

# WOODLAND LOCAL ROAD SAFETY PLAN

Prepared For:



CITY OF  
**WOODLAND**  
CALIFORNIA

Prepared By:

**FEHR & PEERS**

Date Approved:

July 18, 2023

## Engineer's Seal

Chapter 7; Article 3; Section 6735 of the Professional Engineer's Act of the State of California requires engineering calculation(s) or report(s) be either prepared by or under the responsible charge of a licensed civil engineer.

By signing and stamping this Local Road Safety Plan, the engineer is attesting to this report's technical information and engineering data upon which local agency's recommendations, conclusions, and decisions are made.



**Adrian Engel, P.E.**

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**Reviewed by:**

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# EXECUTIVE SUMMARY

The City of Woodland is a city of about 60,000 people located in the Sacramento metropolitan area. Most trips in Woodland are made by personal vehicles, but transit and active transportation trips are also possible on the City's roadway and sidewalk network. Regional trips are typically executed via the Interstate 5 and State Route 113 freeways.

The purpose of this local road safety plan (LRSP) is to aid the City of Woodland in assessing safety issues on its roadway network—both point-location (i.e., hotspot) and systemic issues. In addition, this study identified potential countermeasures to address the safety issues that were uncovered. A framework was also developed

to assist the City in prioritizing the location of future safety projects.

Data for the safety analysis was gathered from various formal and informal sources, including the City's Crossroads database, the Woodland police department, and the public through web map surveys and traffic safety workshops at City Hall. The crash data used in the analysis covered collisions occurring in the City between 2009 and 2020, inclusive.

Data was analyzed in several ways. A collision landscape analysis looked at major trends in the city, including unsafe speed collisions, turning-related collisions, pedestrian collisions, and youth bicycle/ pedestrian collisions. In addition, ten high-risk corridors were identified

and a more in-depth analysis was performed of the crash data along the corridor segments, as well as of the intersections located along the corridors. Profiles were developed for each corridor, identifying major trends and proposing countermeasures to help address safety issues. Finally, the highest occurring crash types were pinpointed and discussed. General countermeasures were proposed to address these more systemic issues.

The next section of this LRSP provides an overview of the benefit-cost analysis executed for countermeasures on each of the ten high-risk corridors. This section also provides information on corridor and intersection crash rates, which provides context to aid the City in prioritizing future safety projects.



The final section of this plan discusses implementation of the plan, including tracking of progress towards completion, oversight, and funding.

This LRSP is an update to the Systemic Safety Analysis Report (SSAR) completed in 2020. The LRSP expands on the analysis with collision data for the years 2016-2020, completed safety improvements, expanded analysis and recommendations for the top priority corridors, and an expanded discussion of and plan for implementation. Additional details of changes between the 2020 SSAR and the 2022 LRSP are provided in Appendix B.



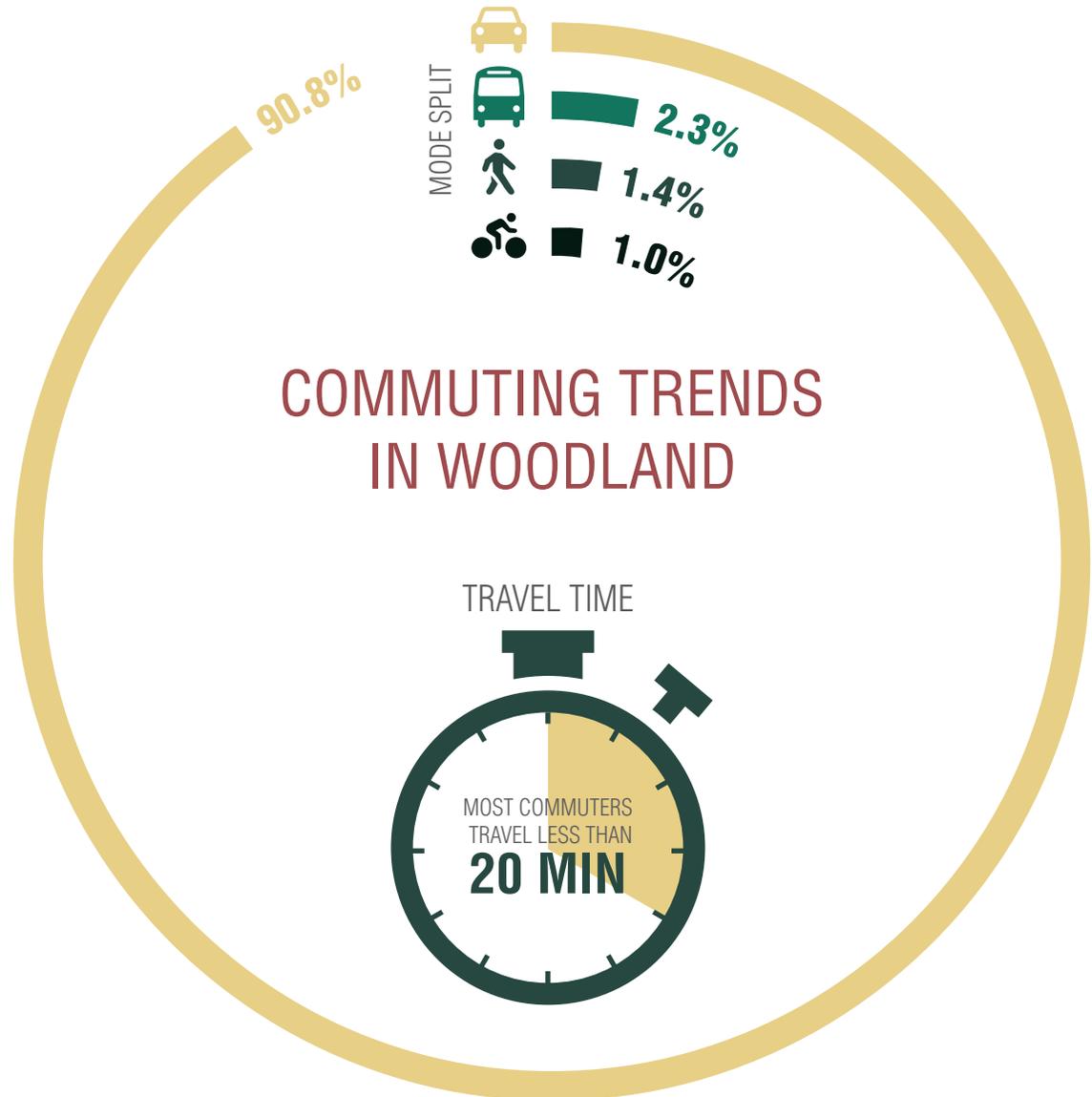


# INTRODUCTION

This chapter provides a high-level description of transportation in the City of Woodland as a context for the data analysis, results discussion, and proposed countermeasures of this LRSP.

