes, lanes should not be narrowed less than 11 feet to accommodate standard bus widths.

Figure 62: Roadway Before Narrowing



References

FHWA Achieving Multimodal Networks (2016)

Figure 61: Narrowing motor vehicle lanes to increase sidewalk and amenity zones

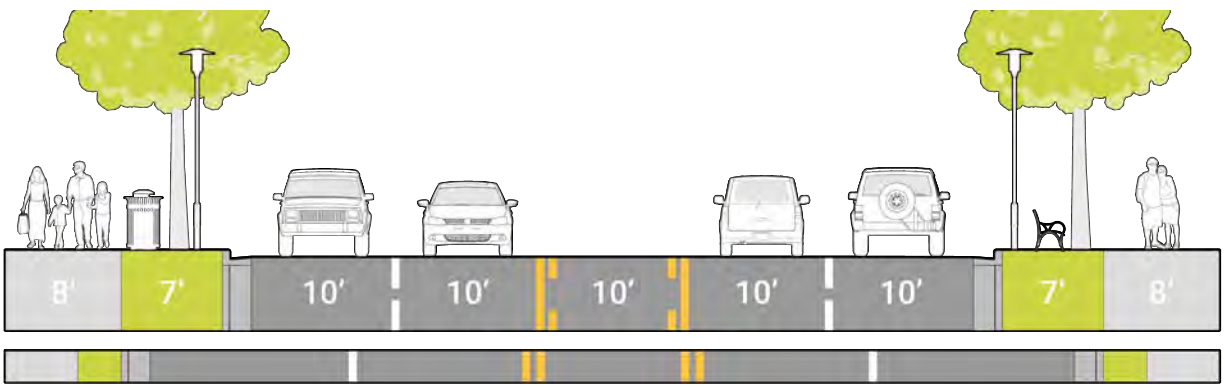
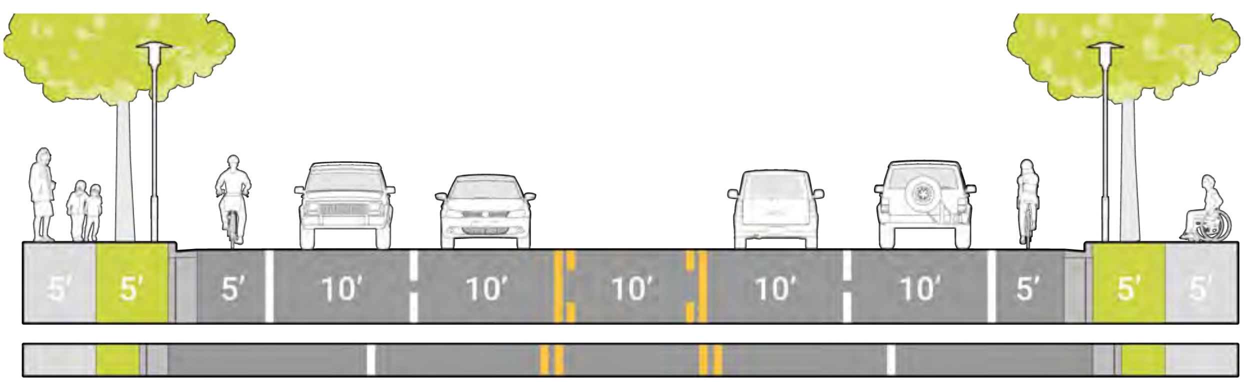


Figure 60: Narrowing motor vehicle lanes to increase amenity zone and bicycle lanes



Lane Reconfiguration

A road diet is a reduction in overall roadway width, typically accomplished by removing motor vehicle travel lanes. This strategy can be applied broadly to a wide variety of cross sections where one or more travel lanes are re-purposed to provide more space for pedestrians and bicyclists. Road diets are most typically done on roadways with excess capacity where anticipated traffic volumes have not materialized to support the need for additional travel lanes.

Considerations

The most common road diet configuration involves converting a four-lane road to three lanes: two travel lanes with a turn lane in the center of the roadway. The center turn lane at intersections often provides a great benefit to traffic congestion. A three-lane configuration with one lane in each direction and a center turn lane is often as productive (or more productive) than a four-lane configuration with two lanes in each direction and no dedicated turn lane.

The space gained for a center turn lane is often supplemented with painted, textured, or raised center islands. If considered during reconstruction, raised center islands may be incorporated in between intersections to provide improved pedestrian crossings, incorporate landscape elements and reduce travel speeds.

Guidance

- Four-lane streets with volumes less than 15,000 vehicles per day are generally good candidates for four- to three-lane conversions.
- Four-lane streets with volumes between 15,000 to 20,000 vehicles per day may be good candidates for four- to three-lane conversions. A traffic analysis is needed to determine feasibility.
- Six-lane streets with volumes less than 35,000 vehicles per day may be good candidates for six- to five-lane (including two-way center turn lane) conversions. A traffic analysis is needed to determine feasibility.

Roadway configurations with two travel lanes and a center turn lane can:

- Discourage speeding and weaving.
- Reduce the potential for rear end and side swipe collisions.
- Improve sight distances for left-turning vehicles.
- Reduce pedestrian crossing distances and exposure to motor vehicle traffic.

Figure 63: Typical four-lane road with on-street parking

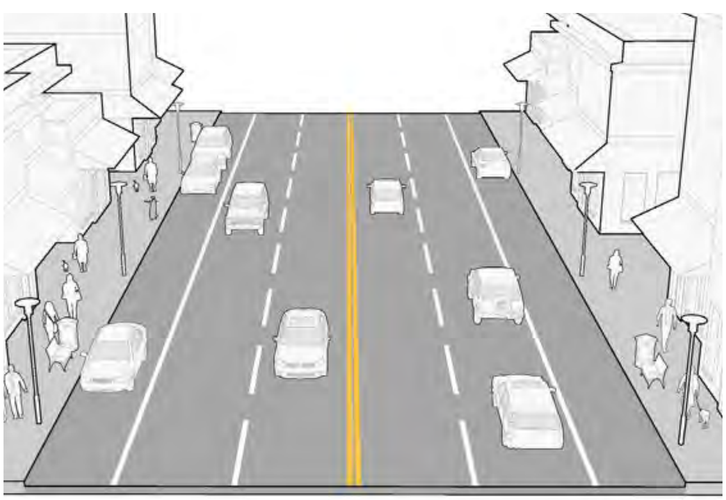
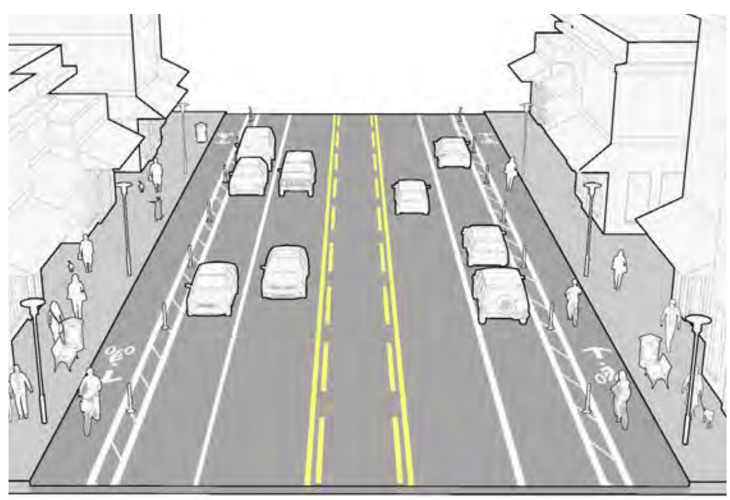


Figure 64: Three-lane road diet (with two-way center turn lane), with on-street parking and separated bicycle lane



References

FHWA Road Diet Informational Guide (2014)

NACTO Urban Street Design Guide (2013)

Manual on Uniform Traffic Control Devices (2009)

Evolution of a bike lane

Separated bike lanes have been implemented in many cases as low-cost retrofit projects (e.g. using flex posts and paint within the existing right-of-way). More permanent forms of separation, such as curb-protected bike lanes, cost more and are less flexible once implemented. A phased implementation approach, where "pilot" projects transition to permanent protected bike lanes may solve both of these problems, by implementing the facility slowly and troubleshooting before permanent materials and high costs are necessary.

Considerations

Lower-cost retrofits or demonstration projects allow for quick implementation, responsiveness to public perception and ongoing evaluation. Separation types for short-term separated bike lane designs often include non-permanent separation, such as flexible delineator posts, planters or parking stops. Pilot projects allow the agency to:

- Test the separated bike lane configuration for bicyclists and traffic operations.
- Evaluate public reaction, design performance, and safety effectiveness.
- Make changes if necessary.
- Transition to permanent design.

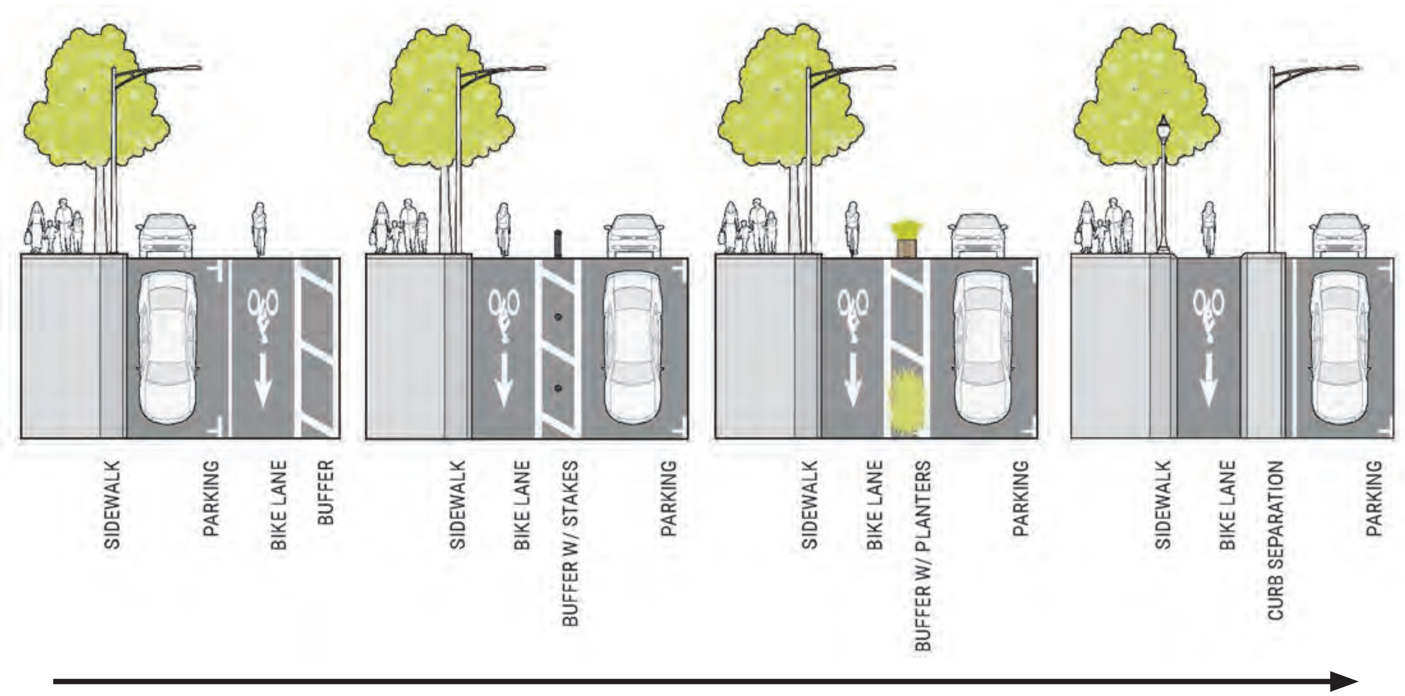
Guidance

Permanent separation designs provide a high level of protection and often have greater potential for placemaking, quality aesthetics, and integration with features such as green stormwater infrastructure. Agencies often implement permanent separation designs by leveraging private development (potentially through developer contribution), major capital construction, and including protected bike lanes in roadway reconstruction designs. Examples of permanent separation materials include rigid bollards, raised medians and grade-protected bike lanes at an intermediate or sidewalk level.

References

NACTO Urban Street Design Guide (2013)

FHWA Separated Bike Lane Planning and Design Guide (2015)



Progression from pilot project to separated bike lane

Bike parking

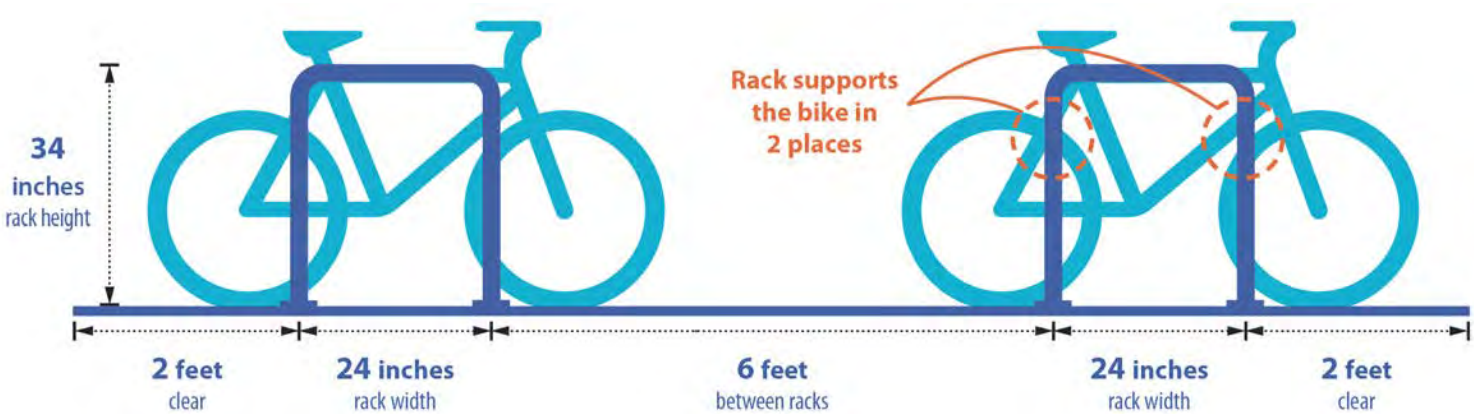
Bicycle parking enhances the effectiveness of bicycle networks by providing locations for the secure storage of bicycles during a trip. Bicycle parking enables bicyclists to secure their bicycles while patronizing businesses, recreating, and going to work. Bicycle parking requires far less space than motor vehicle parking-- in fact, 10 bicycles can typically park in the area needed for a single car.

Considerations

- Bicycle parking consists of a rack that supports the bicycle upright and provides a secure place for locking. Bicycle racks should be permanently affixed to a paved surface. Movable bicycle racks are only appropriate for temporary use, such as at major community gatherings.
- On-street bicycle parking is intended for short term use. Bicyclists typically find a variety of fixed objects in the street to which they lock their bicycles. These include parking meters, tree well fences, lawn fences or other objects. These objects may satisfy the need for bicycle parking, but if this is the intent, they should be designed and located with this use specifically in mind. Otherwise, the use of such objects for parking may indicate insufficient or inappropriately located bicycle parking facilities.

Guidance

- Bicycle parking facility should not obstruct pedestrian traffic or interfering with the use of the pedestrian areas.
- Each parked bicycle should be accessible without moving another bicycle.
- On-street bicycle parking is intended for short term use.
- Multiple types of racks exist, but all should adhere to guidance pictured above regarding providing two points of contact for bike frames to prevent locked bikes from falling.
- Bicycle rack footings can be mounted in soil, concrete, or asphalt, or mounted to stable surfaces using anchors.



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C

PUBLIC PARTICIPATION SUMMARY REPORT

Appendix C
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Overview

The City of Clovis used a variety of outreach strategies to publicize the Active Transportation Plan Update process and gather input from community members on existing and desired walking and bicycling conditions.

The planning process included outreach opportunities that were designed to:

- Engage the community on issues around bicycle and pedestrian mobility and transportation safety;
- Seek input from a variety of stakeholders and viewpoints; and
- Document the everyday transportation experience of Clovis community members.

Guiding Questions for Outreach:

- Who is and is not participating in decision making processes?
- How will the Plan's outcomes benefit historically underserved community members?
- What are potential burdens and unintended consequences that might result from the Plan?

Strategies

Public input was collected using a variety of strategies during the planning process. These strategies included:

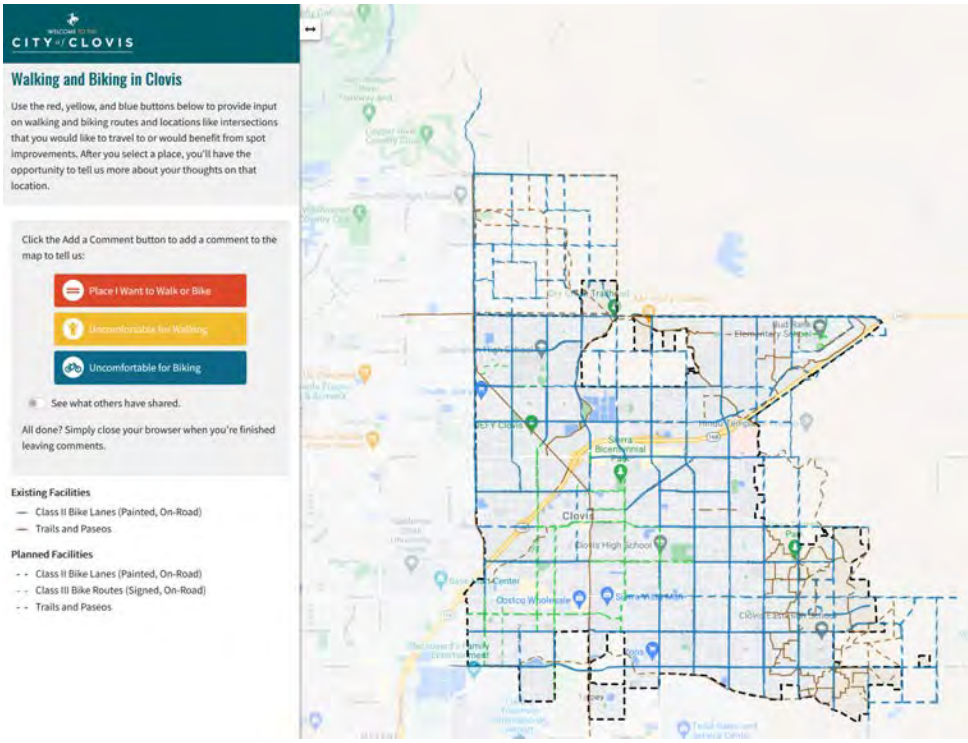
- A survey and interactive web map
- A meeting with the Fresno Cycling Club
- Stakeholder focus groups
- A community meeting

During the public participation process, the City adhered to all state and local health guidelines regarding the Covid-19 Pandemic. These guidelines shifted during the planning process, and outreach strategies were adjusted to reflect those changes.

Survey and Interactive Webmap

The City hosted an online survey and interactive map to collect public feedback on community members' experiences walking and biking in Clovis. The introductory survey asked questions regarding the participants' attitudes and comfort level walking or biking around Clovis, the treatments that would encourage people to walk or bike more, and demographic questions. Participants also had the opportunity to provide feedback using an interactive, online map to identify areas where they felt uncomfortable walking or biking, and areas they

Figure 65: Screenshot of the online, interactive map



would like to walk or bike. Participants were allowed to respond to other users' comments to encourage conversation about treatments and their experiences walking and biking.

The online survey and map were available to the public from July 28 to September 2, 2021. The City raised awareness of the survey and map through social media posts and through the City's contacts with community-based organizations and interest groups. Social media posts and other content were translated to Spanish and Hmong, while the survey and interactive map included a tool to translate text via Google Translate. In total, there were approximately 75 responses to the survey and 55 pieces of input submitted on the map. Figure 65 above shows a screenshot of the interactive map.

Feedback about Walking in Clovis

Survey respondents shared their feelings about walking and what would encourage them to walk more frequently. Nearly 50 percent of respondents indicated that they already felt comfortable walking to most places, and 30 percent indicated that they were interested but something prevented them (e.g., comfort, safety, ability...etc.). Table 13 displays the full distribution of responses to this question.

Almost 70 percent of respondents indicated that more sidewalks or trails in the community would encourage them to walk more, followed by more street trees, shade, and other amenities (38 percent). Respondents also valued better maintenance of sidewalks and trails and better lighting (both 34 percent). Additional factors are listed in Table 14. Percentages sum to more than 100 percent because respondents could select more than one response option for this question.

The addition of more sidewalks and trails was identified as the most common factor that would encourage survey respondents to walk more frequently.

Approximately 70 percent of respondents indicated they would ride more frequently if there were more bike lanes or trails.

More comfortable on-street bikeways would encourage 57 percent of respondents to bicycle more frequently.

Table 13: Attitudes towards walking

Which of the following statements most closely matches your feelings about traveling by walking in Clovis? (Select one)	Percentage of Respondents
I feel comfortable walking to most places	49%
I'm interested, but something (comfort, safety, ability...etc.) prevents me from walking to most places	30%
I walk to my destinations at least some of the time, but I wish it felt more comfortable	8%
I walk to my destinations at least some of the time	7%
I'm not interested in walking anywhere	6%

Note: Approximately 61 people responded to this question.

Table 14: Factors that would encourage walking

What would encourage you to ride or walk more frequently? (Select all that apply)	Percentage of Respondents
More sidewalks or trails in the community	68%
More street trees, shade, or other amenities	38%
Better maintenance of sidewalks and trails	34%
Better lighting of sidewalks, trails, and roads	34%
More accessible infrastructure (curb ramps, wheelchair access, wider sidewalks, etc.)	19%
Better signs on trails so I know where to go	11%
Knowing I could get home quickly if there was an emergency	6%
Nothing would encourage me to walk more	6%
Other	6%
More people to walk with	2%
I already walk for most trips	0%

Note: Approximately 53 people responded to this question. Percentages shown sum to more than 100 percent because participants could select more than one response.

Feedback about Bicycling in Clovis

Among survey respondents, 32 percent indicated that they felt comfortable traveling most places by bicycle. Another 29 percent indicated they ride some of the time, while 19 percent indicated an interest in bicycling but faced a barrier, such as comfort or safety. Fourteen percent expressed that they ride sometimes, but wished it was a more comfortable experience. About six percent indicated they were not interested in bicycling at all. These results indicate that one-third of respondents are interested in bicycling, or bicycling more often, but do not do so due to barriers, including safety or comfort. Table 15 displays the full distribution of responses to this question.

70 percent of respondents indicated th[...] more encouraged to ride if there were more bike lanes or trails in the community. More comfortable on-street bikeways would encourage 57 percent of respondents to bicycle more frequently. Approximately 34 percent and 27 percent of respondents would bicycle more frequently if there was better maintenance of bike lanes and trails and better lighting of trails and roads, respectively. Additional factors are listed in Table 16. Percentages sum to more than 100 percent because respondents could select more than one response option for this question.

Table 15: Attitudes towards bicycling

Which of the following statements most closely matches your feelings about traveling by bicycling in Clovis? (Select one)	Percentage of Respondents
I feel comfortable traveling most places by bike	32%
I ride a bicycle to my destinations at least some of the time	29%
I'm interested, but something (comfort, safety, ability...etc.) prevents me from using a bicycle to get some/most places.	19%
I ride a bicycle to my destinations at least some of the time, but I wish it felt more comfortable	14%
I'm not interested in biking at all.	6%

Note: Approximately 65 people responded to this question.

Table 16: Factors that would encourage bicycling

What would encourage you to ride a bicycle more frequently? (Select all that apply)	Percentage of Respondents
More bike lanes, or trails in the community	70%
More comfortable on-street bikeways	57%
Better maintenance of bike lanes and trails	34%
Better lighting of trails and roads	27%
More bicycle parking and repair stations	23%
Better signs on roads or trails so I know where to go	20%
Showers and lockers at school or work	8%
Other	8%
I already bike for most trips	7%
More people to bike with	7%
Knowing I could get home quickly if there as an emergency	5%
A bike share program or an affordable place to buy used bikes	3%
Nothing would encourage me to walk or bike more.	1%

Note: Approximately 74 people responded to this question. Percentages shown sum to more than 100 percent because participants could select more than one response.

Feedback from the Online Map

Respondents were able to identify streets, trails, or crossings where they wanted to walk or bike, or those where they felt uncomfortable walking or bicycling.

Table 17 lists locations that community members provided feedback on. Common themes included lack of existing walking or bicycling infrastructure, unsafe crossings for walking or bicycling, and uncomfortable existing bicycle facilities.

Respondents identified the following locations as places where they would like to see facilities for walking or bicycling.

- North Clovis
- W Alluvial Avenue
- Herndon Avenue
- Around educational complexes
- Connection between Dry Creek Trail and Enterprise Trail
- Along State Highway 168
- De Wolf Avenue
- Bullard Avenue
- Connection between Fowler Ave and Bullard Avenue/N Locan Avenue
- W Gettysburg Avenue/Minnewawa Avenue/Santa Ana Avenue
- 3rd Street
- 5th Street
- Canal Bank

Table 17: Comments and themes among online map feedback

	Location	Additional information (if applicable)
Lack of sidewalk	Leonard Ave	Leonard Ave mentioned frequently
Unsafe crossing for walking	Herndon Ave and N Willow Ave	-
	Wawona Ranch Ln and Clovis Ave	-
Lack of bicycle facility	N Armstrong Ave	Popular crossing over State Route 168 for people bicycling
	Temperance Ave	Facility ends under the freeway
Uncomfortable existing bike facility	Tollhouse Rd	-
	Fowler Ave	-
	E Bullard Ave	-
	Aluvial Ave/Owens Mountain Pkwy and N Temperance Ave	-
	E Shepherd Ave	-
	Barstow Ave	-
Unsafe crossing for bicycles	Minnewawa Ave and W Bullard Ave	-
	Herndon Ave and N Peach Ave	-
Trail connections	E Shepherd Ave, west of N Sunnyside Ave	Multiple comments about lack of bicycle facility and lack of connection to Dry Creek Trailhead)
	Birch Ave/Dartmouth St to Spruce Ave	Connecting neighborhood to shopping center
	Leigh Ln and Skylar Ln	Bridge over canal to connect existing trail to planned trail

Note: "-" indicates that no additional information was provided.

Community Cycling Club Presentation

On September 22, 2021, community members from the Fresno Cycling Club participated in an online pop-in webinar-style presentation.

At the presentation, the City provided an introduction and background on the Plan, its vision statement, methodology behind pedestrian and bicycle facilities recommendations, as well as a timeline and next steps for the Plan's completion. At the pop-in event, participants were asked about opportunities to improve bicycling, barriers to bicycling, and policies and support programs that the Cycling Club thought would be helpful. The event also allowed participants to ask questions about the Plan and its development.

Stakeholder Focus Groups

The City conducted four stakeholder focus groups with local community-based organizations and regional agencies to identify how the Clovis Active Transportation Plan Update fit into stakeholders' diverse needs. As the State of California loosened public health restrictions during the Summer of 2021, the stakeholder focus groups were held in a hybrid meeting format, which allowed participants to attend the meeting in-person or online through a video platform. Table 18 presents the dates of the focus groups and the agencies represented.

Stakeholders provided feedback on existing technical barriers and recommendations for the Active Transportation Plan Update. School staff discussed an interest in stronger and more interconnected Safe Routes to School programming across the city. Regional and State staff discussed opportunities for funding. Outside of the Plan's technical aspect, some stakeholders also brought up social concerns. For example, Cultiva La Salud, a non-profit focused on expanding health equity in the San Joaquin Valley, raised the issue of police profiling of young Black and Latino pedestrians and bicyclists in Clovis and the lack of safe pedestrian and bicycling facilities in southern Clovis. The group stated that parents of Black and Latino boys and teenagers discourage their children from biking and walking to reduce their interaction with law enforcement, and thus requested that active transportation infrastructure be safe and also inviting for People of Color.

Clovis' future developments was as a key topic among participants in the focus groups. Stakeholders were interested in establishing a set of guidelines to regulate design for future developments. This practice would ensure that new developments in Clovis support walking and bicycling, and that the facilities (e.g., sidewalks) that are built as part of these new development projects meet the current standards.

Table 18: Stakeholder Interview Groups and Interview Dates

Date	Stakeholder Group
School Districts and Higher Education July 28	Clovis Unified School District, Sanger Unified School District, City of Fresno, County of Fresno, Fresno State University, Clovis Community College
City of Clovis July 28	Clovis Department of Public Utilities, City Manager's Staff, Planning Staff, Engineering Staff, Transit, Senior Center, GIS, Public Information Office
Regional and State Agencies July 29	Fresno Council of Governments, Caltrans District 6, Fresno Irrigation District, Fresno Metropolitan Flood Control District, Clovis Community Foundation, Community Medical Centers
Community Organizations and Developer July 29	City of Clovis, Fresno Cycling Club, Leadership Counsel for Justice and Accountability, Disabled Citizen Representative, Building Industry Association, Cultiva La Salud

Participants in the focus groups also recognize that there are opportunities to promote a culture of active transportation to young children. A more coordinated effort among schools, such as a citywide Walk to School Day, and infrastructure improvements may encourage children to be more excited to travel by foot, bike, or skateboard.

Community Meeting

Like the stakeholder focus groups, the community meeting was offered as a hybrid, in-person, and online event. The purpose of this meeting was to present information about the Plan process and gather feedback on opportunities and challenges for people walking and bicycling. The meeting was primarily attended by City staff, who emphasized that evening family walks and bike rides could be an opportunity to promote active transportation. Attendees suggested that improving existing connectivity would create a better walking environment and also provide different travel options to community members. City staff identified funding as the main challenge to encouraging mode and cultural shift to walking and bicycling. One specific funding challenge that staff identified is acquiring funding for retrofit projects.

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FUNDING SOURCES

The following table provides an overview of Federal, State, Regional, and County funds and grant opportunities that can be used for bicycle and pedestrian projects and programs.

Funding Sources	Administering Agency	Availability of Funding	Description	Eligible Improvements
		Federal Funding Programs		
Better Utilizing Investments to Leverage Development (BUILD) Transportation Discretionary Grants[1]	U.S. Department of Transportation (USDOT)	Annually	BUILD (formerly TIGER) is a nationally competitive grant for capital investments on surface transportation projects that achieve a significant impact for a metropolitan area, region, or the nation. Selection criteria encompass safety, economic competitiveness, quality of life, state of good repair, innovation and partnerships with a broad range of stakeholders.	Roads, bridges, transit, rail, ports or intermodal transportation
Congestion Mitigation and Air Quality Improvement (CMAQ) Program[2]	Federal Highway Administration (FHWA)	Annually	CMAQ provides funding for state and local governments for transportation programs and projects that support the Clean Air Act, improving air quality and providing congestion relief.	Bicycle infrastructure
Surface Transportation Block Grant[3]	FHWA, FAST Act Program administered through the Fresno Council of Governments	Every two years; next round anticipated to be due September 2023	Projects must be in the Statewide Transportation Improvement Program (STIP) and be consistent with the Long-Range Statewide Transportation Plan and Metropolitan Transportation Plan. May require 11.47% local match.	Bicycle facilities, including trails.
Transportation Alternatives Program (TAP)[4]	Federal Highway Administration (FWHA)	Yearly; available 2023 funding is $1.3 billion	Caltrans controls a share of the funds to distribute locally through a competitive process. All potential TAP projects require a sponsor for a minimum of 20% of the project costs. Local governments are eligible to apply.	TAP funds projects that create bicycle and pedestrian facilities and convert abandoned railway corridors to pedestrian trails, among others. Eligible activities include pedestrian and bicycle facilities and educational programs, landscaping, rail-to-trail conversions, among others.
Infrastructure for Rebuilding America (INFRA)[5]	US Department of Transportation	$8 billion between FY 2022-2026.	One INFRA grant application that suffices for three different grants, including the Rural Surface Transportation Grant.	Eligible uses include projects that address safety, reduce congestion, enhance resiliency, and address freight bottlenecks.

Funding Sources	Administering Agency	Availability of Funding	Description	Eligible Improvements
Highway Safety Improvement Program (HSIP)[6]	Federal Highway Administration (FHWA)	10% of state's HSIP fund	Projects in high-crash locations are most likely to receive funding. States that have identified bicycle safety and pedestrian safety as Emphasis Areas are more likely to fund bicycle and pedestrian safety projects.	Funding for safety projects aimed at reducing traffic fatalities and serious injuries. Bike lanes, roadway shoulders, crosswalks, intersection improvements, underpasses and signs are examples of eligible projects.
Safe Streets and Roads for All (SS4A)[7]	Federal Highway Administration (FHWA)	Grants typically open in spring and close in early September	Two types of SS4A grants: Planning and Demonstration Grants, which provide funds to develop, complete, or supplement a comprehensive safety action plan, and Implementation Grants, which fund projects and strategies identified in an Action Plan to address a safety issue.	Developing a comprehensive safety action plan or to carry out projects and strategies.
Carbon Reduction Program[8]	Federal Highway Administration	$1.258 billion in FY 2023	Project must be identified in the Statewide Transportation Improvement Program (STIP)/ Transportation Improvement Program).	Includes a transportation alternatives project for on- and off-road trail facilities
National Highway Performance Program (NHPP)[9]	Federal Highway Administration	$29.008 billion in FY 2023.	Projects must be identified in the Statewide Transportation Improvement Program (STIP)/ Transportation Improvement Program (TIP).	Requires that bicycle facilities be for transport purposes only, not recreation purposes.
		State Funding Programs		
California Active Transportation Program (ATP)[10]	California Transportation Commission (CTC)	Biennially	The ATP program resulted from the consolidation of many former federal State programs and funds a wide range of capital and non-capital projects. A strong preference is given to projects in disadvantaged communities.	Bicycle and pedestrian capital infrastructure and non-infrastructure projects (e.g., encouragement, education, and enforcement), and plans (including active transportation and Safe Routes to School plans)
California Sustainable Transportation Equity Project (STEP)[11]	California Air Resources Board (CARB)	Currently a pilot project; eligible funding source if continued	STEP is a transportation equity pilot project for Fiscal Year 2019-20 that aims to address community residents' transportation needs, increase access to key destinations, and reduce greenhouse gas emissions by funding planning, clean transportation, and supporting projects.	Active transportation subsidies, construction of new pedestrian facilities, new bike routes and networks (Class I, II, or IV) and supporting infrastructure

Funding Sources	Administering Agency	Availability of Funding	Description	Eligible Improvements
Clean Mobility Options (CMO)[12]	California Air Resource Board	Annually (based on cap-and-trade dollars)	The Clean Mobility Options Voucher Pilot Program provides voucher-based funding for zero-emission carsharing, car- and van-pooling, bike- and scooter-sharing, innovative transit services, and ride-on-demand services in California's historically underserved communities.	Eligible projects must be in a community that: (1) is on the Disadvantaged Communities List for Climate Investments in accordance with CalEPA's designation (2) is a tribal land or tribal property within AB 1550 designated low-income communities, or (3) serves a deed-restricted affordable housing facility with at least five units and located within an AB 1550 designated low-income community.
California Office of Traffic Safety Grants[13]	California Office of Traffic Safety (OTS)	Annually	For traffic-safety education, awareness and enforcement programs aimed at drivers, pedestrians and cyclists.	Certain activities under the SRTS, safety/education and enforcement programs.
Highway Safety Improvement Program (HSIP)[14]	California Department of Transportation (Caltrans)	Varies; Generally, every 1-2 years	For projects and programs that reduce traffic fatalities and serious injuries by correcting or improving a specific problem. Highly competitive at the state level.	Safety-related pedestrian, bikeway and crossing projects. Certain activities under the SRTS, safety/education and enforcement programs; also, certain spot improvements. Bike lanes, paved shoulders, crosswalks, intersection improvements and signage
Affordable Housing and Sustainable Communities Program (AHSC)[15]	California Strategic Growth Council (SGC)	Annually	Projects that facilitate compact development, including bicycle infrastructure and amenities, with neighborhood scale impacts. Available to government agencies and institutions (including local government, transit agencies and school districts), developers and non-profit organizations.	Bicycle and pedestrian corridor and crossing improvements, particularly those in the area covered in specific plans
Sustainable Transportation Planning Grants[16]	Caltrans	Annually	Funds for communities to do planning, studies, and design work to identify and evaluate projects, including conducting outreach or implementing pilot projects.	Planning, community engagement, studies to improve bicycle and pedestrian connections
Recreational Trails Program[17]	California Department of Parks and Recreation	Program is currently being updated	Funds for recreational trails for active transportation.	Trail maintenance, restoration, trailhead facilities, new trail construction, and maintenance equipment.

Funding Sources	Administering Agency	Availability of Funding	Description	Eligible Improvements
Urban Greening Grants[18]	California Natural Resources Agency	Annually	A statewide program that allocates cap-and-trade dollars to projects that reduce greenhouse gas emissions	Projects that reduce commute vehicle miles traveled by constructing bicycle paths, bicycle lanes or pedestrian facilities that provide safe routes for travel between residences, workplaces, commercial centers, and schools
State Transportation Improvement Program (STIP)[19]	CTC	Biennially	Projects need to be nominated in the Regional Transportation Improvement Program (RTIP), but MTC may nominate fund categories.	Any transportation project eligible for State Highway Account or Federal Funds
State Highway Operation and Protection Program (SHOPP)[20]	Caltrans	Biennially on even-number years	The Office of SHOPP Management is responsible for planning, developing, managing and reporting the four-year SHOPP portfolio of projects. The Program is the State Highway System's "fix it first" program that funds repairs and preservation, emergency repairs, safety improvements, and some highway operational improvements on the State Highway System.	Bike & pedestrian elements in the context of facility type, right of way, project scope, and quality of nearby alternative facilities)
Infill Infrastructure Grant Program (IIG)[21]	California Department of Housing and Community Development	Varies; every 1-2 years	IIG provides grant assistance for infrastructure projects that are an integral part of, of necessary for the development of a Qualifying Infill Project or housing within a Qualifying Infill Area.	Construction, rehabilitation, demolition, relocation, preservation, and acquisition of infrastructure.
Transformative Climate Communities (TCC)[22]	Strategic Growth Council and Department of Conservation	Varies	TCC funds community-led development and infrastructure projects with economic, environmental, and health benefits to disadvantaged communities in California.	Bicycle and pedestrian corridor and crossing improvements, bike share programs
Office of Traffic Safety Grant Program[23]	Office of Traffic Safety (OTS)	Annually	The OTS Grant Program funds education, encouragement, and safety programs and campaigns to prevent serious and fatal injuries resulting from collisions with motor vehicles.	Bicycle and pedestrian safety education and encouragement programs and campaigns

Funding Sources	Administering Agency	Availability of Funding	Description	Eligible Improvements
Local Streets and Roads (LSR) Program[24]	CTC	Annually	The LSR program provides funding to cities and counties for road maintenance and rehabilitation as well as for safety projects.	Bicycle and pedestrian corridor and crossing improvements (emphasis on safety), maintenance and rehabilitation
Solutions for Congested Corridors (SCCP)[25]	CTC	Annually	SCCP provides funding with an ultimate goal of reducing congestion throughout California. The program focuses on multimodal corridor improvements that maintain and enhance community character. Competitive throughout the state.	Multimodal corridor improvements
California Proposition 68 (Parks and Water Bond Act of 2018), Statewide Parks Program (SSP)[26]	California Department of Parks and Recreation	Amount available is $395,333M; grant applications should be between $200K and $8.5M	Eligible projects are from the Statewide Parks Program (SPP)	A variety of park facilities and types, including linear greenbelt parks, nonmotorized trails, pedestrian, and bicycle bridge
Regional Parks Program[27]	California Department of Parks and Recreation	Amount available is $23M	Funding for counties and regional park districts, regional open-space districts, and open-space authorities to create, expand, or improve regional parks and regional park facilities. Funding via Proposition 68.	Acquisition for new or enhanced public access and use. Development to create or renovate: • Trails (preference to multiuse trails over single-use trails) • Regional sports complexes • Visitor and interpretive facilities • Other types of recreation and support facilities in regional parks
Rural Recreation and Tourism Program[28]	California Department of Parks and Recreation	Amount available is $23M	Eligible applicants include cities with population <50,000 and counties with population <500,000.	Projects that support economic and health-related goals for recreation for residents and visitors. Includes accessible trails and bikeways, sports complexes, visitor centers for historic or natural resources, access to waterways
Land and Water Conservation Fund[29]	California Department of Parks and Recreation	Awards up to $3M per application. Typically due June 2023.	Provides funding for the acquisition or development of land to create new outdoor recreation opportunities	Acquisition project or development project for parks, includes trail corridors connecting to recreational opportunities.

Funding Sources	Administering Agency	Availability of Funding	Description	Eligible Improvements
Habitat Conservation Fund[30]	California Department of Parks and Recreation	Over $6.5M; applications due June 2023	Requires 50% match.	Acquisition or development of trails which bring urban residents into park and/or wildlife areas.
Recreational Infrastructure Revenue Enhancement (RIRE)[31]	California Department of Parks and Recreation	$37M available from Proposition 68	Project must be for park and recreational infrastructure purposes, either acquisition or development, for the purposes described in the revenue enhancement measure.	Improving or enhancing local or regional park infrastructure for the purposes of the revenue enhancement measure.
		Regional and County Funding Programs		
Measure C, Transit -Oriented Infrastructure[32]	Fresno Council of Governments	Annually	Program created in the 2006 Measure C Extension Plan. TOD allocation support community-based transit projects aimed at increasing transit use.	Transit facility improvement, bicycle and pedestrian facility improvements, public plaza, streetscape enhancements
Measure C, Local Transportation Program[33]	Fresno County Transportation Authority	Project funding decisions made by the FCTA Board	The Measure C Extension Plan provides multi-modal funding from a percentage of local sales tax revenue in three programs: public transit, local transportation, and regional transportation.	The Local Transportation Program funds various projects including street maintenance and rehabilitation, ADA Compliance, and pedestrian trails and bicycle facilities.
Transportation Development Act Article 3[34]	Fresno Council of Governments	Program is not currently active	Allocated among Fresno member agencies based on population, taxable sales and transit performance.	Bikeways, crossing improvements and safety/ education/training programs for school children and the general population
2021 Fresno COG FTA Section 5310 Grant Application for the Fresno/ Clovis Urbanized Area[35]	Fresno Council of Governments	Biannually	This grant focuses on improving transportation accessibility for senior citizens.	Grant projects may include public transportation projects that include building accessible paths to bus stops, including curb cuts, sidewalks, accessible, pedestrian signals, detectable warnings, and wayfinding.
Regional Sustainable Infrastructure Planning Grant[36]	Fresno Council of Governments	Typically annually. Cycle 3 grant application deadline was August 2019.	Program objective is to encourage local and regional multimodal transportation and land-use planning and addresses the needs of disadvantaged communities.	Planning studies, safe routes to school plans, complete streets plans, bicycle and pedestrian plans with safety enhancement focus (including Vision Zero).
Bike Paths Grant[37]	San Joaquin Valley Air Pollution Control District	Up to $150,000 for Class I bikeway (Bike path)	Projects considered on first-come, first-serve basis until funding is depleted. Project must include transportation purpose, not simply recreational focus.	Provides funds to establish bicycle infrastructure such as Class I or Class II bicycle paths. Excludes landscaping and other aesthetic amenities.

Funding Sources	Administering Agency	Availability of Funding	Description	Eligible Improvements
Other Funding Opportunities				
Community Grant Program[38]	PeopleForBikes	Up to $10,000. Grant cycle typically opens annually in the fall.	Provides funding to bike advocacy and facility-building projects. Requires Letter of Interest and full application	• Bike paths, lanes, and trails • Mountain bike and BMX facilities • Bike parks and pump tracks • Bike racks and bike repair stations • Large-scale bicycle advocacy initiatives. • Programs that transform city streets, such as Ciclovías or Open Streets Days • Campaigns to increase investment in bicycle infrastructure
Land Conservation Loan Program[39]	Conservation Fund	Rolling	Provides loans to quickly purchase high-priority lands	Trail installation/access
National Trails Fund[40]	American Hiking Society	Program not active.	The establishment, protection, and maintenance of trails. Applicant must be an Alliance Organization Member. Eligible to nonprofits.	Projects that improve hiking access or hiker safety. Projects that promote community building surrounding specific trail projects.
The Conservation Alliance[41]	The Conservation Alliance	Twice annually	Seeks to protect threatened wild places for habitat and recreational values. Eligible to nonprofits.	Seek to secure lasting protection of a specific wild land or waterway; engage grassroots citizen action, have a clear recreational benefit; have financial success within four years.
Local Community Grants[42]	Walmart	Applications reviewed quarterly on rolling basis. Funds available up to $5,000	Funding provided directly from local Walmart and Sam's Clubs. May require Letter of Inquiry.	Funding must address one of three priorities: creating opportunity, advancing sustainability, and strengthening community

Endnotes

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WAYFINDING SYSTEM GUIDELINES

Wayfinding System Guidelines

Introduction

These Wayfinding System Guidelines provide the City of Clovis with the tools to plan, design, and implement an effective bicycle and trail wayfinding system. It is intended to help planners and designers as they create a wayfinding system for Clovis' trails, bikeways, and paseos.

What is Wayfinding?

Wayfinding encompasses all the ways in which people orient themselves in physical space and navigate from place to place. A wayfinding system designed specifically for bicyclists and pedestrians can help these roadway and trail users easily and successfully navigate through a network of on-street facilities or trails. The main purpose of a wayfinding system is to connect people to the places they want to go. Wayfinding can take the form of directional signage, mile markers, trail heads, informational signs, map kiosks, and pavement markings to reinforce signage.

Bicycle wayfinding signs are signs that guide bicyclists along preferred, designated routes to destinations throughout the city and region. Bicycle routes may consist of on-street facilities and off-street trails.

Wayfinding Design User

Wayfinding systems designed for bicyclists and trail users can enhance the value of a bicycle and trail network by helping people identify and navigate designated routes between destinations.

Bicycle Design User

During the design and planning of wayfinding systems, planners should imagine a casual or new bicycle rider using the facilities and associated wayfinding. An experienced bicycle commuter or recreational rider knows their favorite routes well and may not need a signed bicycle route system. However, a person who has just moved into a new neighborhood or who is exploring a path for the first time will appreciate the guidance provided by a well-signed route.

Pedestrian Design User

Pedestrians are considered vulnerable users in auto-centric roadway networks and thus pedestrians benefit from separated facilities like trails and paseos, which provide greater safety and comfort. When designing and planning a wayfinding system, those pedestrians who don't drive or don't have access to a car, like older and younger community members are the users who may have the most need for the wayfinding and, as such should be the users that the wayfinding is designed to accommodate. If a system works for those users, it will most likely work for all pedestrians.

Benefits of Wayfinding

Bicycle and trail wayfinding can be an easy-to-implement, low-cost way to support and promote active travel by:

- Helping people identify and navigate desirable routes between destinations
- Knitting together existing bicycle and trail network
- Encouraging all user of all modes (pedestrian, bicyclists, and other non-motorized modes) to travel more confidently
- Reminding drivers of bicyclists' presence

Core Wayfinding Principles

These core wayfinding principles set the tone for the design of the overall wayfinding system and will help create a cohesive wayfinding sign network throughout the city.

Orient the User and Connect Places

- Easy-to-use and intuitive wayfinding helps bicyclists and trails users navigate and understand where they are in relation to nearby landmarks and destinations. Wayfinding should help people travel between destinations and develop an increased sense of mobility and connectivity. It should assist both locals and visitors in navigating between destinations and using services facilities around their neighborhood.

Be Consistent and Predictable

- Wayfinding systems must be designed with a consistent cohesive design language of materials, colors, typefaces and symbols so that they are easily recognizable and helps users quickly understand and interpret messages. Consistent and predictable placement throughout a community earns the trust of users and helps them understand the system and when they can expect signs.

Keep Information Simple and Disclose Information Progressively

- Wayfinding must provide concise messages, revealing enough information without overwhelming the user. Information on each sign should be kept to a minimum to avoid confusion and facilitate quick comprehension.
- Clear, logical, and simple wayfinding signage will help moving bicyclists and trail users make decisions quickly. Information should be clear, legible, and simple enough to be understood by a wide audience.

Allow Bicyclists and Trail Users to Maintain Movement

- Constant stopping and starting can be frustrating to bicyclists. Information on signs should be simple and large enough to be viewed in motion, allowing to maintain momentum along their path. It is also important to locate signs ahead of potential decision point to allow for bicyclists to take in the information on the signs and react in a timely way.

Figure 66: Wayfinding System Guideli

Technical Guidance

The design of bicycle wayfinding signs, and this wayfinding guide rely on guidance from the following documents:

Manual on Uniform Traffic Control Devices Guidelines, Federal Highway Administration (FHWA)

The Manual on Uniform Traffic Control Devices (MUTCD, 2009 edition) includes guidance and standards for:

- Sign design for bicycle guide signs, bicycle routes, and auxiliary plaques
- Sign installation details such as minimum height of signs from the ground and horizontal placement from edge of the roadway or trail
- Symbols and appropriate abbreviations for destination names
- Sign examples
- Sign placement, mounting height requirements, sign size, and layout

The MUTCD introduces sign types and provides additional right-of-way placement guidelines for directional signs. Finally, the MUTCD has a section on community wayfinding, which provides information about customization.

AASHTO Guide for the Planning, Design and Operation of Bicycle Facilities, American Association of State Highway and Transportation Officials (AASHTO)

The AASHTO Bike Guide provides additional information that supplements the MUTCD. The guide explains the use and benefits of different sign types for bicycle wayfinding. It also provides guidance on where to use signs: on what types of routes and how to place signs at intersections. A new edition is currently in development and will include expanded guidance in a full chapter on wayfinding.

Urban Bikeway Design Guide, National Association of City Transportation Officials (NACTO)

The NACTO document provides guidance based on current best practices in large cities. It covers types of signs and destinations, pavement markings, typical applications, and design guidance.

The benefits of using MUTCD-style wayfinding, as opposed to custom designed signs, include ease of implementation and eligibility for federal funding.

Destination & Route Selection

Destination Selection

Connecting places is the first core principle of bicycle wayfinding system design. Determining where bicyclists are trying to go will ultimately inform their desired route, which is why destination selection typically comes prior to route selection.

These guidelines describe the approach used to select and prioritize potential destinations to be included on the wayfinding signs.

Types of Destinations Considered

Destinations that can be considered for inclusion on wayfinding signs included:

- Parks
- Business Districts
- Major Sports Venues
- Major Bikeways
- Well-Known Landmarks
- Schools & Universities
- Libraries

Hierarchy of Destinations

Potential destinations can be assigned to one of three groups, Level 1 (Primary) – Citywide Destinations, Level 2 (Secondary) – Local Destinations, and Level 3 (Tertiary) – Neighborhood Destinations, based upon their usefulness as navigational references for bicyclists and their likelihood of being origins or destinations for bicycling trips. The hierarchy helps planners and designers determine how far from the destination references to it will appear on wayfinding sign panels and helps in the decision about which destinations are included on wayfinding signs.

The general hierarchy of what to include in Primary, Secondary, and Tertiary destinations will vary depending on whether the bike route is in an urban, suburban, or rural area. In urban areas (most of Clovis), destinations are close together and only the most significant destinations should be noted as Primary destinations. However, in rural areas (i.e. outlying parts of Clovis), destinations are sparsely spaced. Neighborhoods and small local parks may be included on wayfinding signage as Tertiary destinations to help as both navigational aids and informational aids for bicyclists to know where they can access services such as water and bathrooms.

To establish a hierarchy, consider the following:

- How well-known is the destination and how useful is it as a navigational reference? The most well-known destinations and most useful navigational references should be in the Primary destination group.
- How popular is the destination in terms of annual or seasonal visitors? How accessible is the destination by pedestrians and bicyclists? Do these users commonly access the destination? Does the route being signed provide good access to the location?
  - The venues that have a large number of visitors and for which the answers to the above questions are positive, should be in the Primary or Secondary destination group.
  - If the venue is likely only serving nearby pedestrian and bicycle users, then it should be a Tertiary destination
- If the destination is a trail or bikeway, is it well-known outside of the immediate area? Is it well used? Does it connect to other more regional trail/ bikeway networks?

Level 1 (Primary) – Citywide Destinations

Primary destinations include cities, regional destinations, or other major destinations. These are often the key destinations included on most signs and establish the origin and destination of a route. Including these destinations on signs helps users identify where a route is ultimately going and what they will see if they continue along the route.

Level 2 (Secondary) – Local Destinations

Secondary, or Level 2 destinations, often include districts, neighborhoods, and major landmarks. These destinations can be signed to from up to two miles away, and often include parks, major shopping districts, etc.

Level 3 (Tertiary) – Neighborhood Destinations

Tertiary, or Level 3 destinations, include pocket parks, small schools, and other minor landmarks that may only be visited by pedestrians and bicyclists who live or work nearby. These destinations may only be listed on wayfinding signs that are within a quarter mile or two blocks.