## Transportation Network

Mobility and accessibility are important aspects of the City of Woodland's small-town character. This City of about 60,000 people has remained relatively compact compared to other suburban communities in the Sacramento region, making transit, walking, and bicycling viable choices for travel. However, automobiles are the primary mode of travel in the City. According to the US Census Bureau 2019 American Community Survey Five-Year Estimates, about 91 percent of City of Woodland residents commute by car, truck, or van. The share of workers that walk to work in the City of Woodland is about 1.4 percent, and the share of those that bike to work is about 1.0 percent. Additionally, about 2.3 percent of workers use public transportation to get to work. Data from this survey also show the amount of time commuters take to get to work. Based on the data, about 56 percent of workers living in Woodland traveled to work in less than 20 minutes with an average travel time estimated to be 23 minutes.



## Local Roadway Network

The City of Woodland uses a combination of functional classification and street typology to describe and plan its roadway system. Woodland's internal roadway network can be seen in Figure 1, which also shows the number of travel lanes on City streets. Descriptions of each roadway classification is provided below.

- **Principal Arterial Streets:** Provide mobility for high traffic volumes between various parts of the City. They typically link freeways to collectors and local streets and generally have higher speeds and more access control. Principal arterials within the city may have up to four travel lanes.
- **Minor Arterial Streets:** Provide mobility for high traffic volumes between various parts of the City. They typically have lower speeds and less access control than a Principal Arterial street due to the intensity of the development in the urban environment. Minor arterials within the City may have up to four travel lanes.
- **Collector Streets:** Provide for relatively short distance travel between and within neighborhoods, and generally have lower speeds and traffic volumes than arterials. Driveway access to collectors is limited less than on arterials, but may still be discouraged. Collectors within the city have two travel lanes.

- **Local Streets:** Provide direct roadway access to adjacent land uses and serve short distance trips within neighborhoods. Traffic volumes and speed limits on local streets are low, and these roadways have no more than two travel lanes.
- **Alleys:** Serve as accessible rights-of-ways for public and private vehicles, bikes, and pedestrians; and as service access to parking lots and businesses.

Woodland's system of arterials, collectors, local streets, and alleys connect neighborhoods, employment centers, and other destinations within the city. The roadway classification for all city streets can be seen in Figure 2, which is based on the City's 2035 General Plan. In addition, average daily traffic (ADT) on major corridors can be seen in Figure 3. This figure is also based on the General Plan analysis and intuitively shows that the highest ADT occurs near the City's major freeway interchanges.

In addition to the roadway classification system, the City of Woodland also uses street-type context to prioritize travel modes. A description of each street type is provided below.

- **Residential Streets:** Designed to move all modes of travel through residential neighborhoods and local areas of the City. They provide property access and multi-modal mobility by emphasizing walking and biking. On-street parking serves adjacent land uses.



- **Mixed-Use Streets:** Provide access in and to the City's downtown core along with retail and mixed land uses along neighborhood centers and corridors. Designed with on-street parking, narrower travel lanes, and speeds to promote safe pedestrian and bicycle movement.
- **Commercial Streets:** Provide access to the City's retail and employment centers, and generally service commercial buildings. Because street design and vehicle speeds are less desirable for pedestrians and bicyclists, landscaped strips separating bicycle and walking facilities are considered in these corridors in the absence of alternate routes
- **Industrial Streets:** Designed to connect people and businesses within the City's industrial areas and accommodate heavy vehicles. Because street designs accommodate heavy vehicles with large turning radii, bicycle and pedestrian facilities are carefully designed only in key corridors and separated from the street where feasible.

These street types guarantee that the application of street standards consider land uses, appropriate speeds, and the need to accommodate other travel modes and user abilities. Figure 4 shows posted speed limits on Woodland's roadway network. Lower speeds can be seen on Main Street in the downtown core, while faster speeds can be seen along arterials and in the City's industrial area north of Main Street.



## Regional Roadway Network

Three major State and Interstate highways are present within the City of Woodland, providing mobility between Woodland and regional destinations, as well as increasing mobility within the City. Freeway access is provided by grade-separated interchanges, while major highways generally have at-grade intersections. These roadways are maintained by Caltrans and include:

- **Interstate 5 (I-5)** is a north/south route that extends the length of California into Oregon and Washington and connects Mexico to Canada. The freeway is one of the more significant goods movement routes between the two countries and serves a number of long distance truck

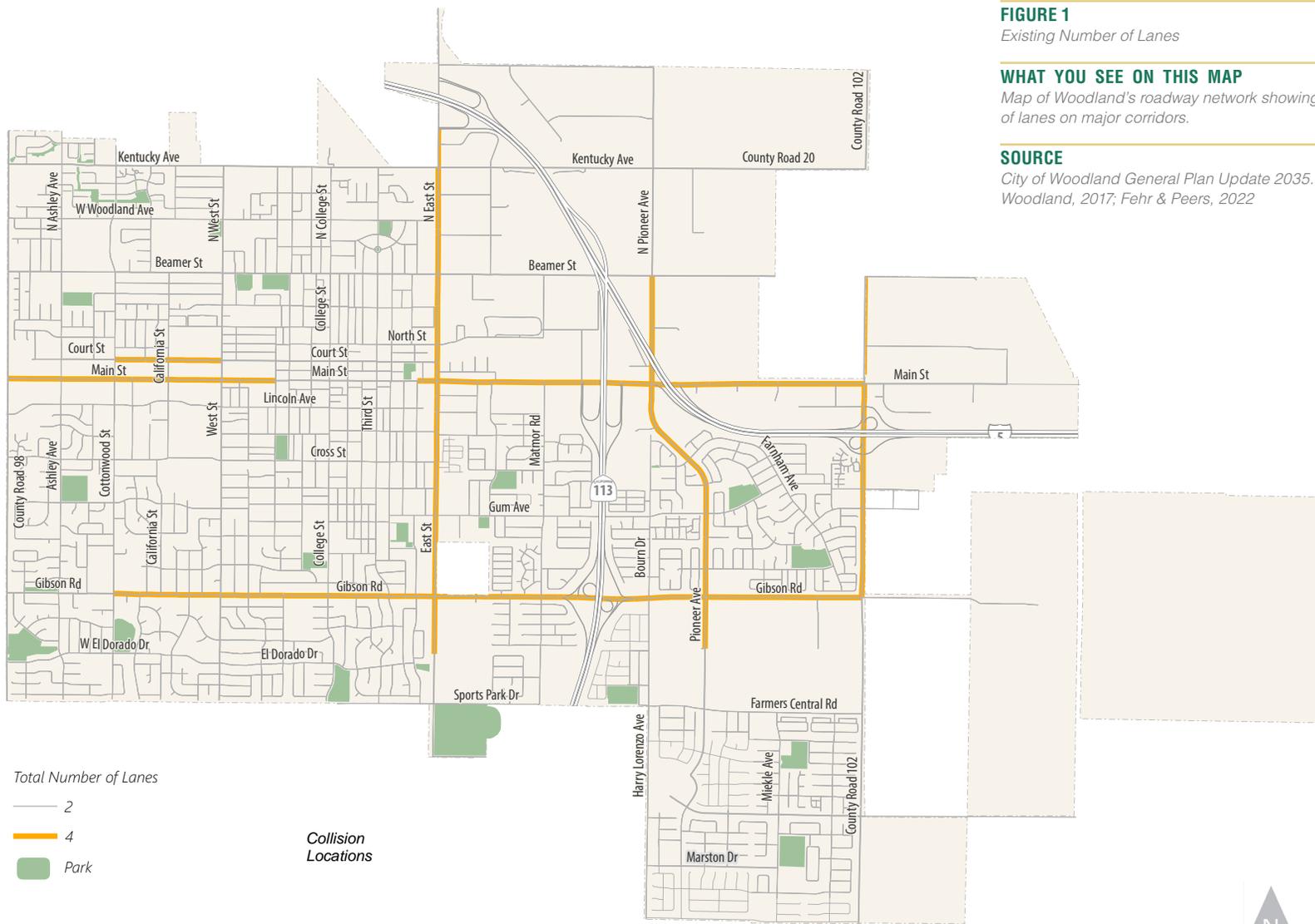
and recreational trips. Within the City of Woodland, I-5 has two general purpose lanes in each direction.

- **State Route 113 (SR 113)** is a north/south route extending from west of Rio Vista to south of Yuba City. The segment between Davis and Woodland is a four-lane freeway and connects I-80 and I-5. SR 113 is also an alternative to SR 99 for regional travel between the San Francisco Bay Area and the rural communities north of Woodland. It continues from I-5 in Woodland to SR 99 as a two-lane conventional highway.
- **State Route 16 (SR 16)** is an east/west route extending from SR 20 in Colusa County to SR 49 in Amador County. In the Woodland area, SR 16 connects directly to Main Street on the west side of the

City before routing north to I-5. SR 16 is the primary route to Cache Creek Resort Casino and is a two-lane conventional highway within the City of Woodland. SR 16 used to extend directly through town as Main Street and although the route designation has changed, SR 16 traffic still contributes to traffic on Main Street.

This system of highways handles the bulk of the long-distance trips that cross through the City of Woodland on the way to other destinations, but it also handles large volumes of commute trips between residential neighborhoods and employment centers in Yolo County and the Sacramento region. Additionally, these highways are utilized by city residents as alternate routes to using some of the City's arterials for intra-city travel.





**FIGURE 1**

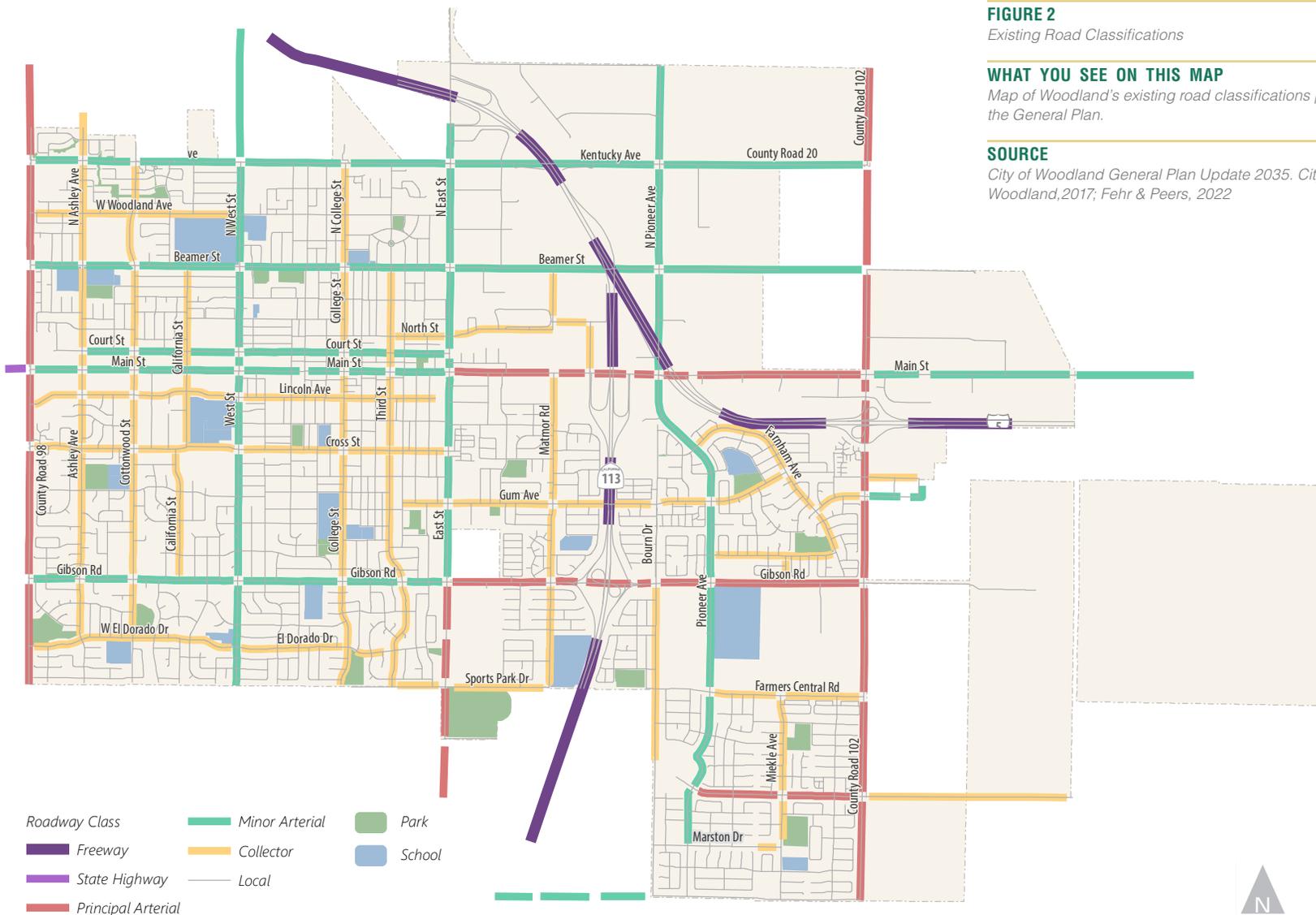
Existing Number of Lanes

**WHAT YOU SEE ON THIS MAP**

Map of Woodland's roadway network showing number of lanes on major corridors.