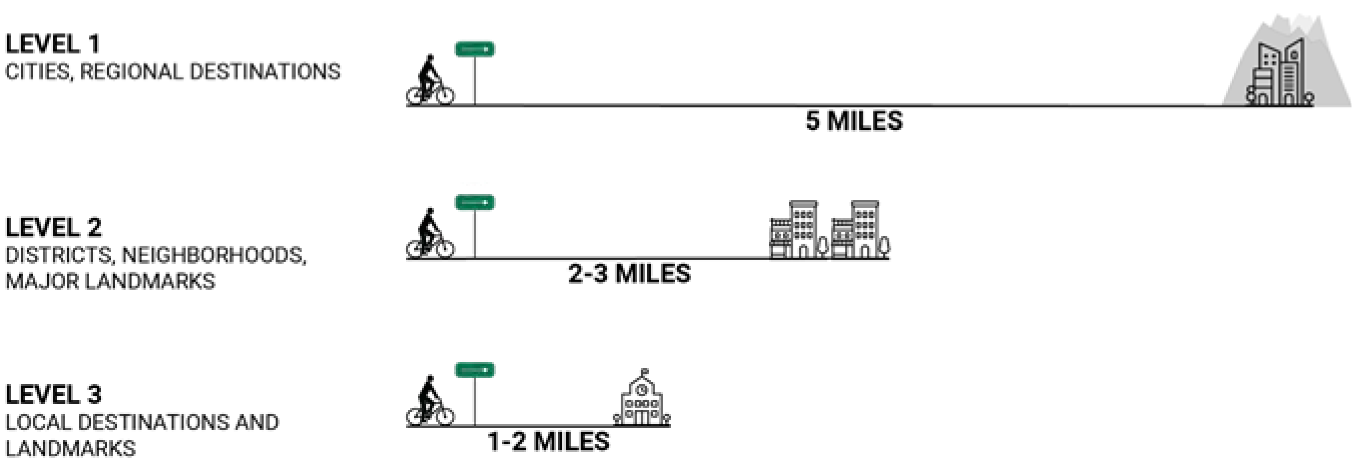
Standards for Measuring Distance to Destinations

A core principle of wayfinding sign design is progressively disclosing information by not overwhelming the bicyclist at any one decision point or sign assembly. Knowing when to introduce a new destination depends largely on its importance and distance from the sign.

Distance to Destination

There will usually be more potential destinations that could be included on a sign than space available. A destination hierarchy can be used to guide the designer on what to include. Suggested distance guidelines for the urban/suburban and rural destination hierarchy are displayed in Figure 67 below. In practice, however, the distance at which each destination appears on

Figure 67: Measuring Distance to Destinations; Image by Toole Design, Icons by Noun Project



wayfinding signs will require the judgement of the designer(s) of the wayfinding system.

Measure-To Points

If the destination is a neighborhood, municipality, or a large park, designers will have to establish a measure-to point.

- For large parks or facilities, it may make sense to measure distance to the main entrance.
- For smaller destinations, the measure-to point may be the front entry.
- The distance to a city, district or neighborhood should be measured to the area's center point, as is the practice in highway wayfinding; Google Maps' bicycle navigation feature also measures distance to the city's center point.

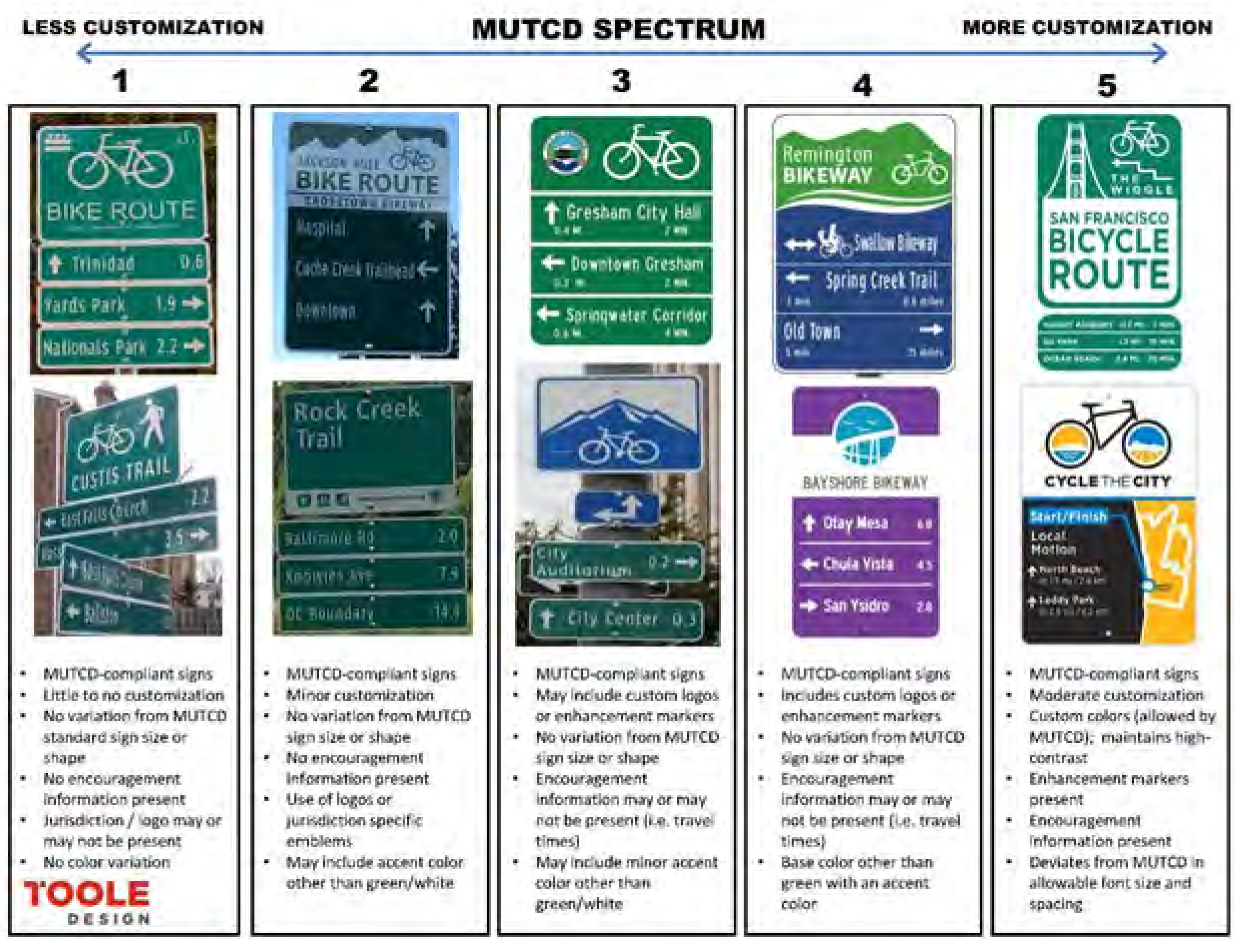
Establishing measure-to points after identifying destinations will keep the distance measurements consistent throughout the bicycle wayfinding network.

Building Blocks: Standard Signs for Bicycle and Trail Wayfinding

The overall approach follows the look and feel of standard highway guide signs while the detailed design is tailored for bicyclists. Wayfinding signs can vary in the level of detail and modification, from standard MUTCD D-series signs to customized signs with unique colors, logos, and font types. The spectrum of how signage can be customized is shown in Figure 68.

To maintain compliance with MUTCD standards, no "assigned" colors were used as the primary base for the wayfinding sign concepts. These colors are used for a variety of regulatory signs in the MUTCD, including red, orange, yellow, fluorescent yellow-green, fluorescent pink, and purple.

Figure 68: MUTCD Sign Customization Spectrum



These guidelines and recommendations use the standard signs in Table 19 from the Manual on Uniform Traffic Control Devices (MUTCD).

Table 19: MUTCD Guide Signs and Application

MUTCD SIGN	SIGN IMAGE	APPLICATION
Bicycle Route Guide Sign D11-1 or D11-1c		• D11-1 is to be used on Class I trails The phrase"BIKE ROUTE" can be subsituted with a trail name. • D11-1c is to be used on Class II, III, and Class IV bike lanes and Level 1/primary destination name. • Bicycle Route Guide signs let bicyclists and pedestrians know they are on a designated bikeway or trail. In the case of bikeways, they alert motorists to the likely presence of bicyclists. • In Clovis, these signs are to be used at the start of paseos to indicate that they are bicycle/ pedestrian routes.
Destination Supplemental Sign D1-1 to D1-1c		• D1-1 to D1-1c are to be used to indicate single destinations, or to list destinations separately. • D1-2, 2a-2c, D1-3, 3a-3c are to be used to combine multiple destination on a single panel; this design is recommended as single panels are easily bent or twisted. • Destination signs without distances are used on signs where there is a decision to be made about which direction to go. • Destinations signs with distances are used as confirmation and information at the start of a bikeway or trail or after a turn/decision point. • To maintain simplicity, decision signs or sign assemblies should not display more than three destinations.
Direction Arrow Supplemental Signs M5-1/5-2, M6-1 to M6-7		• Directional arrow signs are used to provide spot guidance, such as when an on-street route turns but there is no decision to make. • These assemblies usually include the main route confirmation plaque as well as a 6 inch arrow plaque. • These signs can also be used when a path splits.

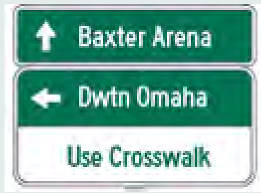
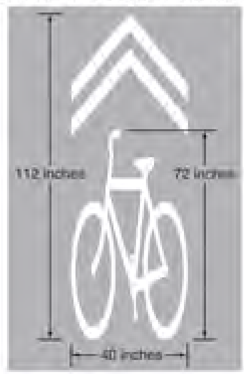
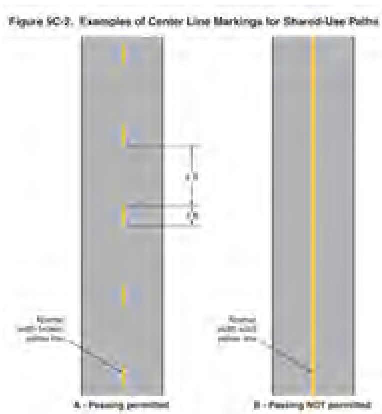
MUTCD SIGN	SIGN IMAGE	APPLICATION
Supplemental Information Signs D1-2 MOD		• Used to provide additional, clarifying information to the bicyclist or pedestrian, such as how to navigate an intersection. • Supplemental signs use a reverse color scheme: green lettering on a white background. Supplemental information can be combined with D1 series panel or made as a separate panel.
Pavement Markings: Shared Lane Markings (SLMs)/ Bike wayfinding dots Centerline markings	Figure 9C-9. Shared Lane Marking  	• SLMs and bike wayfinding dots may be used to supplement directional signs to help bicyclists navigate difficult turns or where the direction of the bike route is not immediately obvious. They are also used on bike boulevards (Class III bikeways). • Centerline markings may be used on trails or side paths to help delineate space for traffic going in both directions. • In areas where there is high traffic of both pedestrians and bicyclists, pavement markings can be used to differentiated where different users can travel to create a safe orderly environment for all users.

Figure 69: Example of shared lane markings used on bike boulevard (Class III bike route)

Figure 70: Example of a bike wayfinding dots used to guide users through an intersection

Assembling the Building Blocks

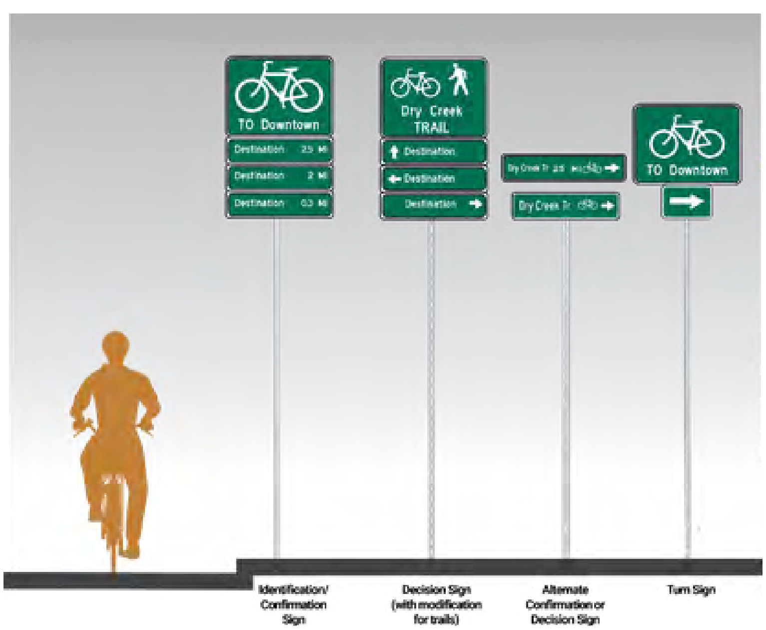
There are four basic steps in wayfinding:

1. **Orientation** refers to determining one's location relative to nearby objects [or landmarks] and the destination.
2. **Route decision** refers to choosing a route to get to the destination.
3. **Route monitoring** refers to monitoring the chosen route to confirm that it is leading to the destination.
4. **Destination recognition** is when the destination is recognized.

The signs, or building blocks, of the wayfinding system are combined into sign assemblies that respond to the first three steps of wayfinding:

1. **Identification/Confirmation signs** provide orientation and route monitoring, by indicating the general direction and confirming that a user is on a designated bikeway or trail.
2. **Decision signs** indicate where the users can choose a different route to reach destinations along the path, or to mark the junction of two or more bikeways or trails.
3. **Turn signs** provide spot guidance along a bikeway where the route turns (but there is not decision to be made) such as when a bikeway turns from one street onto another street.

Figure 71: Sign Assembly Typologies



Branding

Part of the creation of a wayfinding signage system is incorporating trail logos and local branding into the signage. Figure 72 shows some examples of what that could look like. Stylistic changes to logos or sign panel designs are something that should be considered when creating signage plans. For example, the Heritage Grove logo is likely to require the addition of a black outline to be legible on the white sign and would not be legible on a green sign without additional edits.

The MUTCD offers clear guidelines on materials and the use of "assigned" colors in bicycle/pedestrian wayfinding signs but allows for cities to individualize their signs using distinctive (unassigned) colors, typefaces, and symbols.

Figure 72: Local Branding Options

Sign panels are combined in assemblies to respond to wayfinding needs.

Table 20: Sign Assemblies

Route Confirmation/ Identification Assembly	ASSEMBLY COMPONENTS	PLACEMENT
	D11-1 alone or in combination with D1 series	Placed at the beginning of a bikeway or after a turn or intersection to reassure cyclists that they are on the correct route. In areas where a bicycle route continues straight along a roadway or shared use path without any turns or decisions, it is recommended that a confirmation assembly be placed every 3-4 blocks or every quarter to half mile to reassure bicyclists they are still on the designated bikeway. After a turn, confirmation assemblies are placed on the far-side of the intersection, preferably visible to the bicyclist who is engaged in the turning movement, to confirm the correct direction of travel.

Decision Assembly	ASSEMBLY COMPONENTS	PLACEMENT
	D1 series signs can be used alone or in combination with D11-1 series D1 series signs can be used without D11-1 panels if they include bicycle symbols	Placement of a decision sign from a turn or transition is determined by bicycle design speed, sight lines, and roadway slope. Decision signs should be placed in advance of a turn or decision point based on context. To improve user comprehension, through-destinations should be placed at the top of the sign assembly, followed by destinations that require the bicyclist to make a turn (left turns are typically displayed above right turns). Multiple destinations in the same direction can be included on one larger sign with an arrow.

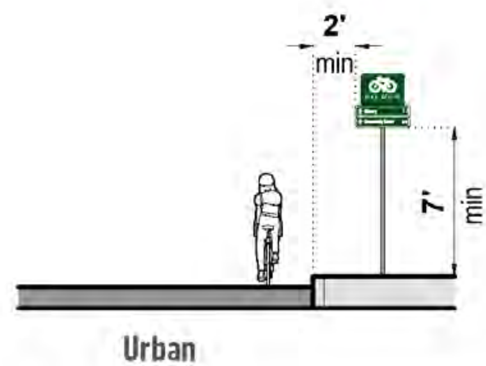
Turn Sign

	ASSEMBLY COMPONENTS	PLACEMENT
	Each turn sign includes D11-1 series sign and M5 series and/or M6 series sign. Sometimes sign assemblies will have all three sign types (D1 series, D11 series, and M5/6 series)	Turn signs should be placed at points prior to the turn to give advance notice of a change in route direction.

General Sign Assembly Design Guidance

For sign assemblies on shared use paths and on-street, the following guidelines apply:

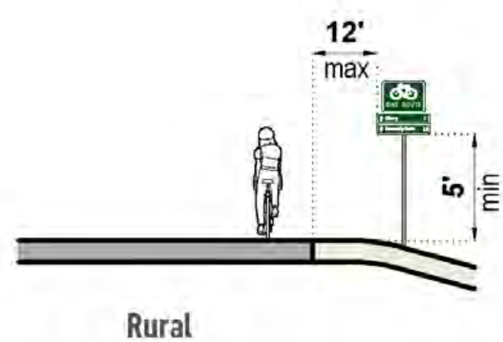
- No more than four sign panels should be included on any single sign pole, due to the need to maintain head clearance for pedestrians and keep information simple. Prioritize sign destinations according to the hierarchy of destinations, from nearest to farthest.
- For assemblies mounted on the same post but perpendicular to each other, group the panels that face the same direction together.
- Destinations within an assembly should be ordered with all through destinations listed first, then left turning destinations, and finally right turning destinations. If there are two or more destinations in the same direction, the closer destination should be on top. This method helps riders continuing straight understand where the route is heading, and prioritizes left turns over right turns, since riders often need to merge to make a left turn.



General Installation Guidelines

General Guidance

- Typically, bicycle and trail wayfinding signs are placed on the right side of the street or trail.
- Arrows on an assembly should not point to a minor side street, alley, or driveway that could be mistaken for the intended turn.
- Where bicyclists are guided to or are likely to use a crosswalk as part of the route, it is often best to locate guide signs near walk/wait pedestrian signal heads.



- Care should be taken to place signs in locations where they will not be blocked from view by tree limbs, vegetation, other signs, parked vehicles (especially large vehicles and trucks), and buses at bus stops.
- Wayfinding signs can be attached to poles with other signs, but not warning signs

In Relation to Intersections

To allow adequate notice of left turns, decision and turn signs should be placed at a distance before the intersection that is based on the number of turn lanes the bicyclist needs to merge across to make a legal left turn.

- Zero-lane merge: 25 feet
- One-lane merge: 100 feet
- Two-lane merge: 200 feet

Typical Sign Placement Scenarios

Figure 73: Intersection of two On-Street Bike Routes

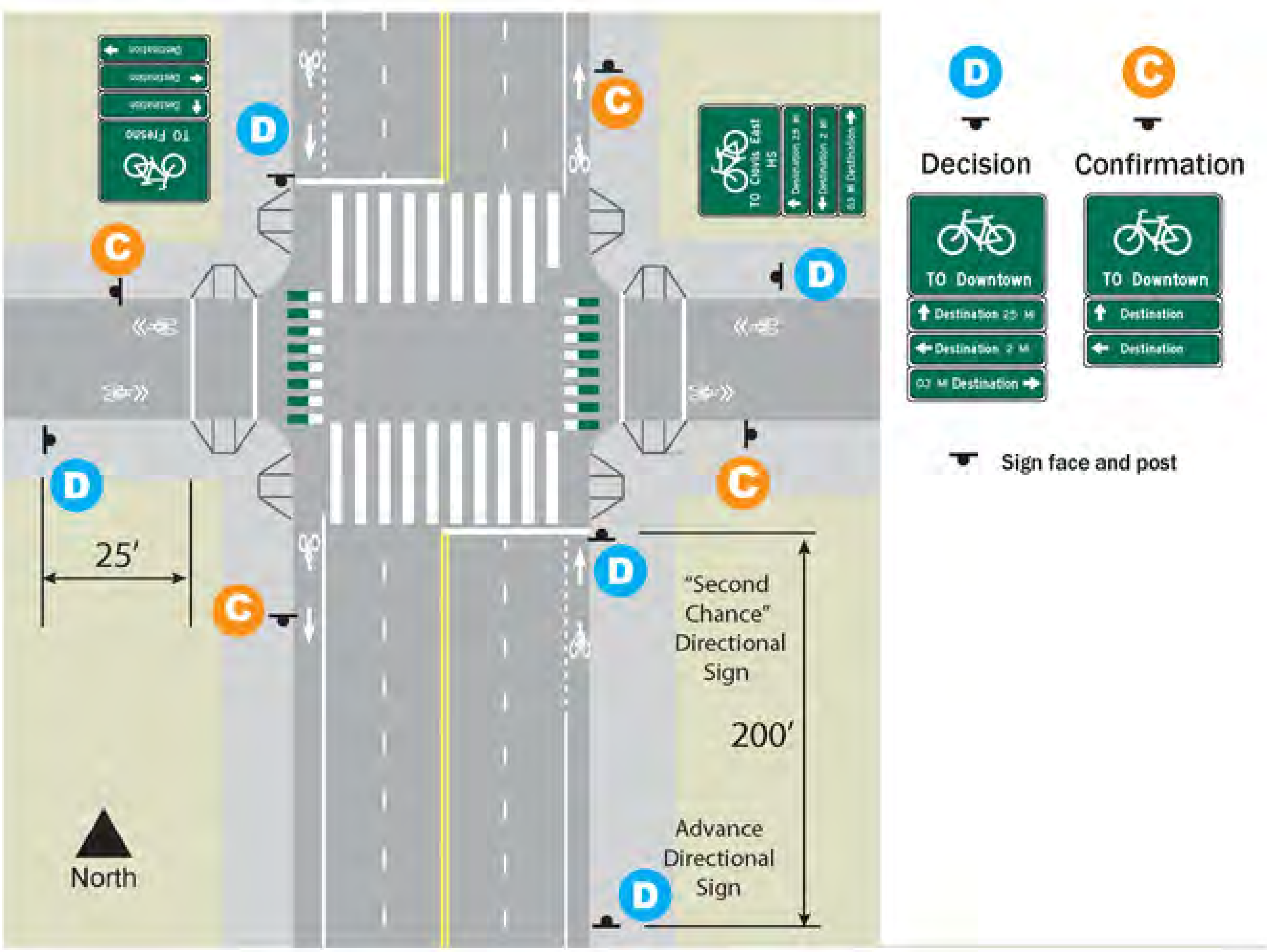


Figure 74: Intersection of a Trail and On-Road Bike Route

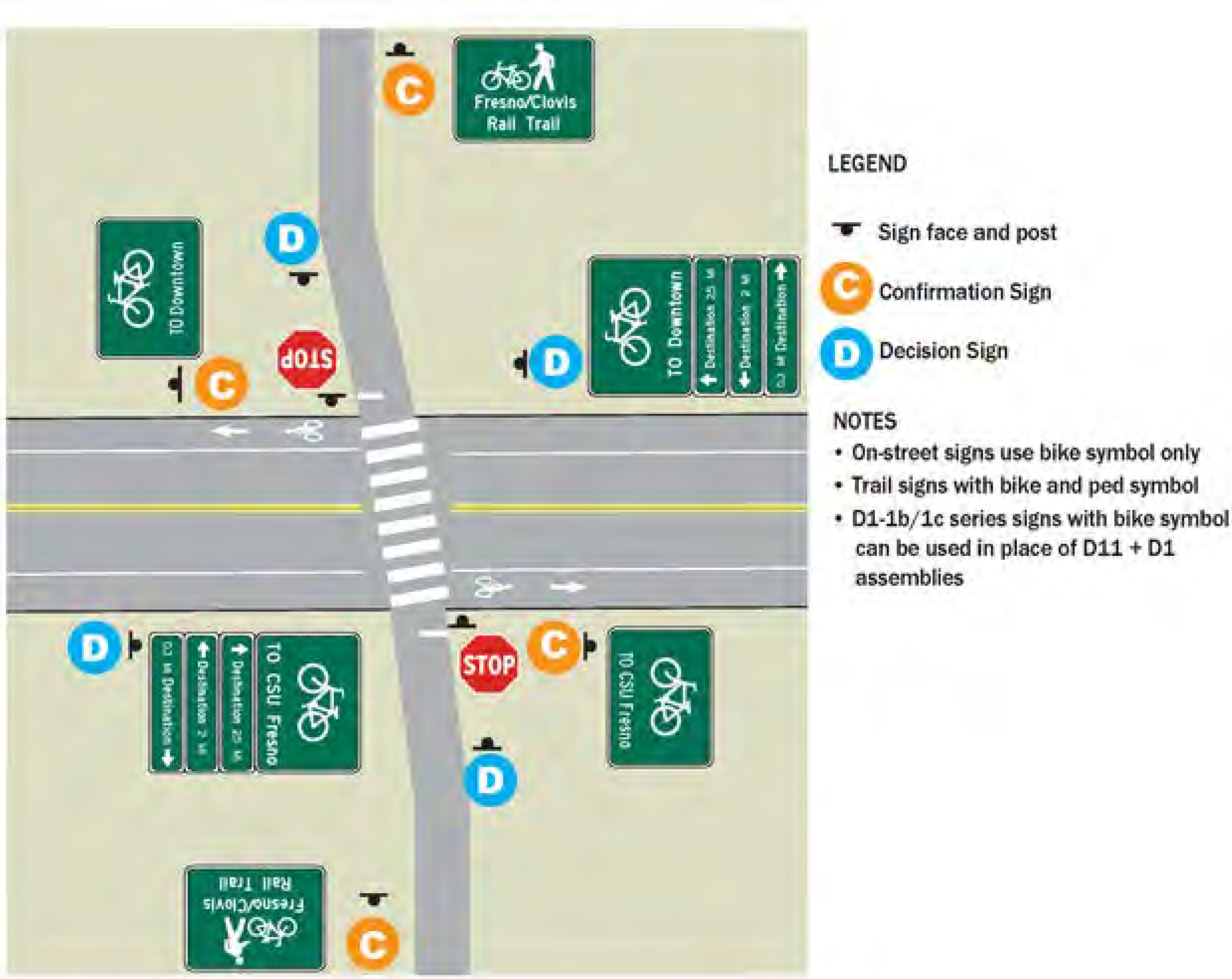
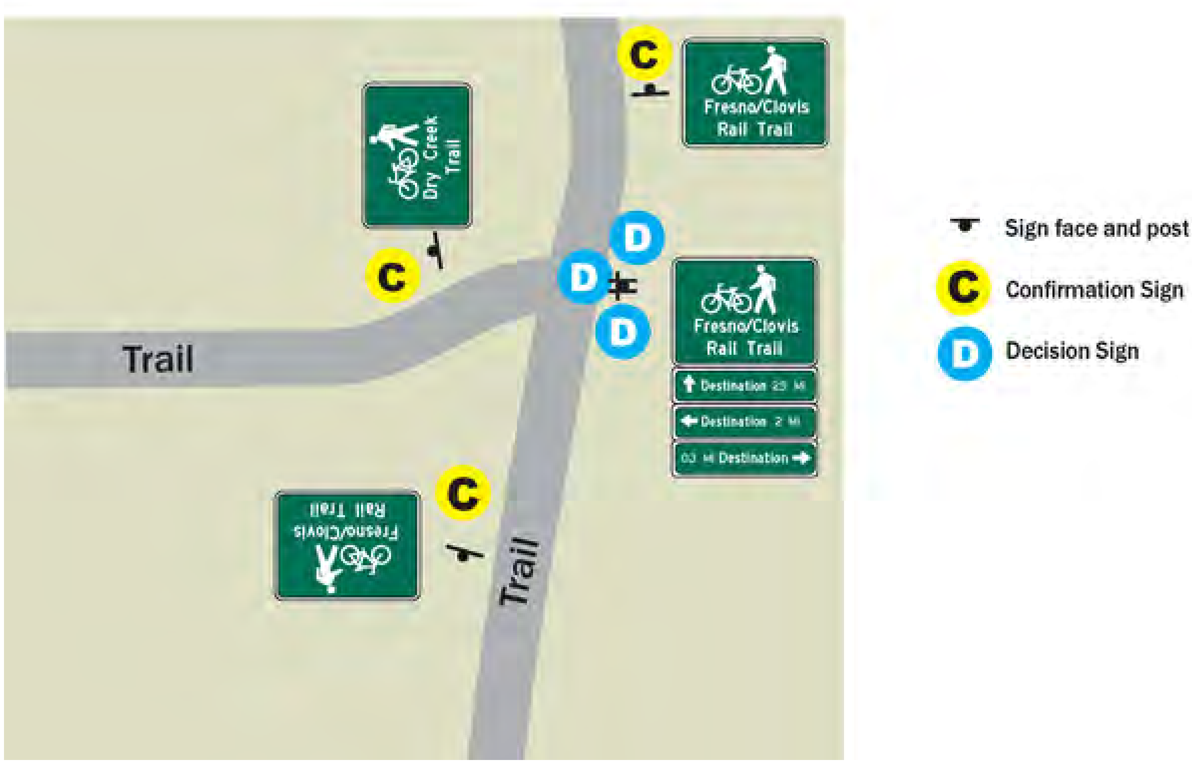
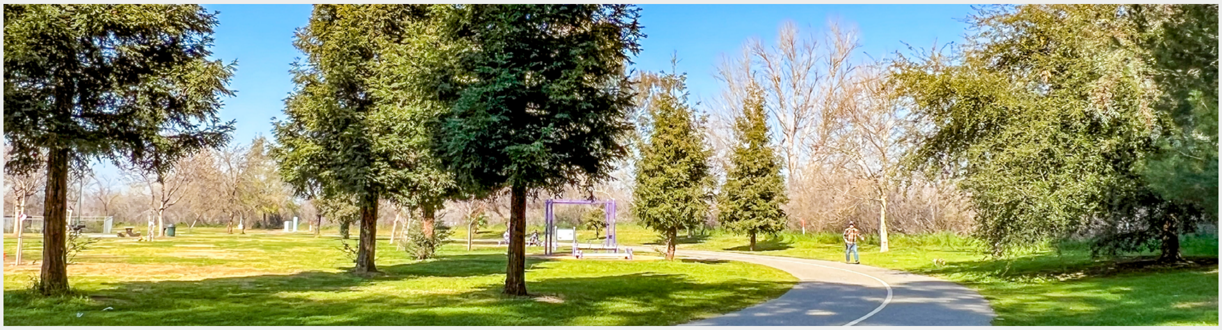


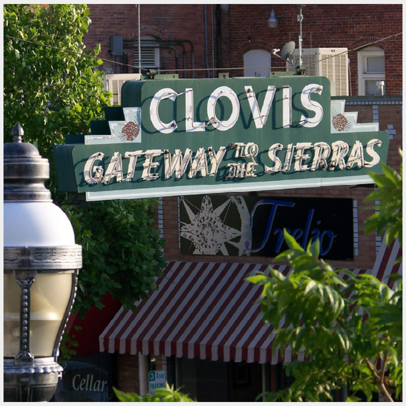
Figure 75: Intersection of Two Trail





City of Clovis
Active Transportation Plan

September 2023



CLOVIS
ACTIVE TRANSPORTATION PLAN

CITY of CLOVIS CALIFORNIA

Acknowledgments

The City of Clovis thanks the residents of Clovis, local and regional agencies, our non-profit partners, stakeholders, and all others who participated in the development and review of the Active Transportation Plan Update.

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01
PLAN PURPOSE

The **Clovis Active Transportation Plan Update** (the Plan) supports walking, bicycling, transit, and use of other emerging modes of personal transport as alternatives to driving within Clovis, to neighboring cities, and regional destinations. The Plan defines a clear vision for the city's active transportation network and proposes a framework for implementing projects, programs, and policies to turn the vision into a reality.

The Plan identifies strategies to improve safety and accessibility for active forms of travel such as walking, bicycling, and rolling (including using assisted mobility devices, e-scooters, skateboards, and other wheeled modes, etc.). It supplements the City of Clovis General Plan (2014) and supersedes the City of Clovis Active Transportation Plan (2016) and will help the City create a sustainable and multi-modal transportation network. This network is intended to serve not only Clovis residents but it will also plays a crucial role in maintaining convenient accessibility between Clovis and neighboring jurisdictions for the purposes of work, education, and reaching recreational destinations.

How Was This Plan Developed?

The Plan was developed over a two-year period, beginning in Spring 2021. The process was guided by City of Clovis staff, stakeholders, and members of the community.

The City of Clovis used community input to develop:

- A vision and suite of goals to encourage walking and bicycling
- An assessment of existing conditions
- Bicycle and pedestrian network and facility recommendations
- Programmatic recommendations
- An implementation and funding strategy

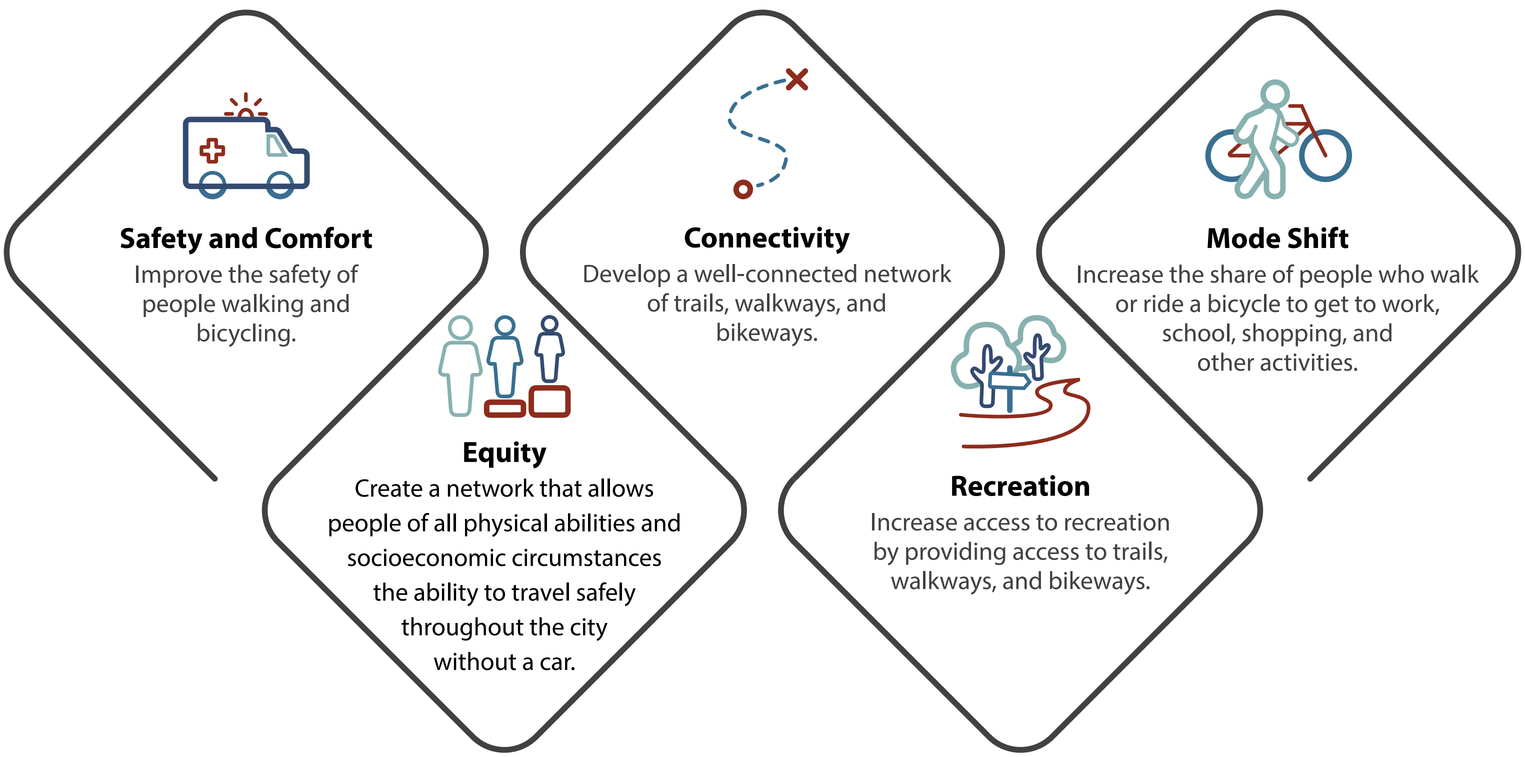
Vision

A city with a **complete and connected network of trails, walkways, and bikeways** that provides **convenient and intuitive connections to key destinations** and supports travel within and between neighborhoods. The network **improves quality of life by encouraging walking and bicycling for transportation and recreation**.

Goals

The following goals guide the recommendations presented in this Plan and define City priorities (see Figure 1). The goals can also be used to measure the City's progress towards implementation of the Plan over time.

Figure 1: Clovis Active Transportation Plan Update Goals



Building Upon Current and Past Plans

As part of the **City of Clovis Active Transportation Plan Update**, the project team reviewed local and regional plans and policies to ensure consistency with these efforts.

City of Clovis Plans

City of Clovis General Plan (2014)

Summary: This long-range plan identifies the goals, policies, and implementation actions to preserve and expand the City's existing community while orienting growth toward three urban centers.

Relevance: The Circulation Element presents goals, policies, and implementation actions to guide transportation decisions in Clovis.

Circulation Element Goals:

- A context-sensitive and "complete streets" transportation network that prioritizes effective connectivity and accommodates a comprehensive range of mobility needs.
- A roadway network that is well planned, funded, and maintained.
- A multimodal transportation network that is safe and comfortable in the context of adjacent neighborhoods.

- A bicycle and transit system that serves as a functional alternative to commuting by car.
- A complete system of trails and pathways accessible to all residents.
- Safe and efficient goods movement with minimal impacts on local roads and neighborhoods.
- A regional transportation system that connects Clovis to the San Joaquin Valley region.

City of Clovis Active Transportation Plan (2016)

Summary: The 2016 Clovis Active Transportation Plan is a comprehensive document outlining the future of walking and bicycling in Clovis.

Relevance: This Plan builds off the vision, goals, and strategies outlined in the 2016 plan.

Goals:

- Increase the number of residents who use walking and bicycling to get to work, school, shopping, and other activities.
- Reduce the number of collisions within the city involving pedestrians and bicyclists.
- Close gaps within the bicycle and pedestrian networks.

Central Clovis Specific Plan (2016)

Summary: The Central Clovis Specific Plan reflects on the history of the central core of Clovis and outlines land uses and design guidelines that aim to maintain the character and quality of downtown Clovis.

Relevance: The Specific Plan includes active transportation improvements as a goal in downtown Clovis, including lane reconfigurations, strategies for increasing pedestrian access, encouraging and identifying areas for bicycle facilities, creating a wayfinding program, and encouraging community events that encourage walking and bicycling.

Goals:

- A thriving local economy enriched with successful businesses.
- A pedestrian and bicycle friendly downtown that connects to regional assets and all transportation modes.
- An entertainment, art and cultural center for the region that preserves, promotes and celebrates the historic heritage of Clovis.
- A place with distinctive gateways and thematic elements.
- An authentic heart of the Clovis Community that offers employment, housing and lifestyle opportunities for all ages and incomes.

Master Plans and Design Guidelines

The following local design guidelines were reviewed as part of the development of this Plan to ensure consistency between existing design guidelines and the recommendations included in this Plan:

- **Central Clovis Specific Plan** (2016). Provides development standards, acceptable land uses, and design standards for central, "Old Town Clovis". This includes street and trail design concepts such as gateways and multimodal street sections that include bikeways and "Pedestrian Residential Tiny Streets".
- **Loma Vista Specific Plan** (2003, revised 2015). Loma Vista is one of three Urban Centers identified by the **City of Clovis General Plan** (1993). This Specific Plan provides design guidance for landscaping and streetscaping along streets and trails. It also provides design guidelines for different land uses, such as residential, commercial, community centers, open spaces, and commercial and business campuses. The guidance from the Loma Vista Specific Plan is reflected in the **Loma Vista Community Centers Master Plan** (2019) and the **Home Place Master Plan** (2022), which include new trails and bike lanes as part of Master Planned Communities in southeast Clovis.
- **Guidance for Uncontrolled Crosswalk Treatments** (2016). Based on research, other cities' policies and guidelines, and City of Clovis staff input, this guidance provides a process for determining the appropriate level of treatments for pedestrian crossings based on roadway characteristics, such as number of lanes, posted speed, sight distance, and demand. Guidance applies to intersection crossings, midblock crosswalks, and trail crossings. Potential crossing treatments include crosswalks, signs, pavement markings, and signals.

- **Heritage Grove Design Guidelines** (2016). Heritage Grove is one of three Urban Centers identified by the **City of Clovis General Plan** (1993). This Master Plan provides design guidance for internal circulation and mobility, access to Clovis' existing active transportation network, and street cross-section concepts.
- **Fresno-Clovis Class IV Bikeway Design Guide** (2017). This design guide provides guidance on determining the appropriate bikeway type, a comparison of institutional guidance on facility design, and feasibility of Class IV segments in Fresno and Clovis. Corridors recommended for Class IV facilities as part of this study will be assessed for the ATP Update.
- **Clovis Standard Specifications** (2020). This document details the process for designing, contracting, and constructing projects within the city of Clovis. It includes design and material specifications for improvements in the public right-of-way, including utilities, sewer and stormwater facilities, sidewalks, curbs, pavement markings, and other surface improvements.

Regional Plans

Fresno Council of Governments Multijurisdictional Local Road Safety Plan (MLRSP) (2022)

Summary: Using crash data analysis and stakeholder input, the MLRSP identifies key roadway safety issues, priority locations, and strategies within each of the participating jurisdictions.

Relevance: Includes a plan for Clovis that analyzes road safety issues for pedestrians and bicyclists. Identifies high crash locations throughout the City and strategies to improve safety.

Key Findings Goals:

- The plan emphasizes that pedestrians and bicyclists in Clovis are overrepresented in fatal and severe injury crashes (i.e. pedestrians are involved in 3 percent of reported crashes but 27 percent of fatal and severe injury crashes).
- Supports the installation of road diets, bike lanes, sidewalks, refuge islands, and other measures proposed in this Plan.

Fresno Council of Governments Regional Transportation Plan (2022)

Summary: The 2022 Regional Transportation Plan is a comprehensive, regional look at transportation options for people and for moving goods.

Relevance: The Plan sets direction for regional transportation values and improvements to pursue, including in Clovis. This plan aligns with the goal to improve community access sustainable transportation options and to have a multimodal transportation network.

Goals:

- Improve mobility and accessibility for all.
- Support vibrant communities that are accessible by sustainable transportation options.
- Create safe, well-maintained, efficient, and climate-resilient multimodal transportation network.
- Build a transportation network that supports a sustainable and vibrant economy.
- Become a region embracing clean transportation, technology, and innovation.

Fresno Council of Governments Regional Active Transportation Plan (2018)

Summary: This Regional Active Transportation Plan is a comprehensive guide outlining the vision for biking, walking, and other human-powered transportation in Fresno County.

Relevance: While this particular plan focuses on the unincorporated areas of Fresno County, active transportation plans for the County's four cities that have active transportation plans were integrated into this plan to ensure consistency between jurisdictions.

Goals:

- Create a network of safe and attractive trails, sidewalks, and bikeways that connect residents to key destinations, especially local schools and parks.
- Create a network of regional bikeways that allows bicyclists to safely ride between cities and other regional destinations.
- Increase walking and bicycling trips in the region by creating user-friendly facilities.
- Increase safety by creating bicycle facilities and improving crosswalks and sidewalks for pedestrians.

Existing Conditions Review

The project team assembled and analyzed data about who is walking and biking in Clovis today and whether there are specific demographic population groups in Clovis that might be particularly reliant on walking, bicycling, or transit, or may have specific needs associated with using these types of modes. In addition to reviewing quantitative data, public input was collected to develop a deeper contextual understanding of walking and biking conditions in Clovis. The team also mapped existing walking and bicycling facilities, such as the Clovis Old Town Trail shown in Figure 2. See Appendix B: Existing Conditions Summary Report for more information.

Public Outreach

To develop the Plan, the City of Clovis used a variety of outreach and engagement strategies to publicize the planning process and gather input from the community. Throughout the Plan development process, the City provided the following opportunities for input:

- Developed and published a Plan accessible on the City's website for public comment
- Hosted two community open houses
- Published an online map and survey
- Facilitated three focus group meetings
- Organized a community meeting

See Appendix C: Public Participation Summary Report for more information.

Network and Facility Recommendations

The existing conditions review and public input were used to develop a list of recommended improvements for walking and bicycling infrastructure throughout Clovis. These recommendations will help the City achieve the goals stated in this Plan. See Appendix A: Prioritized Bicycle Facilities Project List for a complete list of bicycle project recommendations.

Program Recommendations

To support the development of physical infrastructure for people walking and bicycling, the Plan presents a set of complementary program recommendations. These programmatic recommendations focus on end-of-trip facilities, active transportation policies, educational programs, and encouragement events.

Implementation Strategy

This implementation strategy, found in Chapter 6, will assist the City in focusing financial and staff resources on Plan implementation and building the recommended projects. It will help City staff to build upon the momentum of this Plan and swiftly move from Plan adoption to implementation. To view the prioritized project list, see Appendix A: Prioritized Bicycle Facilities Project List and for more information about opportunities to fund projects, refer to Appendix D: Funding Sources.

Figure 2: Clovis Old Town Trail

02

WALKING AND BICYCLING IN CLOVIS TODAY

Existing Conditions

The climate and geography in Clovis are well-suited for walking, bicycling, and rolling (using assisted mobility devices, e-scooters, skateboards, and other wheeled modes). Paseos and canal banks present opportunities for separated connections and high trail use suggests that many are already walking and bicycling for recreation. However, commute patterns and crash data point to a need for safer, more comfortable facilities to encourage widespread adoption of these modes for transportation.

While Clovis already provides an extensive network of bicycle and pedestrian infrastructure, this Plan identifies opportunities to improve existing facilities and build new facilities in such a way that bicycle and pedestrian users are more prominently considered in the design. Arterials and collector streets consist largely of wide, multilane roadways. These conditions tend to encourage faster vehicular speeds which make walking and biking less secure and appealing options. Because they are designed to efficiently move large volumes of vehicular traffic, many of these streets also have limited pedestrian crossing opportunities. An analysis of crash data confirms some of these trends and indicates that severe injuries or fatalities disproportionately impact pedestrians and bicyclists, compared to other road users.

Active Transportation and Public Transit

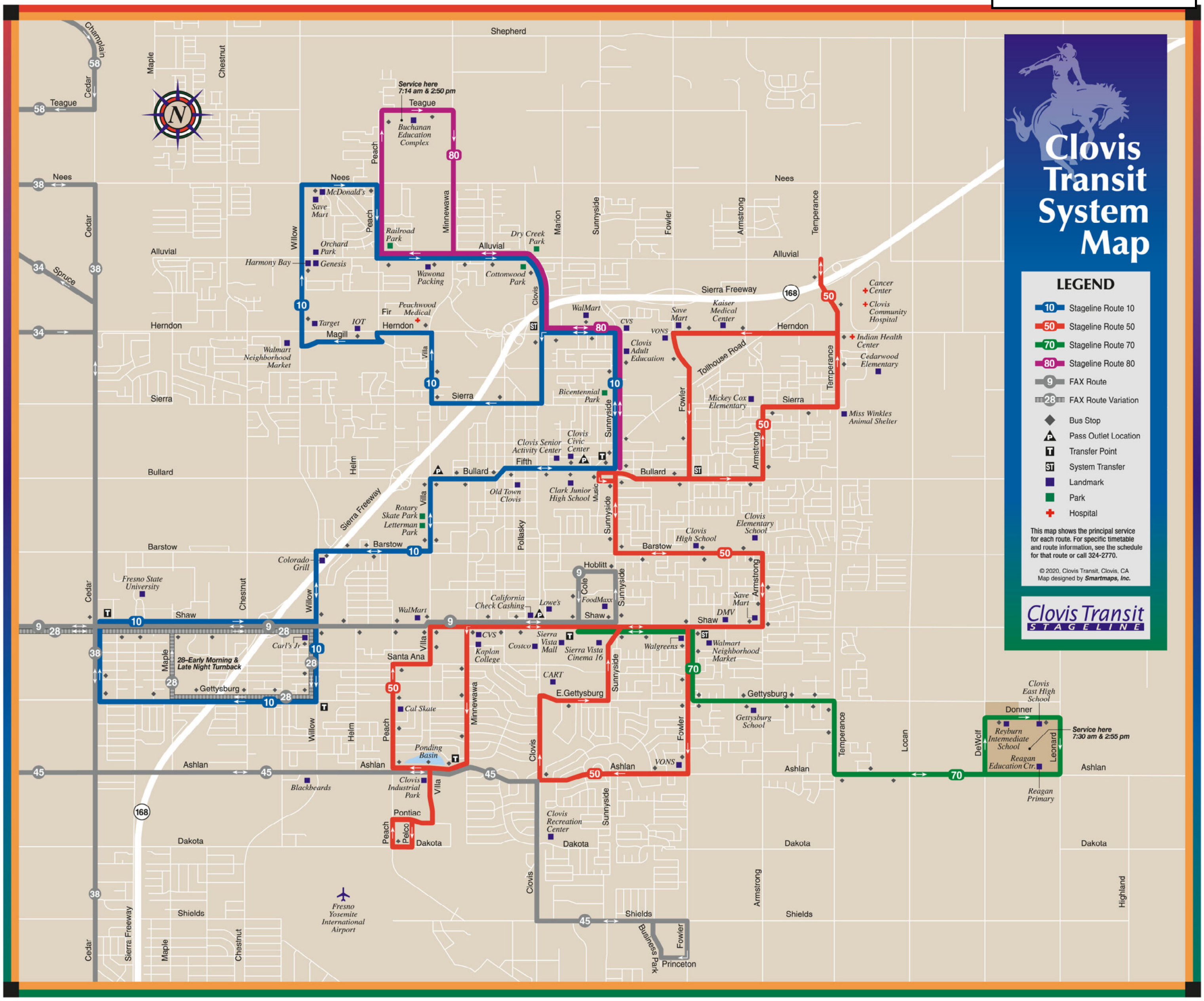
Transit and active transportation mutually reinforce each other. Buses provide convenient transportation options that can be combined with walking and biking trips, while active transportation facilitates first and last-mile connections, enhancing the efficiency and sustainability of the overall system. Public transportation boosts the geographic reach of walking and bicycling.

On-street bicycle facilities consist primarily of Class II bicycle lanes, located in most areas of the City. Off-street bicycle facilities include trails, paseos[1], and sidewalks. The City has 12.5 miles of off-street trails and many more miles of paseos that provide protected spaces for people of all ages to walk and ride a bicycle. Most streets have sidewalks on both sides of the street, but there are some areas that lack a continuous sidewalk network. Within residential areas, the prevalence of dead-ends and cul-de-sacs create barriers to walking and biking, even if destinations are nearby.

The population of Clovis is projected to grow by 14 percent in the the next five years, nearly double the projected growth for Fresno County or California. 41 percent of the population is either under 18 or over 65, representing populations less likely to have access to a

[1] Paseos are trails that provide connections for walking, bicycling, and rolling within neighborhoods.

Map 1: Transit Routes and Stops



vehicle and are more likely to rely on walking, bicycling, or public transit to travel around town.

There are four fixed-service bus routes in Clovis and the City also operates an on-demand paratransit service (refer to Map 1). In the 2019-2020 Fiscal Year the fixed-route service provided 112,478 rides and the paratransit service provided 50,384 rides. Fixed-service bus routes are free to passengers and can accommodate two bicycles at a time.

Existing Facilities to Support Bicycling

Clovis has approximately 55 miles of Class II Bike Lanes.[2] Class II Bike Lanes are located on major arterials and collectors, like the example shown in Figure 3. While the City has made substantial progress in expanding its bike network, many of these facilities are on roads with high vehicular traffic volumes and posted speeds greater than 40 mph and thus may not provide comfortable riding conditions for most people. The network of bicycle facilities is supported by trails and paseos, which provide off-street, concrete and asphalt paths for bicycling, walking, and rolling.

Existing Trails and Paseos

Clovis trails provide a comfortable, low-traffic, low-speed bicycling facility for people who may feel uncomfortable bicycling on the street in mixed traffic, or on bike lanes without physical separation between people bicycling and people driving. Trails also serve

Figure 3: An existing Class II Bike Lane on Gettysburg Avenue

pedestrian needs as off-street walking facilities. The City has the opportunity to enhance its trail network by upgrading infrastructure at major road crossings.

Clovis has a network of paseos in the southeast part of the city, as well as planned connections between existing paseos in the northeast and northwest areas. Community members can walk or bike along paseos in Clovis. See Map 2 on the next page for existing trails and bicycle lanes.

Major Class I Trails include Dry Creek Trail, Old Town Trail, Enterprise Trail, and the Sierra Gateway Trail. See Table 1 for the 2020 total user counts for these trails. Off-street trail facilities are well used in Clovis. From 2017 to 2020, annual trail use increased by 72 percent.[3]

Table 1: Trail/Paseo User Counts

Trail	2020 Average Daily Use	2020 Average Annual Use
Old Town Trail, at Willow/Nees	668	787,014
Dry Creek Trail, at Trailhead	858	1,283,655
Enterprise Trail, at Basin	410	403,372
Sierra Gateway Trail, at Sanders and Muse	339	315,783
Total	**2,275**	**3,004,607**

Source: City of Clovis

[2] 55 miles represents the total lane mileage of streets with bike lanes on at least one side of the street. This means that there may be up to 110 miles of bike lanes in Clovis when counting facilities on each side of the street as separate facilities. However, it is important to note that not all streets have bike lanes on both sides of the street.

[3] Source: City of Clovis

Map 2: Existing Bicycle Facilities in Clovis

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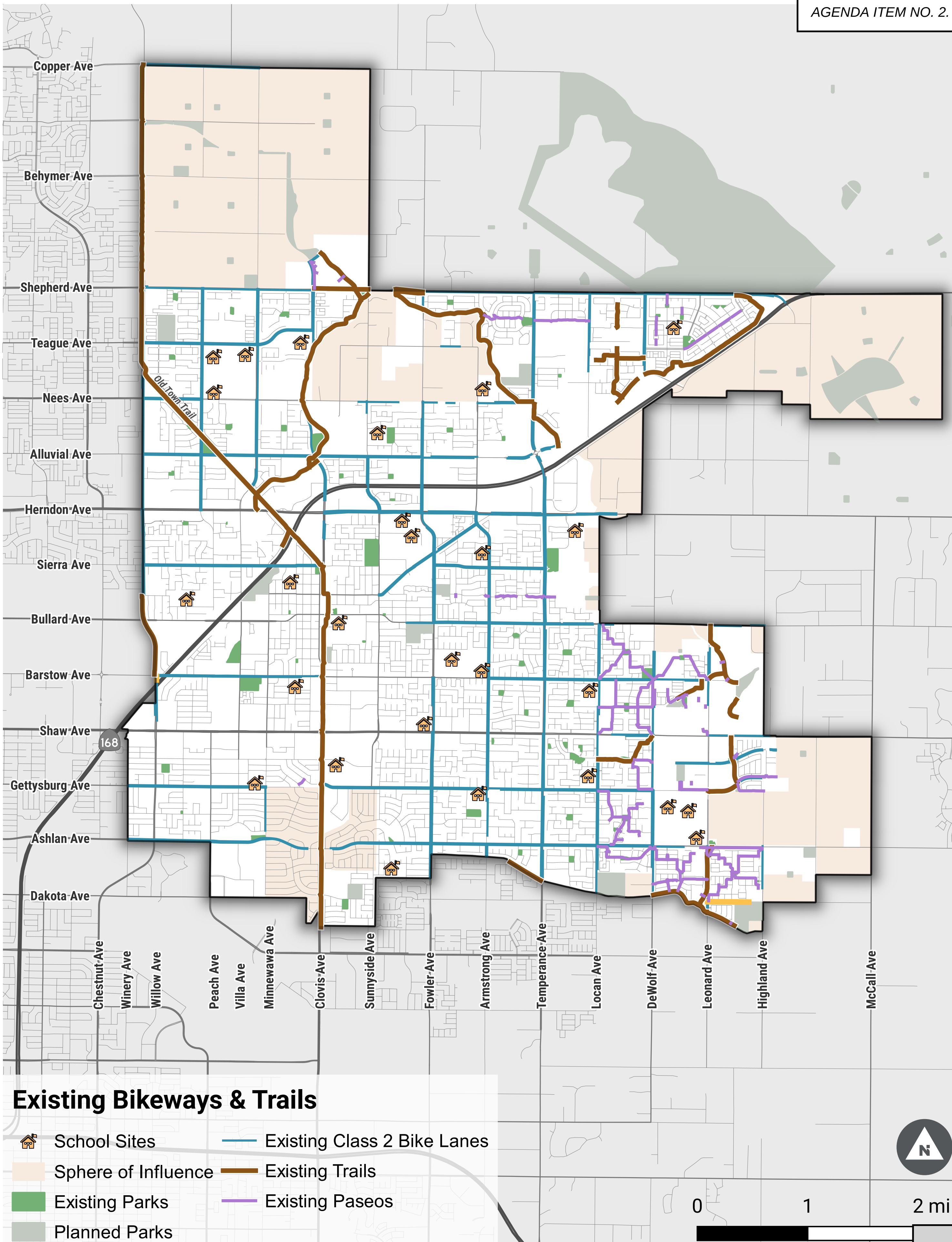

Existing Facilities to Support Walking

Clovis has an extensive existing network of pedestrian facilities, including the growing network of trails and paseos, as discussed previously. Most streets have sidewalks on both sides of the street. However, there are still some areas missing sidewalks (Figure 4), particularly among the recently incorporated areas of Clovis, which had previously been developed under unincorporated County area design guidelines. Pedestrian connectivity would also be improved by installing additional crossings on major roadways. Along many arterials, people walking must travel a quarter mile or more to cross the street at a marked crosswalk.

Many arterials have multiple lanes, which elongates crossing times for pedestrians and, at unsignalized crossings, can increase exposure to traffic. At some crossings, there is also a lack of infrastructure, such as high-visibility crosswalks, advance stop bars for motor vehicles, and median refuge islands that can make crossings safer and more comfortable for people walking.

Some parts of Clovis have a disconnected local street network (e.g. residential developments with lots of dead-ends and cul-de-sacs), which can make walking, bicycling, and rolling less direct and convenient for accessing destinations. Streets that provide key connections between neighborhoods and to frequented destinations are often arterial streets with high volumes of vehicular traffic and high posted speeds.

See Map 3 on the next page for existing sidewalks in Clovis.

Figure 4: There is a Gap in the Sidewalk Network on the South Side of East Herndon Avenue between North Willow Avenue and North Peach Avenue

Map 3: Existing Sidewalk Facilities on Public Streets

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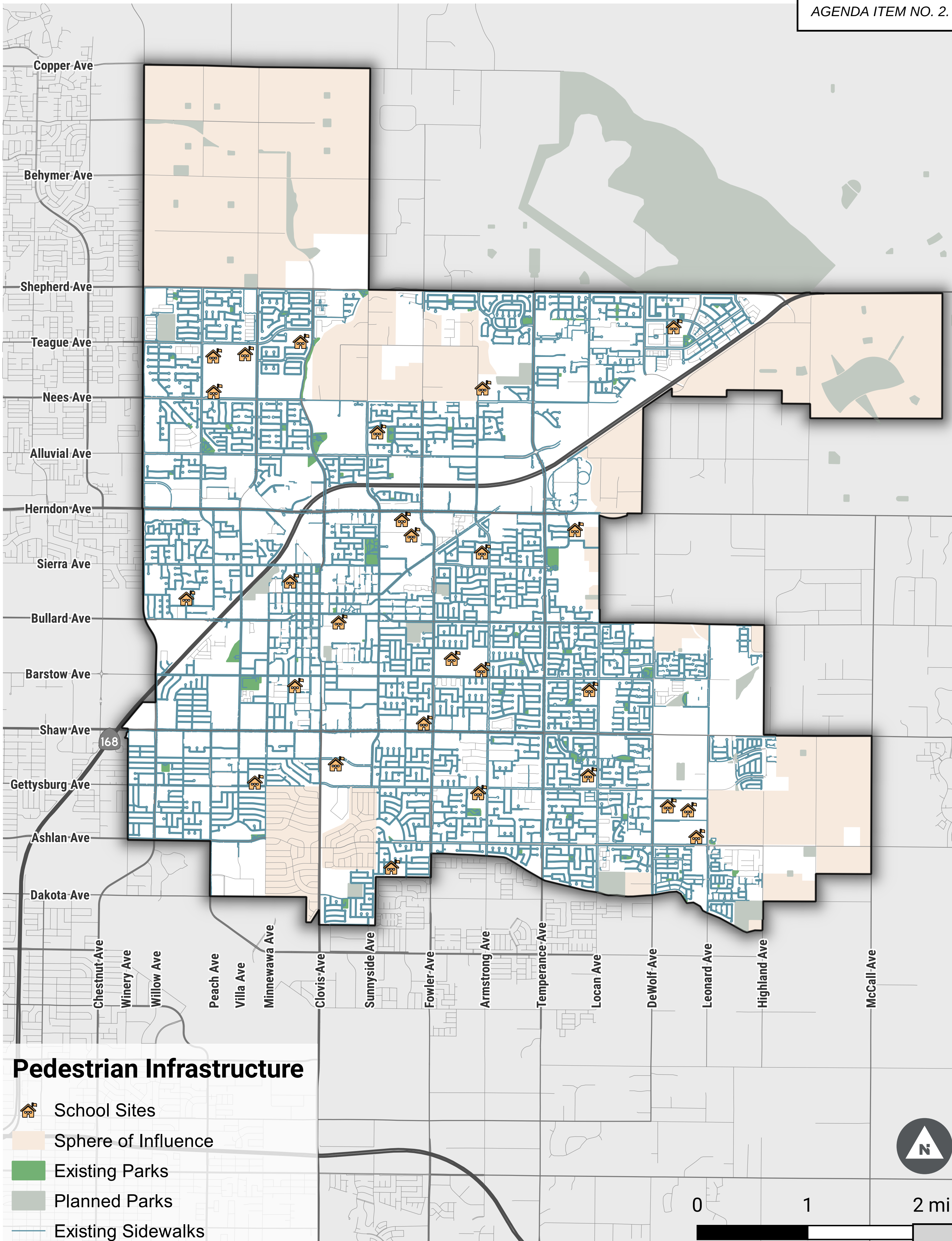
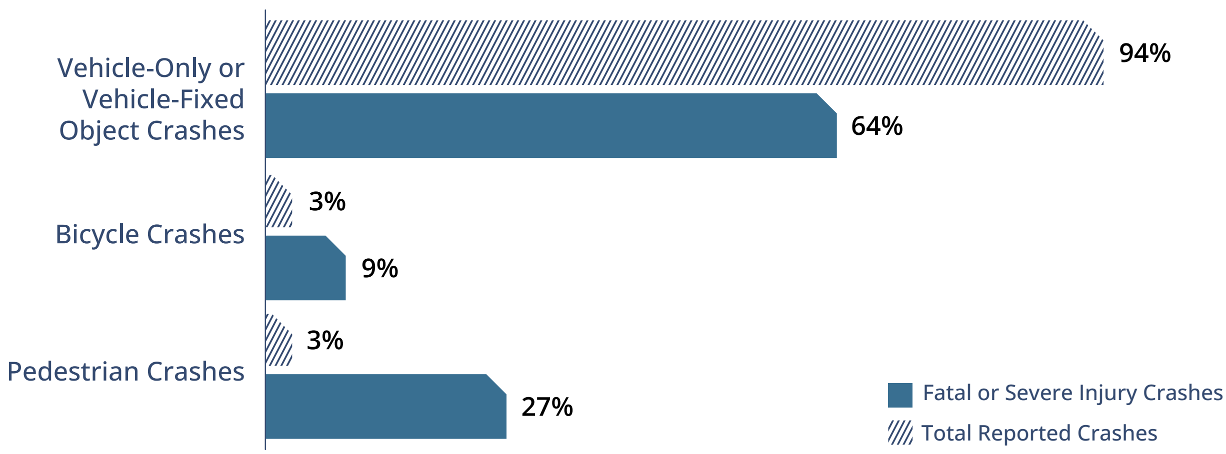


Safety Trends Among People Walking and Bicycling

This Plan analyzed road safety using data from police crash reports retrieved from the Statewide Integrated Traffic Records System (SWITRS). This data shows that, between 2015 and 2019, 3,507 crashes occurred in Clovis. Of those crashes, 6 percent involved people walking or biking. In total, there were 118 crashes involving people bicycling and 90 crashes involving people walking. Of the total number of fatal crashes (10), half involved people walking or bicycling. Among crashes that resulted in a severe injury, one third involved pedestrians (24 percent) or bicyclists (9 percent).

These statistics demonstrate that people walking and bicycling are overrepresented in fatal and severe injury crashes compared to people traveling in motor vehicles. See Figure 5 for a comparison of crash trends among pedestrian, bicycle, and vehicle crashes. Clovis also has a higher share of fatal or severe-injury crashes involving people walking or bicycling (36 percent) than the statewide average (24 percent), according to SWITRS.[4]

Figure 5: Crash Trends in Clovis, 2015 – 2019



Source: Statewide Integrated Traffic Records System, Transportation Injury Mapping System, Kittelson, 2021.

Table 2: Crash Severity by Road User Involved

Road Users Involved	Fatal (% of column)	Severe Injury (% of column)	Visible Injury (% of column)	Complaint of Pain (% of column)	Property Damage Only (% of column)	Total (% of column)
Pedestrian involved	4 (40%)	11 (24%)	25 (9%)	41 (4%)	9 (1%)	90 (3%)
Bicycle involved	1 (10%)	4 (9%)	31 (11%)	59 (6%)	23 (1%)	118 (3%)
Vehicle only or vehicle-fixed object	5 (50%)	31 (67%)	221 (80%)	941 (90%)	2,101 (98%)	3,299 (94%)
Total Reported Collisions	**10 (100%)**	**46 (100%)**	**277 (100%)**	**1,041 (100%)**	**2,133 (100%)**	**3,507 (100%)**

Source: Statewide Integrated Traffic Records System, Transportation Injury Mapping System, Kittelson, 2021.

[4] Fresno Council of Governments. (2022). Multijurisdictional Local Road Safety Plan.

Bicycle Crash Patterns

Between 2015 and 2019, there were 118 crashes involving people bicycling, including one fatality and four severe injuries. See Table 3 for a breakdown of crashes involving people bicycling. Bicyclists were involved in three percent of all reported crashes but nine percent of fatal or severe injury crashes. The most frequently cited primary collision factor was wrong-side-of-the-road driving/riding (36 percent of crashes), followed by drivers turning failing to yield right of way to oncoming traffic (21 percent of crashes), and running a red light or failure to stop at a stop sign (18 percent). Seventy-one percent of crashes involving people bicycling occurred in daylight and 29 percent occurred during dark conditions where streetlights were present. Most crashes involving people bicycling occurred on major streets in the southwest Clovis area. See Map 4 on the next page for the locations of crashes involving people bicycling.

Pedestrian Crash Patterns

Between 2015 and 2019, people walking were involved in three percent of reported crashes which constitutes 27 percent of fatal or severe injury crashes. Sixteen percent of crashes involving people walking resulted in a fatal or severe injury (see Table 4). Among crashes involving people walking, 41 percent occurred while pedestrians were crossing midblock (outside of a crosswalk), 28 percent occurred while pedestrians crossed in a crosswalk at an intersection, and 14 percent occurred while pedestrians were walking along the road (includes shoulders). Approximately 42 percent of crashes involving people walking occurred in the daylight and 30 percent occurred during dark conditions where streetlights were present. Most crashes involving people walking occurred on major streets in southwest Clovis. This suggests the need for improved walking infrastructure along major roadways. See Map 4 on the next page for the locations of crashes involving people walking.

Table 3: Crashes Involving Bicyclists

Type of Crash	Count	Percentage
Fatal	1	1%
Severe Injury	4	3%
Visible Injury	31	26%
Complaint of Pain	59	50%
Property Damage Only	23	19%
Total	**118**	**100%**

Source: Statewide Integrated Traffic Records System, 2015-2019, Kittelson, 2021.

Table 4: Crashes Involving Pedestrians

Type of Crash	Count	Percentage
Fatal	4	*4%*
Severe Injury	11	*12%*
Visible Injury	25	*28%*
Complaint of Pain	41	*46%*
Property Damage Only	9	*10%*
Total	**90**	**100%**

Source: Statewide Integrated Traffic Records System, 2015-2019, Kittelson, 2021.

Map 4: Pedestrian and Bicycle Crashes, 2015-2019

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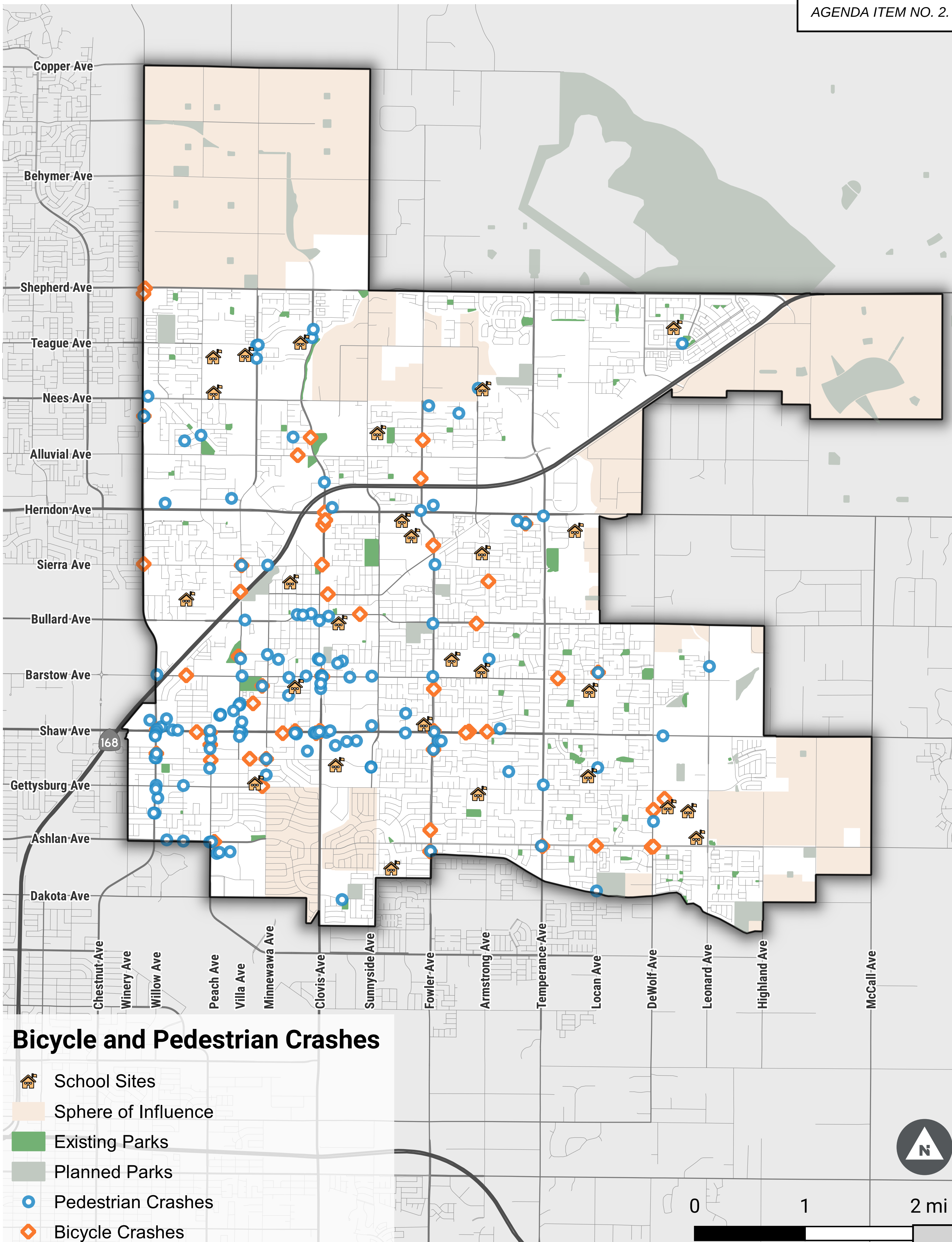
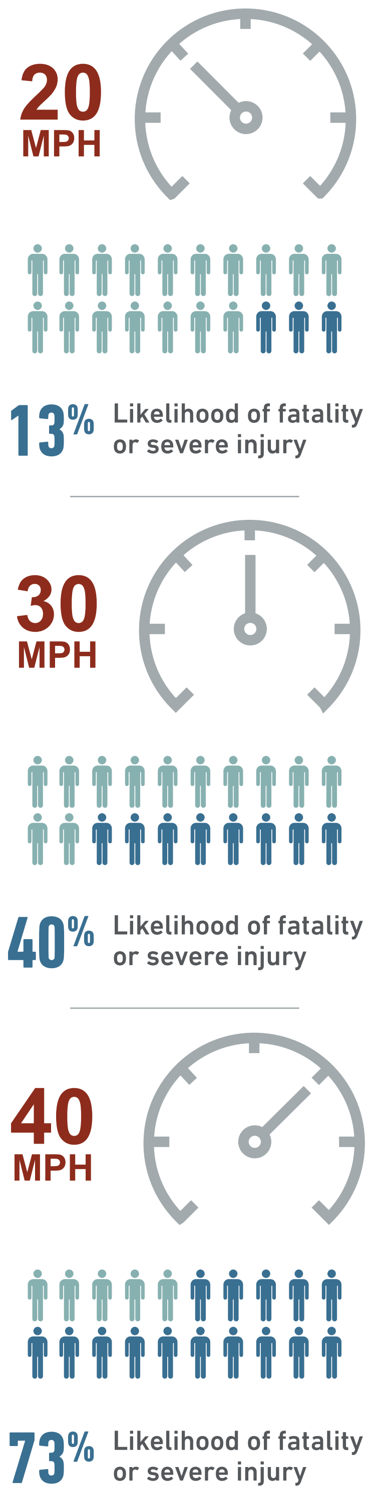


Figure 6: The relationship between vehicle speed and the risk of fatality or severe injury for a pedestrian



Source: Tefft, Brian. (2013). Impact speed and a pedestrian's risk of severe injury or death. AAA Foundation for Traffic Safety.

Disclaimer: Vehicle weights have increased since the publication of this study, which means that they are likely more deadly today than they were in 2013.

Speed

Vehicle speeds have a major effect on the comfort and safety of people walking, bicycling, and rolling. As vehicle speed increases, the risk of a pedestrian or bicyclist experiencing a severe or fatal injury increases greatly. Figure 6 shows the relationship between motor vehicle impact speed and pedestrian risk of injury if involved in a crash. For this reason, addressing high speeds could have a significant impact on reducing the number of fatal or severe injuries for people walking, bicycling, and rolling.

Posted travel speeds in Clovis range from 25 miles per hour to 50 miles per hour. Most arterial and collector streets have posted speeds of 40 or 45 miles per hour. Among arterials, only four blocks within the City of Clovis have posted speeds below 30 miles per hour. Map 5 shows posted speeds along arterials in Clovis.

State and Regional Efforts to Improve Safety in Clovis

Local Road Safety Plans

The planning process for the Clovis Active Transportation Plan Update occurred in parallel to the Multijurisdictional Local Road Safety Plan (MLRSP) led by the Fresno Council of Governments. The MLRSP provides an evaluation of the safety performance of local roads, identifies high priority locations based on crash severity, and recommends a series of infrastructure and programmatic strategies to improve safety in Clovis and Fresno County. The recommendations in this Plan support local and regional efforts to improve safety for people walking or bicycling.

Findings from the MLRSP for the City of Clovis indicate that "unsafe speed"[5] was the primary collision factor for 26 percent of total reported crashes among crashes involving all road users. Among fatal/several injury crashes, unsafe speed accounted for 13 percent of the primary collision factor amongst all collisions, third behind pedestrian violations and driving or bicycling under the influence of alcohol or drugs. Even drivers traveling under the speed limit pose an elevated risk to people walking and biking where speed limits are higher, bicyclists and pedestrians lack adequate separation, and insufficient opportunities to safely cross the street (see Figure 6). Pedestrian and bicycle crashes were identified as an emphasis area in the MLRSP, along with broadside crashes, hit object crashes, unsafe speed, and driving under the influence.

Public outreach completed as part of the MLRSP identified the following top safety concerns from 93 community members who live or work in Clovis and provided input on an online map:

- Many unsafe places to walk, bike, or take the bus
- Lack of safe crossings

[5] Unsafe speed refers to drivers who travel above the speed limit.

Changes to California Speed Limit Legislation

Reducing motor vehicle speeds can be accomplished through physical infrastructure treatments that encourage people to travel slower and through changes to the posted speed limit. Posted speed limit changes can be implemented along a specific corridor or segment of a roadway, as a pilot program, or through citywide policy changes. The City will review other infrastructure treatments to slow motor vehicle speeds on a case-by-case basis, based on industry standards.

Beginning July 30, 2024, Assembly Bill 43 (AB-43) will take effect and provide municipalities in California with new opportunities to reduce posted speeds. This law grants local jurisdictions the flexibility to set speed limits based on the context and needs within their own communities. In doing so, cities will have the authority to quickly respond to traffic safety needs and create safer local conditions for people to walk, bike, ride transit, and travel. Prior to AB-43, city engineers could not lower the posted speed by more than five miles per hour as outlined in the Manual on Uniform Traffic Control Devices. AB-43 gives cities such as Clovis the authority to reduce speed limits by an additional five miles per hour without conducting a speed study. City engineers are allowed to reduce speeds along areas identified as "safety corridors", which include areas where engineers have found high incidents of traffic injuries or where high concentrations of people walking or bicycling are observed or anticipated. In addition, the law allows cities to set a standard speed limit of 20 or 25 miles per hour in business activity districts.

Los Angeles is an example of a city that took advantage of changes under AB-43 to align speed limits with safety goals. LADOT is in the process of reducing speeds by 5 miles per hour on over 177 miles of city streets where limits had previously been increased.

New Guidance on Speed Limits

Historically, guidance for setting speed limits has relied on the 85th percentile speed, or setting speed based on how fast 85 percent of vehicles travel on a road. This approach does not factor in people walking and bicycling, and therefore may not be applicable on many streets. New national guidance provides local jurisdictions with alternative methods for determining speed limits.

The Federal Highway Administration's USLIMITS2 is a free tool that helps local jurisdictions determine appropriate speeds on a variety of road types (not including streets within school zones or construction zones). USLIMITS2 considers factors such as the presence of walking and bicycling activity, operating speed (50th and 85th percentile), traffic volumes, roadway characteristics and topography, the land use, crashes and injuries, and the presence of on-street parking.

The National Association of City Transportation Officials (NACTO) guide, City Limits, provides guidance for setting speed limits on urban streets based on Conflict Density and Activity Level. It also provides details on three separate approaches for setting context-appropriate speed limits:

- Setting Default Speed Limits to apply to an entire defined area
- Designating Slow Zones in sensitive areas, such as near schools or parks
- Setting Corridor Speed Limits specifically applicable to major roads or high-crash corridors

Promoting safer speeds is also a fundamental element of USDOT's Safe Systems Approach. The agency identified Appropriate Speed Limits for All Road Users as one of its Proven Safety Countermeasures.

Map 5: Traffic Signals and Speed Limits along Arterial and Collector Streets in Clovis

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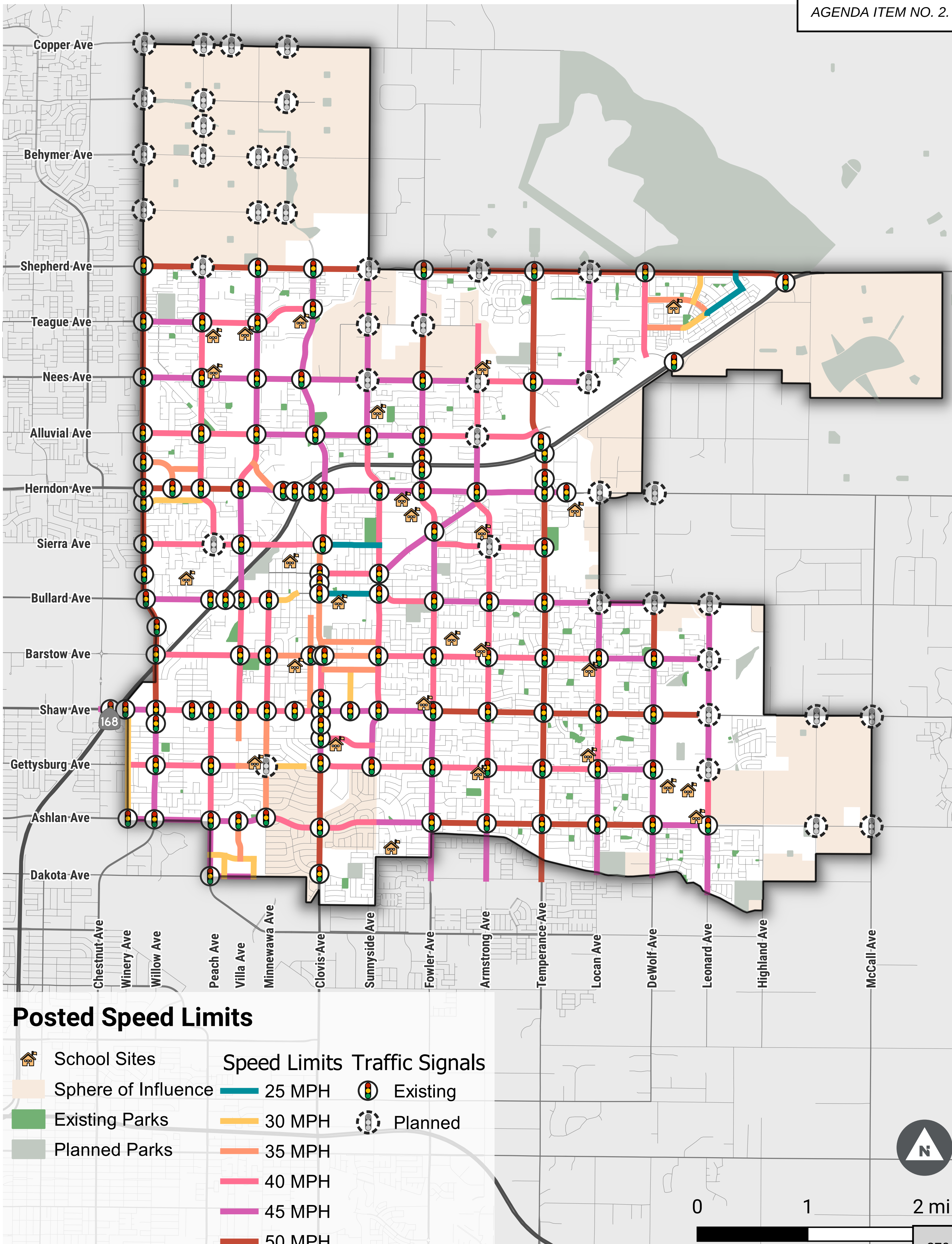

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03

BICYCLE NETWORK

Recommendations Overview

The proposed bicycle network prioritizes connectivity improvements that will help the City of Clovis achieve the vision and goals set forth by the Clovis Active Transportation Plan Update (Plan). The network was developed using input from City staff, community feedback on the online map, focus groups, and a community open house. For more information about community feedback, see Appendix C.

The network presented below aligns with the recommendations in the Multi-jurisdictional Local Road Safety Plan which identified the following recommendations for Clovis:

- Install bike lanes,
- Install bike lane extensions through intersections, and
- Install bike boxes.[6]

Table 6 below presents the mileage of bicycle facility types for existing and proposed bikeways. Map 6 presents existing and proposed bike facilities. Bike facility recommendations presented in Map 6 include facilities in the City of Clovis and Fresno County, where applicable. Facilities in County islands—areas of unincorporated Fresno County surrounded by the City of Clovis—will need to be built to provide a connected network for people bicycling in Clovis. These projects will require partnerships with Fresno County to develop, and are not included in the bicycle project list identified for this Plan. Some of the projects identified in County Islands are not identified in Fresno Council of Government's Regional Active Transportation Plan (2018), however, these projects would improve network connectivity for people living in, or traveling through, Clovis.

The City of Clovis will also work in collaboration with the City and County of Fresno to pinpoint opportunities for connectivity between systems, including bike lanes and Class I trails. These connection points will play a critical role for users of the system, ensuring they can safely and efficently access destinations within Clovis and surrounding areas.

Figure 7: Dedicated Bicycle Facilities Can Improve Safety and Comfort for People Riding

6 Bike boxes will only be used in specific situations where analysis determines they are appropriate.

The City will review all bike recommendations presented in Map 6 to assess feasibility prior to construction consideration. This is particularly important for recommendations such as Class II Buffered Bicycle Lanes which require additional roadway width but provide more separation between people bicycling and people driving. Installing Class II Buffered Bicycle Lanes may also require additional studies to determine whether parking or lane removal, if required, is feasible.

Additional studies may include speed studies, corridor studies, crash analyses, stormwater management studies, or others. Speed studies analyze the actual vehicular travel speeds and compare it to the posted speed. Corridor studies evaluate how a roadway is used in its relation to the surrounding land use. Crash analyses focus on crashes in a certain intersections, corridors, or citywide, to identify needed safety improvements. Stormwater management studies evaluate multiple aspects of stormwater, including the impact of impervious surface area, such as roadway changes, on the flow and filtration of stormwater as it seeps back into the water system.

In addition to Bicycle Lanes and Trails, the proposed network also includes a new typology of bikeway for the City of Clovis: Neighborhood Greenways. Neighborhood Greenways, sometimes referred to as "Bicycle Boulevards", are local streets designated and designed to prioritize bicycle use. They use signs, pavement markings, traffic calming, and other design elements to discourage through trips by motor vehicles while still enabling access for local users. Streets designated as Neighborhood Greenways should have fewer than 3,000 motor vehicles per day and an 85th percentile speed of 25 miles per hour or less. Traffic calming measures such as speed humps, traffic circles, or curb extensions may be used to control speeds and reduce cut-through traffic. Where Neighborhood Greenways cross major streets, crossing treatments may be needed to create a safe and comfortable experience. These may include supplemental signs and markings (e.g. crosswalks and advance stop bars), median refuge islands, flashing beacons, or hybrid beacons.

Table 5: Mileage of the Existing and Proposed Bicycle Network by Facility Type

Facility Type	Existing (miles)	Proposed (miles)	Total (miles)
Trail (Class I)	23	27	50
Paseos	14	8	22
Bicycle Lane (Class II)	59	58	117
Buffered Bicycle Lane (Class II)	0	27	27
Neighborhood Greenway (Class III)	0	4	4
Bicycle Route (Class III)	<1	7	7
Total	**96**	**131**	**227**

Note: Bikeway mileage in terms of street centerline mileage; does not differentiate between streets with bikeways on one or both sides.

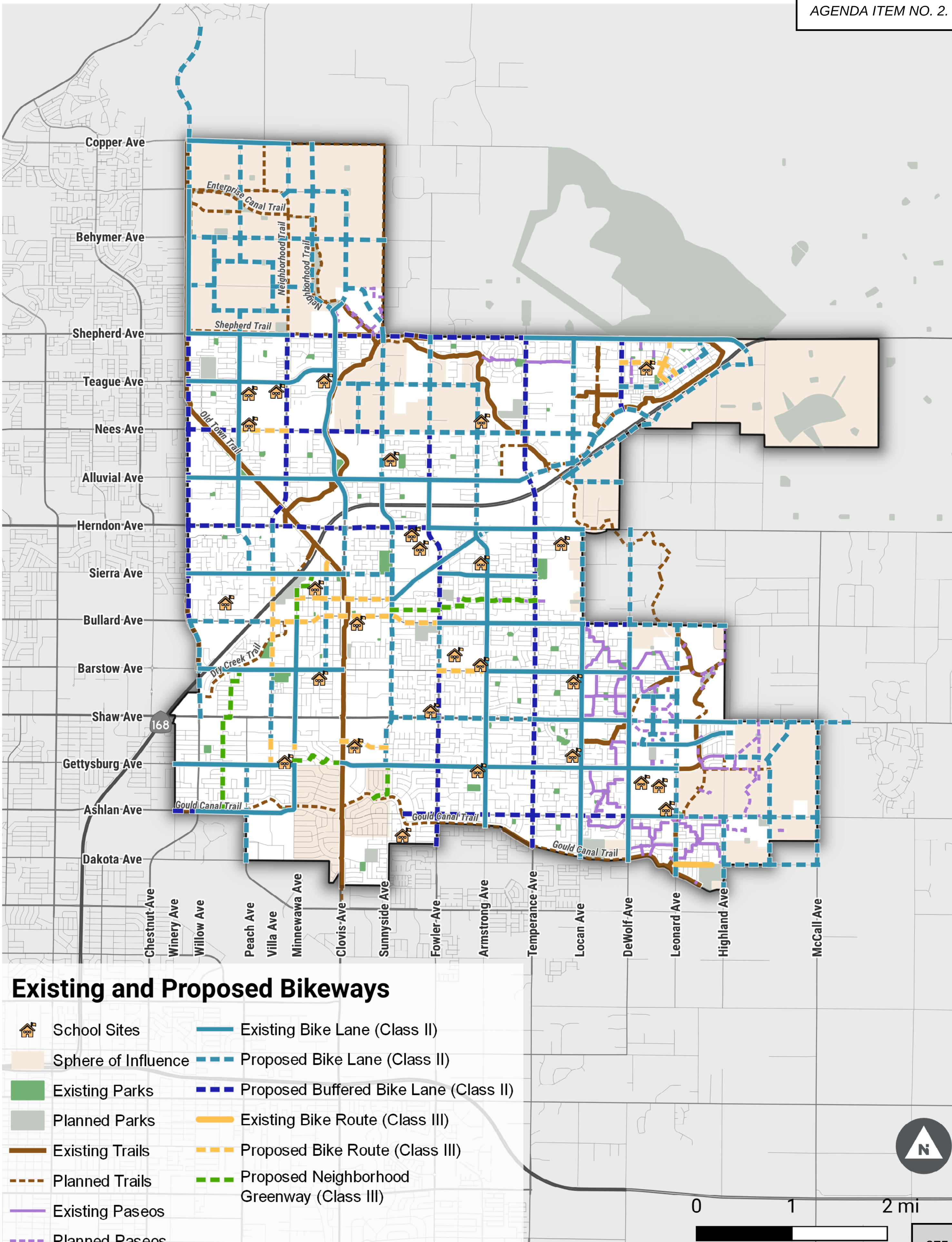
For recommended and existing bicycle facilities, maintenance is vital to encourage continued use. Maintenance tasks, such as addressing foliage infringement, debris removal, and re-striping where needed, can signal from the City the value of bicycling and the bicycle network.

Refer to Appendix A for a detailed list of prioritized bicycle facilities projects.

Figure 8: Neighborhood Greenway, Emeryville, CA

Figure 9: Neighborhood Greenway, Portland, OR

Map 6: Recommended Bicycle Network



Comfort Levels Among Different Types of Bicyclists

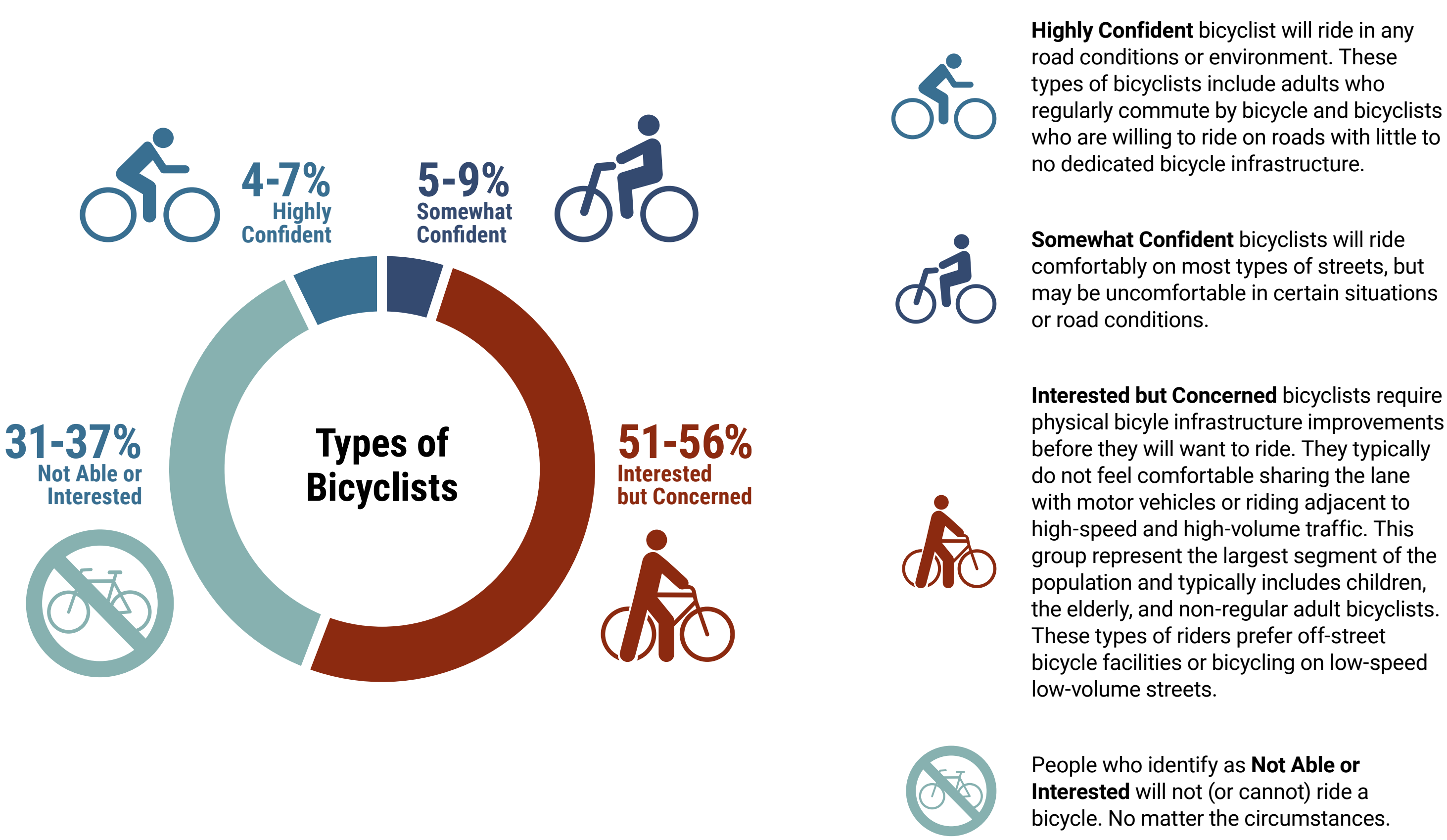
When planning and designing bikeways, it is important to recognize that not all people bicycling feel comfortable on every type of bikeway. A bicycle network that addresses the needs of all types of bicyclists is comprised of low-stress bikeways that are connected, comfortable, and appealing to both new and experienced bicyclists of all ages.

Four Types of Bicyclists

National research indicates that bicyclists are better understood as being part of a spectrum (see Figure 10).[7] On one end of the spectrum are people who are comfortable riding with traffic in almost any condition; on the other end are people who might not bike at all if bikeways are not comfortable enough for them. In Figure 10, the four types of bicyclists are defined as follows:

- **Highly confident** bicyclists will ride in any road conditions or environment. These types of bicyclists include adults who regularly commute by bicycle and bicyclists who are willing to ride on roads with little to no dedicated bicycle infrastructure.
- **Somewhat confident** bicyclists will ride comfortably on most types of streets, but may be uncomfortable in certain situations or some road conditions.
- **Interested but concerned** bicyclists require physical bicycle infrastructure improvements before they will want to ride. They typically do not feel comfortable sharing the lane with motor vehicles or riding adjacent to high-speed and high-volume traffic. This group represents the largest share of the population and typically includes children, the elderly, and non-regular adult bicyclists. These riders prefer off-street bicycle facilities or bicycling on low-speed, low-volume streets.
- **Not able or interested**, refers to be people who will not (or cannot) ride a bicycle, no matter the circumstance.

Figure 10: The Four Types of Bicyclists



[7] Dill, Jennifer and Nathan McNeil. Revisiting the Four Types of Cyclists: Findings from a National Survey. In Transportation Research Record: Journal of the Transportation Research Board, Issue 2587, Washington, DC, 2016.

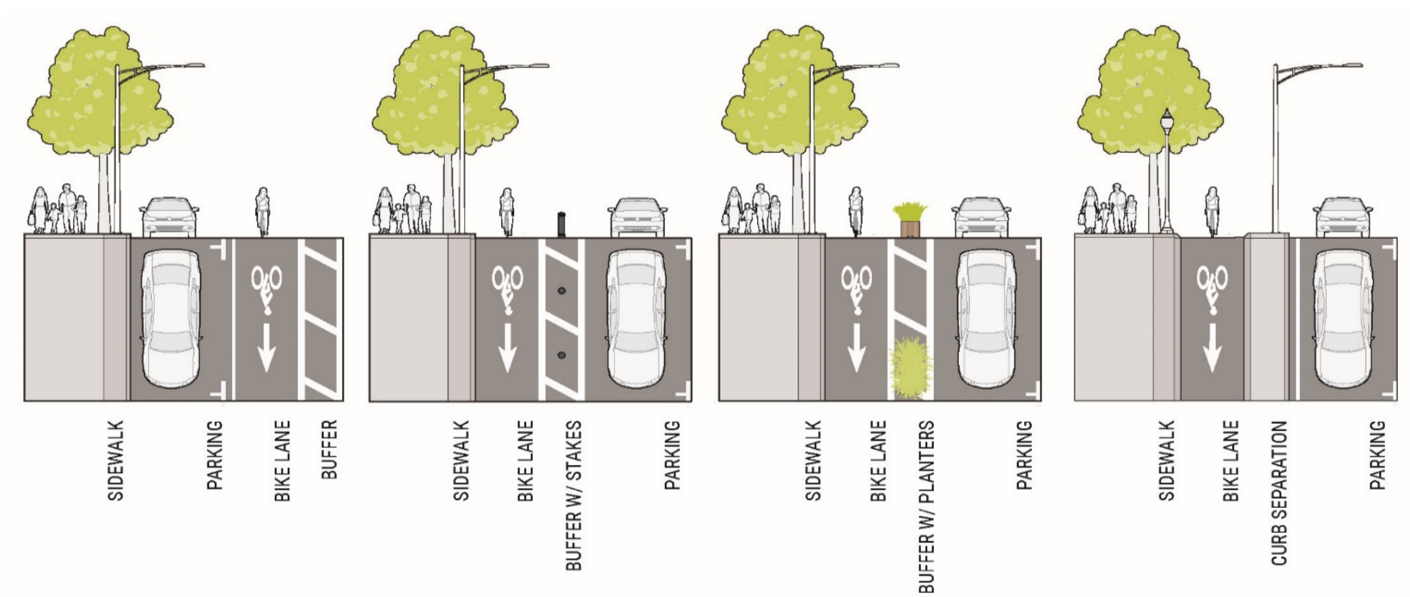
Long-Term Vision for Bicycling in Clovis

In the long term[8], the City will work to revise the recommended bicycle network and consider roadway and bikeway changes that include facilities suitable for all types of bicyclists, including "Interested but concerned" riders. This may include upgrading existing or recommended Class II Bike Lanes and Class II Buffered Bike Lanes to Class IV Separated Bike Lanes, where appropriate. Industry standard design guidelines can provide details to assist the City with installing Class II Buffered Bike Lanes, Class IV Separated Bike Lanes, and other bicycle facilities to improve safety and comfort for all types of bicyclists.

Figure 11 shows the progression of a bike lane from a Class II Buffered Bike Lane to a Class IV Separated Bike Lane. Cities often install Class IV Separated Bike Lanes as low-cost retrofit projects (e.g., using flex posts and paint within the existing right-of-way). More permanent forms of separation, such as curb-protected bike lanes, cost more and are less flexible once implemented. A phased implementation approach, where "pilot" projects transition to permanent separated bike lanes may be a useful approach for Clovis. A pilot approach will allow the City to implement these new facilities slowly and provide time to troubleshoot before permanent materials and high costs are necessary.

The City will also continue to develop its extensive network of Class I Trails, which provide a high comfort facility for users of all ages and abilities. These trails will also be further improved through the installation of mid-block crossings, which provide safe and convenient connectivity for trail users.

Figure 11: Evolution of a Class II Buffered Bicycle Lane to a Class IV Separated Bicycle Lane



[8] Generally, "long term" refers to a length of time that is five to twenty years. "Short term" refers to under five years.

04

PEDESTRIAN NETWORK

Figure 12: High-visibility Crossings help Create a Safer and More Comfortable Pedestrian Network

Recommendations Overview

Recommended improvements to the Clovis pedestrian network were identified using a citywide sidewalk network gap analysis. This analysis identifies locations of existing sidewalks and sidewalk gaps within the city boundary.

The sidewalk network presented below aligns with the recommendations in the Multi-jurisdictional Local Road Safety Plan (2022) which identified the following recommendations for Clovis:

- Install sidewalks or other pathways,
- Install and upgrade pedestrian crossings with enhanced features (such as in Figure 12),
- Install pedestrian countdown signal heads,
- Install pedestrian crossings, and
- Install raised medians and pedestrian refuge islands.

Map 7 shows the locations of existing and missing sidewalks. This analysis excluded identifying existing and missing sidewalks (called “gaps”) on industrial land, large apartment complexes, and private developments, where sidewalks are typically the responsiblity of the developer or not required. Locations in the city where sidewalk infill is needed are primarily located in southwest and southeast Clovis. No sidewalk data was available for areas in the Spheres of Influence or County Islands adjacent to the City of Clovis.

With recommended projects, as well as existing pedestrian facilities, maintaining the network is vital to encourage continued use. Maintenance tasks, such as vegetation management and debris removal, demonstrate the City’s commitment to walkability and an accessible pedestrian network.

Map 7: Existing and Missing Sidewalks

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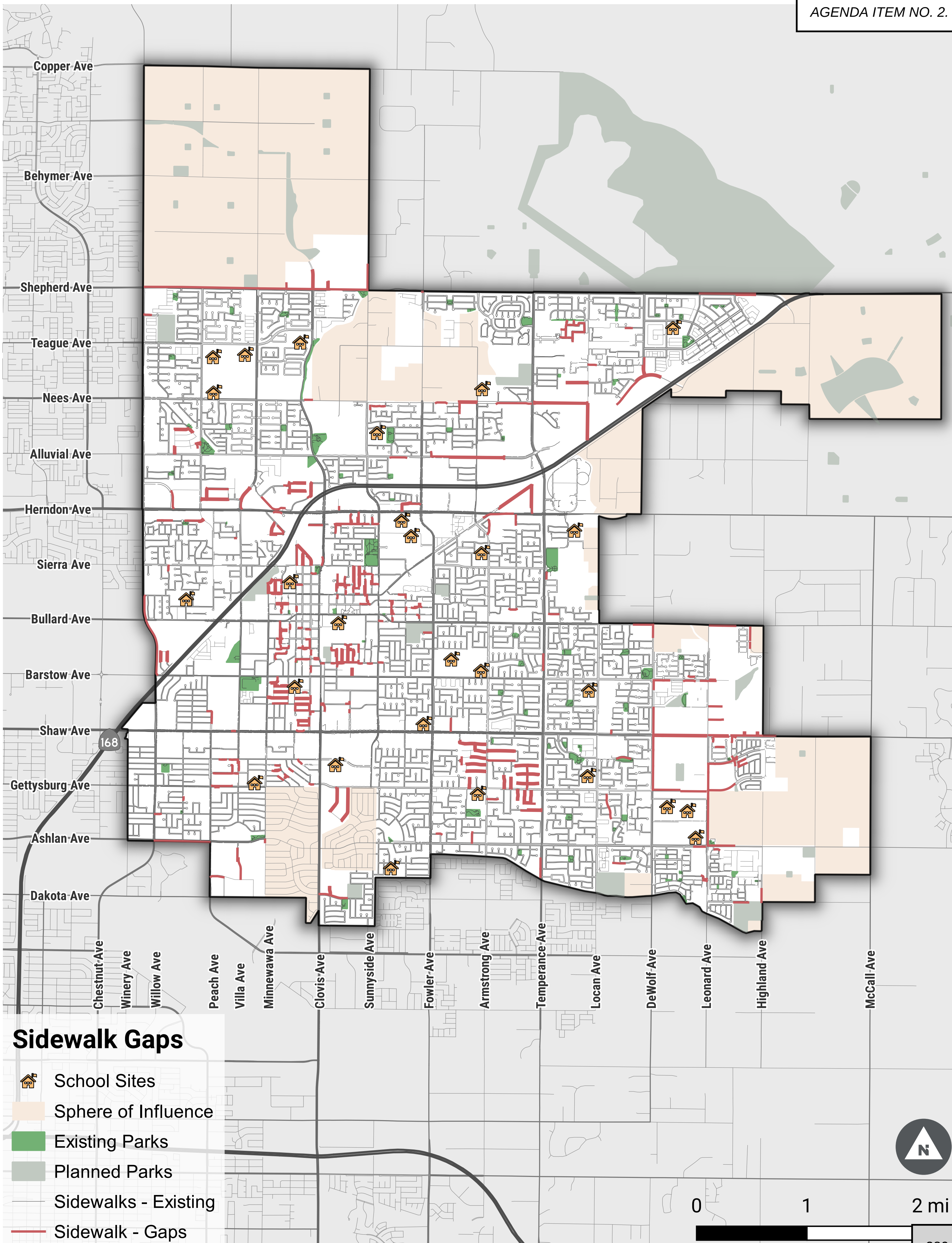


Trails and Paseos

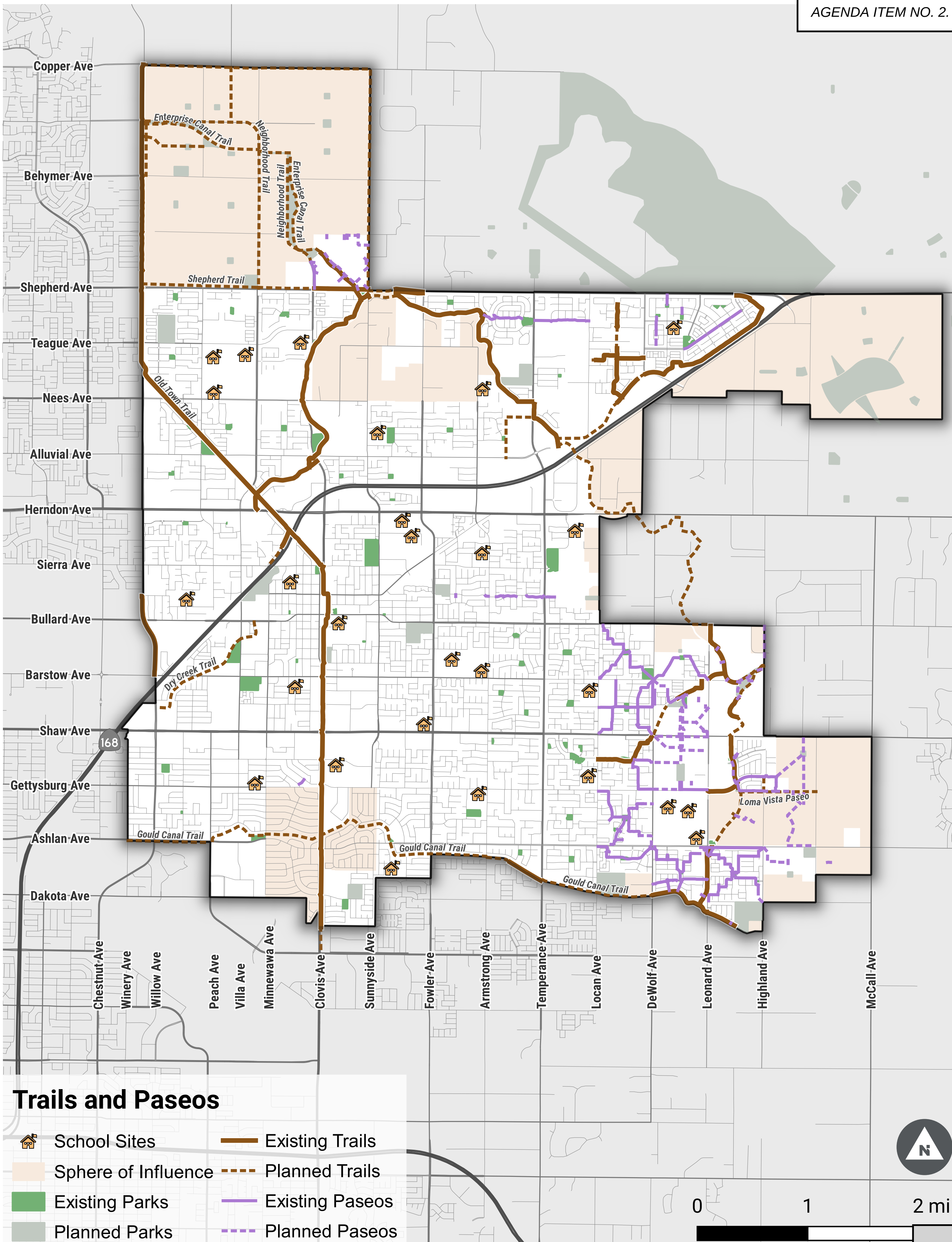
Trails and paseos are important to both the bicycle and pedestrian networks, since they provide an off-street travel option through tree-lined linear parks. The City is dedicated to expanding its trail and paseo networks to provide more opportunities for the public to enjoy. To do this, the City is partnering with the Fresno Irrigation District to allow people to walk along irrigation canals. Map 7 on the following page shows existing and planned trails.