**SOURCE**

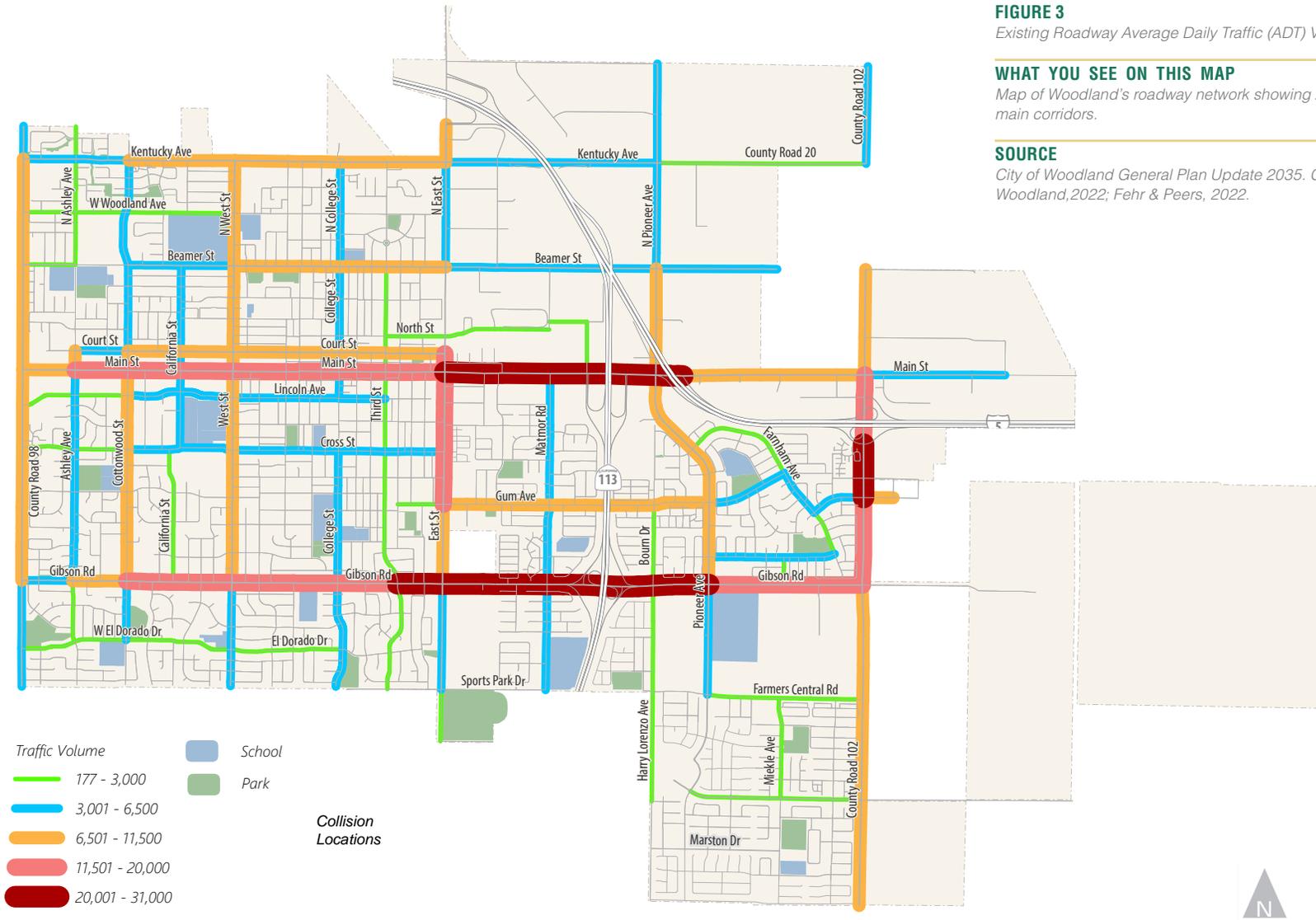
City of Woodland General Plan Update 2035. City of Woodland, 2017; Fehr & Peers, 2022



**FIGURE 2**  
 Existing Road Classifications

**WHAT YOU SEE ON THIS MAP**  
 Map of Woodland's existing road classifications per the General Plan.

**SOURCE**  
 City of Woodland General Plan Update 2035. City of Woodland, 2017; Fehr & Peers, 2022



**FIGURE 3**

Existing Roadway Average Daily Traffic (ADT) Volume

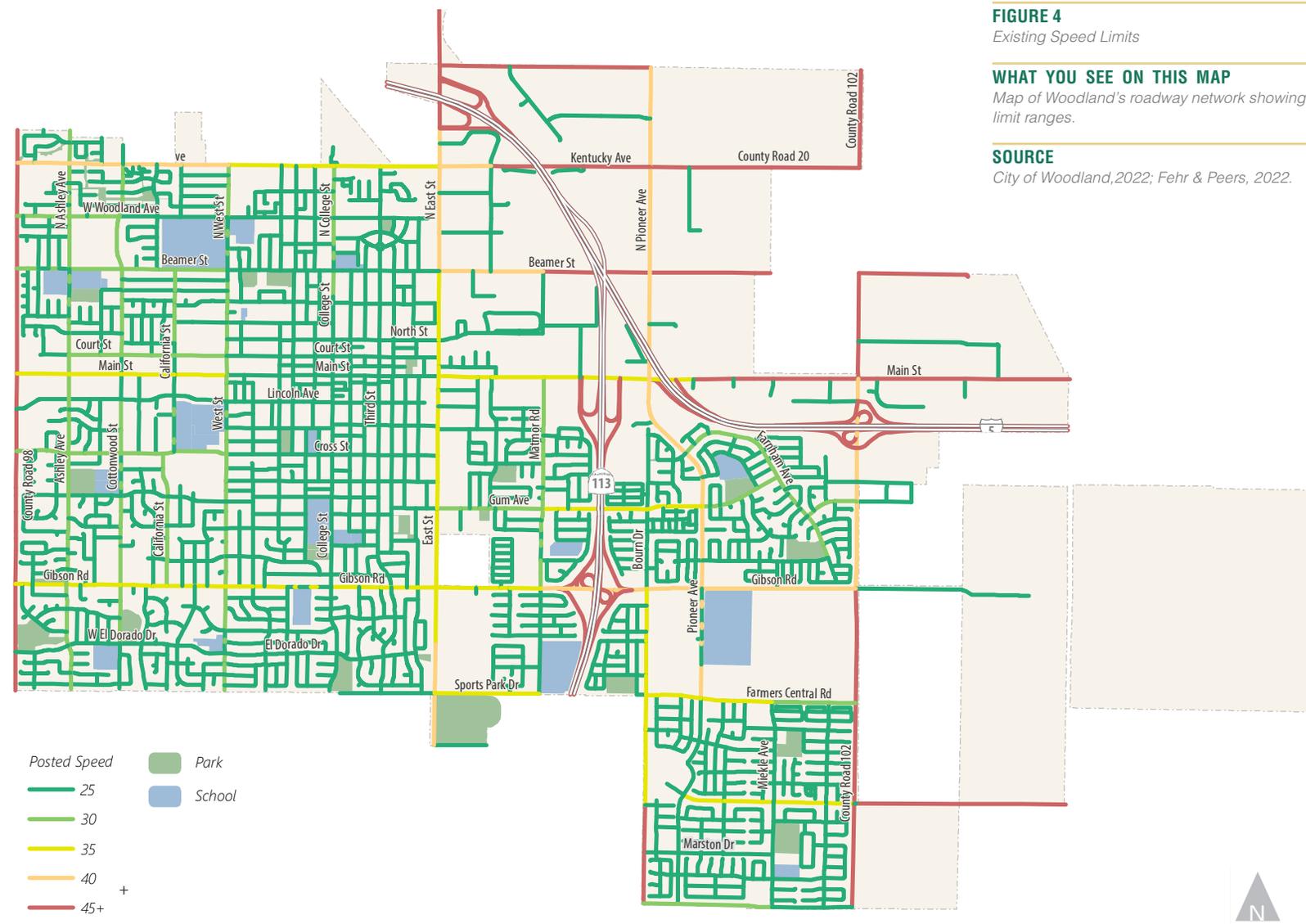
**WHAT YOU SEE ON THIS MAP**

Map of Woodland's roadway network showing ADT on main corridors.

**SOURCE**

City of Woodland General Plan Update 2035. City of Woodland, 2022; Fehr & Peers, 2022.





**FIGURE 4**  
Existing Speed Limits

**WHAT YOU SEE ON THIS MAP**  
Map of Woodland's roadway network showing speed limit ranges.

**SOURCE**  
City of Woodland, 2022; Fehr & Peers, 2022.

## Active Transportation Modes

According to the *Transportation and Circulation Element* (2016), the City “supports Complete Streets to improve safety, promote better public health, improve the convenience of choices amongst travel options, and increase efficiency of travel” (TC 3-7). The city also has a “commitment to a balanced, multimodal transportation network as a whole. While each individual street does not need to provide for all modes of travel, consideration to all roadway users will be prioritized through comprehensive street design using both functional classification and street typology” (TC 3-7). This section provides a quick overview of non-automobile modes of transportation within the city including walking, biking, transit, and railway.



## Pedestrian Facilities

Conditions for walking vary across the city, from industrial districts with little pedestrian infrastructure to suburban neighborhoods with typical sidewalk to the denser, walkable grid of downtown Woodland. The City has emphasized pedestrian travel by enhancing facilities including crosswalks, pedestrian count-down signals, new sidewalks, and traffic calming measures.

Sidewalks are present on the majority of roadways within the city. Most minor arterials, collectors and residential streets have sidewalks on both sides of the street, while principal arterials, especially those on the periphery of the city, typically have sidewalks only on one side. Sidewalks are included on all roadways within the city’s newer planned communities and downtown grid.

The City of Woodland also has off-street facilities for pedestrian travel. Most of these pathways are located in city parks and serve residents who walk for recreation. The off-street facilities typically do not provide direct access to key destinations like commercial and employment centers. Notable off-street facilities include the William Crawford Senior Park cut-through and a multi-use path that accesses the Woodland Community & Senior Center. Multi-use paths are also present within the Spring Lake community and on E. Main Street.



## Bicycle Facilities

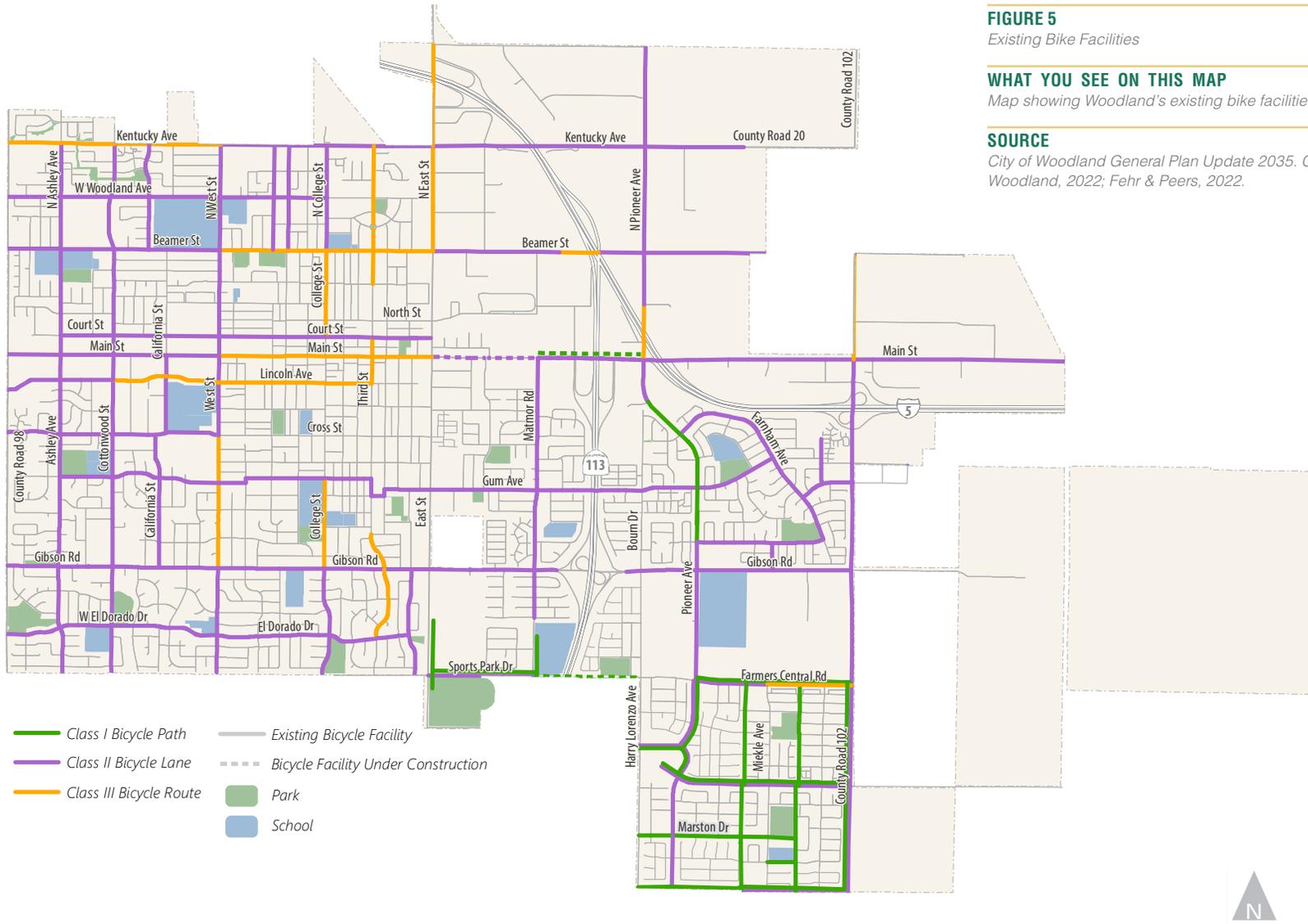
The 2002 City of Woodland Bicycle Transportation Plan (BTP) identifies existing and planned bicycle facilities within the city. The primary purpose of the BTP is to identify on- and off-street bicycle facilities to serve the needs of recreational and commute riders. Fulfilling this purpose is expected to encourage greater levels of bicycling that will contribute to reductions in vehicle travel, air pollution, greenhouse gases, and noise pollution. The plan also presents the appropriate design features of bikeways, such as physical dimensions, signs, and markings. An updated map of the city's existing and planned bike facilities was presented in The City of Woodland's 2035 General Plan, with a caveat that any future update to the BTP would be considered the City's official bikeway plan.

Bikeways in the City of Woodland are classified according to the following three types:

- **Class I** - off-street bike paths;
- **Class II** - on-street bike lanes marked by pavement striping and signage; and
- **Class III** - on-street bike routes that share the road with motorized vehicles.
- **Class IV** - on-street bike routes that share the road with motorized vehicles, but with physical separation, such as parked vehicles or a curb

Existing bike facilities in the City of Woodland can be seen in Figure 5. Many roadways have on-street bike lanes (Class II) or are signed as a bicycle route (Class III). Since 2013, a few Class I bicycle facilities have been constructed along Pioneer Avenue, County Road 102, Heritage Parkway and throughout the Spring Lake Specific Plan area. No Class IV facilities currently exist in the City.