Mid-block Trail Crossings

The City of Clovis has identified several potential locations to install mid-block crossings to increase trail connectivity throughout Clovis. These locations will be further reviewed by City staff, in the future, to determine if a mid-block crossing is feasible. The City will also identify the type of crossing that should be installed based on the City's Guidance for Uncontrolled Crosswalk Treatments in place at that time.

Figure 13: Paseo connecting through Pasa Tiempo Park

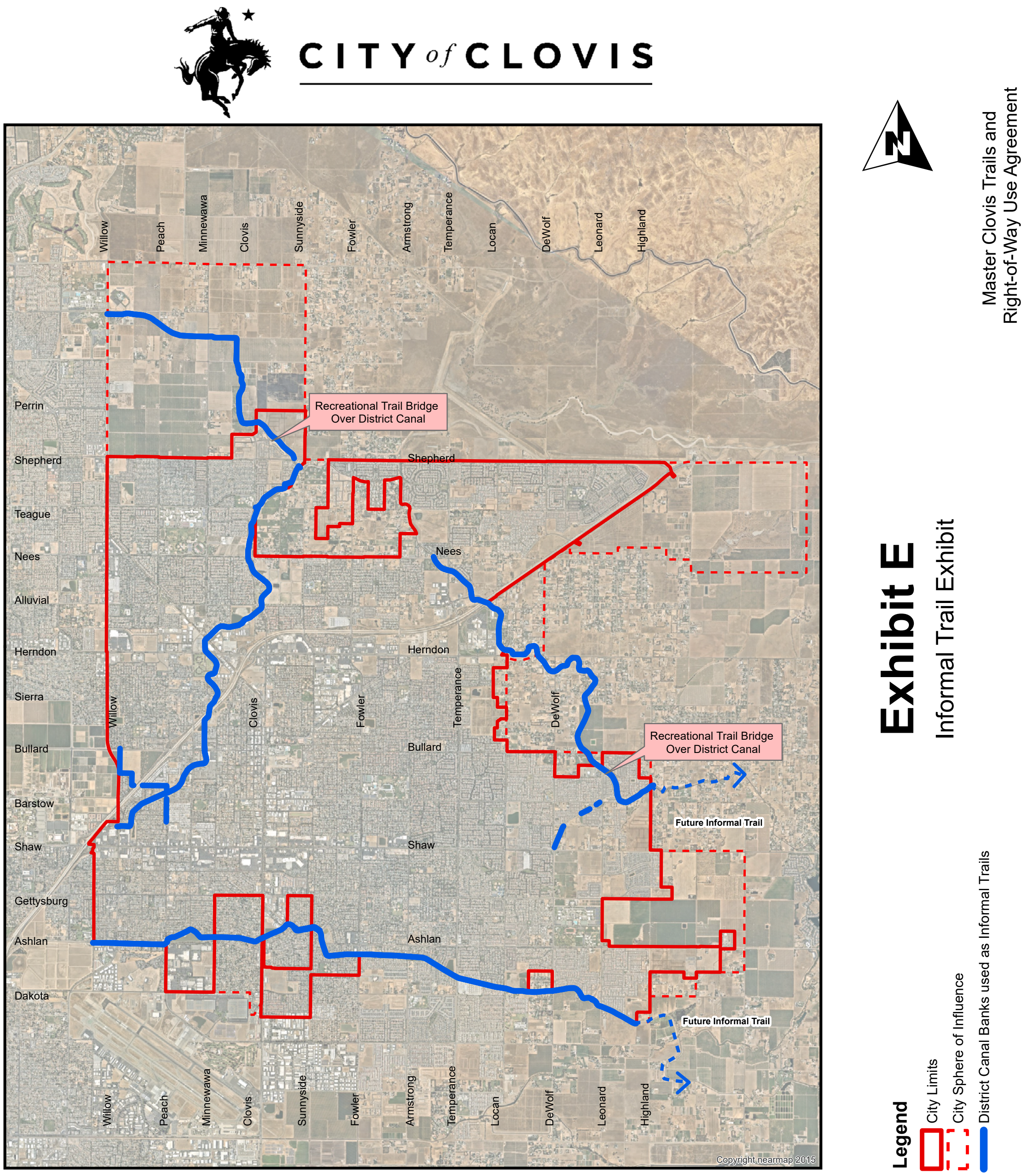
Map 8: Existing and Planned Trails and paseos



Trails and the Fresno Irrigation District

In 2022, the City of Clovis and the Fresno Irrigation District (FID) entered into an agreement to allow the embankments along FID canals to be used as informal trails.[9] This successful agreement has opened doors to growing Clovis' trail network by building relationships with agency partners. It will be particularly helpful in addressing trail network gaps in areas of Clovis that are already developed. Map 9 shows the canals under the jurisdiction of the FID to be used as informal trails.

Map 9: Map of canals under the jurisdiction of the Fresno Irrigation District



[9] Source: Master Trails Agreement with the Fresno Irrigation District.

05

SUPPORT PROGRAMS

Figure 14: Public Off-street Bicycle Parking (top) and On-street Bicycle Corral (bottom)

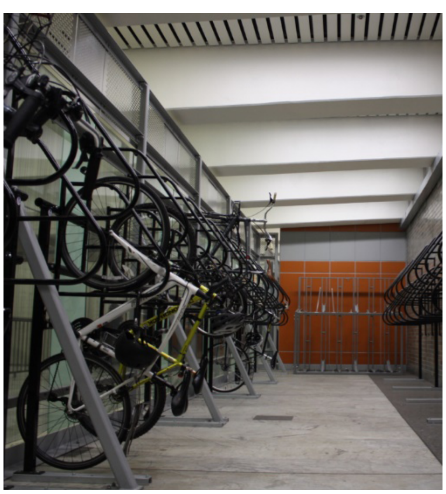
Programs that focus on safe travel behaviors and provide amenities that make it easier and more comfortable for people to walk and bike will help the City achieve the vision and goals presented in this Plan. This chapter describes a variety of programs that should be explored and implemented by the City of Clovis and partner agencies and organizations. These programs will help increase the utility of the network recommendations presented in Chapters 3 and 4. The City can partner with adjacent jurisdictions, and local and regional organizations and businesses to help implement the programs discussed below. For example, local organizations and businesses are important partners for implementing bike parking programs, and school districts and adjacent jurisdictions could partner with the City to implement educational programs or promote encouragement events. The City will explore local, regional, state, and federal funding opportunities for these programs. The City's Planning and Development Services Department will also work with the Clovis Police Department on safety programs and opportunities for promoting current facilities.

Bicycle Parking

The City of Clovis should develop a bicycle parking program to increase the supply of bicycle parking on public and private property throughout Clovis. Providing bike parking at popular destinations and at transit facilities is a critical component to increasing bike trips. Efforts to provide bike parking should coordinate with efforts to implement the Fresno County Regional Long-Range Transit Plan. The City of Clovis may partner with local organizations and agencies to increase the number and quality of bicycle parking in the public right-of-way by providing guidance and potentially funding. Ensuring there is safe and convenient bike parking within the public right-of-way will encourage people to ride bikes with an increased level of comfort and assurance that there is a secure place to store their bicycle when they reach their destination. Bike parking, such as in Figure 14, provided within the public right-of-way is typically intended for short-term use.

Mitigating bicycle theft is critical to encouraging new or experienced riders to use their bikes for a variety of trip purposes. Nationwide, bicycle parking manufacturers, such as Oonee and BikeLink, are creating higher-quality parking facilities. Some of these facilities include key-card access and security cameras. Bicycle parking security can be further enhanced with a partnership with the Clovis Police Department to track and retrieve stolen bikes with the help of Bike Index, a bicycle registration program. Additional strategies to prevent theft include proper design and placement and parking, education on proper locking methods, anti-bike theft signage, and a bait bike program (equipping bait bikes with GPS tracking devices and tracking stolen bikes to the offender).[10]

Figure 15: Long-term Bicycle Parking Facility in San Francisco, CA



Typical rack placement for short-term parking in the public right-of-way may be placed on sidewalks or on-street by repurposing vehicle parking spots. Racks placed on sidewalks should minimize obstruction to people walking, and they should be placed in the sidewalk amenity zone. On-street bicycle parking spots are ideally bicycle corrals, and also have space at both ends of the corral to allow for bicyclist dismount. The City should consider placing on-street bicycle corrals near intersections as a strategy to improve visibility at intersections (also called daylighting).

Conducting a citywide bike parking inventory could determine baseline conditions to identify areas where additional bike parking is needed. Information such as type of rack, bike rack capacity, condition, obstructions (such as racks installed too close to a fence or building), protection from weather elements, and overall security is helpful to know when selecting and installing public bicycle parking.

Types of Bicycle Parking

Although bicycle parking provided within the public right-of-way is typically intended for short-term use, the City can still consider providing both short-term and long-term parking options. Short-term parking is typically designed for people visiting businesses or at locations where the duration of their visit is less than four hours. Typical racks used for short-term parking include inverted U, post and ring, and bike corrals.

Bike corrals have a growing popularity throughout the U.S. Bike corrals typically replace one on-street vehicle parking space with eight to twelve bicycle parking spaces while preserving sidewalk space.

Long-term bicycle parking, like the example shown in Figure 15, is designed toward employees, residents, public transit users, and similar users who need to store their bike for more than four hours. Long-term parking facilities need to have increased security and weather protection to provide assurance that their bike will not be stolen or damaged. Long-term parking facilities include bike lockers and sheltered and secured enclosures.

Section 5.106.4 of the California Green Building Standards Code outlines the bicycle parking minimum requirements for short-term and long-term bicycle parking. Jurisdictions within the State of California must comply with the bicycle parking ordinance unless the jurisdiction has a stricter bicycle parking ordinance (i.e., high bike parking minimum).

The Association of Pedestrian and Bicycle Professional (APBP) has developed the Essentials of Bike Parking: Selecting and Installing Bicycle Parking that Works (2015) and the Bicycle Parking Guidelines, 2nd Edition (2010)[11] that provide widely accepted recommendations and examples of bicycle parking best practices and example policies. City of Clovis staff can also review sample policies, codes, and programs within California in the Bike Parking Sourcebook developed by the Humboldt County Association of Governments (HCAOG)[12].

[10] Equity consideration should be given to the value of the bait bikes; in California, stolen property valued over $950 may result in a felony charge.

[11] APBP Publications: http://www.apbp.org/?page=publications

[12] HCAOG. Bike Parking Sourcebook: http://hcaog.net/sites/default/files/bike_parking_sourcebook_final.pdf

Ways to Provide Bike Parking

There are multiple ways to provide bicycle parking, including:

- A bicycle rack request program,
- A bicycle parking sponsorship program,
- Directing fees from new development to bicycle parking, and
- Developing a regional or municipal-level program,
- Explore public private partnerships to implement bike parking,

Developing a Bicycle Parking program at the municipal level would help to increase the amount of high-quality bicycle parking by improving coordination between public requests, property owners and businesses, city departments and other agencies. The program could also address questions or concerns from developers and ensure bicycle racks are replaced by developers if they are removed during the construction process.

Wayfinding

Wayfinding encompasses all the ways in which people orient themselves in physical space and navigate from place to place. A wayfinding system designed specifically for bicyclists and pedestrians can help these roadway and trail users easily and successfully navigate through a network of on-street facilities or trails. The main purpose of a wayfinding system is to connect people to the places they want to go. Wayfinding can take the form of directional signage, mile markers, trail heads, informational signs, map kiosks, and pavement markings to reinforce signage. Wayfinding signage is a cost-effective way to improve conditions for people bicycling, walking and rolling, create a sense of place, and promote community development. Consistency across jurisdictional boundaries is key to a positive user experience. The City will consider neighboring jurisdiction's wayfinding guides when moving forward in developing their system. See Appendix E for guidelines on designing and implementing wayfinding in Clovis, including destination and route selection, signage and pavement marking selection, branding, and installation.

Figure 16: Clovis Wayfinding Branding Options (top) and Sign Assembly Typologies (bottom)

E-Bicycles

Electric bicycles, or e-bikes, are becoming an increasingly popular option for bicycling. They provide a way for people to take longer trips by bike, appeal to a wider audience of riders, and can help make bicycling more accessible to community members who are interested in bicycling. E-bikes, such as in Figure 17, with the right policies in place, can encourage bicycling as both a recreational and utilitarian mode of transportation. With their increased popularity, state regulations and local policy are critical to supporting the use of the growing bicycle network in Clovis, as well as public education and signage.

State Regulations

In 2015, California passed legislation to create a three-class system to categorize electric bicycles and properly regulate them based on their maximum assisted speed.[13] All three classes of electric bicycles include fully operable pedals and an electric motor of less than 750 watts.

- A "Class 1 electric bicycle" is a bicycle equipped with a motor that provides assistance only when the rider is pedaling, and that ceases to provide assistance when the bicycle reaches the speed of 20 miles per hour.
- A "Class 2 electric bicycle" is a bicycle equipped with a motor that may be used exclusively to propel the bicycle, and that is not capable of providing assistance when the bicycle reaches the speed of 20 miles per hour.
- A "Class 3 electric bicycle" is a bicycle equipped with a motor that provides assistance only when the rider is pedaling, and that ceases to provide assistance when the bicycle reaches the speed of 28 miles per hour, and is equipped with a speedometer.[14] As of January 2023, Class 3 electric bikes are permitted on bicycle paths, trails, and lanes. Local jurisdictions are authorized to prohibit the operation of any electric bicycle or any class of electric bike.

State law permits most low-speed e-bikes (Class 1 and Class 2, less than 20 miles per hour) and restricts higher-speed e-bikes (Class 3 and all other e-bikes). Forthcoming e-bike policies may focus on youth safety using e-bikes.

Figure 17: Example of an E-bike

Opportunities for Local Policy

Current City of Clovis policies for e-bikes restricts "motor-driven cycle[s]" on freeways, canal banks, on private property, and on Sierra Vista Mall roadways and parking facilities (Policy 4.5.880, 4.5.890, 4.5.891, 4.5.892, and 4.5.893)[15]. Additionally, Chapter 10 of the city code prohibits the use of "cycle[s]" to any part of public parks aside from the roads (10.3.01.4)[16].

The City of Clovis has the opportunity to change policy to regulate e-bike use on trails and paseos. A policy could be developed to regulate e-bike user speed to under 20 miles per hour on trails via signage at trailheads and other key access points. This would address safety regarding speed differentials between e-bike users and other trail users. This policy could be accompanied by a map displaying which trails allow e-bikes, and which do not. An additional policy could create speed limits that apply to all trails. A design-focused policy could regulate path width to ensure that users are comfortable with a variety of other trail users on a wider path.

Additional resources for e-bike policies can be found at PeopleForBikes.org:

- National Electric Bicycle Law and Policy Overview: https://www.peopleforbikes.org/electric-bikes/policies-and-laws
- Electric Bicycles: Public Perceptions & Policy: https://prismic-io.s3.amazonaws.com/peopleforbikes/69085e0f-5cc3-4988-9427-7b98795c18ee_E_bikes_mini_report.pdf

[13] AB-1096 Vehicles: electric bicycles: https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201520160AB1096

[14] For more information, see: https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=202120220AB1909

[15] Clovis Municipal Code, Ch. 4.5 Traffic: https://www.codepublishing.com/CA/Clovis/#!/html/Clovis04/Clovis0405.html

[16] Clovis Municipal Code, Ch. 10.3 Prohibited Acts in City Parks: https://www.codepublishing.com/CA/Clovis/#!/html/Clovis10/Clovis1003.html

National resources for motorized scooters and other e-mobility devices are not as developed as e-bikes. However, state law does set provisions on how to operate motorized scooters, namely setting a maximum speed of 15 mph (CVC 22411) and requires motorized scooters to operate in Class II Bicycle Lanes whenever available (with minor exceptions) (CVC 21229) .

Additional E-Bicycle Support

With any policy change, it is important to note the value of a public education campaign to promote the policy. In addition to state regulation and local policies, public education can help integrate e-bikes as a form of active transportation. Focusing an educational campaign about user interactions on trails and paseos can mitigate potential user conflicts. E-bikes can operate at higher speeds than people walking or bicycling without an electric assist. However, public educational campaigns and instructional signage on trails regarding user behavior and proper etiquette can help address concerns about e-bikes.

Additional design policy can inform the design of separated bikeways. With speed differentials, separated bikeways may need wider space for e-bike users to safely pass other non-electric assist bicyclists.

Figure 18: Open Street Event in Minneapolis, MN

Figure 19: Safe Routes to School Programs Educate Children About How to Safely Ride a Bicycle

Encouragement Programs

Encouragement programs support mode shift by encouraging behavior change and promoting new infrastructure. The City can partner with community organizations to spark interest and excitement by creating special events that motivate community members to try new modes of transportation. Encouragement programs often include, but are not limited to, open street events, and Safe Routes to School.

Open Streets

Open street events are popular methods to encourage people to walk or get on their bikes and have fun with their friends, family, and community members. Open street events, such as the one pictured in Figure 18, are essentially a block party that closes a roadway to motor vehicle traffic and only allows people to access the roadway using active transportation modes (e.g., walking, biking, skateboarding, scooters, etc.). Hosting open street events can demonstrate to communities that the City supports and encourages bicycling and other forms of active transportation.

Events to encourage people to walk, bike, or skate for recreation and transportation can be included in branded/marketed events created by communities or events that already exist. Marketing weeks or months for walking or bicycling while hosting events can generate a buzz within communities to encourage people to walk or bike instead of drive.

Safe Routes to School

Safe Routes to School (SRTS) programs are intended to create safe, fun, and social opportunities for children to bike and walk to and from school (see Figure 19). SRTS support healthier children by encouraging them to use active modes of transportation to commute to school rather than be driven in a car. Furthermore, SRTS can lead to children using active modes of transportation into adulthood because they see these modes as a normal everyday activity. The City should partner with the school district to pursue funding to support the coordination of resources to ensure consistent funding for Safe Routes to School programming at schools throughout

Clovis. The City will also work with the Caltrans Office of Traffic Safety on SRTS to identify future opportunities for partnerships.

Walk or bike audits near schools can identify infrastructure improvements needed, and partnerships with school districts can leverage funding and lead to more grant opportunities and applications.

The National Center for Safe Routes to School programs (http://guide.saferoutesinfo.org/steps/) and the Safe Routes Partnership (http://www.saferoutespartnership.org/) have created guides and conducted research to help people interested in creating and improving SRTS programs. Proximity to schools is included as part of the prioritization framework used in this Plan. Refer to Chapter 6 for more information about how promixity to schools was incorporated in to the project prioritization process for bicycle recommendations and sidewalk infill projects.

Education Campaigns

Education campaigns can help encourage safe road user behavior and complement infrastructure improvements. Campaigns can be broad, or they can be more specific by targeting a certain mode of transportation or a certain travel behavior.

Driver-Oriented Materials

The City of Clovis can implement educational campaigns directed towards educating the general public on safe travel behaviors and the impacts of reckless or inconsiderate behaviors. Education can be conducted through advertising campaigns, roadside or trailside events, or one- or two-day training courses in classrooms. Successful events include large signage, paper handouts, issuance of verbal warnings, praising good behavior with prizes, and in-depth conversations about the importance of safe travel behaviors. Topics could include yielding to other road users, traveling at safe speeds, and clarifying the bicycle rules of the road.

Bicycle- and Pedestrian-Oriented Materials

Education materials oriented to people who walk or ride a bicycle can be implemented using a variety of strategies and messaging.

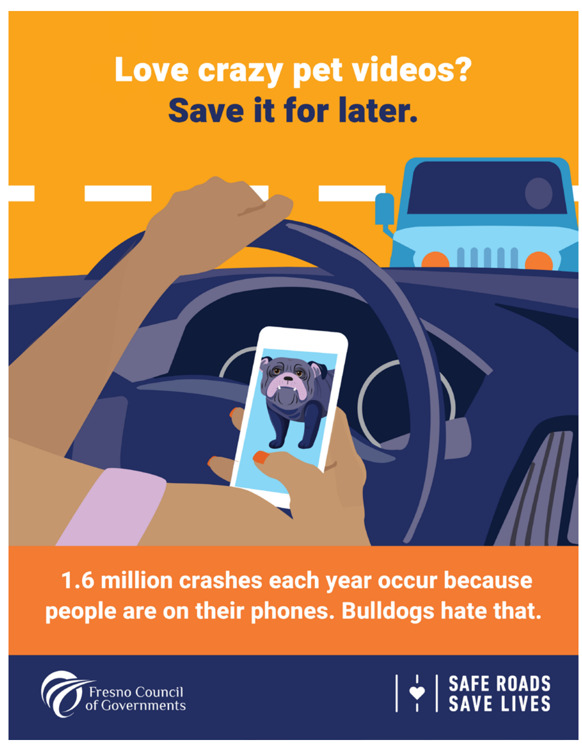
One strategy includes using a bicycling ambassador program, which can be an effective way to educate the public on traffic safety for all roadway users. Some of the services that the bicycle ambassadors could provide include bike mentorship, event attendance, community bicycling workshops, safe cycling rewards, organized rides, commuter pit stops, bike lane stewardship, and e-bike riding etiquette.

The program could be implemented in partnership with other transportation or health-focused organizations, such as Fresno County Department of Public Health, to host outreach events aimed at encouraging people to make trips by bicycle, follow safe travel behaviors, and develop a relationship with the community to foster an engaged community of bicyclists. A similar pedestrian ambassador program could be developed to educate the public on trail etiquette, and promote social walking events, local walking tours, and more.

Both the bicycle and pedestrian ambassador program could partner with local schools as part of a Safe Routes to School program to deliver workshops and events tailored to elementary, middle, and high school students.

Sharing educational resources on the City's website can enhance awareness as well. Collaboratively, City staff will harness the City's social media channels to further the promotion of education and awareness.

Figure 20: Example of a educational campaign targeted at distracted driving



Credit: Fresno Council of Governments

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06
IMPLEMENTATION STRATEGY

Project Prioritization

All projects identified in this Plan are important to improving connectivity and safety for people biking, walking, and rolling. However, due to the realities of finite funding and staffing resources, the City will need to implement projects gradually over time. Prioritizing projects helps guide investments toward projects that provide the greatest benefits. In addition, the prioritization process can help identify projects and their applicability to different grant and funding opportunities. The resulting prioritized project should not be viewed as a mandate to complete projects in a particular order, but rather a measure of which projects best meet the overall goals of this Plan. Project sequencing will be determined by a variety of factors such as budget/cost, local funds and state/federal grant funding availability, active development, and other implementation opportunities. Also, it is important to note that as the City performs reconstruction on its roadways, improvements will be considered at that time, no matter the placement on the prioritization list.

Bikeways and Sidewalk Gaps

As part of this Plan, bikeway recommendations are presented in Chapter 3 and sidewalk gaps identified in Chapter 4 were prioritized using the criteria shown in Table 6. These criteria were developed to align with the Plan's vision and goals and City objectives. The scores reflect a relative ranking of each criterion. For a complete list of prioritized projects and cost estimates, see Appendix A.

Tables 7 and 8 show the highest priority bicycle facility and sidewalk infill projects based on the results of the prioritization analysis. For more information about the cost estimates, refer to Funding and Cost Estimates on page 52.

In addition to the eight sidewalk infill projects presented in Table 8, a series of small, sidewalk infill spot improvements were identified at the locations listed below. All spot improvements are less than 500 feet in length.

- Herndon Avenue, between the Clovis Old Town Trail and Dewitt Avenue
- Clovis Avenue, between the Mariott Driveway and Sierra Avenue
- Shaw Avenue, between 425 Shaw Avenue and 505 Shaw Avenue
- Gettysburg Avenue (south side), between Peach Avenue and 332 Gettysburg Avenue

Table 6: Bikeway and Sidewalk Project Prioritization Criteria

Plan Goal	Criteria	Measure	Notes	Points
Improve safety		**Highest Number of Points Possible**		**40**
Safety	Collision History[17]	Weighted crashes per mile	*Prioritizes segments that have a high concentration of crashes*	40
Increase connectivity and active transportation trip potential		**Highest Number of Points Possible**		**15**
Connectivity and Mode Shift	# of Schools, Colleges, and Universities	Ped: ½ mile Bike: 1 mile	*Prioritizes projects that connect to key destinations*	5
	# of Commercial Areas	Ped: ½ mile Bike: 1 mile		5
	# of Transit stops	Ped: ¼ mile Bike: ½ mile		5
Improve transportation options for all people		**Highest Number of Points Possible**		**15**
Equity	Age	% of the population that is under 18 or 65 or older	*Prioritizes projects in areas with a higher percentage of youth or older adults*	5
	Race/Ethnicity	% of population that is non-white	*Prioritizes projects in areas with a higher percentage of BIPOC population*	5
	Income	Median Household Income	*Prioritizes projects in areas with lower income populations*	5
Increase access to recreation		**Highest Number of Points Possible**		**20**
Recreation	Park	Ped: ½ mile Bike: 1 mile	*Prioritizes projects that connect to recreation areas*	10
	Trail	Ped: ½ mile Bike: 1 mile		10

[17] A weighted crash total of bicycle crashes that occurred between 2015 and 2019 along each project was calculated. Crashes were weighted based on the severity of the most severe injury resulting from the crash: fatal and serious injury crashes at 5 points, all other injury crashes at 3 points.

Table 7: Top 10 Recommended Bicycle Projects

Rank	Corridor	From	To	Recommended Facility	Length (mi)	Total Length (mi)	Estimated Cost
1	Santa Ana Ave	Clovis Ave	Sierra Vista Ave	Class III Bike Route	0.48	0.48	$6,602
2	Shaw Ave	Sunnyside Ave	Temperance Ave	Class II Bike Lane	1.50	1.50	$67,489
3	Clovis Ave	Herndon Ave	Sierra Ave	Class II Bike Lane	0.48	0.48	$21,539
4	Barstow Ave	Fowler Ave	Armstrong Ave	Class III Bike Route	0.50	0.50	$6,881
5	Helm Avenue	West Barstow Avenue	East Ashlan Ave	Class III Neighborhood Greenway	1.65	1.65	$123,697
6	Sunnyside Ave	Herndon Ave	Tarpey Drive	Class II Bike Lane	2.51	2.99	$148,566
				Class III Neighborhood Greenway	0.47		
7	Fowler Ave	Shepherd Ave	Alluvial Ave	Class II Bike Lane	1.00	1.50	$95,790
				Class II Buffered Bike Lane*	0.51		
8	Shaw Ave	DeWolf Ave	460ft East of Leonard Ave	Class II Bike Lane	0.59	0.59	$26,328
9	Fowler Ave	Herndon Ave	City Limits near Griffith Ave	Class II Bike Lane	0.50	3.36	$313,966
				Class II Buffered Bike Lane*	2.86		
10	Ashlan Ave	Leonard Ave	McCall Ave	Class II Bike Lane	1.48	1.48	$66,537

*All Class II Buffered Bicycle Lanes will require further study to assess feasibility.

Table 8: Recommended Sidewalk Infill Projects

Rank	Corridor	From	To	Length (mi)	Estimated Cost
1	Ashlan Ave	Willow Ave	Helm Ave	0.49	$321,930
2	Willow Ave*	W Escalon Ave	W Barstow Ave	0.72	$473,040
3	Gettysburg Ave*	Peach Ave	Homsy Ave	0.17	$111,690
4	Villa Ave	300 ft south of W Ashlan Ave	W Pontiac Way	0.30	$197,100
5	Temperance St	Griffith Ave	Bellaire Way	0.17	$111,690
6	Villa Ave	Clovis Old Town Trail	W Herndon Ave	0.34	$223,380
7	Nees Ave*	N Whittier Ave	Armstrong Ave	0.25	$164,250
8	Alluvial Ave*	N Fordham Ave	West of N Renn Ave	0.14	$91,980

*Indicates a project within one-half mile of a school

Map 10: Prioritized Bikeway Projects

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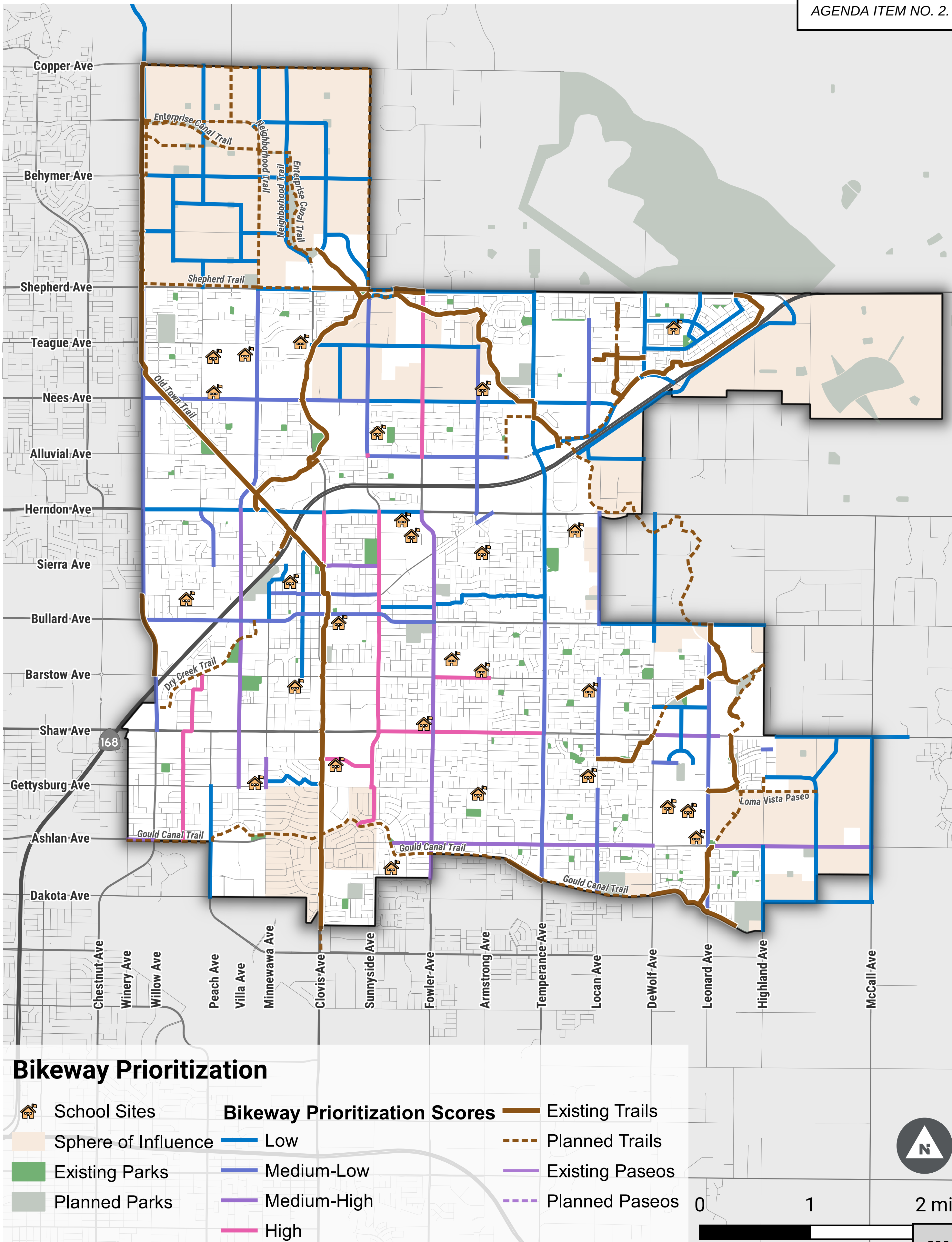

Map 11: Prioritized Sidewalk Projects

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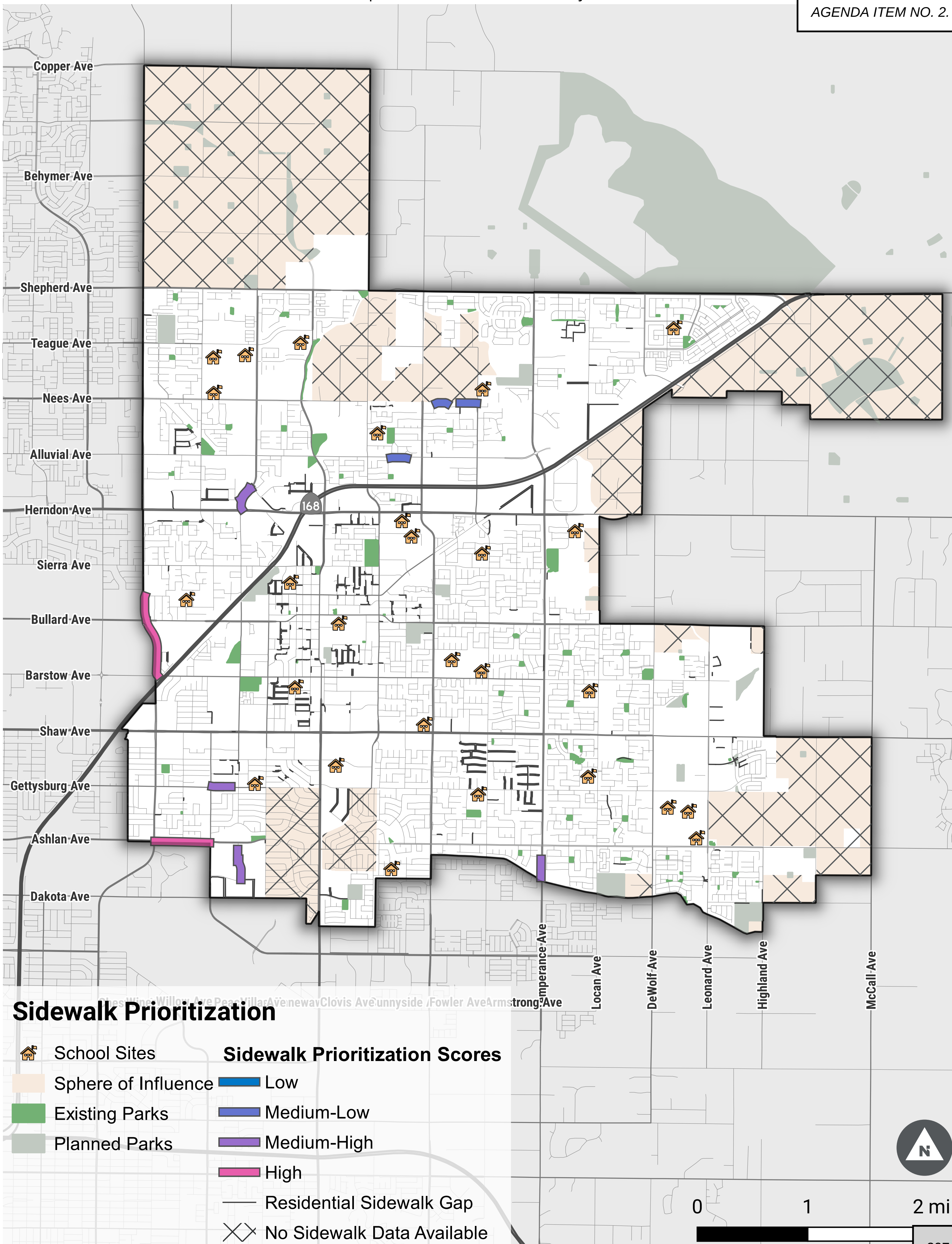


Trails

The trails prioritization follows a similar approach as the on-street bicycle facilities, with some modifications. Prioritization is still based on a project's alignment with Plan and City goals. Table 9 below outlines the prioritization approach for trails. Map 12 shows trails and paseos by prioritization scores. Table 10 displays trail projects that were selected for prioritized implementation based on their potential to improve network connectivity and expand access to key destinations. Paseos were not included in this prioritization as they are typically built by private developers. Some trails are also built by private developers, which is why the City will focus on filling in network gaps.

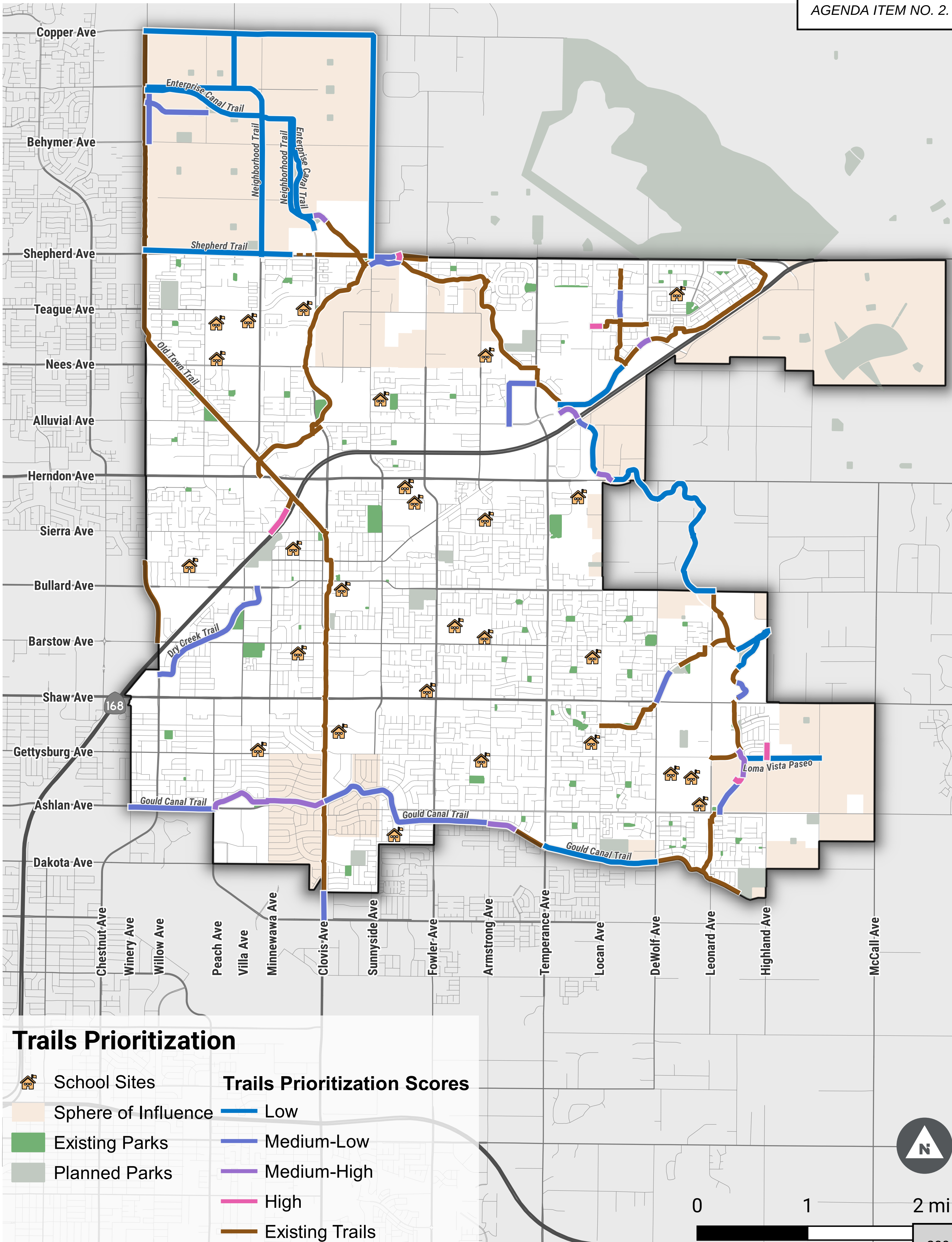
Table 9: Trail Prioritization Criteria

Plan Goal	Criteria	Measure	Notes	Points
Increase connectivity and active transportation trip potential		**Highest Number of Points Possible**		**15**
Connectivity and Mode Shift	# of Schools, Colleges, and Universities	1 mile	*Prioritizes projects that connect to key destinations*	5
	# of Commercial Areas	1 mile		5
	# of Transit stops	1/2 mile		5
Improve transportation options for all people		**Highest Number of Points Possible**		**10**
Equity	Race/Ethnicity	% of population that is non-white	*Prioritizes projects in areas with a higher percentage of BIPOC population*	5
	Income	Median Household Income	*Prioritizes projects in areas with lower income populations*	5
Increase access to recreation		**Highest Number of Points Possible**		**20**
Recreation	Park	1 mile	*Prioritizes projects that connect to recreation areas*	10
	Trail	1 mile		10

Table 10: Top Trail Projects

Corridor	From	To	Length (mi)	Estimated Cost
Dry Creek Trail	Clovis Old Town Trail North	Sierra Ave	0.22	$48,840
Miscellaneous Trail	Northern Enterprise Segment	Southern Enterprise Segment	0.023	$5,106
Greenbelt Path	Locan Ave	330ft east of Locan Ave	0.061	$13,542
Enterprise Canal Trail	Temperance Ave	Herndon Ave	0.11	$24,420
Gould Canal Trail	Armstrong Ave	Joshua Ave	0.21	$46,620
Gould Canal Trail	Minnewawa Ave	Gould Trail East	0.48	$106,560
Sierra Gateway Regional Trail	Shepherd Ave	Enterprise Trail	0.08	$17,760
Dog Creek Trail	Gettysburg Ave	1000ft south of Gettysburg Ave	0.17	$37,740
Enterprise Canal Trail	Temperance Ave	Herndon Ave	0.10	$22,200
Enterprise Canal Trail	Alluvial Ave	Sierra Fwy	0.25	$55,500

Map 12: Prioritized Trail Projects



Mid-block Trail Crossings

The City of Clovis identified potential locations to install mid-block crossings to improve safety and connectivity within the trail network. The dots on Map 13 show locations where the City is considering installing mid-block trail crossings, symbolized by prioritization score. Prioritized mid-block trail crossings are suggestions for where trail crossings would be most effective, not a mandate to implement improvements in a particular order. City staff determine mid-block crossing feasibility and signalization based on City guidelines and the Manual on Uniform Traffic Control Devices (MUTCD).

Table 11 below outlines the prioritization methodology for mid-block crossings. This prioritization methodology places higher priority on mid-block crossings where trails or paseos already exist and intersections where trail users may experience a high level of traffic stress[18]. In turn, this ensures that city resources and capital will be efficiently allocated where need is highest. All mid-block crossings will be evaluated further.

Table 11: Mid-block crossing prioritization criteria

Plan Goal	Criteria	Measure	Notes	Points
Increase connectivity		**Highest Number of Points Possible**		**40**
Connectivity and Mode Shift	Connection to trails or paseos	**Existing Facility:** Mid-block crossing would link existing trail or paseo network	Prioritizes midblock crossings where trails exist currently	40
		Partially Completed Link: Mid-block crossing would connect an existing facility to a planned one		20
		Proposed Facility: Mid-block crossing would link proposed trail or paseo network		10
Improve safety and trip potential		**Highest Number of Points Possible**		**60**
Safety	Level of Pedestrian Stress	**High Stress:** Pedestrian level of traffic stress score of 3,4	Prioritizes projects that reduce crossing barriers at trails	60
		Low Stress: Pedestrian level of traffic stress score of 1,2		10

[18] Level of Traffic Stress (LTS) is a rating given to a road segment or crossing indicating the traffic stress it imposes on pedestrians or bicyclists. Levels of traffic stress range from 1 to 4, with 1 being suitable for users of all ages and abilities and 4 being acceptable for only the most experienced and intrepid users. Crossing Level of Traffic Stress is determined based on traffic speeds, the number of lanes being crossed, and the presence or absence of a crossing island.

Map 13: Prioritized Mid-Block Crossings

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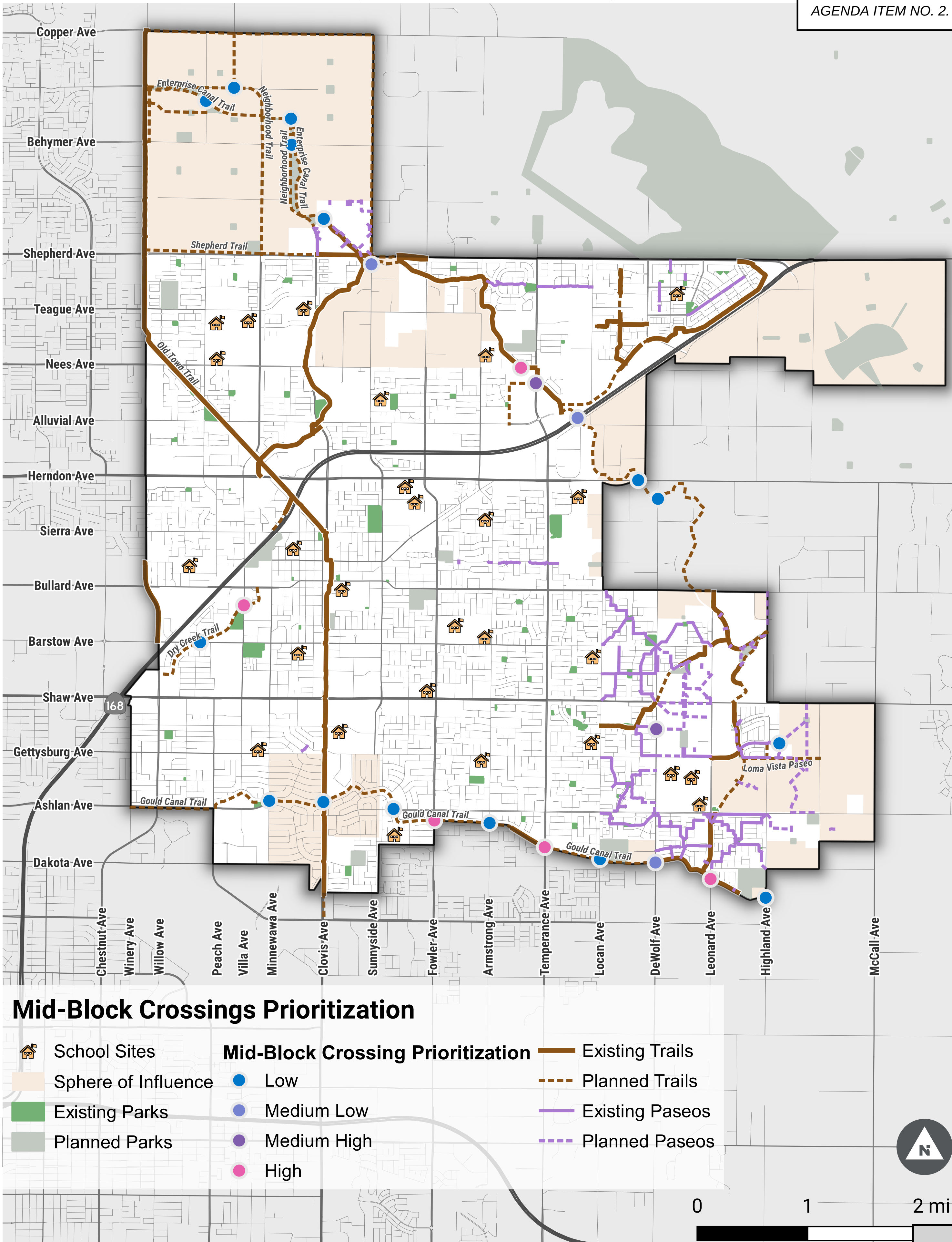

Funding and Cost Estimates

The cost of implementing the active transportation network varies based on the type of bikeway that is planned, and the degree to which existing infrastructure needs to be modified or enhanced. Planning-level cost estimates were developed for the proposed bicycle network's full buildout. Table 12 shows a summary of the cost estimates for the bicycle and pedestrian facilities recommended in this Plan. These reflect typical costs but do not consider project-specific costs such as right-of-way acquisition, landscaping, or other location-specific costs that may increase actual costs. For some projects, costs may be significantly higher. Appendix D: Funding Sources provides a list of funding sources and applicable project types to help the City fund the recommendations identified in this Plan.

For example, the Caltrans' Active Transportation Program funds can be used for infrastructure projects, quick-build pilot projects, planning documents such as this one, and non-infrastructure projects, like the programs recommended in this Plan. The prioritization process presented in Table 10 overlaps with some of the screening criteria Caltrans uses for the Active Transportation Program infrastructure projects. Projects recommended in this Plan that scored well for proximity to schools, trails, and disadvantaged communities are well suited to Caltrans Active Transportation Program funds[19].

Table 12: Summary of Bikeway and Sidewalk Infill Project Cost Estimates

Facility Type	Construction Cost Subtotal per Mile	35% Construction Contingency & Traffic Control	15% Design Costs	Total Cost Per Mile (Rounded)
Sidewalk Infill*	$437,712	$153,199	$65,657	$657,000
Class I Shared Use Trail**	$147,774	$51,721	$22,166	$222,000
Class II Bicycle Lane	$30,000	$10,500	$4,500	$45,000
Class II Buffered Bicycle Lane	$68,000	$23,800	$10,200	$102,000
Class III Neighborhood Greenway***	$50,000	$17,500	$7,500	$75,000
Class III Bicycle Route	$9,200	$3,220	$1,380	$13,800

* Includes concrete curb and gutter.

** Assumes 12-ft x 3-in asphalt concrete trail without landscaping, irrigation, or security lighting. Asphalt concrete may be Type B 1/2-inch medium HMA with PG70-10 (or PG 64-10 min.) asphalt binder with 10% shrinkage from compaction. The unit price of AC with labor and materials is estimated to be $105 per ton. The unit price of 4-inch white thermoplastic center line is $2 per linear foot.

*** Planning level cost estimate based on planning level cost estimates from the Berkeley Bicycle Plan as a recent example from a smaller California city.