**FIGURE 5**  
 Existing Bike Facilities

**WHAT YOU SEE ON THIS MAP**  
 Map showing Woodland's existing bike facilities.

**SOURCE**  
 City of Woodland General Plan Update 2035. City of Woodland, 2022; Fehr & Peers, 2022.



## Transit Facilities

The Yolo County Transportation District (YCTD) operates Yolobus, which provides local and intercity bus service within the City of Woodland, Yolo County, and to Downtown Sacramento and Sacramento International Airport. Routes 42A and 42B have the highest weekly ridership, serving nearly 55 percent of all transit riders. On weekdays, many segments along these routes, including between Woodland and Davis and between West Sacramento and Downtown Sacramento, experience high ridership. Route 215 serving patrons and workers of Cache Creek Casino Resort, has the second highest weekly ridership. Yolobus also provides morning and afternoon express routes, such as Routes 45, 45X, and 46, for commuters traveling between Woodland and downtown Sacramento. Figure 6 shows Yolobus transit routes and their corresponding headways on a typical weekday.

Although Yolobus public fixed-route services are accessible to the disabled community, the agency also offers door-to-door service for patrons unable to travel on fixed-route bus lines, as required by the ADA. The complementary Paratransit Service operates within the same times and places as the fixed-route buses. It is provided by Yolobus Special and Davis Community Transit on a prearranged basis for any trips within the designated service area.



## Railway Facilities

Railways within the Planning Area serve as a vital component of goods movement. Woodland's industrial sector relies on the railway system to connect it to regional destinations. Two freight railways operate on the current railways including the Sierra Northern Railway and the California Northern Railroad. The main railways plus rail spurs have approximately 29 at-grade crossings of public roads in the City, including 15 crossings adjacent to East and North East Streets. Rail spurs are essential for industrial operations in the City of Woodland and are cited as a key factor when evaluating site locations for new industrial businesses. Rail cars are frequently stored in the area northeast of the Main Street/ East Street intersection.

The California Northern Railroad operates approximately 261 miles of track within California linking freight customers in Northern California with the Union Pacific Railroad. Trains operate from 6:00 AM to 6:00 PM Monday through Friday, with additional weekend service according to customer needs. According to data from the Federal Railroad Administration's Office of Safety Analysis website, two trains run adjacent to Main Street on a daily basis while four trains run adjacent to East Street on a daily basis. Based on this data, train traffic is infrequent and, therefore, does not affect travel time during a typical trip. However, although travel time is not directly affected by railroads, the presence of rail lines restricts potential travel routes for pedestrians and bicyclists since railroad crossings are limited in number, potentially increasing travel time by forcing these travelers to take a more circuitous route. In addition, the presence of a rail line parallel to East Street reduces the quality of pedestrian facilities. For instance, paved sidewalks are non-existent on the west side of East Street, and north-south crosswalks are often poorly marked. Out of the 15 crossings adjacent to East and North East Streets, only 7 provide east-west pedestrian crosswalks.

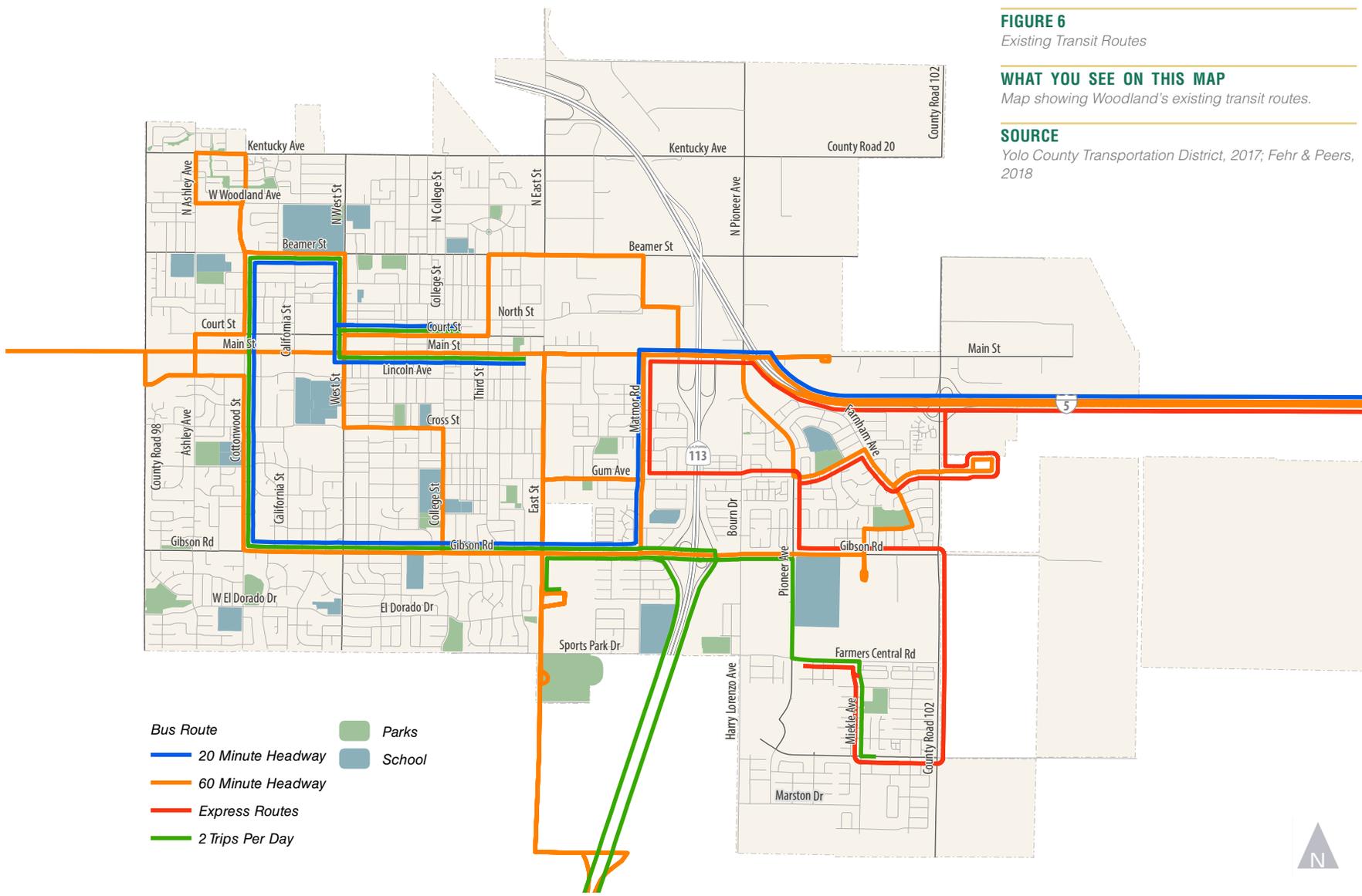
**FIGURE 6**  
Existing Transit Routes

**WHAT YOU SEE ON THIS MAP**

Map showing Woodland's existing transit routes.

**SOURCE**

Yolo County Transportation District, 2017; Fehr & Peers, 2018



# SAFETY ANALYSIS



This chapter summarizes the steps taken in collecting safety data, the methodologies applied in the analysis of the data, and the results. The following information addresses sections 6.3 through 6.7 of Caltrans's *Systemic Safety Analysis Report Program (SSARP) Guidelines* (February 2016) and recommendations in the *Local Road Safety Manual* (April 2022).

## Introduction

The California Office of Traffic Safety (OTS) provides a yearly ranking system that allows individual cities to compare certain safety-related statistics with other, comparably-sized California cities for the purpose of identifying disproportionate traffic safety issues. The rankings are divided into two types: (1) victim and collision, and (2) DUI arrests. The data for these rankings are collected from the Statewide Integrated Traffic Records System (SWITRS) and they include only collisions and DUI arrests that occur on local city streets (i.e., collisions and DUI arrests on roads not part of the city's jurisdiction, such as freeways, are not included even if they occur within city limits). The City of Woodland is in population group C, which includes 105 cities in California with 50,000 to 100,000 residents. The most recent OTS rankings (2019) of Woodland are shown in Tables 1 and 2. Table 1 shows the victim and collision rankings while Table 2 shows the DUI arrests ranking.

Table 1 shows that the City ranked in the top half of most collision types. The City achieved

high rankings in several collision categories, including Total Fatal and Injury collisions, Alcohol Involved collisions, and Night-time collisions. The four collision types for which the City received lower marks are Drinking Driver Less than 21 Years Old, Pedestrian Less than 15 Years Old Involved, Bicyclist Involved, and Bicyclist Less than 15 Years Old Involved. Table 2 shows that the City of Woodland scored near the median of DUI arrest rates for its population category.

Overall, the rankings show that Woodland did well in several categories and poorly in a few. The lowest two rankings suggest that the City should seek to reduce the number of collisions involving bicyclists, particularly young bicyclists, and also young pedestrians, as these statistics are under-performing compared to cities of comparable size. These collision types provided additional points of emphasis in this plan. Generally, it is important to be cautious of scores, especially high marks—of which Woodland has several—because local context should be considered in the interpretation of OTS rankings. The OTS website warns that “rankings are only indicators of potential problems; there are many factors that may either understate or overstate a city/county ranking.” Though these rankings provide big-picture metrics to compare Woodland to similarly-sized cities, this plan looked closely at a variety of data sources in order to be sensitive to Woodland-specific characteristics and circumstances, and to identify appropriate systemic and



hotspot safety countermeasures. The following section explains the data sources examined.

**Table 1: 2019 California OTS Victim and Collision Rankings for the City of Woodland**

Type of Collision	Victims Killed and Injured	OTS Ranking <sup>1</sup>
Total Fatal and Injury	183	79/105
Alcohol Involved	15	80/105
Drinking Driver <21 Years Old	1	37/105
Drinking Driver 21-34 Years Old	2	81/105
Motorcyclist Involved	7	62/105
Pedestrian Involved	10	76/105
Pedestrian Less than 15 Years Old Involved	3	32/105
Pedestrian 65 Years or Older Involved	2	60/105
Bicyclist Involved	18	30/105
Bicyclist Less than 15 Years Old Involved	4	15/105
Speed-Related <sup>2</sup>	34	60/105
Night-time <sup>3</sup>	10	96/105
Hit and Run	7	77/105
Composite <sup>4</sup>	69	77/105

Notes:

1. The higher the OTS ranking (larger number) is, the better the City of Woodland performed in the given collision type in 2019.
2. This includes collisions in which speed was the primary factor.
3. This includes collisions that occurred between 9:00 PM and 2:59 AM.
4. The "composite" collision type consists of a sum of the following other collision types: Alcohol Involved, Drinking Driver <21 Years Old, Drinking Driver 21-34 Years Old, Hit and Run, Night-time, and Speed-Related.

Source: California Office of Traffic Safety, 2022, Fehr & Peers, 2022.



**Table 2: 2019 California OTS DUI Arrests Ranking for the City of Woodland**

Type of Arrest	Arrests	OTS Ranking <sup>2</sup>
Driving Under Influence (DUI)	101	44/105

Note:

1. The lower the DUI arrest ranking is, the lower the arrest rate.  
 Source: Fehr & Peers, 2022.



## Data Collection

Chapter 2 of the LRSM states that safety practitioners should “consider a wide range of data sources to get an overall picture of the safety needs,” dividing these sources into two categories: formal and informal (p. 14). Collection of both formal and informal data sources is recommended when performing safety analysis. The sources utilized in this study are discussed below, while data analysis results are presented in subsequent sections.

### Formal Data Sources

Chapter 2 of the LRSM states that at least three years of crash data should be used but five years of data is preferable. In addition, more years of crash data could be helpful, especially for low-volume roadways. For this plan, 12 years of the most current crash data (2009-2020) available was extracted from the City of Woodland’s Crossroads database. Crossroads is a commercial provider of a database designed to record collision details. It should be noted that although collision data was available for part of 2021, only 2009-2020 data was used to maintain consistency of the number of observed months when analyzing the data by year. The provided dataset included extensive collision details such as collision location, type, severity, parties involved, contributing factors, etc.

In addition to the quantitative data provided by the City, qualitative data was gathered

through field assessments of certain roadway segments being considered for safety countermeasures.

### Informal Data Sources

Chapter 2 of the LRSM also recommends that cities consider informal sources such as “observational information from road maintenance crews, law enforcement, and first responders” (p.14). These data sources provide valuable safety information from those intimately familiar with city roadways and the collisions that take place thereon. In addition to the extensive formal data outlined in the previous section, this study also gathered informal data from the City’s police department and through public outreach.

Several officers were interviewed from the Woodland Police Department that were either currently or previously assigned to traffic safety. In general, Woodland law enforcement is aware and active in the field of traffic enforcement. Based on officer responses, about 1200 hours of department time are dedicated to traffic enforcement per week, and the department regularly conducts pedestrian- and bicycle-oriented enforcement activities such as crosswalk and bike lane enforcement for vehicles and speed enforcement in school zones and areas frequented by pedestrians. One officer has been trained in a 40-hour course about collisions involving pedestrians. The department also has a OTS STEP grant for 48 hours of bicycle, pedestrian, and vehicle

enforcement. The officers are also aware of the City's Crossroads program and its capabilities. They review collision data on a request-only basis.

Other key takeaways from the police department interview include:

- The officers feel that school areas, Gibson Avenue/Pioneer Avenue, and long, straight local roads (such as Pendegast Street, historic neighborhoods, etc.) are locations that have close calls, which are not apparent in the data.
- In terms of balancing response time needs with roadway designs that benefit pedestrian safety/access, the officers' main concern is that physical design features do not impede primary response routes.
- The police department is sometimes involved with design of roadway facilities, but it does not participate in test runs of roadway designs aimed to reduce speed and improve pedestrian access.
- There are no police officers specifically dedicated to foot or bicycle patrols, but motor vehicle officers will take time out of their vehicles to do foot/bike patrols.

Informal data was also collected via a public outreach effort that gathered input from city residents. This effort was especially important given that formal, historical data does not exist for newer neighborhoods in Woodland. In addition, some traffic safety issues may be

perceived by the public that are not readily apparent in the collision data. To gather resident input, an online map survey was developed and publicized to the Woodland community. The map survey is a web-based, custom tool that allowed the public to place point markers on a city map and specify traffic-related concerns such as unsafe behavior observed or an infrastructure problem. Survey map users were also free to provide additional comments if more details about specific issues were necessary. Due to a large Latino presence in the Woodland community, the map survey was provided in both English and Spanish. Overall, the web map input period lasted over six weeks. Comments were then reviewed, consolidated, and summarized in a document shared with City staff. This document can be viewed in Appendix A.