[19] Refer to Caltrans' Active Transportation Program guidelines for more information about project eligibility criteria. https://dot.ca.gov/programs/local-assistance/fed-and-state-programs/active-transportation-program/general-and-technical-information

Implementation Phasing

Each project recommended in this Plan could be implemented one at a time; however, to build a complete network, it is beneficial to combine recommendations with the aim of building connected bikeways or sidewalks, or to fill a gap. For example, implementing connected Class II Bicycle Lanes along a single route would be advantageous for bicycle connectivity. The means by which bicycle infrastructure is implemented varies depending on the bikeway type. Pedestrian recommendations are primarily focused on filling in gaps in the sidewalk network.

Short-Term

The recommended bicycle and pedestrian facilities presented in this Plan are intended to create a connected network for people walking, bicycling, and rolling. In many cases, short-term projects (projects that can be achieved during the life of this plan) may consist of simple restriping of roadways to install or upgrade bike lanes. All planned street resurfacing and reconstruction projects should be reviewed in conjunction with the bicycle and pedestrian project recommendations to identify potential opportunities to incorporate projects recommended in this Plan in the near future.

Long-Term

Some proposed projects, such as Class I Trails or future Class IV Separated Bike Lanes, may require a longer-term effort for the project to come to fruition. Longer-term efforts are ones that will likely be achieved over time, likely beyond the life of this plan. While it may take longer to implement these projects, City departments should start considering what steps are needed to construct these projects either through capital projects or as part of future development. This will allow the City of Clovis to be better situated to take advantage of implementation and grant opportunities as they arise.

Design Guidance

This Plan aims to enhance opportunities for walking, bicycling and using other forms of active transportation. To achieve the goals set forth in this Plan, bicycle and pedestrian facilities must connect to destinations people want to go, and these facilities must feel safe and comfortable. Below are a few general design guidelines City staff should consider as they implement the projects recommended in this Plan:

- **Minimize conflicts**. Conflict points often occur where pedestrians, bicyclists, and motorists cross paths, such as at intersections and driveways. The potential for conflict may be mitigated by combining conflict points (e.g., reducing the number of driveways or reducing the number of travel lanes) or separating modes at conflict points (e.g., through signal phasing). Other solutions include providing signs and pavement markings that clearly conveys interactions between modes and designing facilities that are intuitive and lead to predictable behavior patterns.
- **Provide safe and convenient crossings**. Safe crossings should be provided at or near transit stops, where bike routes cross major streets, and near parks, schools, and other community destinations. To be considered safe, crossings should be clearly marked and provide enough time for non-motorized users to cross the street at a comfortable pace.
- **Reduce vehicle speeds**. Reducing vehicle speeds is key to decreasing collisions among roadway users and minimizing the severity of injuries if a collision occurs. This is especially true for people walking and biking, as they travel slower and are more vulnerable than motorists. This speed differential can negatively affect a person's perception of safety, particularly where there is a lack of separation between vehicles and active transportation users.
- **Provide consistency**. Infrastructure designed with a level of consistency in terms of aesthetics and function improves safety by promoting predictable behaviors and helps road users feel more comfortable following a route.

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A

PRIORITIZED BICYCLE FACILITIES PROJECT LIST

AGENDA ITEM NO. 2.

Bicycle Recommendations Project List

Rank	Plan ID	Corridor	From	To	Recommended Facility	Length (mi)	Total Length (mi)	Estimated Cost
1	24	Santa Ana Ave	Clovis Ave	Sierra Vista Pkwy	Class III Bike Route	0.48	0.48	$6,602
2	23	Shaw Ave	Sunnyside Ave	Temperance Ave	Class II Bike Lane	1.50	1.50	$67,489
3	36	Clovis Ave	Herndon Ave	Sierra Ave	Class II Bike Lane	0.48	0.48	$21,539
4	6	Barstow Ave	Fowler Ave	Armstrong Ave	Class III Bike Route	0.50	0.50	$6,881
5	28	Helm Avenue	West Barstow Avenue	East Ashlan Ave	Class III Neighborhood Greenway	1.65	1.65	$123,697
6	68	Sunnyside Ave	Herndon Ave	Tarpey Drive	Class II Bike Lane	2.51	2.99	$148,566
					Class III Neighborhood Greenway	0.47		
7	69***	Fowler Ave	Shepherd Ave	Alluvial Ave	Class II Bike Lane	1.00	1.50	$95,790
					Class II Buffered Bike Lane	0.51		
8	4	Shaw Ave	DeWolf Ave	460ft East of Leonard Ave	Class II Bike Lane	0.59	0.59	$26,328
9	70***	Fowler Ave	Herndon Ave	City Limits near Griffith Ave	Class II Bike Lane	0.50	3.36	$313,966
					Class II Buffered Bike Lane	2.86		
10	51 *	Ashlan Ave	Leonard Ave	McCall Ave	Class II Bike Lane	1.48	1.48	$66,537
11	19	Ashlan Ave	Fordham Ave	De Wolf Ave	Class II Buffered Bike Lane	2.34	2.34	$238,789
12	16	Sierra Ave	Clovis Ave	Sunnyside Ave	Class III Bike Lane	0.51	0.51	$23,100
13	65	Villa Ave	Herndon Ave	Gettysburg Ave	Class II Bike Lane	1.25	2.51	$73,720
					Class III Bike Route	1.26		
14	11	Minnewawa Ave	Santa Ana Ave	Gettysburg Ave	Class III Bike Route	0.26	0.26	$3,546
15	26***	Ashlan Ave	Winery Ave	Willow Ave	Class II Buffered Bike Lane	0.24	0.24	$23,993
16	64***	Willow Ave	Shepherd Ave	Herndon Ave	Class II Buffered Bike Lane	2.01	2.01	$204,736
17	73***	Nees Ave	Willow Ave	Sunnyside Ave	Class III Bike Route	0.50	2.03	$163,396
					Class II Buffered Bike Lane	1.53		
18	12***	Minnewawa Ave	Shepherd Ave	Herndon Ave	Class II Buffered Bike Lane	2.05	2.05	$208,669
19	63** ***	Willow Ave	Herndon Ave	Shaw Ave	Class II Bike Lane	1.03	2.03	$148,117
					Class II Buffered Bike Lane	1.00		
20	5	3rd Street	Minnewawa Ave	Sunnyside Ave	Class III Bike Route	1.00	1.00	$13,820

Rank	Plan ID	Corridor	From	To	Recommended Facility	Length (mi)	Total Length (mi)	Estimated Cost
21	50	Planned Road 470ft North of San Gabriel Ave	DeWolf Ave	1000ft East of DeWolf Ave	Class II Bike Lane	0.21	0.21	$9,353
22	34	Locan Ave	Herndon Ave	Bullard Ave	Class II Bike Lane	1.01	1.01	$45,226
23	62	Tollhouse Road	Armstrong Ave	Herndon Ave	Class II Bike Lane	0.16	0.16	$7,154
24	60	Loma Visa Parkway	350ft East of San Marino Dr	223ft of Highland Ave	Class II Bike Lane	0.08	0.08	$3,383
25	17	Leonard Ave	Bullard Ave	City Limits Near Amenecer Ave	Class II Bike Lane	2.61	2.61	$117,413
26	74	Bullard Ave	Willow Ave	Fowler Ave	Class III Bike Route	2.65	2.65	$63,756
27	67	Sunnyside Ave	Shepherd Ave	Alluvial Ave	Class II Bike Lane	1.50	1.50	$67,675
28	35	Locan Ave	Powers Ave	Sierra Fwy	Class II Bike Lane	2.71	2.71	$122,000
29	2	Alluvial Ave	Sunnyside Ave	Proposed Trail Connection	Class II Bike Lane	1.26	1.26	$56,885
30	15	Peach Ave	Herndon Ave	Sierra Ave	Class II Bike Lane	0.54	0.54	$24,493
31	72***	Temperance Ave	Bullard Ave	City Limits near Griffith Ave	Class II Buffered Bike Lane	2.33	2.33	$238,141
32	14	Armstrong Ave	Teague Ave	Herndon Ave	Class II Bike Lane	1.51	1.51	$68,163
33	20***	Herndon Ave	Willow Ave	Fowler Ave	Class II Buffered Bike Lane	2.52	2.52	$257,201
34	49	U-Shaped Road between DeWolf and Leonard Aves	Loma Vista Pkwy	Loma Vista Pkwy	Class II Bike Lane	0.35	0.35	$15,717
35	43	Peach Ave	Planned Road 1281ft North of Shepherd Ave	Shepherd Ave	Class II Bike Lane	0.24	0.24	$10,886
36	59	Planned Road 1360ft East of DeWolf Ave	San Jose Ave	Planned Road 578ft North of Loma Vista Pkwy	Class II Bike Lane	0.39	0.39	$17,478
37	1	Pico Ave	Minnewawa Ave	Clovis Ave	Class III Neighborhood Greenway	0.58	0.58	$43,280

AGENDA ITEM NO. 2.

Rank	Plan ID	Corridor	From	To	Recommended Facility	Length (mi)	Total Length (mi)	Estimated Cost
38	58	San Jose Ave	DeWolf Ave	Leonard Ave	Class II Bike Lane	0.50	0.50	$22,422
39	40	Perrin Ave	Willow Ave	Planned Road 1370ft East of Willow Ave	Class II Bike Lane	0.26	0.26	$11,805
40	30	Marion Ave	Teague Ave	Nees Ave	Class II Bike Lane	0.49	0.49	$22,231
41	66	Woodworth Ave	Pollasky Ave	Barstow Ave	Class III Bike Route	0.12	1.12	$1,601
					Class II Bike Lane	1.01		
42	27	Enterprise Canal Channel	Sunnyside Ave	Existing Enterprise Canal Trail	Class I Trail	0.26	0.26	$57,483
43	61	Alluvial Ave	Locan Ave	DeWolf Ave	Class II Bike Lane	0.60	0.60	$27,066
44	25	2nd Street/ Minnewawa Ave	Sierra Ave	Bullard Ave	Class III Neighborhood Greenway	0.61	0.61	$45,653
45	33	DeWolf Ave	Herndon Ave	Roberts Ave	Class II Bike Lane	1.15	1.15	$51,589
46	76***	Bullard Ave	Locan Ave	Highland Ave	Class II Bike Lane	0.99	1.49	$95,617
					Class II Buffered Bike Lane	0.50		
47	10	Leonard Ave	Shepherd Ave	Harlan Ranch Blvd	Class III Bike Route	0.48	0.48	$6,693
48	8	Planned Road Parallel to Enterprise Canal Trail	Planned Road 2090ft West of Sunnyside Ave	Shepherd Ave	Class II Bike Lane	0.70	0.70	$31,305
49	29	Powers Ave	De Wolf Ave	Harlan Ranch Blvd	Class III Neighborhood Greenway	0.61	0.61	$8,361
50	46	Planned Road 814ft West of Minnewawa Ave	Planned Road 1300ft North of Perrin Rd	Planned Road 1300ft South of Perrin Ave	Class II Bike Lane	0.51	0.51	$22,843
51	13***	DeWolf Ave	Shepherd Ave	Owens Mt Pkway	Class II Buffered Bike Lane	0.75	0.75	$76,365
52	52	Highland Ave	Ashlan Ave	Southern City Limits Near Gould Canal	Class II Bike Lane	0.76	0.76	$34,035
53	3	Peach Ave	Gettysburg Ave	Dakota Ave	Class II Bike Lane	1.00	1.00	$44,967
54	47	Planned Road 1350ft North of Perrin Ave	Planned Road 1380ft East of Willow Ave	Planned Road 815ft West of Minnewawa Ave	Class II Bike Lane	0.61	0.61	$27,568

AGENDA ITEM NO. 2.

Rank	Plan ID	Corridor	From	To	Recommended Facility	Length (mi)	Total Length (mi)	Estimated Cost
55	7	Gibson St	Sunnyside Ave	Temperance Ave	Class III Neighborhood Greenway	1.63	1.63	$122,225
56	75	Harlan Ranch Boulevard	DeWolf Ave	Shepherd Ave	Class II Bike Lane	1.15	1.15	$51,964
57	39	Perrin Rd	Planned Road 815ft West of Minnewawa Ave	Clovis Ave	Class II Bike Lane	0.40	0.40	$18,169
58	31	Willow Ave	1200ft south of Via Monte Verdi Ave	International Ave	Class II Bike Lane	1.80	1.80	$81,033
59	45	Planned Road 1440ft East of Minnewawa Ave	Behymer Ave	Planned Road 1385ft South of Perrin Rd	Class II Bike Lane	0.77	0.77	$34,494
59	53	Dakota Ave	Highland Ave	Shockley Ave	Class II Bike Lane	0.98	0.98	$44,307
60	44	Planned Road 1350ft North of Perrin Ave	Planned Road 1380ft East of Willow Ave	Minnewawa Ave	Class II Bike Lane	0.77	0.77	$34,726
61	57	Planned Road 950ft East of Thompson Ave	Shaw Ave	Thompson Ave	Class II Bike Lane	0.45	0.45	$20,243
62	32	Tollhouse Road	Enterprise Canal Trail	Shepherd Ave	Class II Bike Lane	2.56	2.56	$115,251
63	55	Thompson Ave	Gettysyburg Ave	Dakota Ave	Class II Bike Lane	1.53	1.53	$92,151
63	37	Behymer Ave	Willow Ave	Sunnyside Ave	Class II Bike Lane	2.05	2.05	$68,964
64	48	Owens Mountain Pkwy	Temperance Ave	Sierra Fwy	Class II Bike Lane	1.56	1.56	$70,339
65	9	Minnewawa Ave	Copper Ave	International Ave	Class II Bike Lane	0.56	0.56	$25,081
65	41	Peach Ave	Copper Ave	Planned Road 1300ft South of Behymer Ave	Class II Bike Lane	1.25	1.25	$56,264

Rank	Plan ID	Corridor	From	To	Recommended Facility	Length (mi)	Total Length (mi)	Estimated Cost
66	54	McCall Ave	Shaw Ave	Dakota Ave	Class II Bike Lane	1.49	1.49	$66,958
67	56	Shaw Ave	Highland Ave	McCall Ave	Class II Bike Lane	1.19	1.19	$53,352
68	18	Teague Ave	Clovis Ave	Armstrong Ave	Class II Bike Lane	1.50	1.50	$67,715
69	42	International Ave/Planned Road 3210ft East of Minnewawa Ave	International Ave	Enterprise Canal Trail	Class II Bike Lane	1.79	1.79	$80,550
70	38	Clovis Ave	Copper Ave	Neighborhood Trail	Class II Bike Lane	1.85	1.85	$83,395
71	22	Nees Ave	Sunnyside Ave	Locan Ave	Class II Bike Lane	2.24	2.24	$100,818
72	21***	Shepherd Ave	Minnewawa Ave	Temperance Ave	Class II Buffered Bike Lane	2.50	2.50	$255,494
73	71***	Temperance Ave	Shepherd Ave	Bullard Ave	Class II Buffered Bike Lane	3.01	3.01	$307,257

*Project has a bike lane only on one side of the street.

**This project will require further study to determine the appropriate facility type. Parking removal would be required to convert this facility to a Class II Bike Lane.

***All Class II Buffered Bicycle Lanes will require further study to assess feasibility.

B

DESIGN GUIDELINES

Glossary

There are many terms used to describe different components of the transportation system, treatments, and bikeway facility types. To promote consistency and ease of understanding, the following terms are used throughout this guide. For glossary resources, see the end of glossary section.

Accessible Pedestrian Signal – Device that communicates information about the WALK and DON'T WALK intervals at signalized intersections in non-visual formats to pedestrians who are blind or have low vision.[8]

Amenities – Elements such as benches, kiosks, bicycle parking, points of interest displays, or trash receptacles that are placed on a sidewalk, pedestrian mall, or at transit stops in order to improve the convenience and attractiveness of the facility.[1]

Arterial Road – Roadway designed for high-speed, high-volume travel between major points in both urban and rural areas.[1]

Average Daily Traffic (ADT) – The total volume of traffic on a street during a given time period divided by the number of days in that time period.[1]

Bicycle Boulevard – Bicycle boulevards are streets with low motorized traffic volumes and speeds, designated and designed to give bicycle travel priority. Bicycle boulevards use signs, pavement markings, and speed and volume management measures to discourage through trips by motor vehicles and create safe, convenient bicycle crossings of busy arterial streets.[6]

Bicycle Box – Designated area on the approach to a signalized intersection consisting of an advanced stop line and bicycle symbols. Bicycle boxes should be primarily considered to mitigate conflicts between through bicyclists and right-turning motorists and to reduce conflicts between motorists and bicyclists at the beginning of the green signal phase.[6]

Bicycle Detection – A system of hardware and software that detects the presence of bicyclists at a traffic signal and calls the green signal for the activated approach. Bicycle detection may consist of inductive loops, microwave, magnetometers, or pushbutton technologies.[1]

Bicycle Pockets - Bicycle pockets are bicycle through lanes in between vehicle travel lanes and vehicle right-turn lanes at the approach to an intersection. A bicycle pocket carves out space for bicyclists to improve rider visibility and mitigate conflicts with motorists, primarily to prevent right-turn collisions between riders and motorists.[6]

Bicycle Signal – Traffic control device used to improve intersection safety and operations for bicyclists. Bicycle signal heads can be installed at signalized intersections to indicate bicycle signal phases and other bicycle-specific timing strategies.[3, 6]

Bicycle Signal Head – An assembly of one or more signal faces that is provided for controlling bicycle traffic movements on one or more intersection approaches.[3]

Bike Lane – A portion of a roadway that has been designated for preferential or exclusive use by bicyclists by pavement markings and, if used, signs.[4]

Bike Route – A signed route that is preferred for bicycling due to low traffic or access to destinations. Does not necessarily have a delineated or dedicated space for bicycling.[1]

Bikeway – Generally, any type of bicycle facility, including paths in separate rights-of-way and on-street bikeways. Includes bike lanes, paved shoulders, signed bike routes, and sidepaths.[12]

Centerline – Line dividing the roadway from opposite moving traffic. Also the survey line with continuous stationing for the length of the project.[9]

Cone of Vision – A transportation safety concept pertaining to the visual acuity of the human eye and the area of focus by a motorist or other roadway user. Motorists tend to focus on the roadway at a distance three to four times the stopping sight distance. Because of this tendency, as motorists drive at higher speeds, they are less likely to notice objects, pedestrians, or bicyclists in the area of their peripheral vision.[3]

Conflict Areas – A two-dimensional zone within which potential travel paths cross and crashes could occur between users of the same mode or users of differing modes. Typical conflict areas include approaches to intersections, intersections, and driveways.[1, 6]

Contra-Flow Bikeway – A bikeway (usually a bike lane) in the opposite direction of motor vehicle traffic on a one-way street. Contra-flow bikeways require careful consideration of traffic control and conflicts with motor vehicle traffic.[6]

Crossing Island – Raised islands placed on a street at intersections or midblock locations to separate crossing pedestrians from motor vehicles. Also known as refuge areas, refuge islands, center islands, pedestrian islands, or median slow points.[3]

Crosswalk – Legal crosswalks exist at all intersections, whether marked or unmarked. Midblock crosswalks must be marked in order for pedestrians to legally have the right-of-way.[6]

Curb Extension – Treatment or application designed to visually and physically narrow the roadway in order to create safer and shorter crossing distances for pedestrians while increasing the available space for street furniture, benches, plantings, and trees.[6]

Curb Radius – The radius of the arc formed where two intersecting curbs meet. Smaller curb radii encourage slower turning speeds at intersections.[1]

Curb Ramp – The transition for pedestrians from the sidewalk to the street. ADA Standards require all pedestrian crossings to be accessible to people with disabilities by providing curb ramps at intersections and mid-block crossings as well as other locations where pedestrians can be expected to enter the street.[3]

Design Speed – Design speed is a selected speed used to determine various geometric design features of the roadway. The assumed design speed should be logical with respect to the topography, anticipated operating speed, adjacent land uses, and the functional classification of the roadway.[1]

Detectable Warning – Standardized feature usually comprised of truncated domes of a contrasting color, which are built into, or applied to, walking surfaces. Detectable warnings alert people with vision impairments that they have reached a location where caution should be exercised. At these locations, visually- impaired pedestrians typically stop and determine their position relative to the roadway before proceeding further.[1]

Flexible Delineator Posts – Flexible delineator posts, also called flex posts or flex stakes, are used to provide vertical demarcation of a roadway feature, including some bike lanes. These posts are typically made of plastic with an internal spring mechanism mounted to a base plate. Flexible delineator posts can be secured to the pavement using bolts, epoxy, or other techniques. The color of the plastic post should match the color of the pavement marking or striping with which it is associated.[1, 6]

Grade (site) – The grade of a site is de [illegible] slope of the ground surface. The slope is calculated by the vertical difference divided by the horizontal difference. For example, if a 1-foot vertical elevation change is present over a 50-foot distance, the resulting grade is 1/50 = .02 . This equates to a 2 percent site grade.[11]

Horizontal Deflection Treatment – Traffic calming techniques that compel motorists to reduce their travel speed by changing the width or directionality of travel lanes at defined locations along a street. Examples include narrow lanes, chicanes, neckdowns, traffic circles, and curb extensions.[9]

Landing Area – A level area at a curb ramp or raised crossing with less than 2 percent grade or cross slope, designed for wheelchair users to wait, maneuver into or out of a curb ramp, or to bypass a ramp altogether.[1]

Lane Diet – See Lane Narrowing.

Lane Narrowing – A design strategy used for traffic calming effects and for reallocating existing pavement width to create designated space for other uses, including bicycle lanes.[3]

Leading Pedestrian Interval (LPI) – At intersections with high pedestrian volumes and high conflicting turning vehicle volumes, a brief leading pedestrian interval may be used, during which an advance WALKING PERSON (symbolizing WALK) indication is displayed for the crosswalk while red indications continue to be displayed to parallel through and/or turning traffic. The LPI may be used to reduce conflicts between pedestrians and turning vehicles. If a leading pedestrian interval is used, it should be timed to allow pedestrians to cross at least one lane of traffic or to travel far enough for pedestrians to establish their position ahead of the turning traffic before the turning traffic is released. Chapter 4E of the MUTCD provides specifications regarding pedestrian signals.[4]

Local Road – Locally classified roads account for the largest percentage of all roadways in terms of mileage. Local roads are not intended for long-distance travel, instead providing direct access to abutting land on the origin and/or destination end of a trip. Local roads are often designed to discourage through traffic.[3]

Mast Arm – A structure, also referred to as a cantilevered signal structure, that is rigidly attached to a vertical pole and is used to provide overhead support of traffic signal faces or grade crossing signal units. Traffic control signs may also be mounted to a mast arm.[4]

Mid-Block Crossing – Designated crosswalks away from an established intersection provided to facilitate crossings at places where there is a significant pedestrian desire line such as bus stops, parks, and building entrances.[6]

Mixing Zone – A mixing zone requires turning motorists to merge across a separated bike lane at a defined location in advance of an intersection. Unlike a standard bike lane, where a motorist can merge across at any point, a mixing zone design limits bicyclists' exposure to motor vehicles by defining a limited merge area for the turning motorist. Mixing zones are compatible only with one-way separated bike lanes.[3]

Mountable Curb/Truck Apron – Mountable curbs with curb aprons deter passenger vehicles from making higher-speed turns but accommodate the occasional large vehicle without encroachment or off-tracking into pedestrian areas.[3]

MUTCD – The Manual on Uniform Traffic Control Devices is a compilation of national standards for all traffic control devices, including traffic signals.[4]

Neighborhood Traffic Circles – Raised islands typically built at the intersections of local residential streets to reduce motor vehicle speeds. They may be operated without stop control, or as two-way or all-way stop-controlled intersections. Neighborhood traffic circles frequently do not include raised channelization to guide approaching traffic into the circulatory roadway.[3, 7]

Offset Intersection – Offset intersections are locations where two segments of a street connection do not directly align where they meet another street. These configurations are most challenging for bicyclists when offset local streets serving as bike routes or bike boulevards intersect with larger collector or arterial streets.[6]

Parking T – A short vertical white line to mark the side of a parking space, coupled with a short horizontal white line crossing it to mark each end of the space.[4]

Path – Short for "shared use path" and often synonymous with the word "trail," a path is a separated facility, typically in an independent right-of-way such as a greenbelt or abandoned railroad. See Shared Use Path.

Paved Shoulder – Paved area at the edges of rural roadways. A paved shoulder is suitable for bicyclists if it is at least 4 feet in width.[3]

Pavement Markings – Pavement ma[illegible] to convey messages to roadway (or shared use path) users. They indicate which part of the road to use, provide information about conditions ahead, and indicate where passing is allowed. Yellow lines separate traffic flowing in opposite directions. White lines separate lanes in which travel is in the same direction. Symbols are used to indicate permitted lane uses. The MUTCD provides specifications regarding pavement markings.[4]

Pedestrian Change Interval – A pedestrian change interval consists of a flashing UPRAISED HAND (symbolizing DON'T WALK) signal indication, and begins immediately following the WALKING PERSON (symbolizing WALK) signal indication. Chapter 4E of the MUTCD provides specifications regarding pedestrian signals.[4]

Pedestrian Hybrid Beacon – The pedestrian hybrid beacon (also known as the High-Intensity Activated crosswalk, or HAWK) is a pedestrian-activated warning device located on the roadside or on mast arms over midblock pedestrian crossings. The beacon head consists of two red lenses above a single yellow lens. Chapter 4F of the MUTCD includes information on the pedestrian hybrid beacon and how it should be used.[4]

Pedestrian Signal Head – Provide special types of traffic signal indications exclusively intended for controlling pedestrian traffic. These signal indications consist of the illuminated symbols of a WALKING PERSON (symbolizing WALK) and an UPRAISED HAND (symbolizing DON'T WALK). Chapter 4E of the MUTCD provides specifications regarding pedestrian signals.[4]

Raised Crosswalk – Traffic calming device at a pedestrian crossing or crosswalk that raises the entire wheelbase of a vehicle to encourage motorists to reduce speed.[6]

Rectangular Rapid Flashing Beacon (RRFB) – User-actuated amber light-emitting diodes (LEDs) that supplement warning signs at unsignalized intersections or mid-block crosswalks. They can be activated by pedestrians manually by a push button or passively by a pedestrian detection system.[3]

Restroom, Plumbed or Vault – A plumbed restroom is a toilet facility that is fully plumbed with running water. It is connected to a public water line and sanitary sewer line. A vault restroom is a toilet that does not have any running water and typically has a large tank below ground. A vault toilet requires regular maintenance to clear out the vault.[2]

Right(s)-of-Way – Land or property that is used for public purposes including streets, sidewalks, utilities, etc.

Road Diet – A short-hand term referring to reconfiguring a roadway to remove lanes in order to provide more space for pedestrians and bicyclists. Road diets are most typically performed on roadways where traffic volumes do not necessitate the existing number of lanes.3

Roadway – The paved portion of a street, from curb to curb, designed to convey motor vehicle, bicycle, transit, and/or freight traffic.3

Separated Bike Lane – One- or two-way bikeway that combines the user experience of a sidepath with the on-street infrastructure of a conventional bike lane. They are physically separated from both motor vehicle and pedestrian traffic.3

Shared Lane Marking – Shared lane markings (or "sharrows") are pavement markings that denote shared bicycle and motor vehicle travel lanes. The markings are two chevrons positioned above a bicycle symbol, placed where the bicyclist is anticipated to operate.6

Shared Roadway – Roadway that is open to both bicycle and motor vehicle travel.1

Shared Use Path – Shared use paths, also commonly referred to as trails or greenways, are paths designed for and generally used by bicyclists, pedestrians, and other non-motorized users. Shared use paths are generally the preferred type of infrastructure for the majority of bicyclists in the "interested but concerned" category, due to their separation from the roadway and vehicular traffic. In many states, the term "trail" refers to an unimproved recreational facility intended for uses such as walking, hiking, and mountain biking. Care should be taken when using this term, as in some parts of the country, trails have distinctly different design guidelines.1

Shoulder – The portion of the roadway contiguous with the traveled way that accommodates stopped vehicles, emergency use, and lateral support of the subbase, base, and surface courses. Shoulders, where paved, are often used by bicyclists.1

Sidepath – A separated path along a roadway that serves people bicycling and walking within the street right-of-way. Compared to paths in independent rights-of-way, sidepaths have a higher likelihood of interactions with motor vehicles at driveways and intersections.1

Sidewalk Buffer – The space between the sidewalk and the adjacent roadway designed to improve pedestrian safety and to enhance the overall walking experience. Sidewalk buffers also provide an area for snow storage and splash protection for pedestrians, as well as space for curb ramps, light poles and traffic signs.1

Sight Distance – Sight distance is the visually unobstructed distance required to execute a stopping maneuver (stopping sight distance), pass another vehicle (passing sight distance), perform an unexpected maneuver (decision sight distance), or execute a movement at an intersection (intersection sight distance). Sight distances depend on roadway geometry, travel speeds, deceleration rates, and reaction times.1

Signal Timing – The process of selecting appropriate values for timing parameters implemented in traffic signal controllers and associated system software.8

Signal Warrant – Traffic control signal warrants define the minimum conditions under which installing traffic control signals might be justified. An engineering study of traffic conditions, pedestrian characteristics, and physical characteristics of the location shall be performed to determine whether installation of a traffic control signal is justified at a particular location. The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal. Chapter 4C of the MUTCD provides specifications regarding traffic control signal warrants. Warrants for installation of multi-way stop sign control are provided in Chapter 2B of the MUTCD.4

Signalized Intersection – Intersection between two traveled ways (roadway/roadway or roadway/shared use path) where user movements are regulated by a traffic control signal.3

Speed Cushion – Speed cushions are either speed humps or speed tables that include wheel cutouts to allow large vehicles to pass unaffected, while reducing passenger car speeds. Speed cushions extend across one direction of travel from the centerline, with a longitudinal gap provided to allow vehicles with wide wheel bases to straddle the hump.6

Speed Hump – Parabolic vertical traffic calming devices intended to slow traffic speeds on low-volume, low-speed streets.**6**

Steep Grade – Steep grades in landscaped areas are grades exceeding a slope of 4 (horizontal) to 1 (vertical) or 25 percent. Steep grades along a trail are typically 5 percent or greater. Refer to ADA and AASHTO for steep grade recommendations.**11**

Stop Bar – Solid white pavement marking line extending across approach lanes to indicate the point at which a stop is intended or required to be made.**4**

Street – A public corridor designed to provide access to businesses, housing, parks, and civic buildings within a city. The entire right-of-way, including sidewalks, the roadway, vegetated buffers, etc. is considered part of the street.

Street Buffer – The portion of a separated bike lane design that divides the bike lane from motor vehicle traffic.**5**

Traffic Calming – A strategy and toolkit to slow the speeds of motor vehicle traffic to a "desired speed" by incorporating physical features, such as chicanes, mini traffic circles, speed humps, and curb extensions.**3**

Traffic Control – Devices such as traffic signals, warning signs, stop signs, yield signs, and other regulatory signs.**4**

Traffic Volume – The number of vehicles passing a given point over a specific period of time.

Transit Stop– Location where public transportation vehicles (bus or rail) will stop to allow passengers to board or alight the transit vehicle.**10**

Transit Stop Wheelchair Landing Pad – The wheelchair landing is a portion of the waiting pad at a paved bus stop. This landing provides a location with a curb-height solid surface for buses to "kneel" and deploy the bus wheelchair ramp. Wheelchair landings must comply with ADA guidelines.**10**

Truncated Dome – See Detectable Warning.

Two-Stage Turn Queue Box – Two-stage turn queue boxes are areas set aside for bicyclists to queue to turn at signalized intersections outside of the traveled path of motor vehicles and other bicycles. In addition to mitigating conflicts inherent in merging across traffic to turn, two-stage bicycle turn boxes reduce conflicts between bicycles and pedestrians and separate queued bicyclists waiting to turn from through bicyclists moving on the green signal.**4**

Underpass – Grade-separated facility designed to convey vehicular, bicycle, and/or pedestrian traffic under an intersecting roadway or railroad.**8**

Vertical Deflection Treatment – Traffic calming techniques that compel motorists to reduce their travel speed by changing the elevation of the roadway at defined locations along a street. Examples include speed humps, speed tables, and raised crosswalks.**1**

Walk Interval – The walk interval is the portion of the signal timing intended for pedestrians to start their crossing of the roadway. The walk interval should be at least 7 seconds in duration so that pedestrians will have adequate opportunity to leave the curb or shoulder before the pedestrian clearance time begins, unless pedestrian volumes and characteristics do not require a 7-second walk interval, in which case walk intervals as short as 4 seconds may be used. Chapter 4E of the MUTCD provides specifications regarding pedestrian signals.**4**

Wayfinding – A system of directional signs along streets or paths that assist people in finding major destinations. Wayfinding can be designed specifically for drivers, bicyclists, or pedestrians.**3**

Glossary Resources

1 American Association of State Highway Transportation Officials (AASHTO)

2 California State Water Resources Control Board

3 Federal Highway Administration (FHWA)

4 Manual on Uniform Traffic Control Devices (MUTCD)

5 Massachusetts Department of Transportation (MassDOT)

6 National Association of City Transportation Officials (NACTO)

7 National Center for Safe Routes to School

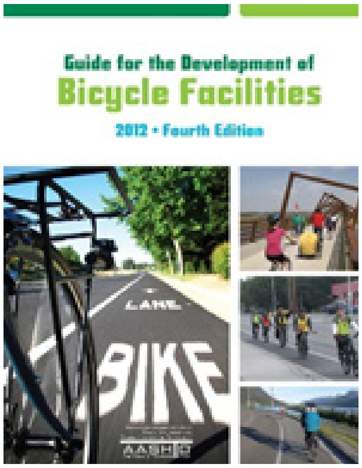
8 National Cooperative Highway Research Program (NCHRP)

9 Texas Department of Transportation (TxDOT)

10 Transit Cooperative Research Program (TCRP)

11 United States Access Board

12 Caltrans Streets and Highway Manual



National Standards and Resources

The publications listed here are excellent resources for planning and design guidance in implementing safe, comfortable accommodations for pedestrians and bicyclists in a variety of environments. Many of these resources are available on-line at no cost.

American Association of State Highway and Transportation Officials (AASHTO)

- Guide for the Development of Bicycle Facilities (2012) (Update anticipated in 2024)
- Guide for the Planning, Design, and Operation of Pedestrian Facilities (2004)
- A Policy on Geometric Design of Highways and Streets, 6th Edition (2011)

Federal Highway Administration (FHWA)

- Bikeway Selection Guide (2019)

Caltrans

- Manual on Uniform Traffic Control Devices (2014)
- Complete Streets Elements Toolbox
- National Association of City Transportation Officials (NACTO)
- Urban Street Design Guide (2013)
- Transit Street Design Guide (2016)
- Urban Bikeway Design Guide (2014)

Pedestrian Crossing Treatments

Marked Crosswalks

Legal crosswalks exist at all locations where sidewalks meet the roadway, regardless of whether pavement markings are present. Drivers are legally required to yield to pedestrians at intersections, even when there are no pavement markings. Providing marked crosswalks communicates to drivers that pedestrians may be present, and helps guide pedestrians to locations where they should cross the street. In addition to pavement markings, crosswalks may include signals/ beacons, warning signs, and raised platforms. To help evaluate marked crosswalk candidates refer to the City of Clovis Memorandum on Guidance for Uncontrolled Crosswalk Treatments (2016).

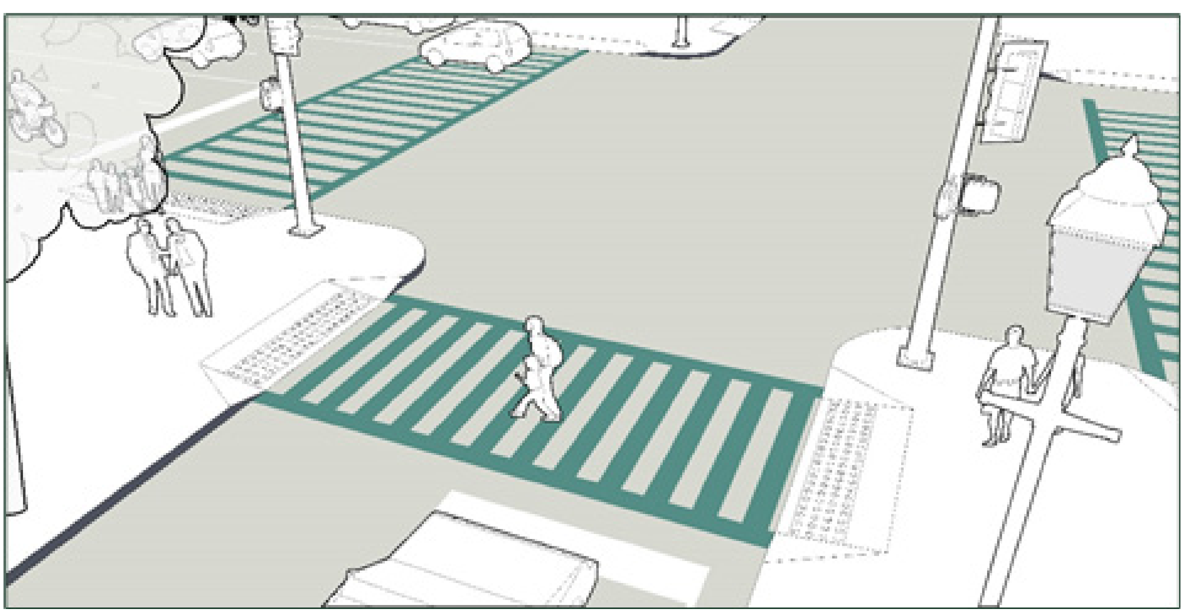
Considerations

- There are many different styles of crosswalk striping and some are more effective than others. Ladder and continental striping patterns are more visible to drivers.
- Signal phasing is very important. Pedestrian signal phases must be timed based on the length of the crossing. If pedestrians are forced to wait longer than 30 seconds, non- compliance is more likely.
- Raised crossings can calm traffic and increase the visibility of pedestrians.
- Curb extensions, also known as bulb-outs and bump-outs, reduce the distance pedestrians have to cross and calm traffic.

Guidance

- Place crosswalks on all legs of signalized intersections, in school zones, and across streets with more than minimal levels of traffic.
- Crosswalks should be at least 10 feet wide or the width of the approaching sidewalk if it is greater. In areas of heavy pedestrian volumes (such as Transit Station Areas, School Zones, and Main Streets) crosswalks can be up to 25 feet wide.
- Stop lines at stop-controlled and signalized intersection approaches should be striped no less than 4 feet and no more than 30 feet from the edge of crosswalks.
- For enhanced crossing treatments, refer to the section of this guide addressing Rectangular Rapid Flashing Beacons and Pedestrian Hybrid Beacons.
- Crosswalks should be oriented perpendicular to streets, minimizing crossing distances and therefore limiting the time that pedestrians are exposed to motor vehicles and other roadway users.

Figure 21: Crosswalks with ladder striping pattern



References

NACTO Urban Street Design Guide (2013)

ADA Accessibility Guidelines (2004)

Manual on Uniform Traffic Control Devices (2009)

Proposed Accessibility Guidelines for Pedestrian Facilities in the Public Right-of-Way (PROWAG) (2011)

Guide for Improving Pedestrian Safety at Uncontrolled Crossing Locations (2018)

Curb Extensions

Curb extensions, also known as neck downs, bulb-outs, or bump-outs, are created by extending the sidewalk at corners or mid-block. Curb extensions are intended to increase safety, calm traffic, and provide extra space along sidewalks for users and amenities. In addition to shortening crossing distances, curb extensions can be used to change the geometry of intersections resulting in smaller corner radii and slowing turning motor vehicles.

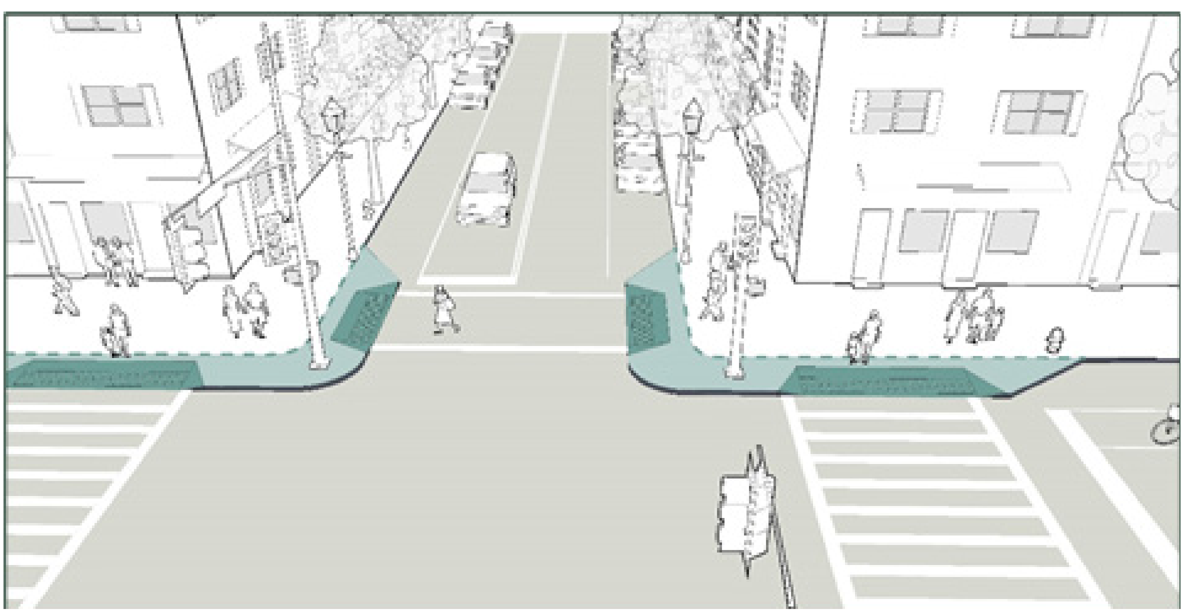
Considerations

- The turning needs of emergency and larger vehicles should be considered in curb extension design.
- Care should be taken to maintain direct routes across intersections by aligning pedestrian desire lines on either side of the sidewalk. Curb extensions often make this possible as they provide extra space for grade transitions.
- Consider providing a 20 feet long curb extension to restrict parking within 20 feet of an intersection to enhance visibility.
- When curb extensions conflict with turning movements, reducing the width and/or length of the curb extension should be prioritized over elimination.
- Emergency access is often improved through the use of curb extensions because intersections are kept clear of parked cars.

Guidance

- Curb extensions should be considered only where parking is present or where motor vehicle traffic deflection is provided through other curbside uses such as bikeshare stations or parklets.
- Curb extensions are particularly valuable in locations with high volumes of pedestrian traffic, near schools, at unsignalized pedestrian crossings, or where there are demonstrated pedestrian safety issues.
- A typical curb extension extends approximately the width of a parked car (or about 6 feet from the curb).
- The minimum length of a curb extension is the width of the crosswalk, allowing the curvature of the curb extension to start after the crosswalk, which should deter parking; NO STOPPING signs should also be used to discourage parking. The length of a curb extension can vary depending on the intended use (i.e., stormwater management, transit stop waiting areas, parking restrictions).
- Curb extensions should not reduce a travel lane or a bicycle lane to an unsafe width.

Figure 22: Curbs extensions



References

AASHTO Guide for the Development of Bicycle Facilities (2012)

NACTO Urban Street Design Guide (2013) - Curb Extensions

Median Refuge Islands

Median refuge or crossing islands are raised islands that provide a pedestrian refuge and allow multi-stage crossings of wide streets. They can be located mid-block or at intersections and along the centerline of a street, as roundabout splitter islands, or as “pork chop” islands where right-turn slip lanes are present.

Considerations

- There are two primary types of median refuge islands. The first type provides a cut-through of the island, keeping pedestrians at street-grade. The second type ramps pedestrians up above street grade and may present challenges to constructing accessible curb ramps unless they are more than 17 feet wide (accommodating for ramp width and landing area).
- Crossing islands should be considered where crossing distances are greater than 50 feet. For long distances, islands can allow multi-stage crossings, which in turn allow shorter signal phases.
- Crossing islands can be coupled with other traffic calming features, such as partial diverters and curb extensions at mid-block and intersection locations.
- At mid-block crossings where width is available, islands should be designed with a stagger, or in a “Z” pattern, encouraging pedestrians within the median to face oncoming traffic before crossing.

Guidance

- Minimum width: 6 feet
- Preferred Width: 10 feet (to accommodate bicyclists with trailers and wheelchair users)
- Cut-through openings should equal the width of the crosswalk. Cut-throughs may be wider in order to allow the clearing of debris but should not encourage motor vehicles to use the space for U-turns.
- Curb ramps with truncated dome detectable warnings and 5-foot by 5-foot landing areas are required when the pedestrians are taken above the street level.
- A “nose” that extends past the crosswalk is not required, but is recommended to protect people waiting on the crossing island and to slow turning drivers.
- Vegetation and other aesthetic treatments may be incorporated, but must not obscure visibility.

Figure 23: Intersection Crossing Islands

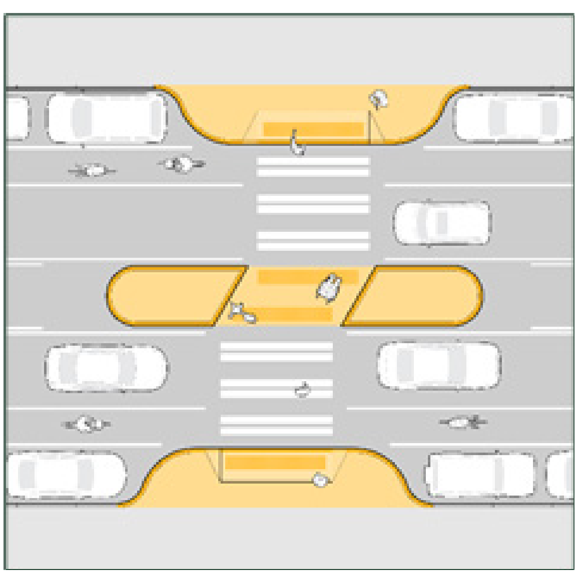
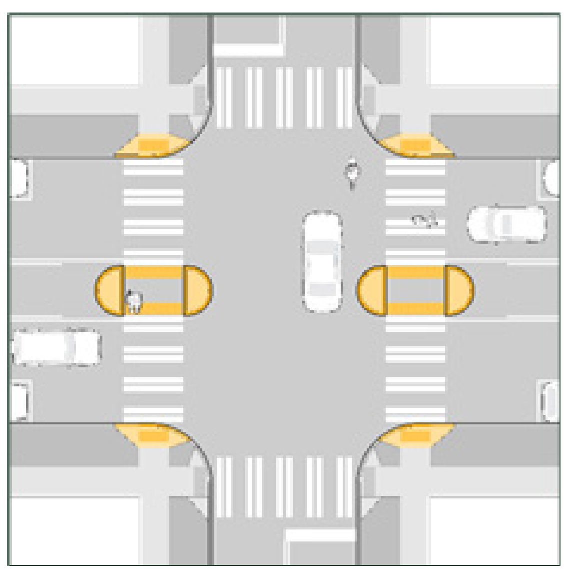


Figure 24: Mid-block Crossing Island with Curb Extensions



References

NACTO Urban Street Design Guide (2013)

Manual on Uniform Traffic Control Devices (2009)

Pedestrian Signals and Leading Pedestrian Intervals

Pedestrian signal heads display the three intervals of the pedestrian phase: (1) The Walk Interval, signified by the WALK indication (or the walking person symbol) alerts pedestrians to begin crossing the street. (2) The Pedestrian Change Interval, signified by the flashing DON'T WALK indication (or the flashing hand symbol and countdown display) alerts pedestrians approaching the crosswalk that they should not begin crossing the street. (3) The Don't Walk Interval, signified by a steady DON'T WALK indication (or the steady upraised hand symbol) alerts pedestrians that they should not cross the street.

Considerations

A primary challenge for traffic signal design is minimizing conflicts between motor vehicle and pedestrian movements. Intersection geometry and traffic controls should encourage turning vehicles to yield the right-of-way to pedestrians. Traffic movements should be analyzed to implement WALK intervals during non-conflicting phases.

Signal design should also minimize the time that pedestrians must wait. Requiring pedestrians to wait for extended periods can encourage crossing against the signal. The 2010 Highway Capacity Manual states that pedestrians have an increased likelihood of risk-taking behavior (crossing against the signal) after waiting longer than 30 seconds.

Free-flowing right-turn lanes are discouraged at signalized intersections. Where they are present and unsignalized, the pedestrian signal and pushbutton should be located on the channelization ("pork chop") island and a yield or crosswalk warning sign should be placed in advance of the crosswalk.

Guidance: Timing and Activation

- Pedestrian signals should allocate enough time for pedestrians of all abilities to safely cross the roadway. The MUTCD specifies a pedestrian walking speed of 3.5 feet per second to account for an aging population.
- Countdown pedestrian displays inform pedestrians of the amount of time in seconds that is available to safely cross during the flashing DON'T WALK (or upraised hand) interval. All pedestrian signal heads should contain a countdown display provided with the DON'T WALK (or upraised hand) indication.
- In areas with higher pedestrian activity, such as near transit stations, Main Streets, and school zones, push button actuators may not be appropriate. People should expect to get a pedestrian cycle at every signal phase, rather than having to push a button to call for a pedestrian phase.

Figure 25: Pedestrian signal

References

FHWA. Manual on Uniform Traffic Control Devices. 2009.

NACTO. Urban Street Design Guide. 2013.

Guidance: Leading Pedestrian Interval (LPI)

The Leading Pedestrian Interval initiates the pedestrian WALK indication three to seven seconds before motor vehicles traveling in the same direction are given the green indication. This signal timing technique allows pedestrians to enter the intersection prior to turning vehicles, increasing visibility between all roadway users.

- The LPI should be used at intersections with high volumes of pedestrians and conflicting turning vehicles, and at locations with a large population of elderly or school children who tend to walk slower.
- A lagging protected left arrow for vehicles should be provided to accommodate the LPI.
- If an intersection has particularly high pedestrian traffic, consider lengthening the leading pedestrian interval or adding an exclusive pedestrian phase instead of a leading pedestrian interval.
- If an intersection has such high pedestrian volumes that motorists are unable to turn across the crosswalk, the green interval for the parallel concurrent vehicle traffic can be set to extend beyond the pedestrian interval to provide turning drivers with sufficient green time to make their turns.
- The LPI should be accompanied by an audible noise to inform visually-impaired pedestrians that it is safe to cross.
- LPIs may be less effective when used at intersections without right-turn-on-red restrictions.

Guidance: Protected Signal Phasing

Protected phases at intersections provide a way to separate vehicular traffic from pedestrian and/or bicyclist movements, particularly for left-turns when concurrent phasing would result in a conflict with crossing pedestrians and left-turning vehicles and right-turns when concurrent phasing would result in a conflict with through bicyclists or crossing pedestrians and right-turning vehicles.

Signal timing decisions should consider the needs of pedestrians, bicyclists, trucks, buses, and other motor vehicles.

Protected signal phasing may be appropriate at the following locations:

- Urban areas, particularly downtown locations.
- Intersections with a history of left- or right-hook crashes with pedestrians (or bicyclists).
- Intersections with high volumes of pedestrians (or bicyclists) and turning vehicles.

Pedestrian Hybrid Beacons (PHB)

Pedestrian Hybrid Beacons, including the High-intensity Activated Crosswalk Beacon (HAWK), are a type of hybrid signal intended to allow pedestrians and bicyclists to stop traffic to cross high-volume arterial streets. This type of signal may be used in lieu of a full signal that meets any of the traffic signal control warrants in the MUTCD. To help evaluate marked crosswalk candidates with a PHB refer to the City of Clovis Memorandum on Guidance for Uncontrolled Crosswalk Treatments (2016). It may also be used at locations which do not meet traffic signal warrants but where assistance is needed for pedestrians or bicyclists to cross a high-volume arterial street.

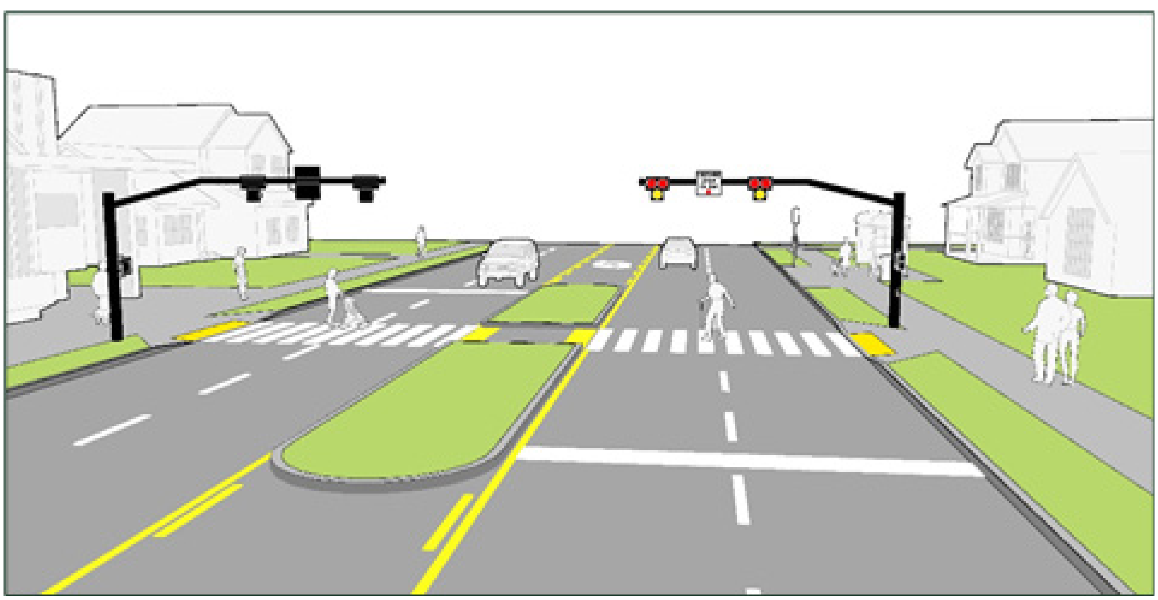
Considerations

- While this type of device is intended for pedestrians, it can be beneficial to retrofit it for bicyclists as several cities have done, using bicycle detection and bicycle signal heads on major cycling networks. Depending upon the detection design, the agency implementing these devices may have the option to provide different clearance intervals for bicyclists and pedestrians. The provision of bicycle signal heads would require permission to experiment from FHWA.

Guidance

- The MUTCD recommends minimum volumes of 20 pedestrians or bicyclists an hour for major arterial crossings (volumes exceeding 2,000 vehicles/hour).
- This type of device should be considered for all arterial crossings in a bicycle network and for path crossings if other engineering measures are found inadequate to create safe crossings.
- Pushbutton actuators should be "hot" (respond immediately when pressed), be placed in convenient locations for all users, and abide by other ADA standards. Passive signal activation, such as video or infrared detection, may also be considered.
- See FHWA's Guide for Improving Pedestrian Safety at Uncontrolled Crossing Locations publication and the Manual of Uniform Traffic Control Devices to determine warrants for traffic control at midblock crossings.

Figure 26: Pedestrian Hybrid Beacon



References

NACTO Urban Street Design Guide (2013)

Manual on Uniform Traffic Control Devices (2009)

FHWA Guide for Improving Pedestrian Safety at Uncontrolled Crossing Locations (2018)

Rectangular Rapid Flashing Beacons (RRFB)

At some uncontrolled crossings, particularly those with four or more lanes, it can be difficult to achieve compliance with laws that require motorists to yield to pedestrians. Vehicle speeds and poor pedestrian visibility combine to create conditions in which very few drivers are compelled to yield. One type of device proven to be successful in improving yielding compliance at these locations is the Rectangular Rapid Flashing Beacon (RRFB). RRFBs combine a pedestrian crossing sign with a bright flashing beacon that is activated only when a pedestrian is present. To help evaluate marked crosswalk candidates with a RRFB refer to the City of Clovis Memorandum on Guidance for Uncontrolled Crosswalk Treatments (2016).

Considerations

RRFBs are considerably less expensive to install than mast arm-mounted signals. They can also be installed with solar power panels to eliminate the need for an external power source.

RRFBs should be limited to locations with critical safety concerns, and should not be installed in locations with sight distance constraints that limit the driver's ability to view pedestrians on the approach to the crosswalk.

RRFBs should be used in conjunction with advance stop bars and signs.

RRFBs are usually implemented at high-volume pedestrian crossings, but may also be considered for priority bicycle route crossings or locations where bike facilities cross roads at mid-block locations.

Guidance

- The design of RRFBs should be in accordance with FHWA's Interim Approval 11 (IA-11) for Optional Use of Rectangular Rapid Flashing Beacons issued July 16, 2008 and the Interpretation Letter 4(09)-41 (I) - Additional Flash Pattern for RRFBs issued July 25, 2014.
- RRFBs can be used when a signal is not warranted at an unsignalized crossing. They are not appropriate at intersections with signals or STOP signs.
- RRFBs are installed on both sides of the roadway at the edge of the crosswalk. If there is a pedestrian refuge or other type of median, an additional beacon should be installed in the median.
- See FHWA's Guide for Improving Pedestrian Safety at Uncontrolled Crossing Locations publication and the Manual of Uniform Traffic Control Devices to determine warrants for traffic control at midblock crossings.

Figure 27: Rectangular Rapid Flashing Beacon (RRFB)

References

NACTO Urban Street Design Guide (2013)

Manual on Uniform Traffic Control Devices (2009)

FHWA Guide for Improving Pedestrian Safety at Uncontrolled Crossing Locations (2018)

In-Street Pedestrian Crossing Signs

In-street pedestrian crossing signs (MUTCD R-16) are a low-cost sign treatment which can be used to encourage slower driving speeds and increase the likelihood that drivers will yield to pedestrians crossing the street. The sign may be placed on lane lines or in the gutter of the roadway by the curb. The placement of two or more signs at one crossing is referred to as a gateway treatment and requires motorists to drive between the signs. Gateway treatments have been shown to increase motorist awareness of the crossing, reduce approach speeds, and to improve yielding rates.

Considerations

- Recommended for use in combination with high-visibility crosswalk markings, and curb ramps. May also be combined with curb extensions, crossing islands, warning signs (MUTCD W11-1, W11-2, W11-15, or S1-1), and lighting.
- On multilane approaches, advance yield/stop lines and Stop Here for Pedestrians or Yield Here to Pedestrians signs (MUTCD R1-5 series) are recommended.
- The narrower the gap between the signs, the more effective the gateway treatment.
- A rubberized curb sign base may increase the longevity of the device.

Guidance

- Applicable at uncontrolled crossings on roads with speed limits of 30 miles per hour or less.
- Applicable at uncontrolled crossings on roads with speed limits of 35 miles per hour with average annual daily traffic levels below 12,000.
- The signs should be placed on both sides of all travel lanes.
- The signs may be located on a center line, a median or crossing island, on a lane line, within a gutter, or near the curb at the edge of the street to create the gateway effect.
- The signs should be placed at the crosswalk, but neither the sign nor the sign base should be within the crosswalk or on the crosswalk lines.

Figure 28: Crossing Sign

References

Transportation Research Board Guidance to Improve Pedestrian and Bicyclist Safety at Intersections (2020)

Raised Crossings

Vertical traffic calming treatments such as speed tables and raised crosswalks compel motorists to slow their speeds which improves safety and comfort for pedestrians and bicyclists. Raised crosswalks are created by raising the crossing to the level of the sidewalk. Raised crosswalks are speed tables, or trapezoid-shaped speed humps with a marked crosswalk across the top of the table. These treatments provide an array of benefits especially for people with mobility and visual impairments because there are no vertical transitions to navigate. The following is best practice guidance for raised crosswalks.

Considerations

- Consider using raised crosswalks and speed tables at intersections to slow traffic turning onto a traffic-calmed street from a major street.
- Raised crossings and speed tables are appropriate in areas of high pedestrian demand, including commercial and shopping districts, campuses, and school zones. They should also be considered at locations where pedestrian visibility and motorist yielding have been identified as issues.
- Raised crossings and speed tables are particularly valuable at unsignalized mid-block locations, where drivers are less likely to expect or yield to pedestrians.
- Raised crossings can be provided along side streets of major thoroughfares to slow traffic exiting the main street.
- Raised crossings should provide pavement markings for motorists and appropriate signage at crosswalks per the MUTCD.
- Raised crossings and speed tables may not be appropriate for high-speed roadways. Vehicle speeds, volumes, and the types of vehicles using the roadways are also factors to consider when implementing raised crossings.

Guidance

- Raised crossings require detectable warnings for the visually impaired at the curb line to indicate where the roadway begins.
- High-visibility or textured paving materials can be used to enhance the contrast between the raised crossing or intersection and the surrounding roadway.
- Raised crossings can be used as gateway treatments to signal to drivers when there are transitions to a slower speed environment that is more pedestrian-oriented.
- Designs should be carefully thought out to ensure proper drainage. Raised intersections can simplify drainage inlet placement by directing water away from the intersection. If the intersecting streets are sloped, catch basins should be placed on the high side of the intersection at the base of the ramp.
- Design speeds and emergency vehicle routes must be considered when designing approach ramps.

References

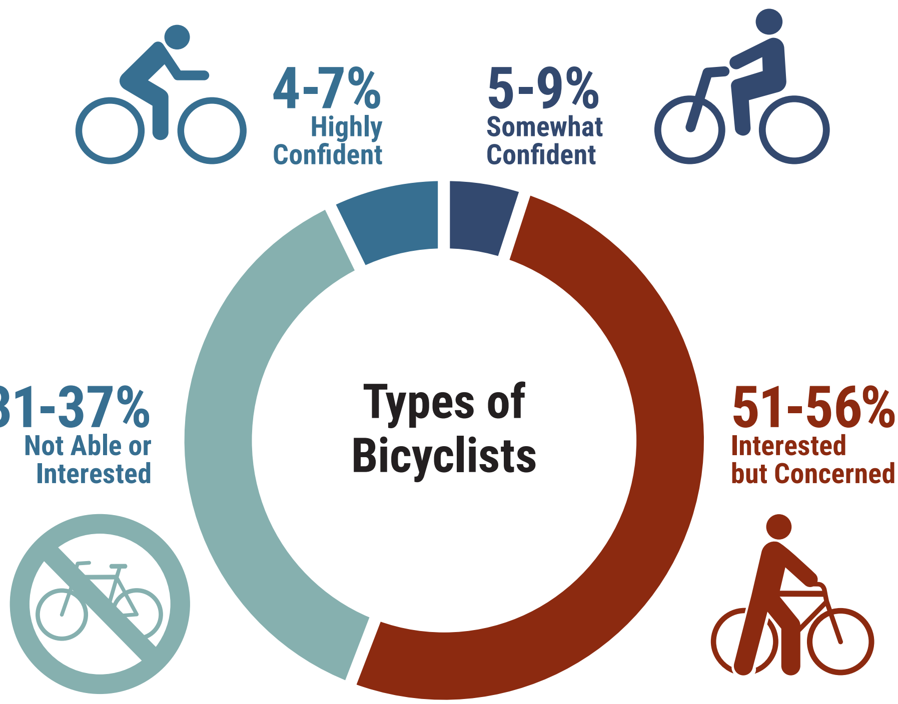
NACTO. Urban Bikeway Design Guide. 2014.

NACTO. Urban Street Design Guide. 2013.

Bicycle facility selection guidance

Potential Bicycle Users

The figure below illustrates a typical range of bicyclists. Estimates show the greatest percentage of the population—over half—fall into the “Interested but Concerned” category. The “Interested but Concerned” are most comfortable biking when separated from motorized vehicles. On the other end of the spectrum, “Highly Confident” people are comfortable sharing the road with motorized vehicles. In the middle, “Somewhat Confident” people are comfortable biking for short distances with motorized vehicles.



Highly Confident bicyclist will ride in any road conditions or environment. These types of bicyclists include adults who regularly commute by bicycle and bicyclists who are willing to ride on roads with little to no dedicated bicycle infrastructure.

Somewhat Confident bicyclists will ride comfortably on most types of streets, but may be uncomfortable in certain situations or road conditions.

People who identify as **Not Able or Interested** will not (or cannot) ride a bicycle. No matter the circumstances.

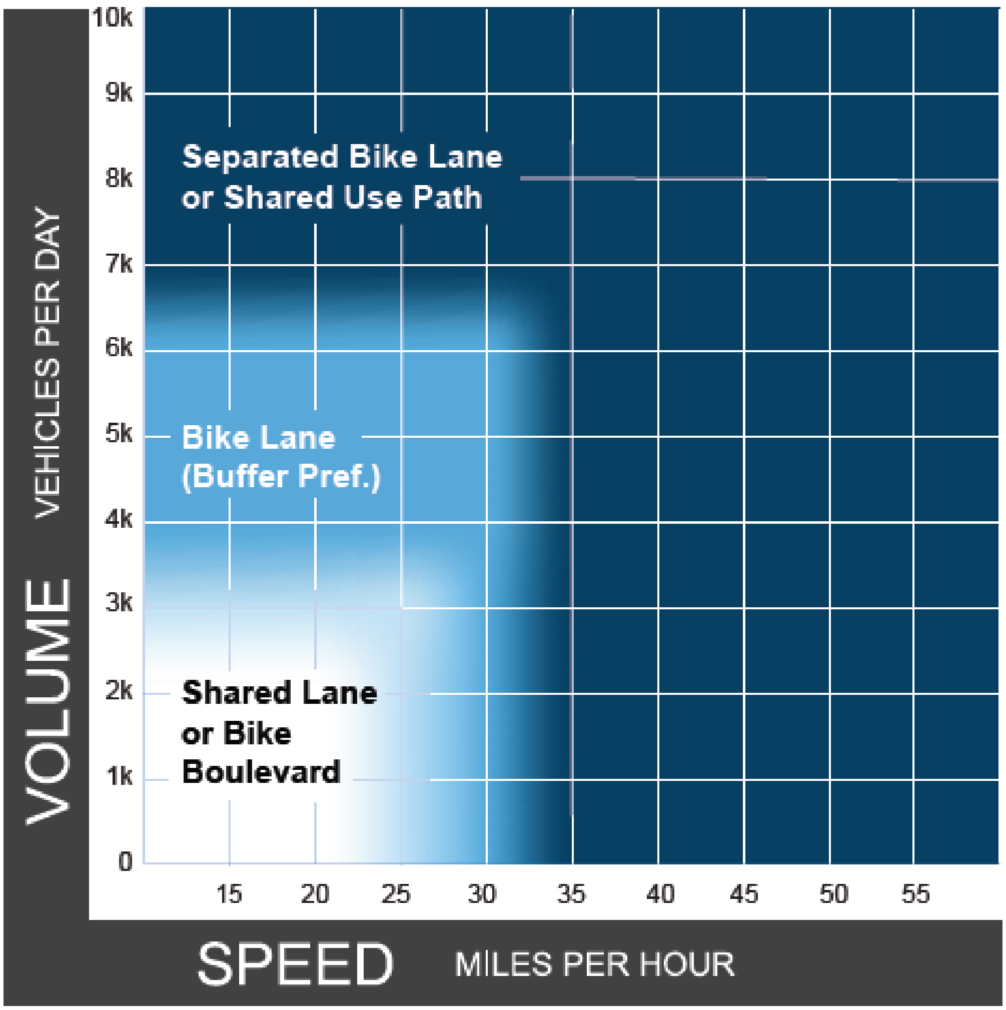
Interested but Concerned bicyclists require physical bicyle infrastructure improvements before they will want to ride. They typically do not feel comfortable sharing the lane with motor vehicles or riding adjacent to high-speed and high-volume traffic. This group represent the largest segment of the population and typically includes children, the elderly, and non-regular adult bicyclists. These types of riders prefer off-street bicycle facilities or bicycling on low-speed low-volume streets.

Source: Dill, Jennifer and McNeil, Nathan, Revisiting the Four Types of Cyclists: Findings from a National Survey, Transportation Research Record: Journal of the Transportation Research Board, January 12, 2016.

Facility Selection

The facility selection chart below can be used to guide decisions about which bikeway to install based on motor vehicle speed and traffic volumes. This chart is applicable for urban and suburban contexts. It was developed with the needs of "interested but concerned" bicyclists in mind.

"Interested but concerned" bicyclists prefer physical separation as traffic volumes and speeds increase. The bikeway facility selection chart below identifies bikeway facilities that improve operating environment for this bicyclist type at different roadway speeds and traffic volumes. Many "highly confident" bicyclists will also prefer bikeway treatments noted in this chart. Selecting facility types based on this chart is recommended in order to serve the largest share of the population and increase bicycling in the community.



Notes

1 *Chart assumes operating speeds are similar to posted speeds. If they differ, use operating speed rather than posted speed.*

2 *Advisory bike lanes may be an option where traffic volume is <3K ADT.*

Source: Bikeway Selection Guide, Federal Highway Administration, 2019

Bicycle facility overview

Shared-Use Paths and Trails (Class 1)

Shared-use paths can generally be considered on any road with one or more of the following characteristics:

- Total traffic lanes: 3 lanes or more
- Posted speed limit: 30 miles per hour or higher
- Average Daily Traffic: 9,000 vehicles or more
- Parking turnover: frequent
- Bike lane obstruction: likely to be frequent
- Streets that are designated as truck or bus routes

Shared-use paths may be preferable to separated bike lanes in low density areas where pedestrian volumes are anticipated to be fewer than 200 people per hour on the path.

Separated Bike Lane (Class 4)

Separated bike lanes can generally be considered on any road with one or more of the following characteristics:

- Total traffic lanes: 3 lanes or more
- Posted speed limit: 30 miles per hour or higher
- Average Daily Traffic: 9,000 vehicles or more
- Parking turnover: frequent
- Bike lane obstruction: likely to be frequent
- Streets that are designated as truck or bus routes

Preferred in higher density areas, adjacent to commercial and mixed-use development, and near major transit stations or locations where observed or anticipated pedestrian volumes will be higher.

Buffered Bike Lane (Class 2)

Buffered bike lanes can generally be considered on any road with one or more of the following characteristics:

- Total traffic lanes: 3 lanes or fewer
- Posted speed limit: 30 miles per hour or lower
- Average Daily Traffic: up to 9,000 vehicles
- Parking turnover: infrequent.
- Bike lane obstruction: likely to be infrequent
- Where a separated bike lane or shared-use path is infeasible or not desirable due to cost, lack of public support, etc.
- Buffer may be located on the parking lane side of the bike lane, the travel lane side of the bike lane, or on both sides of the bike lane.

Bike Lane (Class 2)

- Conventional bike lanes can generally be considered on any road with one or more of the following characteristics:
- Total traffic lanes: 3 lanes or fewer
- Posted speed limit: 30 miles per hour or lower
- Average Daily Traffic: up to 7,500 vehicles
- Parking turnover: infrequent
- Bike lane obstruction: likely to be infrequent
- Where a separated bike lane or shared-use path is infeasible or not desirable

Shoulder Bikeway (Class 3)

Shoulder bike lanes can generally be considered on any road without on-street parking and one or more of the following characteristics:

- Total traffic lanes: 3 lanes or fewer
- Average Daily Traffic: up to 7,500 vehicles
- Shoulder obstruction: likely to be infrequent
- Where a separated bike lane or shared-use path is infeasible or not desirable

The minimum width of a shoulder bikeway is 4 feet (exclusive of the gutter if one exists). Wider shoulders should be provided on streets or roads with average daily traffic higher than 3,500 vehicles. To increase comfort on Class III bike route shoulders, rumble strips should be placed between the shoulder and the adjacent travel lane, and minimum widths should follow the Federal Small Town and Rural Multimodal Networks guidance.[21]

Shared Roadway (Class 3)

Shared roadways can be considered on any road with one or more of the following characteristics:

- Total traffic lanes: 3 lanes or fewer
- Posted speed limit: 25 miles per hour or lower

[21] https://www.fhwa.dot.gov/environment/bicycle_pedestrian/publications/small_towns/fhwahep17024_lg.pdf

- Average Daily Traffic: Up to 3,000 vehicles
- Where a separated bike lane or shared-use path is infeasible or not desirable

Class 1: Shared-Use Paths and Trails

A shared use-path is a two-way facility that is physically separated from motor vehicle traffic and used by bicyclists, pedestrians, and other non-motorized users. Shared-use paths, also referred to as trails, are often located in an independent alignment, such as a greenbelt or abandoned railroad right-of-way. Shared-use paths may make up a network or system of routes designed specifically for off-street travel and are used for recreation, leisure, and commuting trips.

Considerations

- Shared-use paths should not be used to preclude on-street bicycle facilities, but rather to supplement a network of on-street bikeways. In some situations it may be appropriate to provide an on-street bikeway in addition to a shared-use path along the same roadway.
- Shared-use paths make up a network or system of routes designed specifically for off-street travel.
- These paths are located along waterways, within parks and open spaces, along roadways, and through easements and rights-of-way for utilities.
- Shared-use paths are appropriate when an on-street route may be too dangerous due to traffic volumes and speeds, to provide a direct route between points of interest, or when the majority of users are recreational or leisure users, 'interested but concerned' users, or users with a slower travel speed, such as children or older adults.

Guidance

- Shared-use paths typically have a lower design speed for bicyclists than on-street facilities and may not provide appropriate accommodation for more confident bicyclists who desire to travel at greater speeds. In addition, greater numbers of driveways or intersections along a sidepath corridor can decrease bicycle travel speeds and traffic signals can increase delay for bicyclists on shared-use paths compared to cyclists using in-street bicycle facilities such as bike lanes. Therefore, paths should not be considered a substitute to accommodating more confident bicyclists within the roadway.
- Conflicts between path users and motor vehicles at intersections and driveways can be reduced by minimizing the number of driveway and street crossings present along a path, selecting alignments with fewer crossings, and otherwise providing high-visibility crossing treatments. In areas with high concentrations of driveways and intersections, on-street accommodations (including bike lanes and separated bike lanes) are likely to be safer.
- Lighting should be provided at path/roadway intersections at a minimum and at other locations where personal security may be an issue or where nighttime use is likely to be high.

Figure 29: Shared-use path

References

AASHTO Guide for the Development of Bicycle Facilities (2012)

FHWA Shared Use Path Level of Service Calculator (2006)

Shared-Use Paths and Trails: Separation

Considerations

- Trails with high use may require pedestrians and bicyclists to be separated.
- Trails on steep grades (3 to 5 percent) should be wider to account for higher bicycle speed in the downhill direction and additional space for faster bicyclists to pass slower bicyclists and pedestrians in the uphill direction.
- On sections with long steep grades, provide periodic sections with a flat grade to permit users to stop and rest.
- Consider providing amenities such as restrooms, bike racks, and potable water at trailheads, and covered rest stops along the trail to ensure that paths are welcoming to a variety of user types, including families with children and older adults.
- Consider providing maps and signs to improve wayfinding for users, such as signs that show trail names, connections to nearby trails, and/or nearby destinations.

Minimizing user conflicts

- Vertical objects close to the path edge can endanger users and reduce the comfortable usable width of the path. Vertical objects should be set back at least 3 feet from the edge of the path, for a height of 8 feet.
- 3 foot wide (minimum) shoulders provide space for users who step off the path to rest or to allow users to pass one another.
- Include signage that dictates yielding responsibilities to reduce conflict between different types of trail users.
- The most applicable design guidance for shared-use path design at intersections is the Dutch CROW Manual. Its guidelines recommend 16-23 feet of setback from the curbline of the parallel road, with the path offset bend beginning at least 115 feet from the intersection with curve radii at least 39 feet (which serves to slow bicyclists). These recommendations are for intersections between arterial roads and collector/local roads. For intersections between two arterial roads, the crossings should be closer to the intersection and bicycle-specific signal heads should be used.

Figure 30: Two-way shared use path with mixed users

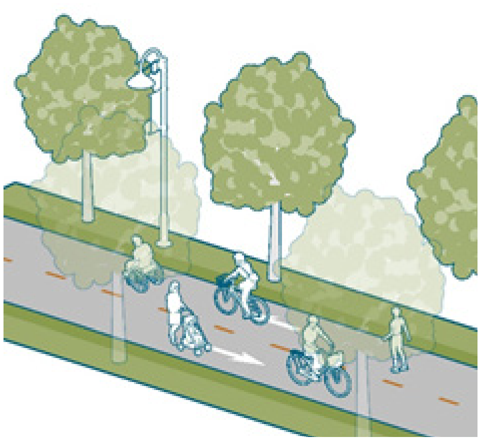
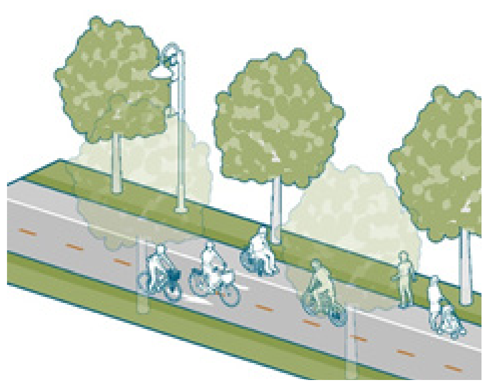


Figure 31: Two-way shared use path with separated users



References

FHWA Shared Use Path Level of Service Calculator (2006)

Manual on Uniform Traffic Control Devices (2009)

Class 2: Bicycle Lane

Bicycle lanes provide an exclusive space for bicyclists in the roadway. Bicycle lanes are established through the use of lines and symbols on the roadway surface. Bicycle lanes are for one-way travel and are normally provided in both directions on two-way streets and/or on one side of a one-way street. Bicyclists are not required to remain in a bicycle lane when traveling on a street and may leave the bicycle lane as necessary to make turns, pass other bicyclists, or to properly position themselves for other necessary movements. Bicycle lanes may only be used temporarily by vehicles accessing parking spaces and entering and exiting driveways and alleys.

Considerations

- Typically installed by reallocating existing street space.
- Can be used on one-way or two-way streets.
- Contra flow bicycle lanes may be used on short segments of streets that are designated for one-way motor vehicle travel to improve bicycle network connectivity. They are best suited on streets in more urban contexts with lower speeds and volumes.
- Stopping, standing, and parking in bike lanes is prohibited and may be problematic in areas of high parking demand and deliveries, especially in commercial areas.
- Wider bike lanes or buffered bike lanes are preferable at locations with high parking turnover.
- Bike lanes can be placed on the left side of one-way streets and some median-divided streets, resulting in fewer conflicts between bicyclists and motor vehicles, particularly on streets with heavy right-turn volumes, on-street parking, and/or frequent bus service.

Guidance

A The minimum width of a bike lane adjacent to a curb is 5 feet exclusive of a gutter (4 feet in highly constrained locations); a desirable width is 6 feet.

B The minimum width of a bike lane adjacent to parking is 5 feet; a desirable width is 6 feet.

C Optional parking T's or hatch marks can highlight the door zone on constrained corridors with high parking turnover to guide bicyclists away from motor vehicle doors.

Figure 34: Bike Lane Adjacent to a Curb

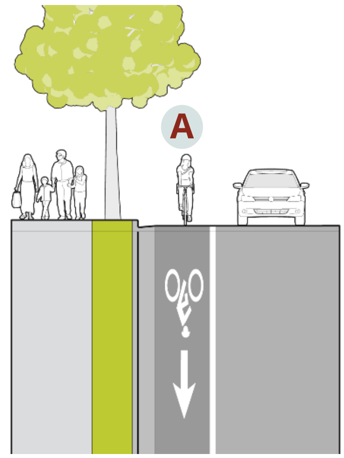


Figure 33: Bike Lane Adjacent to Parking

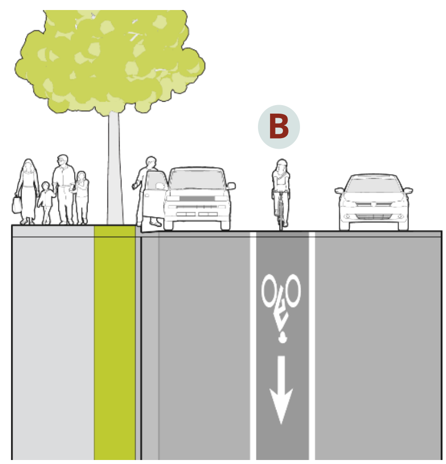
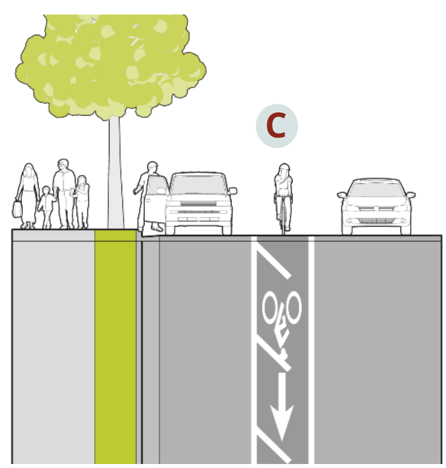


Figure 32: Bike Lane with Door Zone Marking



References

AASHTO Guide for the Development of Bicycle Facilities (2012)

NACTO Urban Bikeway Design Guide (2014)

Class 2: Buffered Bicycle Lane

Buffered bike lanes are created by painting or otherwise creating a flush buffer zone between a bicycle lane and the adjacent travel lane. While buffers are typically used between bicycle lanes and motor vehicle travel lanes to increase bicyclists' comfort, they can also be provided between bicycle lanes and parking lanes in locations with high parking turnover to discourage bicyclists from riding too close to parked vehicles.

Considerations

- Preferable to a conventional bicycle lanes when used as a contra-flow bike lane on one-way streets.
- Typically installed by reallocating existing street space.
- Can be used on one-way or two-way streets.
- Consider placing buffer next to parking lane where there is commercial or metered parking.
- Consider placing buffer next to travel lane where speeds are 30 miles per hour or greater or when traffic volume exceeds 6,000 vehicles per day.
- Where there is 7 feet of roadway width available for a bicycle lane, a buffered bike lane should be installed instead of a conventional bike lane. The preferred configuration is a 5-foot or wider bike lane. **A** and an 18-inch or wider buffer. Typical buffer widths are 3 to 5 feet. **B**
- Buffered bike lanes allow bicyclists to ride side by side or to pass slower moving bicyclists.
- Research has documented buffered bicycle lanes increase the perception of safety.

Guidance

A The minimum width of a buffered bike lane adjacent to parking or a curb is 4 feet exclusive of gutter (if present); a desirable width is 6 feet.

B The minimum buffer width is 18 inches. There is no maximum width. Diagonal cross hatching should be used for buffers <3 feet in width. Chevron cross hatching should be used for buffers >3 feet in width.

C Buffers are to be broken where curbside parking is present to allow cars to cross the bike lane.

Figure 35: Buffered Bike Lane Adjacent to Curb

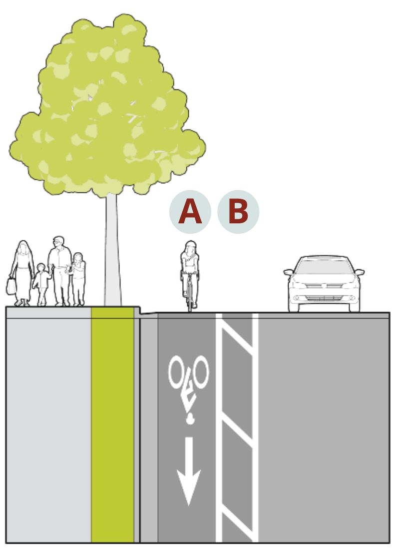
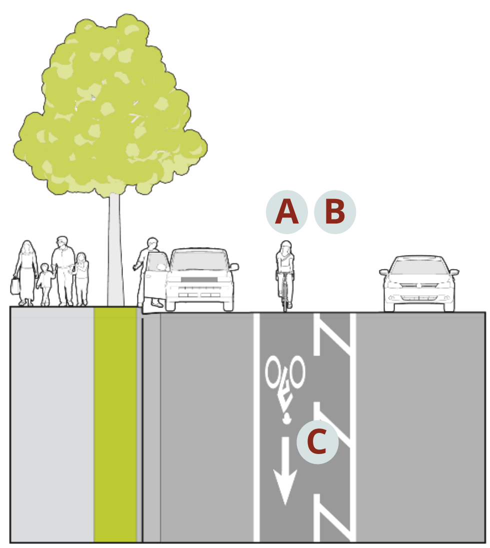


Figure 36: Buffered Bike Lane Adjacent to a Parking



References

AASHTO Guide for the Development of Bicycle Facilities (2012)

NACTO Urban Bikeway Design Guide (2014)

Evaluation of Innovative Bicycle Facilities: SW Broadway Cycle Track & SW Stark/Oak Street Buffered Bike Lanes. Final Report. (2011)

Class 3: Shared Roadway/ Bicycle Route

Shared lane markings (or "sharrows") are pavement markings that denote shared bicycle and motor vehicle travel lanes. These markings can be placed on streets to designate bike routes and to alert drivers to expect bicyclists in the travel lane. The markings are two chevrons positioned above a bicycle symbol, placed where the bicyclist is anticipated to operate. In general, this is a design solution that should only be used in locations with low traffic speeds and volumes as part of a signed route or bicycle boulevard. Bike Routes are sometimes used as a temporary solution on constrained, higher-traffic streets (up to 10,000 vehicles per day) until additional right-of-way can be acquired, but should not be considered a permanent solution in these contexts.

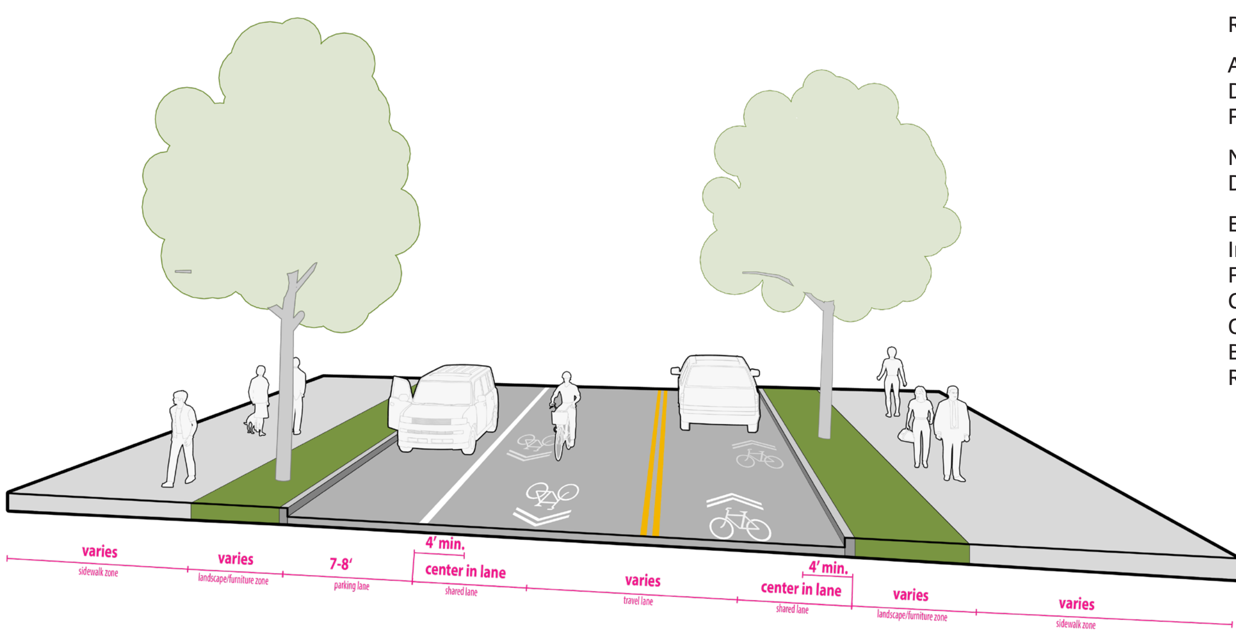
Considerations

- Typically used on local, collector, or minor arterial streets with low traffic volumes. Commonly used on bicycle boulevards to reinforce the priority for bicyclists.
- Typically feasible within existing right-of-way and pavement width even in constrained situations that preclude dedicated facilities.
- May be used as interim treatments to fill gaps between bike lanes or other dedicated facilities for short segments where there are space constraints.
- May be used for downhill bicycle travel in conjunction with climbing lanes intended for uphill travel.
- Typically supplemented by signs, especially Bikes May Use Full Lane (R4-11).

Guidance

- Intended for use only on streets with posted speed limits of up to 25 miles per hour and traffic volumes of less than 4,000 vehicles per day.
- May be used as a temporary solution on constrained streets with up to 10,000 vehicles per day until a more appropriate bikeway facility can be implemented.
- Intended for use on lanes up to 14 feet wide (up to 13 feet preferred). For lanes 15 feet wide or greater, stripe a 4-foot bike lane instead of using shared lane markings.
- The marking's centerline must be at least 4 feet from curb or edge of pavement where parking is prohibited.
- The marking's centerline must be at least 11 feet from curb where parking is permitted, so that it is outside the door zone of parked vehicles.
- For narrow lanes (11 feet or less), it may be desirable to center shared lane markings along the centerline of the outside travel lane.

Figure 37: Shared roadway



References

AASHTO Guide for the Development of Bicycle Facilities (2012)

NACTO Urban Bikeway Design Guide (2014)

Evaluation of Innovative Bicycle Facilities: SW Broadway Cycle Track & SW Stark/ Oak Street Buffered Bike Lanes. Final Report. (2011)

Class 3: Bicycle Boulevard

Bicycle boulevards are a variation of a shared roadway that incorporate traffic calming treatments and facilitate crossings of major streets with the primary goal of prioritizing bicycle through-travel, while discouraging motor vehicle traffic and maintaining relatively low motor vehicle speeds. These treatments are typically applied on quiet streets, often through residential neighborhoods. Treatments vary depending on context, but often include traffic diverters, speed attenuators such as speed humps or chicanes, pavement markings, and signs. Bicycle boulevards are also known as neighborhood greenways and neighborhood bikeways, among other locally-preferred terms.

Considerations

Many cities already have signed bike routes along neighborhood streets that provide an alternative to traveling on high-volume, high-speed arterials. Applying bicycle boulevard treatments to these routes makes them more suitable for bicyclists of all ages and abilities and can reduce crashes as well.

Stop signs or traffic signals should be placed along the bicycle boulevard in a way that prioritizes the bicycle movement, minimizing stops for bicyclists whenever possible.

Bicycle boulevard treatments include traffic calming measures such as street trees, traffic circles, chicanes, and speed humps. Traffic management devices such as diverters or semi-diverters can redirect cut-through vehicle traffic and reduce traffic volume while still enabling local access to the street.

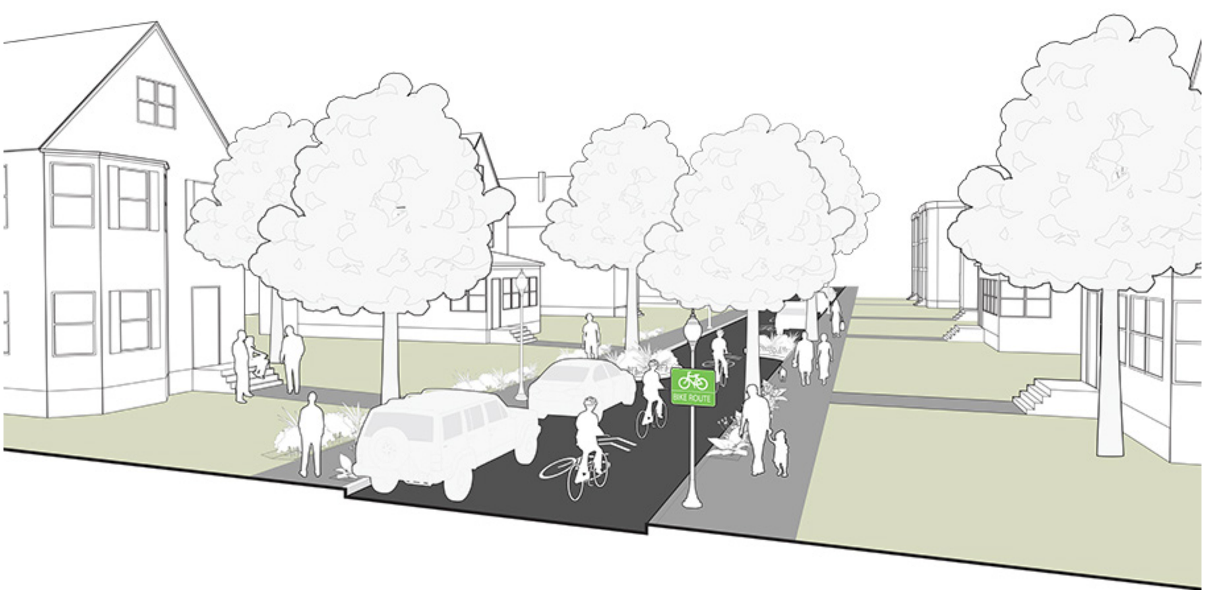
Communities can begin by implementing bicycle boulevard treatments on one pilot corridor to measure the impacts and gain community support. The pilot program should include before-and-after crash studies, motor vehicle counts, and bicyclist counts on both the bicycle boulevard and parallel streets. Findings from the pilot program can be used to justify bicycle boulevard treatments on other neighborhood streets.

Additional treatments for major street crossings may be needed, such as median refuge islands, rapid flashing beacons, bicycle signals, and pedestrian hybrid beacons or half signals.

Guidance

- Maximum Average Daily Traffic (ADT): 3,000
- Preferred ADT: Up to 1,000
- Target speeds for motor vehicle traffic are typically around 20 miles per hour; there should be a maximum 15 miles per hour speed differential between bicyclists and vehicles.

Figure 38: Bicycle boulevard



References

AASHTO Guide for the Development of Bicycle Facilities (2012)

NACTO Urban Bikeway Design Guide (2012)

Manual on Uniform Traffic Control Devices (2009)

Fundamentals of Bicycle Boulevard Planning & Design (2009)

Class 4: Separated Bike Lane

Separated Bike Lanes (also known as protected bike lanes or cycletracks) are an exclusive bikeway facility type that combines the user experience of a path with the on-street infrastructure of a conventional bike lane. They are physically separated from motor vehicle traffic and distinct from the sidewalk. Separated Bike Lanes are more attractive to a wider range of bicyclists than striped bikeways on higher volume and higher speed roads. They eliminate the risk of a bicyclist being hit by an opening car door and prevent motor vehicles from driving, stopping or waiting in the bikeway. They also provide greater comfort to pedestrians by separating them from bicyclists operating at higher speeds.

Considerations

Separated bike lanes can provide different levels of separation:

- Separated bike lanes with flexible delineator posts (“flex posts”) alone offer the least separation from traffic and are appropriate as an interim solution.
- Separated bike lanes that are raised with a wider buffer from traffic provide the greatest level of separation from traffic, but will often require road reconstruction.
- Separated bike lanes that are protected from traffic by a row of on-street parking offer a high degree of separation.

In constrained environments, reductions should be made to the street and vehicle space before narrowing sidewalks and other spaces allocated to pedestrians. This reduction can include decreasing the number of travel lanes, narrowing existing lanes or adjusting on-street parking.

Sidewalk-level bike lanes:

- May encourage pedestrian and bicyclist encroachment unless discouraged with a continuous sidewalk buffer.
- Requires no transition for raised bicycle crossings at driveways, alleys or streets.
- May provide level landing areas for parking, loading or bus stops along the street buffer.
- May reduce maintenance needs by prohibiting debris build up from roadway runoff.

Figure 39: Two way separated bike lanes

References

AASHTO Guide for the Development of Bicycle Facilities (2012)

NACTO Urban Bikeway Design Guide (2014)

MassDOT Separated Bike Lane Planning and Design Guide (2015)

FHWA Separated Bike Lane Planning and Design Guide (2015)

Intermediate-level bike lanes:

- Preserve separation between bicyclists and pedestrians where sidewalk buffers are eliminated.
- Ensures a detectable edge is provided for people with vision disabilities.
- May reduce maintenance needs by prohibiting debris build up from roadway runoff.
- May require careful consideration of drainage design and in some cases may require catch basins to manage bike lane runoff.

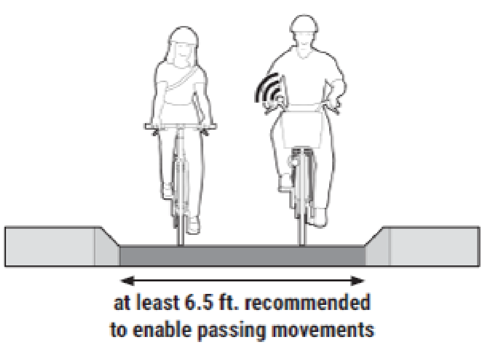
Street-level bike lanes:

- Preserve separation between bicyclists and pedestrians where sidewalk buffers are eliminated.
- Ensures a detectable edge is provided for people with vision disabilities.
- May increase maintenance needs to remove debris from roadway runoff unless street buffer is raised.
- May require careful consideration of drainage design and in some cases may require catch basins to manage bike lane runoff.

Guidance

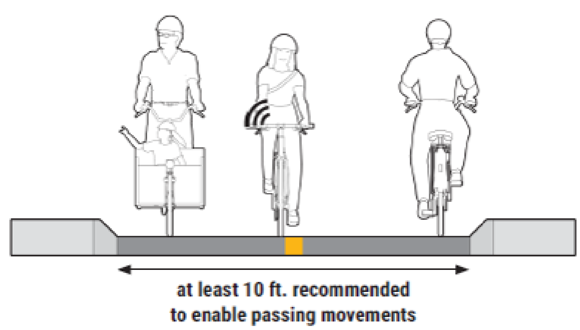
The recommended minimum width of a one-way separated bicycle lane is shown in Figure 41. A constrained bicycle lane width of 4 feet (one-way only) may be used for short distances to navigate around transit stops, accessible parking spaces, or other obstacles. The recommended minimum width of a two-way separated bicycle lane is shown in Figure 42.

Figure 40: One-way separated bicycle lane widths



Same Direction Bicyclists/ Peak Hour	Bike Lane Width (ft.)	
	Rec.	Min.*
<150	6.5	5.0
150-750	8.0	6.5
>750	10.0	8.0

Figure 41: Two-way separated bicycle lane widths



Bidirectional Bicyclists/ Peak Hour	Bike Lane Width (ft.)	
	Rec.	Min.*
<150	10.0	8.0
150-400	11.0	10.0
>400	14.0	11.0

Separated Bike Lanes at Driveways

Most bicycle facilities will need to cross streets, driveways, or alleys at multiple locations along a corridor. At these locations, the crossings should be designed to 1) delineate a preferred path for people bicycling through the intersection with the driveway and 2) to encourage driver yielding behavior, where applicable. Bicycle crossings may be supplemented with green pavement, yield lines, and/or regulatory signs.

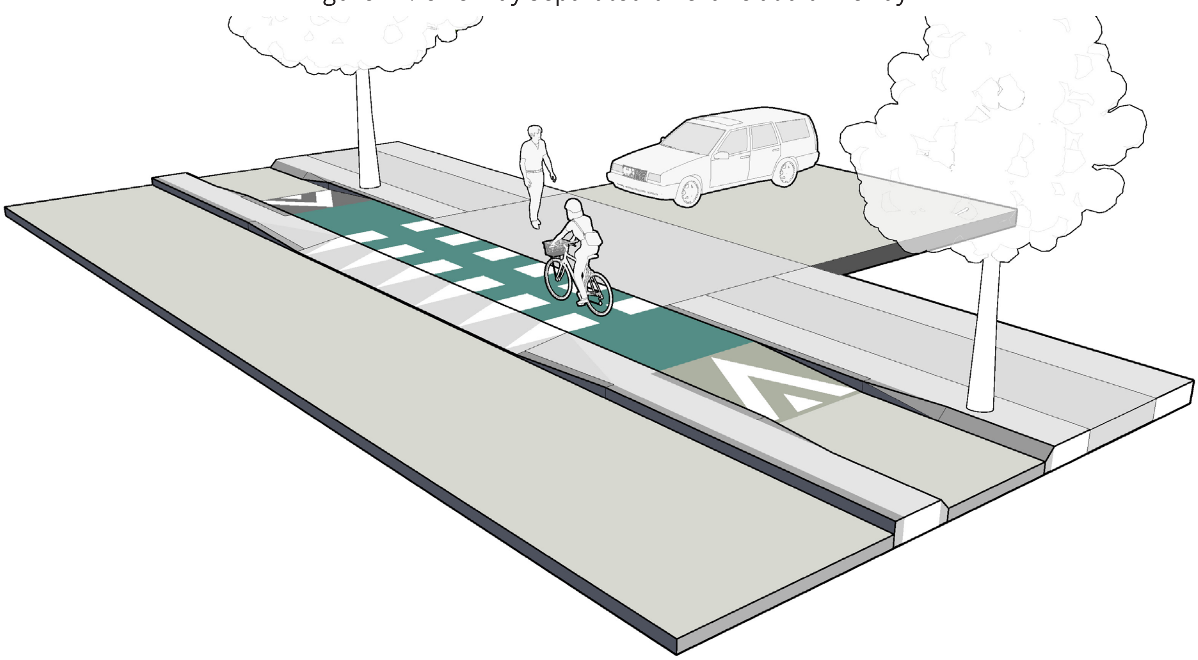
Considerations

- Supplemental yield lines, otherwise known as shark's teeth, can be used to indicate priority for people bicycling and may be used in advance of unsignalized crossings at driveways, at signalized intersections where motorists may turn across a bicycle crossing during a concurrent phase, and in advance of bicycle crossings located within roundabouts.
- Raised bicycle crossings further promote driver yielding behavior by slowing their speed before the crossing and increasing visibility of people bicycling.

Guidance

- The bicycle crossing may be bounded by 12-inch (perpendicular) and 24-inch (parallel) white pavement dashes, otherwise known as elephant's feet. Spacing for these markings should be coordinated with zebra, continental, or ladder striping of the adjacent crosswalk.
- The bicycle crossing should be at least 6 feet wide for one-way travel and at least 10 feet wide for two-way travel, as measured from the outer edge of the elephant's feet. Bicycle lane symbol markings should be avoided in bicycle crossings. Directional arrows are preferred within two-way bicycle crossings.
- Dashed green colored pavement may be utilized within the bicycle crossing to increase the conspicuity of the crossing where permitted conflicts occur. Green color may be desirable at crossings where concurrent vehicle crossing movements are allowed and where sight lines are constrained, or where motor vehicle turning speeds exceed 10 miles per hour.

Figure 42: One-way separated bike lane at a driveway



References

MassDOT Separated Bike Lane Planning and Design Guide (2015)

FHWA Separated Bike Lane Planning and Design Guide (2015)

Bicycle Intersection Design and Spot Treatments

Conflict Area Markings

Conflict area markings are intersection pavement markings designed to improve visibility, alert all roadway users of expected behaviors, and to reduce conflicts with turning vehicles.

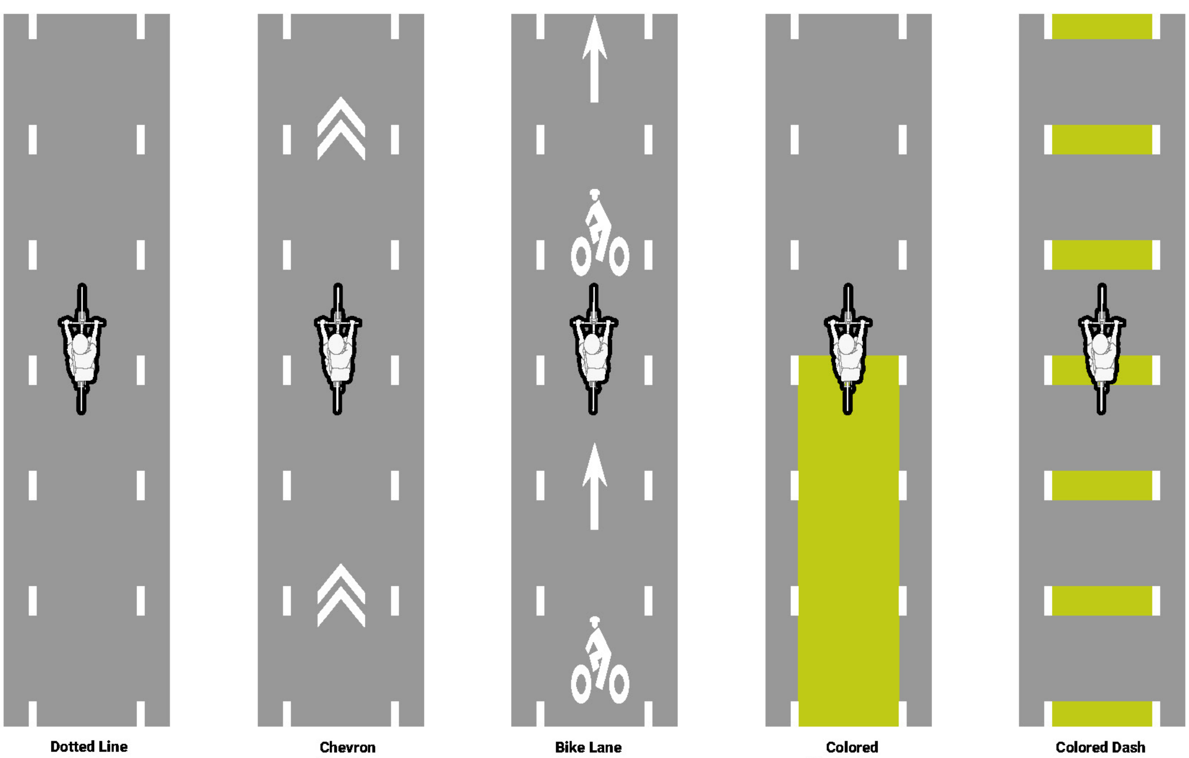
Considerations

- The appropriate treatment for conflict areas can depend on the desired emphasis and visibility. Dotted lane lines (with or without bike symbols) may be sufficient for guiding bicyclists through intersections; however, consider providing enhanced markings with green pavement and/or symbols at complex intersections or at intersections with safety concerns.
- Symbol placement within intersections should consider vehicle wheel paths and minimize maintenance needs associated with wheel wear.
- Driveways with higher volumes may require additional pavement markings such as the solid colored conflict area marking pictured above and signage.
- Consideration should be given to using intersection conflict markings as spot treatments or standard intersection treatments. A corridor-wide treatment can maintain consistency; however, spot treatments can be used to highlight conflict locations.

Guidance

- The width of conflict area markings should be as wide as the bike lanes on either side of the intersection.
- Dotted white lane lanes should conform to the latest edition of the MUTCD. These markings can be used through different types of intersections based on engineering judgment.
- A variety of pavement marking symbols can enhance intersection treatments to guide bicyclists and warn of potential conflicts.
- Green pavement markings can be used along the length of a corridor or in select conflict locations.

Figure 43: Conflict area markings



References

AASHTO Guide for the Development of Bicycle Facilities (2012)

NACTO Urban Bikeway Design Guide (2014)

Manual on Uniform Traffic Control Devices (2009)

Bike Box

A bicycle box provides dedicated space between the crosswalk and vehicle stop line where bicyclists can wait during the red light at signalized intersections. The bicycle box allows a bicyclist to take a position in front of motor vehicles at the intersection, which improves visibility and motorist awareness, and allows bicyclists to "claim the lane" if desired. Bike boxes aid bicyclists in making turning maneuvers at the intersection, and provide more queuing space for multiple bicyclists than that provided by a typical bicycle lane.

Considerations

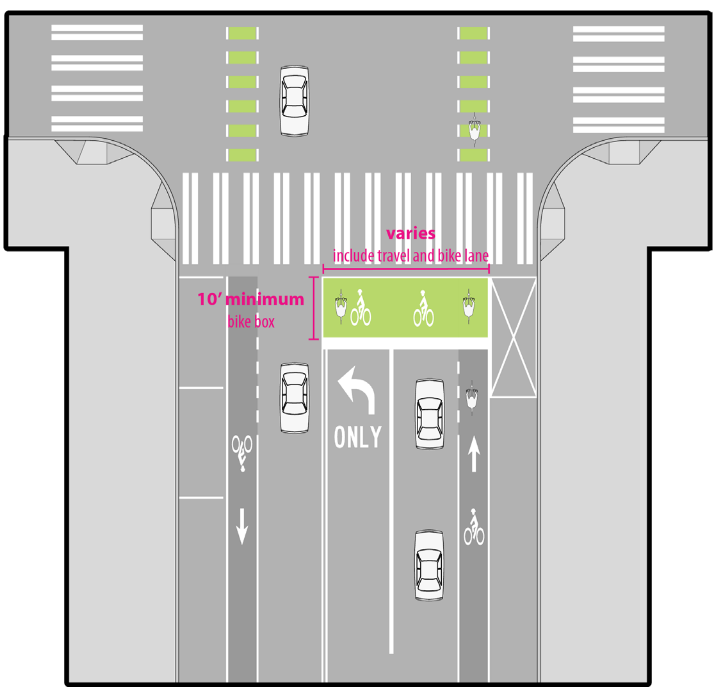
In locations with high volumes of turning movements by bicyclists, a bicycle box should be used to allow bicyclists to shift towards the desired side of the travel way. Depending on the position of the bicycle lane, bicyclists can shift sides of the street to align themselves with vehicles making the same movement through the intersection.

In locations where motor vehicles can continue straight or cross through a right-side bicycle lane while turning right, the bicycle box allows bicyclists to move to the front of the traffic queue and make their movement first, minimizing conflicts with the turning. When a bicycle box is implemented in front of a vehicle lane that previously allowed right turn on red, the right turn on red movement must be restricted using signage and enforcement following installation of the bike box.

Guidance

- Bicycle boxes are typically painted green and are a minimum of 10 feet in depth and are the width of the entire travel lane(s).
- Bicycle box design should be supplemented with appropriate signage according to the latest version of the MUTCD.
- Bicycle box design should include appropriate signalization adjustment in determining the minimum green time.
- Where right-turn lanes for motor vehicles exist, bicycle lanes should be designed to the left of the turn lane. If right turns on red are permitted, consider ending the bicycle box at the edge of the bicycle lane to allow motor vehicles to make this turning movement.

Figure 44: Bike box placement



References

NACTO Urban Bikeway Design Guide - Bike Boxes (2014)

FHWA Separated Bike Lane Planning and Design Guide (2015)

MassDOT Separated Bike Lane Planning & Design Guide (2015)

Bicycle Pockets

Bicycle pockets are bicycle through lanes in between vehicle travel lanes and vehicle right-turn lanes at the approach to an intersection. A bicycle pocket carves out space for bicyclists to improve rider visibility and mitigate conflicts with motorists, primarily to prevent right-turn collisions between riders and motorists. Bicycle pockets are something the City is evaluating and installing wherever right of way allows. It will be a standard treatment feature for newly installed roadways.

Considerations

Bicycle pockets should be used on streets with vehicle right-turn only lanes, where the right lane terminates into a turn lane, or where a parking lane transitions into a turn lane at an intersection.

Bicycle pockets should not be used on streets with double right-turn lanes since these lanes are more difficult to navigate. Instead, sharrows can be used in the outer right-turn lane to indicate that the lane should be shared between motorists and cyclists. The bicycle lane should not be terminated before the intersection. For a street that is not wide enough for a bicycle pocket, sharrows can be used to indicate a combined bicycle/ turn lane.

References

NACTO Urban Bikeway Design Guide

Guidance

- The bicycle pocket should be placed in between the vehicle travel lane and the vehicle right-turn lane.
- The vehicle right-turn lane should be no less than 9 feet wide. Right-turn only lanes should be as short as possible to reduce the speed of traffic driving into the lane.
- Required signage is R3-7R Right Lane Must Turn Right and R4-4 Begin Right Turn Yield to Bikes.
- Dashed white lines that signify the merge area should begin no less than 50 feet before the intersection. If the intersection is at a high speed or high-volume roadway, the lines should start no less than 100 feet before the intersection. Dashed white lines should be 6 inches wide and 2 feet long with a 6-foot gap between the dashes.
- If the area for vehicles to merge into the right-turn lane occurs at an angle, additional treatments beyond dashed white lines should be provided, such as pavement coloring and increased signage.
- A dashed bicycle transition lane into the bicycle pocket is recommended to be 6 feet wide, with a minimum width of 4 feet.
- Bicycle detection loops to trigger green signals for bicyclists when no cars are present should be provided within the bicycle pocket.
- Maintenance of signage and street marking should be prioritized, as their effectiveness depends on visibility.

Two-Stage Turn Box

A two-stage turn queue box should be considered where bike lanes are continued up to an intersection and a protected intersection is not provided. The two-stage turn queue box designates a space for bicyclists to wait while performing a two-stage turn across a street at a location outside the path of traffic.

Considerations

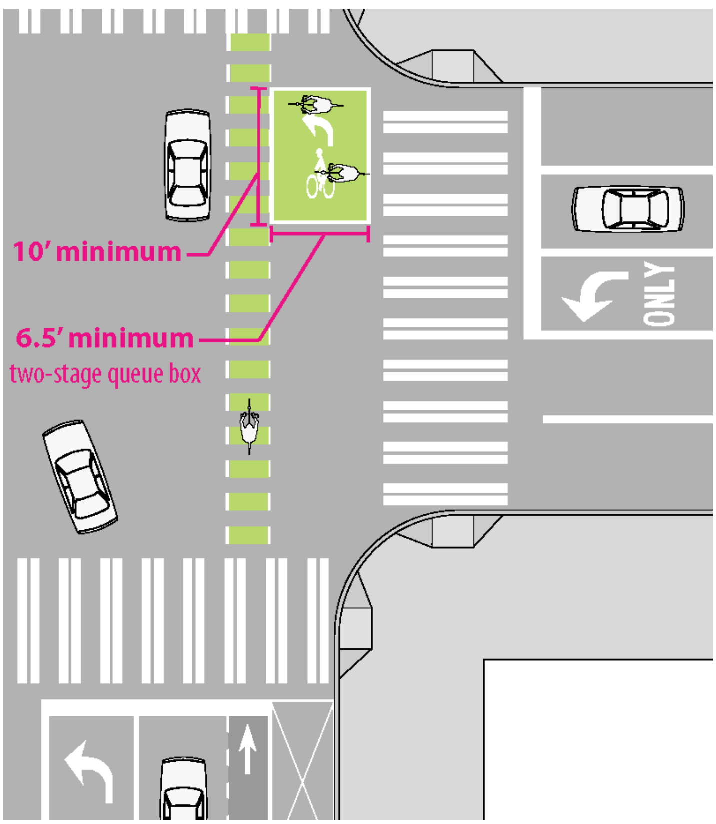
FHWA granted interim approval to two-stage turn queue boxes on July 13, 2017.

Two-stage turn queue box dimensions will vary based on the street operating conditions, the presence or absence of a parking lane, traffic volumes and speeds, and available street space. The turn box may be placed in a variety of locations including in front of the pedestrian crossing (the crosswalk location may need to be adjusted), in a 'jug-handle' configuration within a sidewalk, or at the tail end of a parking lane or a median island.

Guidance

- A minimum width of 10 feet is recommended.
- A minimum depth of 6.5 feet is recommended.
- Dashed bike lane extension markings may be used to indicate the path of travel across the intersection.
- NO TURN ON RED (R10-11) restrictions should be used to prevent vehicles from entering the queuing area.
- The use of a supplemental sign instructing bicyclists how to use the box is optional.
- The box should consist of a green box outlined with solid white lines supplemented with a bicycle symbol and a turn arrow to emphasize the crossing direction.

Figure 45: Two-stage turn box placement



References

NACTO Urban Bikeway Design Guide (2014)

MassDOT Separated Bike Lane Planning and Design Guide (2015)

FHWA Separated Bike Lane Planning and Design Guide (2015)

FHWA Bicycle Facilities and the Manual on Uniform Traffic Control Devices - Two-Stage Turn Box (2015)

Crossing Treatments

While the street segments of a bicycle boulevard or other traffic-calmed street may be generally comfortable for bicyclists without significant improvement, major street crossings must be addressed to provide safe, convenient and comfortable travel along the entire route. Treatments provide waiting space for bicyclists, control cross traffic, or ease bicyclist use by removing traffic control for travel along the bicycle boulevard route.

Considerations

- Adjustments to traffic control such as a Pedestrian Hybrid Beacon or stop sign adjustments may necessitate a traffic study.
- Median islands may be constructed to require right-in/right-out turns by motor vehicles while still allowing left turns by bicyclists at off-set intersections.
- Numerous treatments exist to accommodate offset intersection crossings for bicyclists, and the full range of design treatments should be considered in these situations. These treatments include left turn queue boxes, two-way center left turn lanes (optionally designed solely for bicyclists), median left turn pockets and short sidepath segments.

Guidance

Medians should be a minimum of 6 feet in width, though 8 feet is desirable to allow adequate space for a bicycle.

Intersections along a bicycle boulevard route may need treatment in the following situations:

- Unsignalized crossings of arterial or collector streets with high traffic volumes and speeds.
- Offset intersections where the greenway route makes two turns in short succession.

Figure 47: Median Diverter

Figure 46: Bicycle Box with Lead-In Bike Lane

Figure 48: Pedestrian Hybrid Beacon

Figure 49: Offset Crossing Left Turn Box with Lead-In Bike Lane

References

Fundamentals of Bicycle Boulevard Planning & Design (2009)

NACTO Urban Bikeway Design Guide (2014)

Portland's Neighborhood Greenway Assessment Report (2015)

Bicycle Signals, Detection, and Actuation

Bicyclists have unique needs at signalized intersections. Bicycle movements may be controlled by the same indications that control motor vehicle movements, by pedestrian signals, or by bicycle-specific traffic signals. The introduction of separated bike lanes creates situations that may require leading or protected phases for bicycle traffic, or place bicyclists outside the cone of vision of existing signal equipment. In these situations, provision of signals for bicycle traffic will be required.

Considerations

- Bicycle-specific signals may be appropriate to provide additional guidance or separate phasing for bicyclists per the 2012 AASHTO Guide for the Development of Bicycle Facilities.
- It may be desirable to install advanced bicycle detection on the intersection approach to extend the phase, or to prompt the phase and allow for continuous bicycle through movements.
- Video detection, microwave and infrared detection can be an alternative to loop detectors.
- Another strategy in signal timing is coordinating signals to provide a "green wave", such that bicycles will receive a green indication and not be required to stop. Several cities including Denver, CO, Portland, OR, and San Francisco, CA have implemented "green waves" for bicycles.

Guidance

- A stationary, or "standing", cyclist entering the intersection at the beginning of the green indication can typically be accommodated by increasing the minimum green time on an approach per the 2012 AASHTO Guide for the Development of Bicycle Facilities.
- A moving, or "rolling", bicyclist approaching the intersection towards the end of the phase can typically be accommodated by increases to the red times (change and clearance intervals) per the 2012 AASHTO Guide for the Development of Bicycle Facilities.
- Set loop detectors to the highest sensitivity level possible without detecting vehicles in adjacent lanes and field check. Type D and type Q loops are preferred for detecting bicyclists.
- Install bicycle detector pavement markings and signs per the MUTCD, 2012 AASHTO Guide for the Development of Bicycle Facilities, and the NACTO Urban Bikeway Design Guide.

Figure 50: Bicycle signal

References

AASHTO Guide for the Development of Bicycle Facilities (2012)

NACTO Urban Bikeway Design Guide (2014)

Manual on Uniform Traffic Control Devices (2009)

MassDOT Separated Bike Lane Planning and Design Guide (2015)

Mixing Zones

A mixing zone requires turning motorists to merge across a separated bike lane at a defined location in advance of an intersection. Unlike a standard bike lane, where a motorist can merge across at any point, a mixing zone design limits bicyclists' exposure to motor vehicles by defining a limited merge area for the turning motorist. Mixing zones are compatible only with one-way separated bike lanes.

Considerations

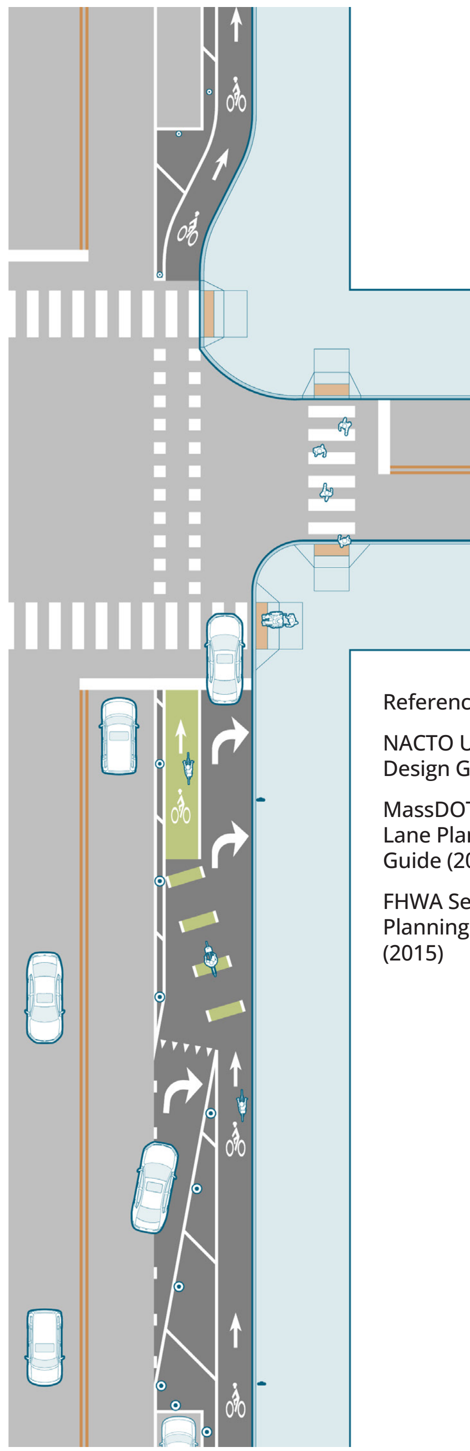
Protected intersections are preferable to mixing zones. Mixing zones are generally appropriate as an interim solution or in situations where severe right-of-way constraints make it infeasible to provide a protected intersection.

Mixing zones are only appropriate on street segments with one-way separated bike lanes. They are not appropriate for two-way separated bike lanes due to the contra-flow bicycle movement.

Guidance

- Locate merge points where the entering speeds of motor vehicles will be 20 miles per hour or less by (a) minimizing the length of the merge area and (b) locating the merge point as close as practical to the intersection.
- Minimize the length of the storage portion of the turn lane.
- Provide a buffer and physical separation (e.g. flexible delineator posts) from the adjacent through lane after the merge area, if feasible.
- Highlight the conflict area with green surface coloring and dashed bike lane markings, as necessary, or shared lane markings placed on a green box.
- Provide a BEGIN RIGHT (or LEFT) TURN LANE YIELD TO BIKES sign (R4-4) at the beginning of the merge area.
- Restrict parking within the merge area.
- At locations where raised separated bike lanes approach the intersection, the bike lane should transition to street elevation at the point where parking terminates.
- Where posted speeds are 35 miles per hour or higher, or at locations where it is necessary to provide storage for queued vehicles, it may be necessary to provide a deceleration/storage lane in advance of the merge point.

Figure 51: Mixing zone placement



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FHWA Separated Bike Lane Planning and Design Guide (2015)

Additional Considerations

The Effect of Speed and Traffic Calming Treatments

Traffic calming aims to slow the speeds of motorists to a “desired speed” (usually 20 miles per hour or less for residential streets and 25 to 35 miles per hour for collectors and minor arterials). The greatest benefit of traffic calming is increased safety and comfort for all users on and crossing the street. Compared with conventionally-designed streets, traffic calmed streets typically have fewer collisions and far fewer injuries and fatalities. These safety benefits are the result of slower speeds for motorists that result in greater driver awareness, shorter stopping distances, and less kinetic energy during a collision.

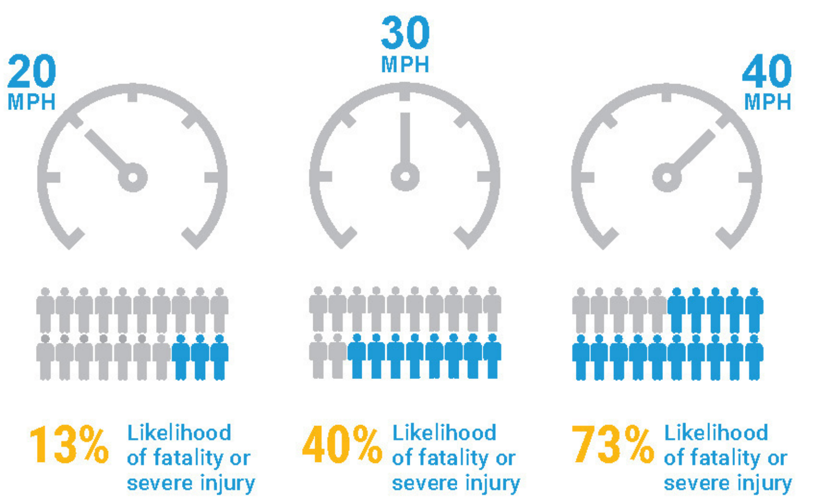
Considerations

Traffic calming is a program that incorporates a variety of vertical and horizontal treatments to reduce motor vehicle speeds. Vertical deflection treatments include speed cushions, speed humps, and raised crosswalks. Horizontal treatments include chicanes, neck downs, curb extensions, and traffic circles.

Prior to permanently implementing a traffic calming measure, it may be useful to introduce a temporary measure using paint, cones, or street furniture, as changes can easily be made to the design.

Guidance

- Vertical deflections such as speed humps and speed cushions should have a smooth leading edge and be engineered for a speed of 25 to 30 miles per hour. Speed humps should be clearly marked with reflective markings and signs.
- Where traffic calming must not slow an emergency vehicle, traffic calming should focus on horizontal treatments. If vertical deflection is desired, speed cushions should be used. Speed cushions provide gaps spaced for an emergency vehicle’s wheelbase to pass through without slowing.
- A typical curb radius of 20 feet should be used wherever possible, including locations with higher pedestrian volumes and fewer larger vehicles.



Source: Tefft, Brian C. Impact speed and a pedestrian’s risk of severe injury or death. Accident Analysis & Prevention. 50. 2013

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ITE Traffic Calming Web site

NACTO Urban Street Design Guide (2013)

NCHRP Research Report 966: Posted Speed Limit Setting Procedure and Tool (2021)

Traffic Calming – Vertical Deflection Treatments

Vertical traffic calming treatments compel motorists to slow speeds. By lowering the speed differential between bicyclists and motorists, safety and bicyclist comfort is increased. These treatments are typically used where other types of traffic controls are less frequent, for instance along a segment where stop signs may have been removed to ease bicyclist travel. The following is best practice guidance for vertical traffic calming.

Considerations

- Typically, speed humps are 12 to 22 feet in length (perpendicular to the roadway), with a rise of 4 to 6 inches above the roadway. They should extend the full width of the roadway and should be tapered to the gutter to accommodate drainage. Speed humps are not typically used on roads with rural cross-sections; however, if they are used on such roads, they should match the full pavement width (including paved shoulders).
- Speed humps and raised crosswalks impact bicyclist comfort. The approach profile should preferably be sinusoidal or flat.
- Speed humps or speed cushions are not typically used on collector or arterial streets.
- Consider using raised crosswalks at intersections to slow traffic turning onto the traffic-calmed street from a major street.

Guidance

Vertical traffic calming will not be necessary on all traffic-calmed streets but should be considered on any street with the following characteristic:

- Locations with measured or observed speeding issues, with 50th percentile of traffic exceeding the posted limit.

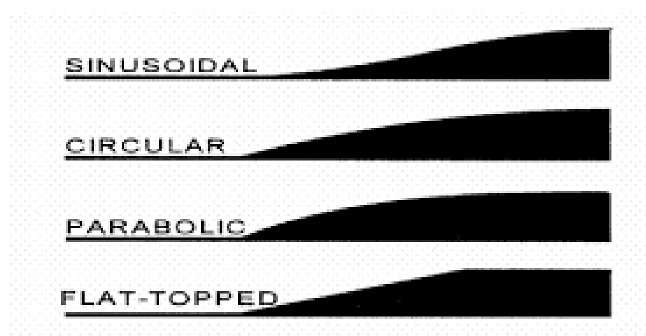
Devices that are continuous across the roadway, such as speed humps and raised crosswalks, are more effective for achieving slower speeds than speed cushions.

Figure 52: Speed hump

Figure 53: Speed cushion

Figure 54: Raised crosswalk

Figure 55: Curve profile options



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NACTO Urban Bikeway Design Guide (2014)

Portland's Neighborhood Greenway Assessment Report (2015)

Traffic Calming – Horizontal Treatments

Horizontal traffic calming reduces speeds by narrowing lanes, which creates a sense of enclosure and additional friction between passing vehicles. Narrower conditions require more careful maneuvering around fixed objects and when passing bicyclists or oncoming motor vehicle traffic. Some treatments may slow traffic by creating a yield situation where one driver must wait to pass.

Considerations

- Horizontal traffic calming treatments must be designed to deflect motor vehicle traffic without forcing the bicycle path of travel to be directed into a merging motorist.
- Neighborhood traffic circles should be considered at local street intersections to prioritize the through movement of bicyclists (by removing stop control or converting to yield control) without enabling an increase in motorist's speeds.
- Infrastructure costs will range dependent upon the complexity and permanence of design. Simple, interim treatments such as striping and flex posts are low-cost. Curbed, permanent treatments that integrate plantings or green infrastructure are higher-cost.

Guidance

Horizontal traffic calming treatments can be appropriate along street segments or at intersections where width contributes to higher motor vehicle speeds. It can be particularly effective at locations where:

- On-street parking is low-occupancy during most times of day.
- There is desire to remove or decrease stop control at a minor intersection.

Horizontal treatments are most effective if they deflect motorists midblock (with chicanes) or within intersections (with neighborhood traffic circles).

- The size of chicanes will vary based on the targeted design speed and roadway width, but must be 20 feet wide curb-to-curb at a minimum to accommodate emergency vehicles.

Figure 56: Chicane

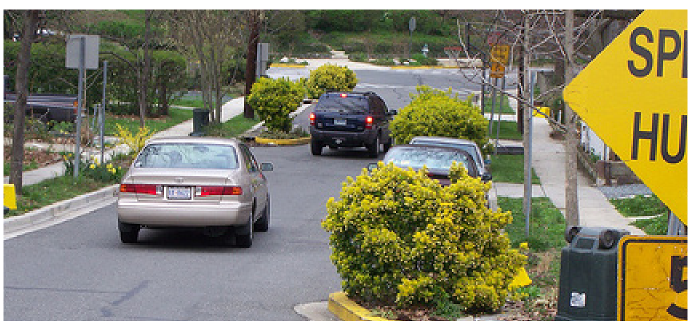


Figure 57: Neck down

Figure 58: Curb extension

Figure 59: Neighborhood traffic circle

References

Fundamentals of Bicycle Boulevard Planning & Design (2009)

NACTO Urban Bikeway Design Guide (2014)

Portland's Neighborhood Greenway Assessment Report (2015)

Lane Narrowing

Lane narrowing can improve comfort and safety for vulnerable road users. Narrowing lanes creates space that can be reallocated to other modes, in the form of wider sidewalks, bike lanes, and buffers between bicyclists, pedestrians and motor vehicles. Space can also be dedicated to plantings and amenity zones, and reduces crossing distances at intersections. The following is best practice guidance for lane narrowing.

Considerations

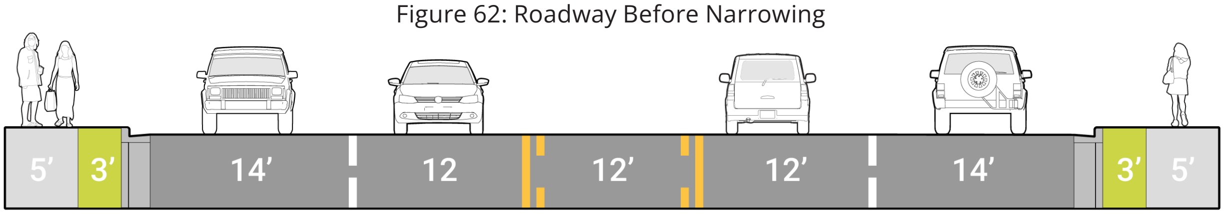
Narrowing existing motor vehicle lanes may result in enough space to create separated bicycle lanes, widened sidewalks and buffers, or a combination of on-street bike lanes and enhancements to the pedestrian corridor.

Narrower lanes can contribute to lower operating speeds along the roadway, which may be appropriate in dense, walkable corridors.

Guidance

- Motor vehicle travel lanes as narrow as 10 feet are allowed in low-speed environments (45 miles per hour or less) according to the AASHTO Green Book.
- 10-foot travel lanes are not appropriate on 4-lane undivided arterial roadways.
- Along bus routes, lanes should not be narrowed less than 11 feet to accommodate standard bus widths.

Figure 62: Roadway Before Narrowing



References

FHWA Achieving Multimodal Networks (2016)

Figure 61: Narrowing motor vehicle lanes to increase sidewalk and amenity zones

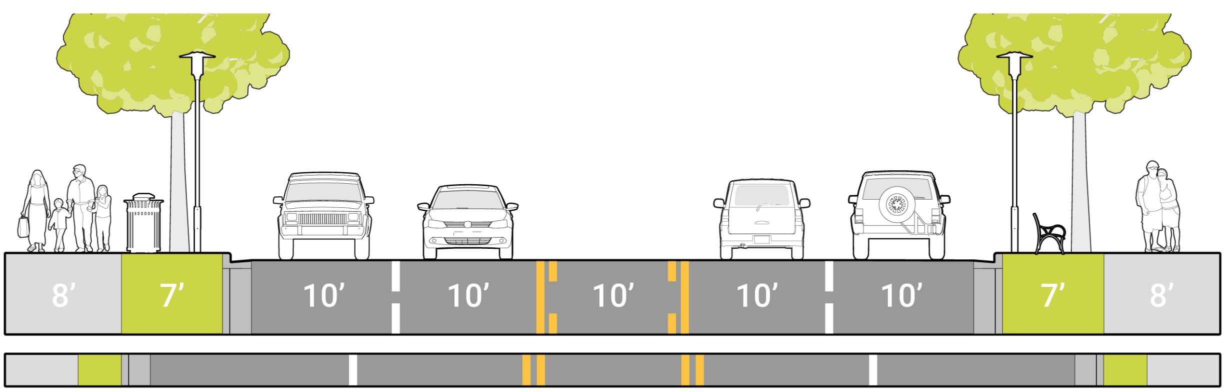
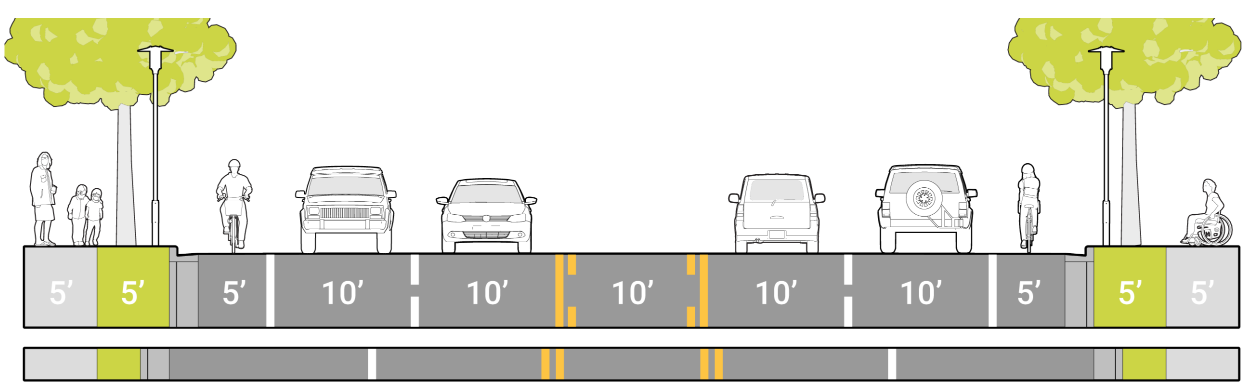


Figure 60: Narrowing motor vehicle lanes to increase amenity zone and bicycle lanes



Lane Reconfiguration

A road diet is a reduction in overall roadway width, typically accomplished by removing motor vehicle travel lanes. This strategy can be applied broadly to a wide variety of cross sections where one or more travel lanes are re-purposed to provide more space for pedestrians and bicyclists. Road diets are most typically done on roadways with excess capacity where anticipated traffic volumes have not materialized to support the need for additional travel lanes.

Considerations

The most common road diet configuration involves converting a four-lane road to three lanes: two travel lanes with a turn lane in the center of the roadway. The center turn lane at intersections often provides a great benefit to traffic congestion. A three-lane configuration with one lane in each direction and a center turn lane is often as productive (or more productive) than a four-lane configuration with two lanes in each direction and no dedicated turn lane.

The space gained for a center turn lane is often supplemented with painted, textured, or raised center islands. If considered during reconstruction, raised center islands may be incorporated in between intersections to provide improved pedestrian crossings, incorporate landscape elements and reduce travel speeds.

Guidance

- Four-lane streets with volumes less than 15,000 vehicles per day are generally good candidates for four- to three-lane conversions.
- Four-lane streets with volumes between 15,000 to 20,000 vehicles per day may be good candidates for four- to three-lane conversions. A traffic analysis is needed to determine feasibility.
- Six-lane streets with volumes less than 35,000 vehicles per day may be good candidates for six- to five-lane (including two-way center turn lane) conversions. A traffic analysis is needed to determine feasibility.

Roadway configurations with two travel lanes and a center turn lane can:

- Discourage speeding and weaving.
- Reduce the potential for rear end and side swipe collisions.
- Improve sight distances for left-turning vehicles.
- Reduce pedestrian crossing distances and exposure to motor vehicle traffic.

Figure 63: Typical four-lane road with on-street parking

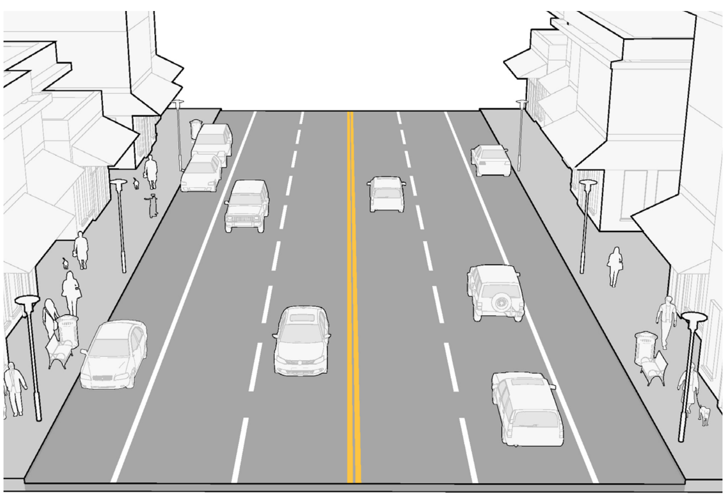
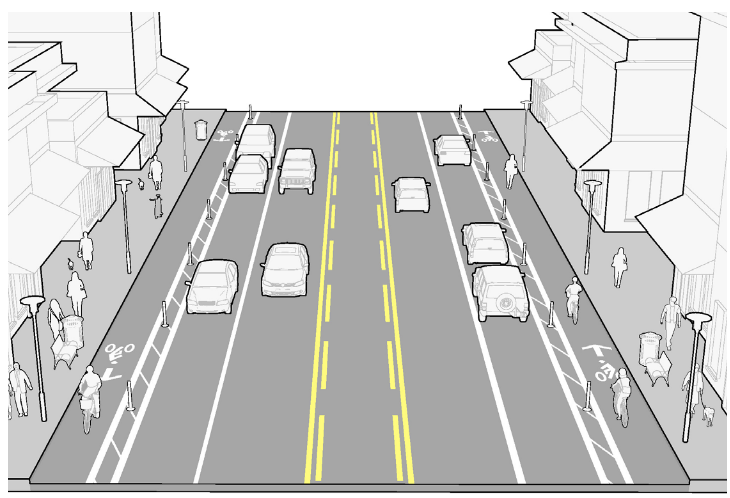


Figure 64: Three-lane road diet (with two-way center turn lane), with on-street parking and separated bicycle lane



References

FHWA Road Diet Informational Guide (2014)

NACTO Urban Street Design Guide (2013)

Manual on Uniform Traffic Control Devices (2009)

Evolution of a bike lane

Separated bike lanes have been implemented in many cases as low-cost retrofit projects (e.g. using flex posts and paint within the existing right-of-way). More permanent forms of separation, such as curb-protected bike lanes, cost more and are less flexible once implemented. A phased implementation approach, where “pilot” projects transition to permanent protected bike lanes may solve both of these problems, by implementing the facility slowly and troubleshooting before permanent materials and high costs are necessary.

Considerations

Lower-cost retrofits or demonstration projects allow for quick implementation, responsiveness to public perception and ongoing evaluation. Separation types for short-term separated bike lane designs often include non-permanent separation, such as flexible delineator posts, planters or parking stops. Pilot projects allow the agency to:

- Test the separated bike lane configuration for bicyclists and traffic operations.
- Evaluate public reaction, design performance, and safety effectiveness.
- Make changes if necessary.
- Transition to permanent design.

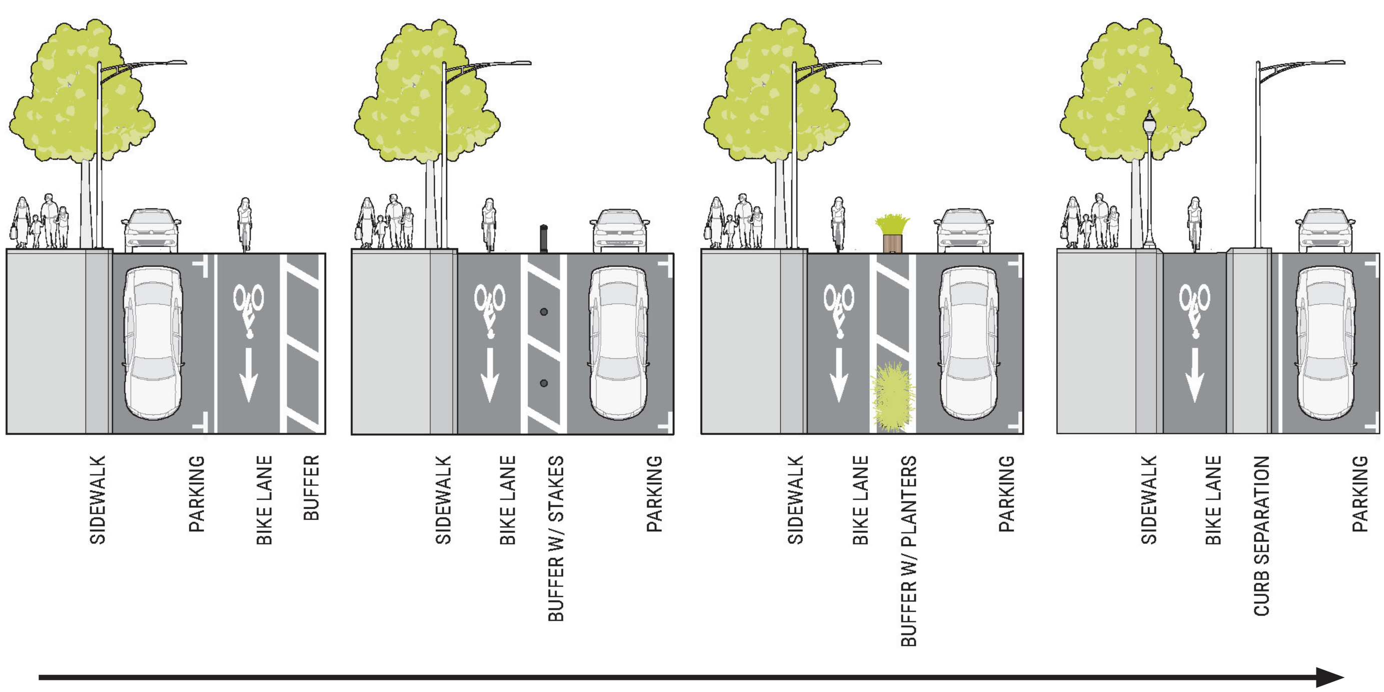
Guidance

Permanent separation designs provide a high level of protection and often have greater potential for placemaking, quality aesthetics, and integration with features such as green stormwater infrastructure. Agencies often implement permanent separation designs by leveraging private development (potentially through developer contribution), major capital construction, and including protected bike lanes in roadway reconstruction designs. Examples of permanent separation materials include rigid bollards, raised medians and grade-protected bike lanes at an intermediate or sidewalk level.

References

NACTO Urban Street Design Guide (2013)

FHWA Separated Bike Lane Planning and Design Guide (2015)



Progression from pilot project to separated bike lane

Bike parking

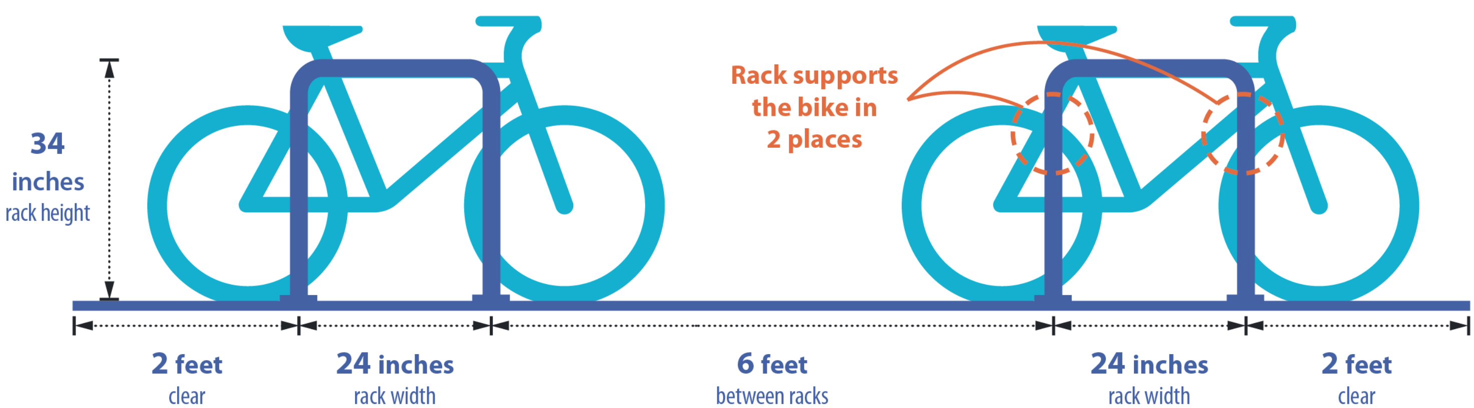
Bicycle parking enhances the effectiveness of bicycle networks by providing locations for the secure storage of bicycles during a trip. Bicycle parking enables bicyclists to secure their bicycles while patronizing businesses, recreating, and going to work. Bicycle parking requires far less space than motor vehicle parking-- in fact, 10 bicycles can typically park in the area needed for a single car.

Considerations

- Bicycle parking consists of a rack that supports the bicycle upright and provides a secure place for locking. Bicycle racks should be permanently affixed to a paved surface. Movable bicycle racks are only appropriate for temporary use, such as at major community gatherings.
- On-street bicycle parking is intended for short term use. Bicyclists typically find a variety of fixed objects in the street to which they lock their bicycles. These include parking meters, tree well fences, lawn fences or other objects. These objects may satisfy the need for bicycle parking, but if this is the intent, they should be designed and located with this use specifically in mind. Otherwise, the use of such objects for parking may indicate insufficient or inappropriately located bicycle parking facilities.

Guidance

- Bicycle parking facility should not obstruct pedestrian traffic or interfering with the use of the pedestrian areas.
- Each parked bicycle should be accessible without moving another bicycle.
- On-street bicycle parking is intended for short term use.
- Multiple types of racks exist, but all should adhere to guidance pictured above regarding providing two points of contact for bike frames to prevent locked bikes from falling.
- Bicycle rack footings can be mounted in soil, concrete, or asphalt, or mounted to stable surfaces using anchors.



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C

PUBLIC PARTICIPATION SUMMARY REPORT

Appendix C
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Overview

The City of Clovis used a variety of outreach strategies to publicize the Active Transportation Plan Update process and gather input from community members on existing and desired walking and bicycling conditions.

The planning process included outreach opportunities that were designed to:

- Engage the community on issues around bicycle and pedestrian mobility and transportation safety;
- Seek input from a variety of stakeholders and viewpoints; and
- Document the everyday transportation experience of Clovis community members.

Guiding Questions for Outreach:

- Who is and is not participating in decision making processes?
- How will the Plan's outcomes benefit historically underserved community members?
- What are potential burdens and unintended consequences that might result from the Plan?

Strategies

Public input was collected using a variety of strategies during the planning process. These strategies included:

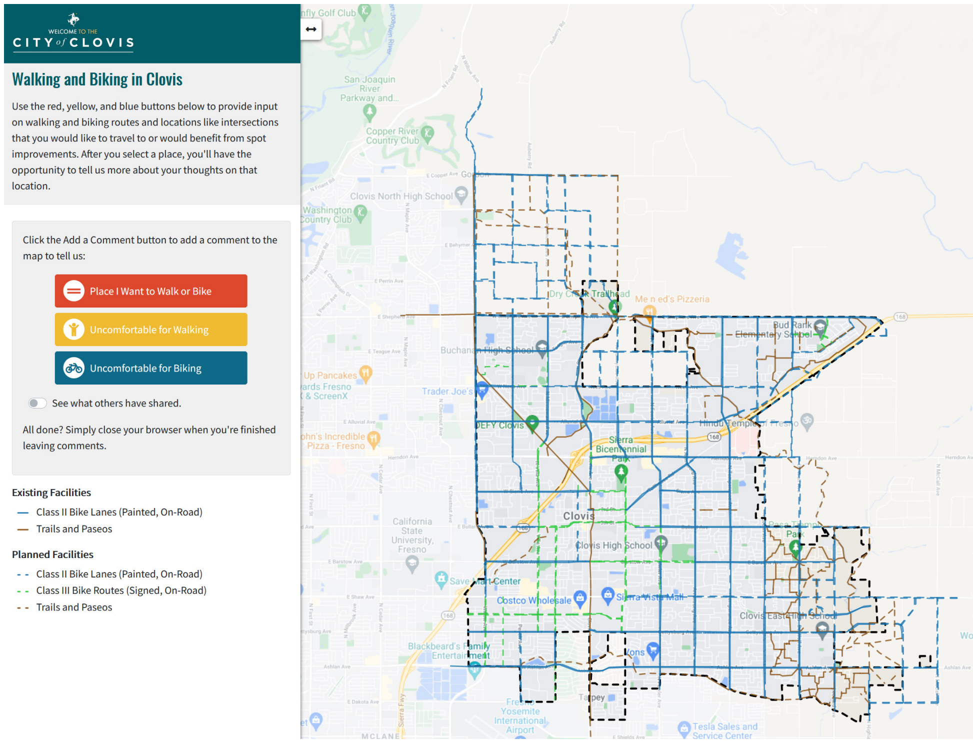
- A survey and interactive web map
- A meeting with the Fresno Cycling Club
- Stakeholder focus groups
- A community meeting

During the public participation process, the City adhered to all state and local health guidelines regarding the Covid-19 Pandemic. These guidelines shifted during the planning process, and outreach strategies were adjusted to reflect those changes.

Survey and Interactive Webmap

The City hosted an online survey and interactive map to collect public feedback on community members' experiences walking and biking in Clovis. The introductory survey asked questions regarding the participants' attitudes and comfort level walking or biking around Clovis, the treatments that would encourage people to walk or bike more, and demographic questions. Participants also had the opportunity to provide feedback using an interactive, online map to identify areas where they felt uncomfortable walking or biking, and areas they

Figure 65: Screenshot of the online, interactive map



would like to walk or bike. Participants were allowed to respond to other users' comments to encourage conversation about treatments and their experiences walking and biking.

The online survey and map were available to the public from July 28 to September 2, 2021. The City raised awareness of the survey and map through social media posts and through the City's contacts with community-based organizations and interest groups. Social media posts and other content were translated to Spanish and Hmong, while the survey and interactive map included a tool to translate text via Google Translate. In total, there were approximately 75 responses to the survey and 55 pieces of input submitted on the map. Figure 65 above shows a screenshot of the interactive map.

Feedback about Walking in Clovis

Survey respondents shared their feelings about walking and what would encourage them to walk more frequently. Nearly 50 percent of respondents indicated that they already felt comfortable walking to most places, and 30 percent indicated that they were interested but something prevented them (e.g., comfort, safety, ability...etc.). Table 13 displays the full distribution of responses to this question.

Almost 70 percent of respondents indicated that more sidewalks or trails in the community would encourage them to walk more, followed by more street trees, shade, and other amenities (38 percent). Respondents also valued better maintenance of sidewalks and trails and better lighting (both 34 percent). Additional factors are listed in Table 14. Percentages sum to more than 100 percent because respondents could select more than one response option for this question.

The addition of more sidewalks and trails was identified as the most common factor that would encourage survey respondents to walk more frequently.

Approximately 70 percent of respondents indicated they would ride more frequently if there were more bike lanes or trails.

More comfortable on-street bikeways would encourage 57 percent of respondents to bicycle more frequently.

Table 13: Attitudes towards walking

Which of the following statements most closely matches your feelings about traveling by walking in Clovis? (Select one)	Percentage of Respondents
I feel comfortable walking to most places	49%
I'm interested, but something (comfort, safety, ability...etc.) prevents me from walking to most places	30%
I walk to my destinations at least some of the time, but I wish it felt more comfortable	8%
I walk to my destinations at least some of the time	7%
I'm not interested in walking anywhere	6%

Note: Approximately 61 people responded to this question.

Table 14: Factors that would encourage walking

What would encourage you to ride or walk more frequently? (Select all that apply)	Percentage of Respondents
More sidewalks or trails in the community	68%
More street trees, shade, or other amenities	38%
Better maintenance of sidewalks and trails	34%
Better lighting of sidewalks, trails, and roads	34%
More accessible infrastructure (curb ramps, wheelchair access, wider sidewalks, etc.)	19%
Better signs on trails so I know where to go	11%
Knowing I could get home quickly if there was an emergency	6%
Nothing would encourage me to walk more	6%
Other	6%
More people to walk with	2%
I already walk for most trips	0%

Note: Approximately 53 people responded to this question. Percentages shown sum to more than 100 percent because participants could select more than one response.

Feedback about Bicycling in Clovis

Among survey respondents, 32 percent indicated that they felt comfortable traveling most places by bicycle. Another 29 percent indicated they ride some of the time, while 19 percent indicated an interest in bicycling but faced a barrier, such as comfort or safety. Fourteen percent expressed that they ride sometimes, but wished it was a more comfortable experience. About six percent indicated they were not interested in bicycling at all. These results indicate that one-third of respondents are interested in bicycling, or bicycling more often, but do not do so due to barriers, including safety or comfort. Table 15 displays the full distribution of responses to this question.

70 percent of respondents indicated th[...] more encouraged to ride if there were more bike lanes or trails in the community. More comfortable on-street bikeways would encourage 57 percent of respondents to bicycle more frequently. Approximately 34 percent and 27 percent of respondents would bicycle more frequently if there was better maintenance of bike lanes and trails and better lighting of trails and roads, respectively. Additional factors are listed in Table 16. Percentages sum to more than 100 percent because respondents could select more than one response option for this question.

Table 15: Attitudes towards bicycling

Which of the following statements most closely matches your feelings about traveling by bicycling in Clovis? (Select one)	**Percentage of Respondents**
I feel comfortable traveling most places by bike	32%
I ride a bicycle to my destinations at least some of the time	29%
I'm interested, but something (comfort, safety, ability...etc.) prevents me from using a bicycle to get some/most places.	19%
I ride a bicycle to my destinations at least some of the time, but I wish it felt more comfortable	14%
I'm not interested in biking at all.	6%

Note: Approximately 65 people responded to this question.

Table 16: Factors that would encourage bicycling

What would encourage you to ride a bicycle more frequently? (Select all that apply)	**Percentage of Respondents**
More bike lanes, or trails in the community	70%
More comfortable on-street bikeways	57%
Better maintenance of bike lanes and trails	34%
Better lighting of trails and roads	27%
More bicycle parking and repair stations	23%
Better signs on roads or trails so I know where to go	20%
Showers and lockers at school or work	8%
Other	8%
I already bike for most trips	7%
More people to bike with	7%
Knowing I could get home quickly if there as an emergency	5%
A bike share program or an affordable place to buy used bikes	3%
Nothing would encourage me to walk or bike more.	1%

Note: Approximately 74 people responded to this question. Percentages shown sum to more than 100 percent because participants could select more than one response.

Feedback from the Online Map

Respondents were able to identify streets, trails, or crossings where they wanted to walk or bike, or those where they felt uncomfortable walking or bicycling.

Table 17 lists locations that community members provided feedback on. Common themes included lack of existing walking or bicycling infrastructure, unsafe crossings for walking or bicycling, and uncomfortable existing bicycle facilities.

Respondents identified the following locations as places where they would like to see facilities for walking or bicycling.

- North Clovis
- W Alluvial Avenue
- Herndon Avenue
- Around educational complexes
- Connection between Dry Creek Trail and Enterprise Trail
- Along State Highway 168
- De Wolf Avenue
- Bullard Avenue
- Connection between Fowler Ave and Bullard Avenue/N Locan Avenue
- W Gettysburg Avenue/Minnewawa Avenue/Santa Ana Avenue
- 3rd Street
- 5th Street
- Canal Bank

Table 17: Comments and themes among online map feedback

	Location	Additional information (if applicable)
Lack of sidewalk	Leonard Ave	Leonard Ave mentioned frequently
Unsafe crossing for walking	Herndon Ave and N Willow Ave	-
	Wawona Ranch Ln and Clovis Ave	-
Lack of bicycle facility	N Armstrong Ave	Popular crossing over State Route 168 for people bicycling
	Temperance Ave	Facility ends under the freeway
Uncomfortable existing bike facility	Tollhouse Rd	-
	Fowler Ave	-
	E Bullard Ave	-
	Aluvial Ave/Owens Mountain Pkwy and N Temperance Ave	-
	E Shepherd Ave	-
	Barstow Ave	-
Unsafe crossing for bicycles	Minnewawa Ave and W Bullard Ave	-
	Herndon Ave and N Peach Ave	-
Trail connections	E Shepherd Ave, west of N Sunnyside Ave	Multiple comments about lack of bicycle facility and lack of connection to Dry Creek Trailhead)
	Birch Ave/Dartmouth St to Spruce Ave	Connecting neighborhood to shopping center
	Leigh Ln and Skylar Ln	Bridge over canal to connect existing trail to planned trail

Note: "-" indicates that no additional information was provided.

Community Cycling Club Presentation

On September 22, 2021, community members from the Fresno Cycling Club participated in an online pop-in webinar-style presentation.

At the presentation, the City provided an introduction and background on the Plan, its vision statement, methodology behind pedestrian and bicycle facilities recommendations, as well as a timeline and next steps for the Plan's completion. At the pop-in event, participants were asked about opportunities to improve bicycling, barriers to bicycling, and policies and support programs that the Cycling Club thought would be helpful. The event also allowed participants to ask questions about the Plan and its development.

Stakeholder Focus Groups

The City conducted four stakeholder focus groups with local community-based organizations and regional agencies to identify how the Clovis Active Transportation Plan Update fit into stakeholders' diverse needs. As the State of California loosened public health restrictions during the Summer of 2021, the stakeholder focus groups were held in a hybrid meeting format, which allowed participants to attend the meeting in-person or online through a video platform. Table 18 presents the dates of the focus groups and the agencies represented.

Stakeholders provided feedback on existing technical barriers and recommendations for the Active Transportation Plan Update. School staff discussed an interest in stronger and more interconnected Safe Routes to School programming across the city. Regional and State staff discussed opportunities for funding. Outside of the Plan's technical aspect, some stakeholders also brought up social concerns. For example, Cultiva La Salud, a non-profit focused on expanding health equity in the San Joaquin Valley, raised the issue of police profiling of young Black and Latino pedestrians and bicyclists in Clovis and the lack of safe pedestrian and bicycling facilities in southern Clovis. The group stated that parents of Black and Latino boys and teenagers discourage their children from biking and walking to reduce their interaction with law enforcement, and thus requested that active transportation infrastructure be safe and also inviting for People of Color.

Clovis' future developments was as a key topic among participants in the focus groups. Stakeholders were interested in establishing a set of guidelines to regulate design for future developments. This practice would ensure that new developments in Clovis support walking and bicycling, and that the facilities (e.g., sidewalks) that are built as part of these new development projects meet the current standards.

Table 18: Stakeholder Interview Groups and Interview Dates

Date	Stakeholder Group
School Districts and Higher Education July 28	Clovis Unified School District, Sanger Unified School District, City of Fresno, County of Fresno, Fresno State University, Clovis Community College
City of Clovis July 28	Clovis Department of Public Utilities, City Manager's Staff, Planning Staff, Engineering Staff, Transit, Senior Center, GIS, Public Information Office
Regional and State Agencies July 29	Fresno Council of Governments, Caltrans District 6, Fresno Irrigation District, Fresno Metropolitan Flood Control District, Clovis Community Foundation, Community Medical Centers
Community Organizations and Developer July 29	City of Clovis, Fresno Cycling Club, Leadership Counsel for Justice and Accountability, Disabled Citizen Representative, Building Industry Association, Cultiva La Salud

Participants in the focus groups also recognize that there are opportunities to promote a culture of active transportation to young children. A more coordinated effort among schools, such as a citywide Walk to School Day, and infrastructure improvements may encourage children to be more excited to travel by foot, bike, or skateboard.

Community Meeting

Like the stakeholder focus groups, the community meeting was offered as a hybrid, in-person, and online event. The purpose of this meeting was to present information about the Plan process and gather feedback on opportunities and challenges for people walking and bicycling. The meeting was primarily attended by City staff, who emphasized that evening family walks and bike rides could be an opportunity to promote active transportation. Attendees suggested that improving existing connectivity would create a better walking environment and also provide different travel options to community members. City staff identified funding as the main challenge to encouraging mode and cultural shift to walking and bicycling.
One specific funding challenge that staff identified is acquiring funding for retrofit projects.

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FUNDING SOURCES

The following table provides an overview of Federal, State, Regional, and County funds and grant opportunities that can be used for bicycle and pedestrian projects and programs.

Funding Sources	Administering Agency	Availability of Funding	Description	Eligible Improvements
		Federal Funding Programs		
Better Utilizing Investments to Leverage Development (BUILD) Transportation Discretionary Grants[1]	U.S. Department of Transportation (USDOT)	Annually	BUILD (formerly TIGER) is a nationally competitive grant for capital investments on surface transportation projects that achieve a significant impact for a metropolitan area, region, or the nation. Selection criteria encompass safety, economic competitiveness, quality of life, state of good repair, innovation and partnerships with a broad range of stakeholders.	Roads, bridges, transit, rail, ports or intermodal transportation
Congestion Mitigation and Air Quality Improvement (CMAQ) Program[2]	Federal Highway Administration (FHWA)	Annually	CMAQ provides funding for state and local governments for transportation programs and projects that support the Clean Air Act, improving air quality and providing congestion relief.	Bicycle infrastructure
Surface Transportation Block Grant[3]	FHWA, FAST Act Program administered through the Fresno Council of Governments	Every two years; next round anticipated to be due September 2023	Projects must be in the Statewide Transportation Improvement Program (STIP) and be consistent with the Long-Range Statewide Transportation Plan and Metropolitan Transportation Plan. May require 11.47% local match.	Bicycle facilities, including trails.
Transportation Alternatives Program (TAP)[4]	Federal Highway Administration (FWHA)	Yearly; available 2023 funding is $1.3 billion	Caltrans controls a share of the funds to distribute locally through a competitive process. All potential TAP projects require a sponsor for a minimum of 20% of the project costs. Local governments are eligible to apply.	TAP funds projects that create bicycle and pedestrian facilities and convert abandoned railway corridors to pedestrian trails, among others. Eligible activities include pedestrian and bicycle facilities and educational programs, landscaping, rail-to-trail conversions, among others.
Infrastructure for Rebuilding America (INFRA)[5]	US Department of Transportation	$8 billion between FY 2022-2026.	One INFRA grant application that suffices for three different grants, including the Rural Surface Transportation Grant.	Eligible uses include projects that address safety, reduce congestion, enhance resiliency, and address freight bottlenecks.

Funding Sources	Administering Agency	Availability of Funding	Description	Eligible Improvements
Highway Safety Improvement Program (HSIP)[6]	Federal Highway Administration (FHWA)	10% of state's HSIP fund	Projects in high-crash locations are most likely to receive funding. States that have identified bicycle safety and pedestrian safety as Emphasis Areas are more likely to fund bicycle and pedestrian safety projects.	Funding for safety projects aimed at reducing traffic fatalities and serious injuries. Bike lanes, roadway shoulders, crosswalks, intersection improvements, underpasses and signs are examples of eligible projects.
Safe Streets and Roads for All (SS4A)[7]	Federal Highway Administration (FHWA)	Grants typically open in spring and close in early September	Two types of SS4A grants: Planning and Demonstration Grants, which provide funds to develop, complete, or supplement a comprehensive safety action plan, and Implementation Grants, which fund projects and strategies identified in an Action Plan to address a safety issue.	Developing a comprehensive safety action plan or to carry out projects and strategies.
Carbon Reduction Program[8]	Federal Highway Administration	$1.258 billion in FY 2023	Project must be identified in the Statewide Transportation Improvement Program (STIP)/ Transportation Improvement Program).	Includes a transportation alternatives project for on- and off-road trail facilities
National Highway Performance Program (NHPP)[9]	Federal Highway Administration	$29.008 billion in FY 2023.	Projects must be identified in the Statewide Transportation Improvement Program (STIP)/ Transportation Improvement Program (TIP).	Requires that bicycle facilities be for transport purposes only, not recreation purposes.
		State Funding Programs		
California Active Transportation Program (ATP)[10]	California Transportation Commission (CTC)	Biennially	The ATP program resulted from the consolidation of many former federal State programs and funds a wide range of capital and non-capital projects. A strong preference is given to projects in disadvantaged communities.	Bicycle and pedestrian capital infrastructure and non-infrastructure projects (e.g., encouragement, education, and enforcement), and plans (including active transportation and Safe Routes to School plans)
California Sustainable Transportation Equity Project (STEP)[11]	California Air Resources Board (CARB)	Currently a pilot project; eligible funding source if continued	STEP is a transportation equity pilot project for Fiscal Year 2019-20 that aims to address community residents' transportation needs, increase access to key destinations, and reduce greenhouse gas emissions by funding planning, clean transportation, and supporting projects.	Active transportation subsidies, construction of new pedestrian facilities, new bike routes and networks (Class I, II, or IV) and supporting infrastructure

Funding Sources	Administering Agency	Availability of Funding	Description	Eligible Improvements
Clean Mobility Options (CMO)[12]	California Air Resource Board	Annually (based on cap-and-trade dollars)	The Clean Mobility Options Voucher Pilot Program provides voucher-based funding for zero-emission carsharing, car- and van-pooling, bike- and scooter-sharing, innovative transit services, and ride-on-demand services in California's historically underserved communities.	Eligible projects must be in a community that: (1) is on the Disadvantaged Communities List for Climate Investments in accordance with CalEPA's designation (2) is a tribal land or tribal property within AB 1550 designated low-income communities, or (3) serves a deed-restricted affordable housing facility with at least five units and located within an AB 1550 designated low-income community.
California Office of Traffic Safety Grants[13]	California Office of Traffic Safety (OTS)	Annually	For traffic-safety education, awareness and enforcement programs aimed at drivers, pedestrians and cyclists.	Certain activities under the SRTS, safety/education and enforcement programs.
Highway Safety Improvement Program (HSIP)[14]	California Department of Transportation (Caltrans)	Varies; Generally, every 1-2 years	For projects and programs that reduce traffic fatalities and serious injuries by correcting or improving a specific problem. Highly competitive at the state level.	Safety-related pedestrian, bikeway and crossing projects. Certain activities under the SRTS, safety/education and enforcement programs; also, certain spot improvements. Bike lanes, paved shoulders, crosswalks, intersection improvements and signage
Affordable Housing and Sustainable Communities Program (AHSC)[15]	California Strategic Growth Council (SGC)	Annually	Projects that facilitate compact development, including bicycle infrastructure and amenities, with neighborhood scale impacts. Available to government agencies and institutions (including local government, transit agencies and school districts), developers and non-profit organizations.	Bicycle and pedestrian corridor and crossing improvements, particularly those in the area covered in specific plans
Sustainable Transportation Planning Grants[16]	Caltrans	Annually	Funds for communities to do planning, studies, and design work to identify and evaluate projects, including conducting outreach or implementing pilot projects.	Planning, community engagement, studies to improve bicycle and pedestrian connections
Recreational Trails Program[17]	California Department of Parks and Recreation	Program is currently being updated	Funds for recreational trails for active transportation.	Trail maintenance, restoration, trailhead facilities, new trail construction, and maintenance equipment.

Funding Sources	Administering Agency	Availability of Funding	Description	Eligible Improvements
Urban Greening Grants[18]	California Natural Resources Agency	Annually	A statewide program that allocates cap-and-trade dollars to projects that reduce greenhouse gas emissions	Projects that reduce commute vehicle miles traveled by constructing bicycle paths, bicycle lanes or pedestrian facilities that provide safe routes for travel between residences, workplaces, commercial centers, and schools
State Transportation Improvement Program (STIP)[19]	CTC	Biennially	Projects need to be nominated in the Regional Transportation Improvement Program (RTIP), but MTC may nominate fund categories.	Any transportation project eligible for State Highway Account or Federal Funds
State Highway Operation and Protection Program (SHOPP)[20]	Caltrans	Biennially on even-number years	The Office of SHOPP Management is responsible for planning, developing, managing and reporting the four-year SHOPP portfolio of projects. The Program is the State Highway System's "fix it first" program that funds repairs and preservation, emergency repairs, safety improvements, and some highway operational improvements on the State Highway System.	Bike & pedestrian elements in the context of facility type, right of way, project scope, and quality of nearby alternative facilities)
Infill Infrastructure Grant Program (IIG)[21]	California Department of Housing and Community Development	Varies; every 1-2 years	IIG provides grant assistance for infrastructure projects that are an integral part of, of necessary for the development of a Qualifying Infill Project or housing within a Qualifying Infill Area.	Construction, rehabilitation, demolition, relocation, preservation, and acquisition of infrastructure.
Transformative Climate Communities (TCC)[22]	Strategic Growth Council and Department of Conservation	Varies	TCC funds community-led development and infrastructure projects with economic, environmental, and health benefits to disadvantaged communities in California.	Bicycle and pedestrian corridor and crossing improvements, bike share programs
Office of Traffic Safety Grant Program[23]	Office of Traffic Safety (OTS)	Annually	The OTS Grant Program funds education, encouragement, and safety programs and campaigns to prevent serious and fatal injuries resulting from collisions with motor vehicles.	Bicycle and pedestrian safety education and encouragement programs and campaigns

Funding Sources	Administering Agency	Availability of Funding	Description	Eligible Improvements
Local Streets and Roads (LSR) Program[24]	CTC	Annually	The LSR program provides funding to cities and counties for road maintenance and rehabilitation as well as for safety projects.	Bicycle and pedestrian corridor and crossing improvements (emphasis on safety), maintenance and rehabilitation
Solutions for Congested Corridors (SCCP)[25]	CTC	Annually	SCCP provides funding with an ultimate goal of reducing congestion throughout California. The program focuses on multimodal corridor improvements that maintain and enhance community character. Competitive throughout the state.	Multimodal corridor improvements
California Proposition 68 (Parks and Water Bond Act of 2018), Statewide Parks Program (SSP)[26]	California Department of Parks and Recreation	Amount available is $395,333M; grant applications should be between $200K and $8.5M	Eligible projects are from the Statewide Parks Program (SPP)	A variety of park facilities and types, including linear greenbelt parks, nonmotorized trails, pedestrian, and bicycle bridge
Regional Parks Program[27]	California Department of Parks and Recreation	Amount available is $23M	Funding for counties and regional park districts, regional open-space districts, and open-space authorities to create, expand, or improve regional parks and regional park facilities. Funding via Proposition 68.	Acquisition for new or enhanced public access and use. Development to create or renovate: • Trails (preference to multiuse trails over single-use trails) • Regional sports complexes • Visitor and interpretive facilities • Other types of recreation and support facilities in regional parks
Rural Recreation and Tourism Program[28]	California Department of Parks and Recreation	Amount available is $23M	Eligible applicants include cities with population <50,000 and counties with population <500,000.	Projects that support economic and health-related goals for recreation for residents and visitors. Includes accessible trails and bikeways, sports complexes, visitor centers for historic or natural resources, access to waterways
Land and Water Conservation Fund[29]	California Department of Parks and Recreation	Awards up to $3M per application. Typically due June 2023.	Provides funding for the acquisition or development of land to create new outdoor recreation opportunities	Acquisition project or development project for parks, includes trail corridors connecting to recreational opportunities.

Funding Sources	Administering Agency	Availability of Funding	Description	Eligible Improvements
Habitat Conservation Fund[30]	California Department of Parks and Recreation	Over $6.5M; applications due June 2023	Requires 50% match.	Acquisition or development of trails which bring urban residents into park and/or wildlife areas.
Recreational Infrastructure Revenue Enhancement (RIRE)[31]	California Department of Parks and Recreation	$37M available from Proposition 68	Project must be for park and recreational infrastructure purposes, either acquisition or development, for the purposes described in the revenue enhancement measure.	Improving or enhancing local or regional park infrastructure for the purposes of the revenue enhancement measure.
Regional and County Funding Programs				
Measure C, Transit -Oriented Infrastructure[32]	Fresno Council of Governments	Annually	Program created in the 2006 Measure C Extension Plan. TOD allocation support community-based transit projects aimed at increasing transit use.	Transit facility improvement, bicycle and pedestrian facility improvements, public plaza, streetscape enhancements
Measure C, Local Transportation Program[33]	Fresno County Transportation Authority	Project funding decisions made by the FCTA Board	The Measure C Extension Plan provides multi-modal funding from a percentage of local sales tax revenue in three programs: public transit, local transportation, and regional transportation.	The Local Transportation Program funds various projects including street maintenance and rehabilitation, ADA Compliance, and pedestrian trails and bicycle facilities.
Transportation Development Act Article 3[34]	Fresno Council of Governments	Program is not currently active	Allocated among Fresno member agencies based on population, taxable sales and transit performance.	Bikeways, crossing improvements and safety/ education/training programs for school children and the general population
2021 Fresno COG FTA Section 5310 Grant Application for the Fresno/ Clovis Urbanized Area[35]	Fresno Council of Governments	Biannually	This grant focuses on improving transportation accessibility for senior citizens.	Grant projects may include public transportation projects that include building accessible paths to bus stops, including curb cuts, sidewalks, accessible, pedestrian signals, detectable warnings, and wayfinding.
Regional Sustainable Infrastructure Planning Grant[36]	Fresno Council of Governments	Typically annually. Cycle 3 grant application deadline was August 2019.	Program objective is to encourage local and regional multimodal transportation and land-use planning and addresses the needs of disadvantaged communities.	Planning studies, safe routes to school plans, complete streets plans, bicycle and pedestrian plans with safety enhancement focus (including Vision Zero).
Bike Paths Grant[37]	San Joaquin Valley Air Pollution Control District	Up to $150,000 for Class I bikeway (Bike path)	Projects considered on first-come, first-serve basis until funding is depleted. Project must include transportation purpose, not simply recreational focus.	Provides funds to establish bicycle infrastructure such as Class I or Class II bicycle paths. Excludes landscaping and other aesthetic amenities.

Funding Sources	Administering Agency	Availability of Funding	Description	Eligible Improvements
Other Funding Opportunities				
Community Grant Program[38]	PeopleForBikes	Up to $10,000. Grant cycle typically opens annually in the fall.	Provides funding to bike advocacy and facility-building projects. Requires Letter of Interest and full application	• Bike paths, lanes, and trails • Mountain bike and BMX facilities • Bike parks and pump tracks • Bike racks and bike repair stations • Large-scale bicycle advocacy initiatives. • Programs that transform city streets, such as Ciclovías or Open Streets Days • Campaigns to increase investment in bicycle infrastructure
Land Conservation Loan Program[39]	Conservation Fund	Rolling	Provides loans to quickly purchase high-priority lands	Trail installation/access
National Trails Fund[40]	American Hiking Society	Program not active.	The establishment, protection, and maintenance of trails. Applicant must be an Alliance Organization Member. Eligible to nonprofits.	Projects that improve hiking access or hiker safety. Projects that promote community building surrounding specific trail projects.
The Conservation Alliance[41]	The Conservation Alliance	Twice annually	Seeks to protect threatened wild places for habitat and recreational values. Eligible to nonprofits.	Seek to secure lasting protection of a specific wild land or waterway; engage grassroots citizen action, have a clear recreational benefit; have financial success within four years.
Local Community Grants[42]	Walmart	Applications reviewed quarterly on rolling basis. Funds available up to $5,000	Funding provided directly from local Walmart and Sam's Clubs. May require Letter of Inquiry.	Funding must address one of three priorities: creating opportunity, advancing sustainability, and strengthening community

Endnotes

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WAYFINDING SYSTEM GUIDELINES

Wayfinding System Guidelines

Introduction

These Wayfinding System Guidelines provide the City of Clovis with the tools to plan, design, and implement an effective bicycle and trail wayfinding system. It is intended to help planners and designers as they create a wayfinding system for Clovis' trails, bikeways, and paseos.

What is Wayfinding?

Wayfinding encompasses all the ways in which people orient themselves in physical space and navigate from place to place. A wayfinding system designed specifically for bicyclists and pedestrians can help these roadway and trail users easily and successfully navigate through a network of on-street facilities or trails. The main purpose of a wayfinding system is to connect people to the places they want to go. Wayfinding can take the form of directional signage, mile markers, trail heads, informational signs, map kiosks, and pavement markings to reinforce signage.

Bicycle wayfinding signs are signs that guide bicyclists along preferred, designated routes to destinations throughout the city and region. Bicycle routes may consist of on-street facilities and off-street trails.

Wayfinding Design User

Wayfinding systems designed for bicyclists and trail users can enhance the value of a bicycle and trail network by helping people identify and navigate designated routes between destinations.

Bicycle Design User

During the design and planning of wayfinding systems, planners should imagine a casual or new bicycle rider using the facilities and associated wayfinding. An experienced bicycle commuter or recreational rider knows their favorite routes well and may not need a signed bicycle route system. However, a person who has just moved into a new neighborhood or who is exploring a path for the first time will appreciate the guidance provided by a well-signed route.

Pedestrian Design User

Pedestrians are considered vulnerable users in auto-centric roadway networks and thus pedestrians benefit from separated facilities like trails and paseos, which provide greater safety and comfort. When designing and planning a wayfinding system, those pedestrians who don't drive or don't have access to a car, like older and younger community members are the users who may have the most need for the wayfinding and, as such should be the users that the wayfinding is designed to accommodate. If a system works for those users, it will most likely work for all pedestrians.

Benefits of Wayfinding

Bicycle and trail wayfinding can be an easy-to-implement, low-cost way to support and promote active travel by:

- Helping people identify and navigate desirable routes between destinations
- Knitting together existing bicycle and trail network
- Encouraging all user of all modes (pedestrian, bicyclists, and other non-motorized modes) to travel more confidently
- Reminding drivers of bicyclists' presence

Core Wayfinding Principles

These core wayfinding principles set the tone for the design of the overall wayfinding system and will help create a cohesive wayfinding sign network throughout the city.

Orient the User and Connect Places

- Easy-to-use and intuitive wayfinding helps bicyclists and trails users navigate and understand where they are in relation to nearby landmarks and destinations. Wayfinding should help people travel between destinations and develop an increased sense of mobility and connectivity. It should assist both locals and visitors in navigating between destinations and using services facilities around their neighborhood.

Be Consistent and Predictable

- Wayfinding systems must be designed with a consistent cohesive design language of materials, colors, typefaces and symbols so that they are easily recognizable and helps users quickly understand and interpret messages. Consistent and predictable placement throughout a community earns the trust of users and helps them understand the system and when they can expect signs.

Keep Information Simple and Disclose Information Progressively

- Wayfinding must provide concise messages, revealing enough information without overwhelming the user. Information on each sign should be kept to a minimum to avoid confusion and facilitate quick comprehension.
- Clear, logical, and simple wayfinding signage will help moving bicyclists and trail users make decisions quickly. Information should be clear, legible, and simple enough to be understood by a wide audience.

Allow Bicyclists and Trail Users to Maintain Movement

- Constant stopping and starting can be frustrating to bicyclists. Information on signs should be simple and large enough to be viewed in motion, allowing to maintain momentum along their path. It is also important to locate signs ahead of potential decision point to allow for bicyclists to take in the information on the signs and react in a timely way.

Figure 66: Wayfinding System Guideline Components

Technical Guidance

The design of bicycle wayfinding signs, and this wayfinding guide rely on guidance from the following documents:

Manual on Uniform Traffic Control Devices Guidelines, Federal Highway Administration (FHWA)

The Manual on Uniform Traffic Control Devices (MUTCD, 2009 edition) includes guidance and standards for:

- Sign design for bicycle guide signs, bicycle routes, and auxiliary plaques
- Sign installation details such as minimum height of signs from the ground and horizontal placement from edge of the roadway or trail
- Symbols and appropriate abbreviations for destination names
- Sign examples
- Sign placement, mounting height requirements, sign size, and layout

The MUTCD introduces sign types and provides additional right-of-way placement guidelines for directional signs. Finally, the MUTCD has a section on community wayfinding, which provides information about customization.

AASHTO Guide for the Planning, Design and Operation of Bicycle Facilities, American Association of State Highway and Transportation Officials (AASHTO)

The AASHTO Bike Guide provides additional information that supplements the MUTCD. The guide explains the use and benefits of different sign types for bicycle wayfinding. It also provides guidance on where to use signs: on what types of routes and how to place signs at intersections. A new edition is currently in development and will include expanded guidance in a full chapter on wayfinding.

Urban Bikeway Design Guide, National Association of City Transportation Officials (NACTO)

The NACTO document provides guidance based on current best practices in large cities. It covers types of signs and destinations, pavement markings, typical applications, and design guidance.

The benefits of using MUTCD-style wayfinding, as opposed to custom designed signs, include ease of implementation and eligibility for federal funding.

Destination & Route Selection

Destination Selection

Connecting places is the first core principle of bicycle wayfinding system design. Determining where bicyclists are trying to go will ultimately inform their desired route, which is why destination selection typically comes prior to route selection.

These guidelines describe the approach used to select and prioritize potential destinations to be included on the wayfinding signs.

Types of Destinations Considered

Destinations that can be considered for inclusion on wayfinding signs included:

- Parks
- Business Districts
- Major Sports Venues
- Major Bikeways
- Well-Known Landmarks
- Schools & Universities
- Libraries

Hierarchy of Destinations

Potential destinations can be assigned to one of three groups, Level 1 (Primary) – Citywide Destinations, Level 2 (Secondary) – Local Destinations, and Level 3 (Tertiary) – Neighborhood Destinations, based upon their usefulness as navigational references for bicyclists and their likelihood of being origins or destinations for bicycling trips. The hierarchy helps planners and designers determine how far from the destination references to it will appear on wayfinding sign panels and helps in the decision about which destinations are included on wayfinding signs.

The general hierarchy of what to include in Primary, Secondary, and Tertiary destinations will vary depending on whether the bike route is in an urban, suburban, or rural area. In urban areas (most of Clovis), destinations are close together and only the most significant destinations should be noted as Primary destinations. However, in rural areas (i.e. outlying parts of Clovis), destinations are sparsely spaced. Neighborhoods and small local parks may be included on wayfinding signage as Tertiary destinations to help as both navigational aids and informational aids for bicyclists to know where they can access services such as water and bathrooms.

To establish a hierarchy, consider the following:

- How well-known is the destination and how useful is it as a navigational reference? The most well-known destinations and most useful navigational references should be in the Primary destination group.
- How popular is the destination in terms of annual or seasonal visitors? How accessible is the destination by pedestrians and bicyclists? Do these users commonly access the destination? Does the route being signed provide good access to the location?
    - The venues that have a large number of visitors and for which the answers to the above questions are positive, should be in the Primary or Secondary destination group.
    - If the venue is likely only serving nearby pedestrian and bicycle users, then it should be a Tertiary destination
- If the destination is a trail or bikeway, is it well-known outside of the immediate area? Is it well used? Does it connect to other more regional trail/ bikeway networks?

Level 1 (Primary) – Citywide Destinations

Primary destinations include cities, regional destinations, or other major destinations. These are often the key destinations included on most signs and establish the origin and destination of a route. Including these destinations on signs helps users identify where a route is ultimately going and what they will see if they continue along the route.

Level 2 (Secondary) – Local Destinations

Secondary, or Level 2 destinations, often include districts, neighborhoods, and major landmarks. These destinations can be signed to from up to two miles away, and often include parks, major shopping districts, etc.

Level 3 (Tertiary) – Neighborhood Destinations

Tertiary, or Level 3 destinations, include pocket parks, small schools, and other minor landmarks that may only be visited by pedestrians and bicyclists who live or work nearby. These destinations may only be listed on wayfinding signs that are within a quarter mile or two blocks.

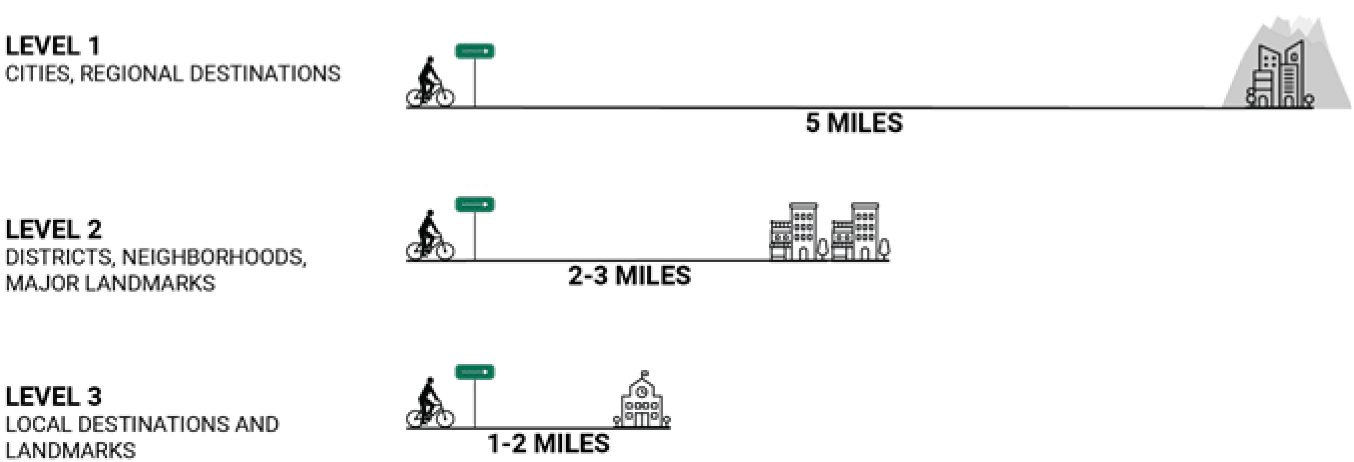
Standards for Measuring Distance to Destinations

A core principle of wayfinding sign design is progressively disclosing information by not overwhelming the bicyclist at any one decision point or sign assembly. Knowing when to introduce a new destination depends largely on its importance and distance from the sign.

Distance to Destination

There will usually be more potential destinations that could be included on a sign than space available. A destination hierarchy can be used to guide the designer on what to include. Suggested distance guidelines for the urban/suburban and rural destination hierarchy are displayed in Figure 67 below. In practice, however, the distance at which each destination appears on

Figure 67: Measuring Distance to Destinations; Image by Toole Design, Icons by Noun Project



wayfinding signs will require the judgement of the designer(s) of the wayfinding system.

Measure-To Points

If the destination is a neighborhood, municipality, or a large park, designers will have to establish a measure-to point.

- For large parks or facilities, it may make sense to measure distance to the main entrance.
- For smaller destinations, the measure-to point may be the front entry.
- The distance to a city, district or neighborhood should be measured to the area's center point, as is the practice in highway wayfinding; Google Maps' bicycle navigation feature also measures distance to the city's center point.

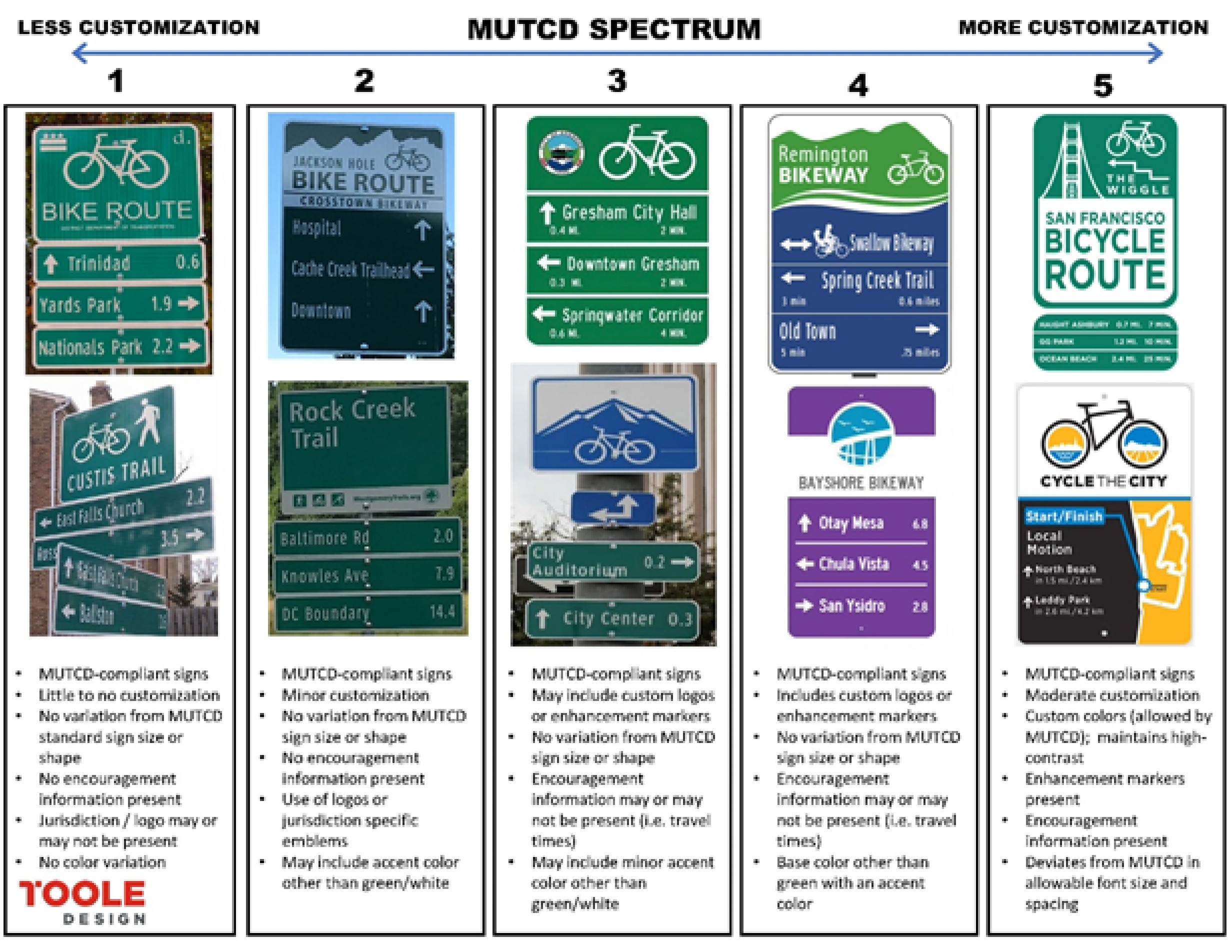
Establishing measure-to points after identifying destinations will keep the distance measurements consistent throughout the bicycle wayfinding network.

Building Blocks: Standard Signs for Bicycle and Trail Wayfinding

The overall approach follows the look and feel of standard highway guide signs while the detailed design is tailored for bicyclists. Wayfinding signs can vary in the level of detail and modification, from standard MUTCD D-series signs to customized signs with unique colors, logos, and font types. The spectrum of how signage can be customized is shown in Figure 68.

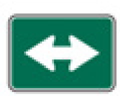
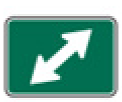
To maintain compliance with MUTCD standards, no "assigned" colors were used as the primary base for the wayfinding sign concepts. These colors are used for a variety of regulatory signs in the MUTCD, including red, orange, yellow, fluorescent yellow-green, fluorescent pink, and purple.

Figure 68: MUTCD Sign Customization Spectrum



These guidelines and recommendations use the standard signs in Table 19 from the Manual on Uniform Traffic Control Devices (MUTCD).

Table 19: MUTCD Guide Signs and Application

MUTCD SIGN	SIGN IMAGE	APPLICATION
Bicycle Route Guide Sign D11-1 or D11-1c	 D11-1  D11-1c	• D11-1 is to be used on Class I trails The phrase“BIKE ROUTE” can be subsituted with a trail name. • D11-1c is to be used on Class II, III, and Class IV bike lanes and Level 1/primary destination name. • Bicycle Route Guide signs let bicyclists and pedestrians know they are on a designated bikeway or trail. In the case of bikeways, they alert motorists to the likely presence of bicyclists. • In Clovis, these signs are to be used at the start of paseos to indicate that they are bicycle/ pedestrian routes.
Destination Supplemental Sign D1-1 to D1-1c	 D1-1  D1-1a  D1-1b  D1-1c  D1-2  D1-3	• D1-1 to D1-1c are to be used to indicate single destinations, or to list destinations separately. • D1-2, 2a-2c, D1-3, 3a-3c are to be used to combine multiple destination on a single panel; this design is recommended as single panels are easily bent or twisted. • Destination signs without distances are used on signs where there is a decision to be made about which direction to go. • Destinations signs with distances are used as confirmation and information at the start of a bikeway or trail or after a turn/decision point. • To maintain simplicity, decision signs or sign assemblies should not display more than three destinations.
Direction Arrow Supplemental Signs M5-1/5-2, M6-1 to M6-7	 M5-1  M5-2  M6-1  M6-2  M6-3  M6-4  M6-5  M6-6  M6-7	• Directional arrow signs are used to provide spot guidance, such as when an on-street route turns but there is no decision to make. • These assemblies usually include the main route confirmation plaque as well as a 6 inch arrow plaque. • These signs can also be used when a path splits.

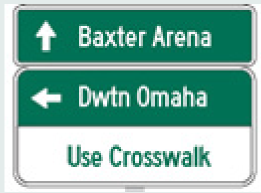
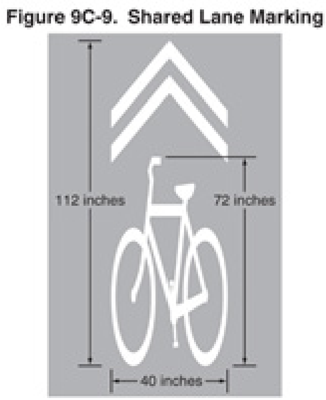
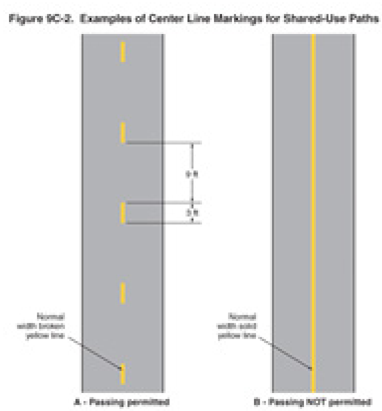
MUTCD SIGN	SIGN IMAGE	APPLICATION
Supplemental Information Signs D1-2 MOD		• Used to provide additional, clarifying information to the bicyclist or pedestrian, such as how to navigate an intersection. • Supplemental signs use a reverse color scheme: green lettering on a white background. Supplemental information can be combined with D1 series panel or made as a separate panel.
Pavement Markings: Shared Lane Markings (SLMs)/ Bike wayfinding dots Centerline markings		• SLMs and bike wayfinding dots may be used to supplement directional signs to help bicyclists navigate difficult turns or where the direction of the bike route is not immediately obvious. They are also used on bike boulevards (Class III bikeways). • Centerline markings may be used on trails or side paths to help delineate space for traffic going in both directions. • In areas where there is high traffic of both pedestrians and bicyclists, pavement markings can be used to differentiated where different users can travel to create a safe orderly environment for all users.

Figure 69: Example of shared lane markings used on bike boulevard (Class III bike route)

Figure 70: Example of a bike wayfinding dots used to guide users through an intersection

Assembling the Building Blocks

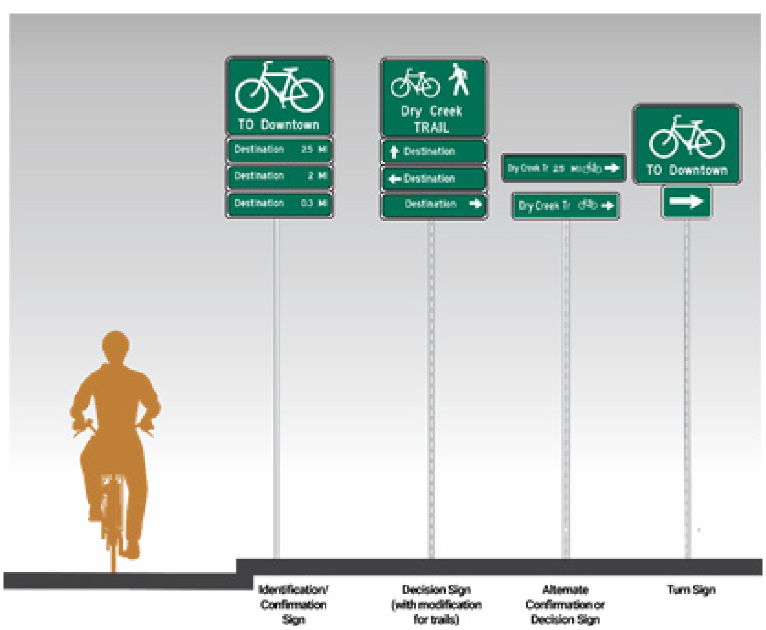
There are four basic steps in wayfinding:

1. **Orientation** refers to determining one's location relative to nearby objects [or landmarks] and the destination.
2. **Route decision** refers to choosing a route to get to the destination.
3. **Route monitoring** refers to monitoring the chosen route to confirm that it is leading to the destination.
4. **Destination recognition** is when the destination is recognized.

The signs, or building blocks, of the wayfinding system are combined into sign assemblies that respond to the first three steps of wayfinding:

1. **Identification/Confirmation signs** provide orientation and route monitoring, by indicating the general direction and confirming that a user is on a designated bikeway or trail.
2. **Decision signs** indicate where the users can choose a different route to reach destinations along the path, or to mark the junction of two or more bikeways or trails.
3. **Turn signs** provide spot guidance along a bikeway where the route turns (but there is not decision to be made) such as when a bikeway turns from one street onto another street.

Figure 71: Sign Assembly Typologies



Branding

Part of the creation of a wayfinding signage system is incorporating trail logos and local branding into the signage. Figure 72 shows some examples of what that could look like. Stylistic changes to logos or sign panel designs are something that should be considered when creating signage plans. For example, the Heritage Grove logo is likely to require the addition of a black outline to be legible on the white sign and would not be legible on a green sign without additional edits.

The MUTCD offers clear guidelines on materials and the use of "assigned" colors in bicycle/pedestrian wayfinding signs but allows for cities to individualize their signs using distinctive (unassigned) colors, typefaces, and symbols.

Figure 72: Local Branding Options

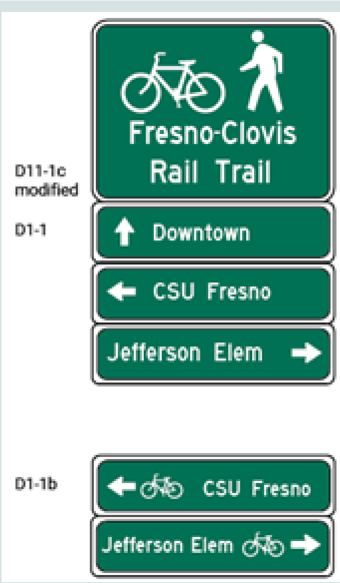
Sign panels are combined in assemblies to respond to wayfinding needs.

Table 20: Sign Assemblies

Route Confirmation/ Identification Assembly

	ASSEMBLY COMPONENTS	PLACEMENT
	D11-1 alone or in combination with D1 series	Placed at the beginning of a bikeway or after a turn or intersection to reassure cyclists that they are on the correct route. In areas where a bicycle route continues straight along a roadway or shared use path without any turns or decisions, it is recommended that a confirmation assembly be placed every 3-4 blocks or every quarter to half mile to reassure bicyclists they are still on the designated bikeway. After a turn, confirmation assemblies are placed on the far-side of the intersection, preferably visible to the bicyclist who is engaged in the turning movement, to confirm the correct direction of travel.

Decision Assembly

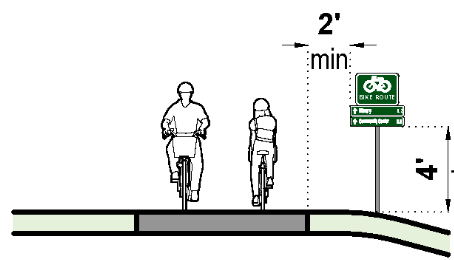
	ASSEMBLY COMPONENTS	PLACEMENT
	D1 series signs can be used alone or in combination with D11-1 series D1 series signs can be used without D11-1 panels if they include bicycle symbols	Placement of a decision sign from a turn or transition is determined by bicycle design speed, sight lines, and roadway slope. Decision signs should be placed in advance of a turn or decision point based on context. To improve user comprehension, through-destinations should be placed at the top of the sign assembly, followed by destinations that require the bicyclist to make a turn (left turns are typically displayed above right turns). Multiple destinations in the same direction can be included on one larger sign with an arrow.

Turn Sign	ASSEMBLY COMPONENTS	PLACEMENT
	Each turn sign includes D11-1 series sign and M5 series and/ or M6 series sign. Sometimes sign assemblies will have all three sign types (D1 series, D11 series, and M5/6 series)	Turn signs should be placed at points prior to the turn to give advance notice of a change in route direction.

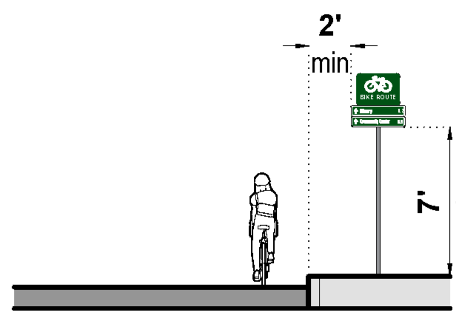
General Sign Assembly Design Guidance

For sign assemblies on shared use paths and on-street, the following guidelines apply:

- No more than four sign panels should be included on any single sign pole, due to the need to maintain head clearance for pedestrians and keep information simple. Prioritize sign destinations according to the hierarchy of destinations, from nearest to farthest.
- For assemblies mounted on the same post but perpendicular to each other, group the panels that face the same direction together.
- Destinations within an assembly should be ordered with all through destinations listed first, then left turning destinations, and finally right turning destinations. If there are two or more destinations in the same direction, the closer destination should be on top. This method helps riders continuing straight understand where the route is heading, and prioritizes left turns over right turns, since riders often need to merge to make a left turn.



Shared Use Path

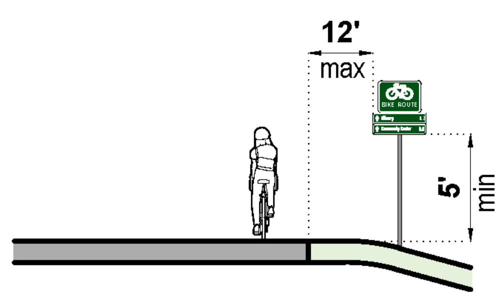


Urban

General Installation Guidelines

General Guidance

- Typically, bicycle and trail wayfinding signs are placed on the right side of the street or trail.
- Arrows on an assembly should not point to a minor side street, alley, or driveway that could be mistaken for the intended turn.
- Where bicyclists are guided to or are likely to use a crosswalk as part of the route, it is often best to locate guide signs near walk/wait pedestrian signal heads.



Rural

- Care should be taken to place signs in locations where they will not be blocked from view by tree limbs, vegetation, other signs, parked vehicles (especially large vehicles and trucks), and buses at bus stops.
- Wayfinding signs can be attached to poles with other signs, but not warning signs

In Relation to Intersections

To allow adequate notice of left turns, decision and turn signs should be placed at a distance before the intersection that is based on the number of turn lanes the bicyclist needs to merge across to make a legal left turn.

- Zero-lane merge: 25 feet
- One-lane merge: 100 feet
- Two-lane merge: 200 feet

Typical Sign Placement Scenarios

Figure 73: Intersection of two On-Street Bike Routes

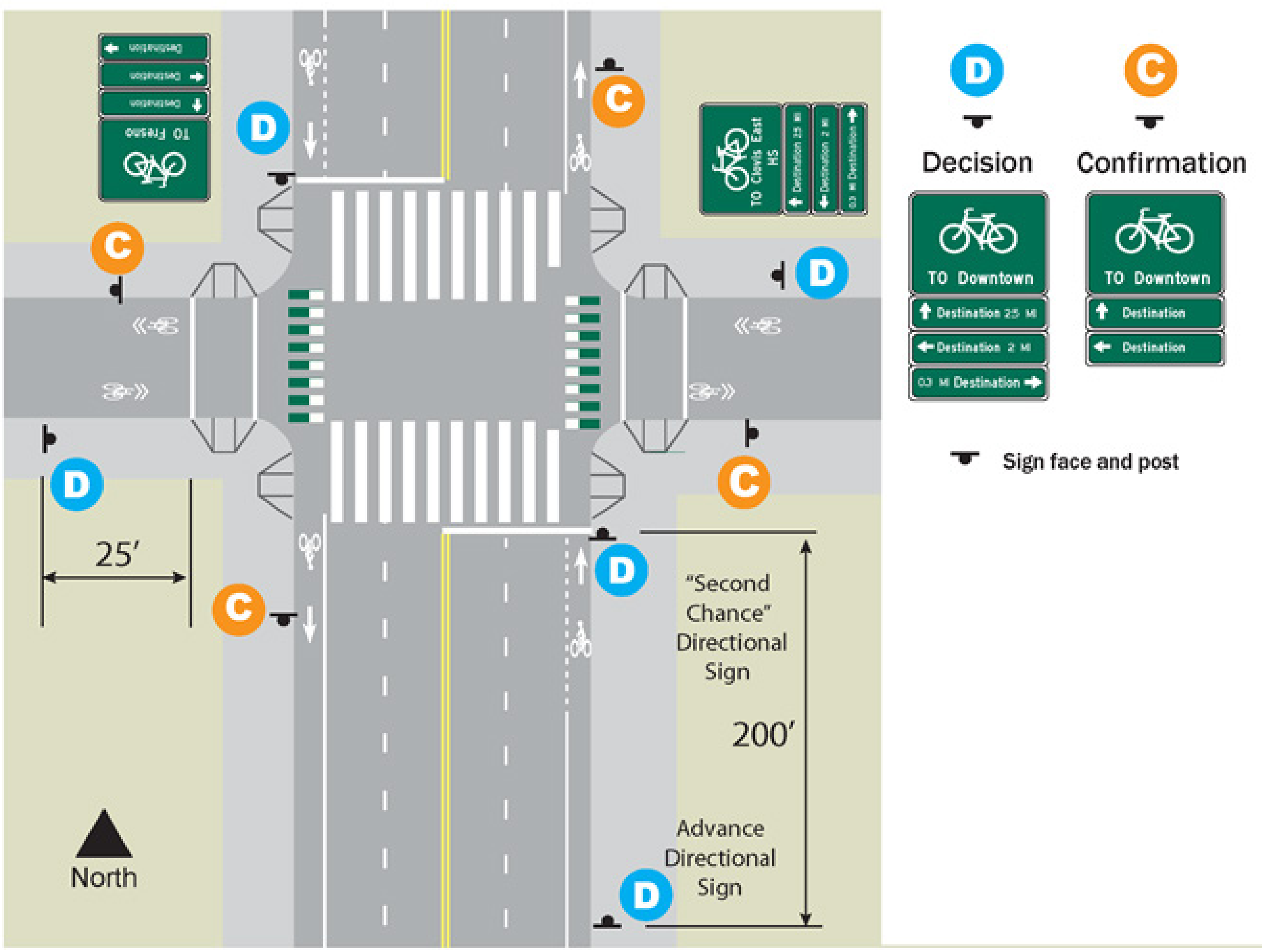
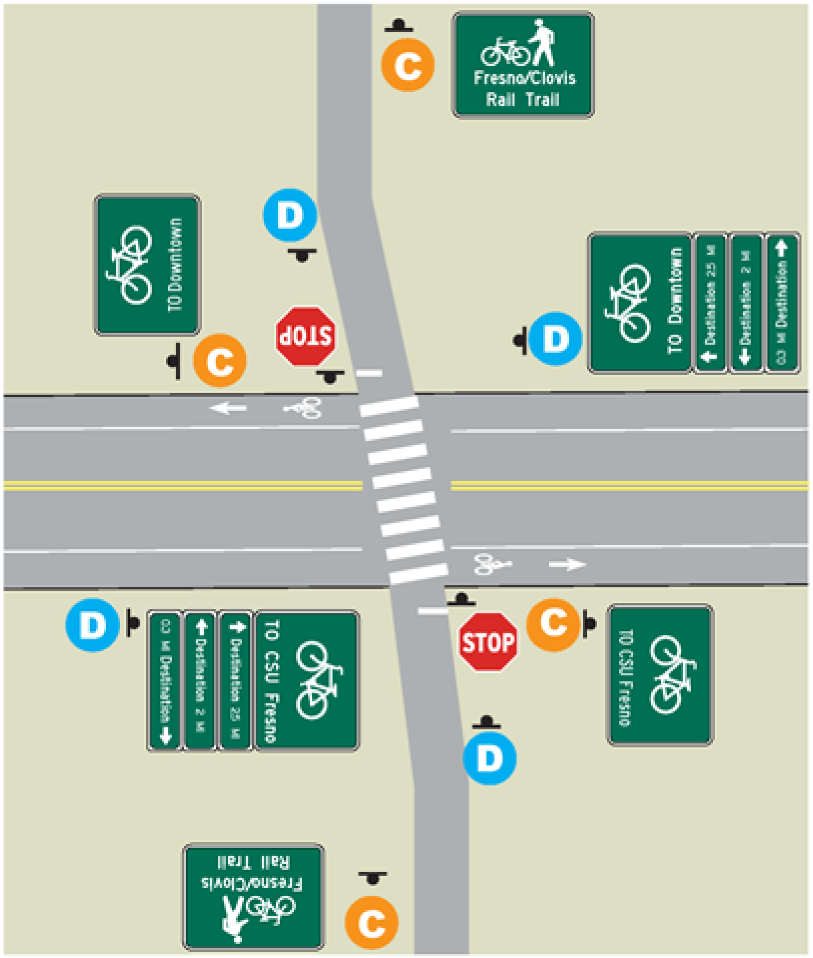


Figure 74: Intersection of a Trail and On-Road Bike Route



LEGEND

- Sign face and post
- C Confirmation Sign
- D Decision Sign

NOTES

- On-street signs use bike symbol only
- Trail signs with bike and ped symbol
- D1-1b/1c series signs with bike symbol can be used in place of D11 + D1 assemblies

Figure 75: Intersection of Two Trail

- Sign face and post
- C Confirmation Sign
- D Decision Sign