To draw public attention to this study and the web map, a Traffic Safety Public Workshop was held in the City of Woodland council chambers on February 13, 2018. The workshop was publicized on the City's website and in several articles by the Daily Democrat, Woodland's local newspaper. At the workshop, attendees received a briefing on the project and the collision landscape analysis results. They were also able to fill out comment cards or use two on-site computers to provide traffic safety input via the web map. Comment cards were later manually entered into the web map survey as well. The workshop was well-attended by City staff and residents, who filled most of the seats in the council chambers. A

summary of the workshop event can be found in the Daily Democrat (local newspaper) article "Woodlanders look at city's most hazardous roads" (February 16, 2018, <https://www.dailydemocrat.com/2018/02/16/woodlanders-look-at-citys-most-hazardous-roads/>).

## Stakeholders

As a key input to the development of the LRSP, a group of stakeholders was consulted to provide input to the plan development and feedback on the plan conclusions. These stakeholders included:

- City Council Infrastructure Subcommittee
- Public Works staff
- City Manager
- Woodland Police Community Relations Commander
- Woodland Fire Department Chief
- Representatives from Bike Campaign and Outta Sight (advocates for the visually impaired)
- Woodland Police Community Relations

This group reviewed and supported the overall objectives of the plan, and provided input to its development. They also reviewed the draft plan prior to release.

# DATA ANALYSIS TECHNIQUES, RESULTS, AND COUNTERMEASURES

Both formal and informal data were collected and processed. This section documents the data analysis techniques used and presents results of that analysis. The chapter also presents the proposed countermeasures developed to address the prioritized safety issues from the analysis.

## Collision Landscape Analysis

After receiving formal data from the City of Woodland, a collision landscape analysis was performed. This analysis involved looking at the entire City's roadway network to identify prevailing crash trends and crash concentrations. As a part of this process, collisions were summarized across many different frameworks. First, collisions were divided according to transportation mode (vehicle-involved, bicycle-involved, and pedestrian-involved) and then further disaggregated by collision severity. These categories were then analyzed in the context of many other factors, such as cause, movement, time of day, collision type, pedestrian action, lighting, weather conditions, etc. Through this exercise, several prevalent crash characteristics for the City of Woodland surfaced. These were prepared spatially on maps of the City's roadway network to identify systemic trends and hotspots. In addition, the "high-risk corridors/intersections" analysis outlined in the next section provided insight

into crash characteristics related to turning movements. Maps were also developed that displayed a complete collision history (2009-2020), only collisions that involved severe injury, and only fatal collisions. As outlined below, Figures 7-14 were the end product of this entire process.

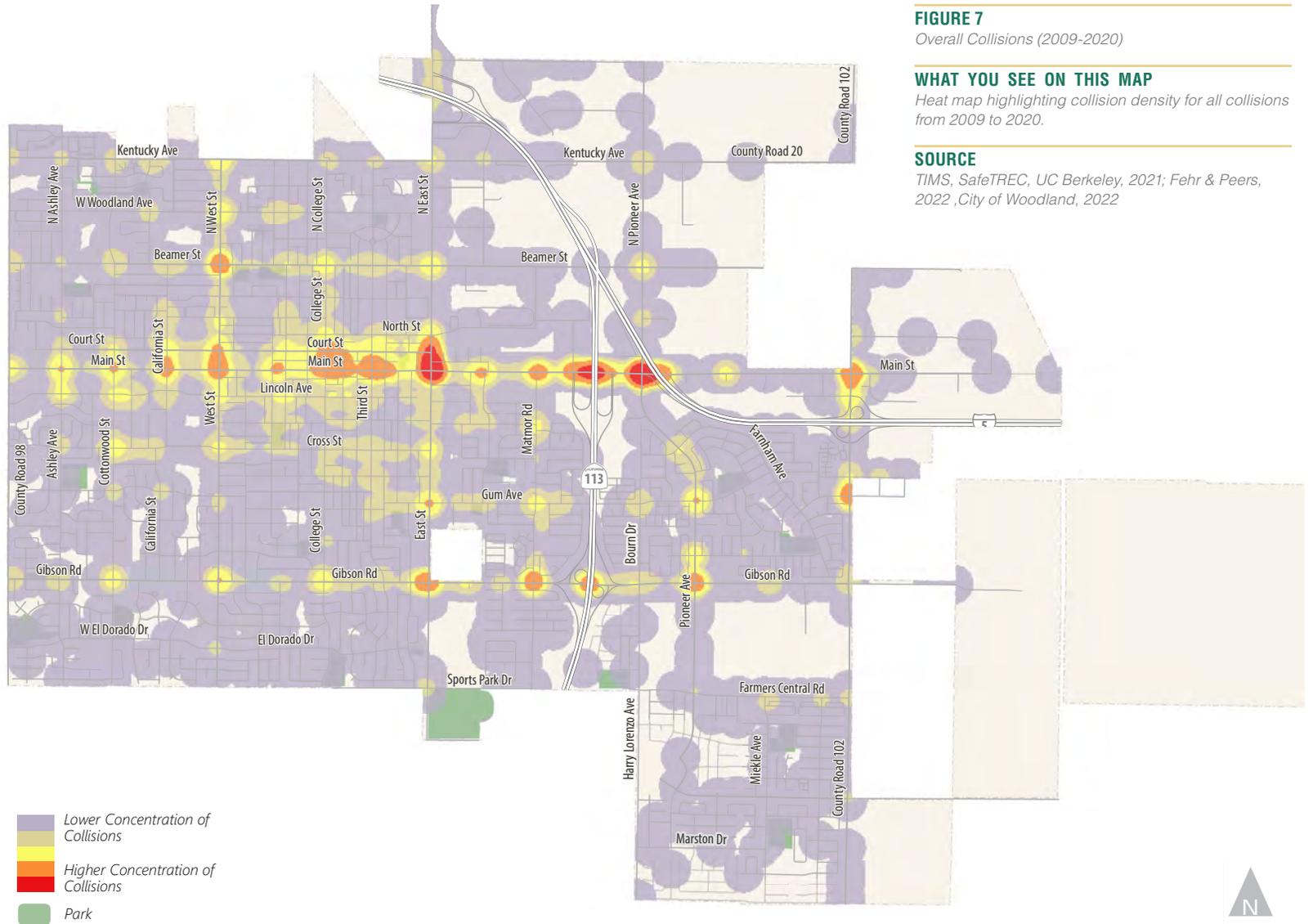
- Overall Collisions (Figure 7)
- Severely Injured Collisions (Figure 8)
- Fatality Collisions (Figure 9)
- Primary Factor Unsafe Speed Collisions (Figure 10)
- Primary Factor Turning-Related Collisions (Figure 11)
- Pedestrian Collisions (Figure 12)
- Youth Bicycle Collisions (Figure 13)
- Youth Pedestrian Collisions (Figure 14)

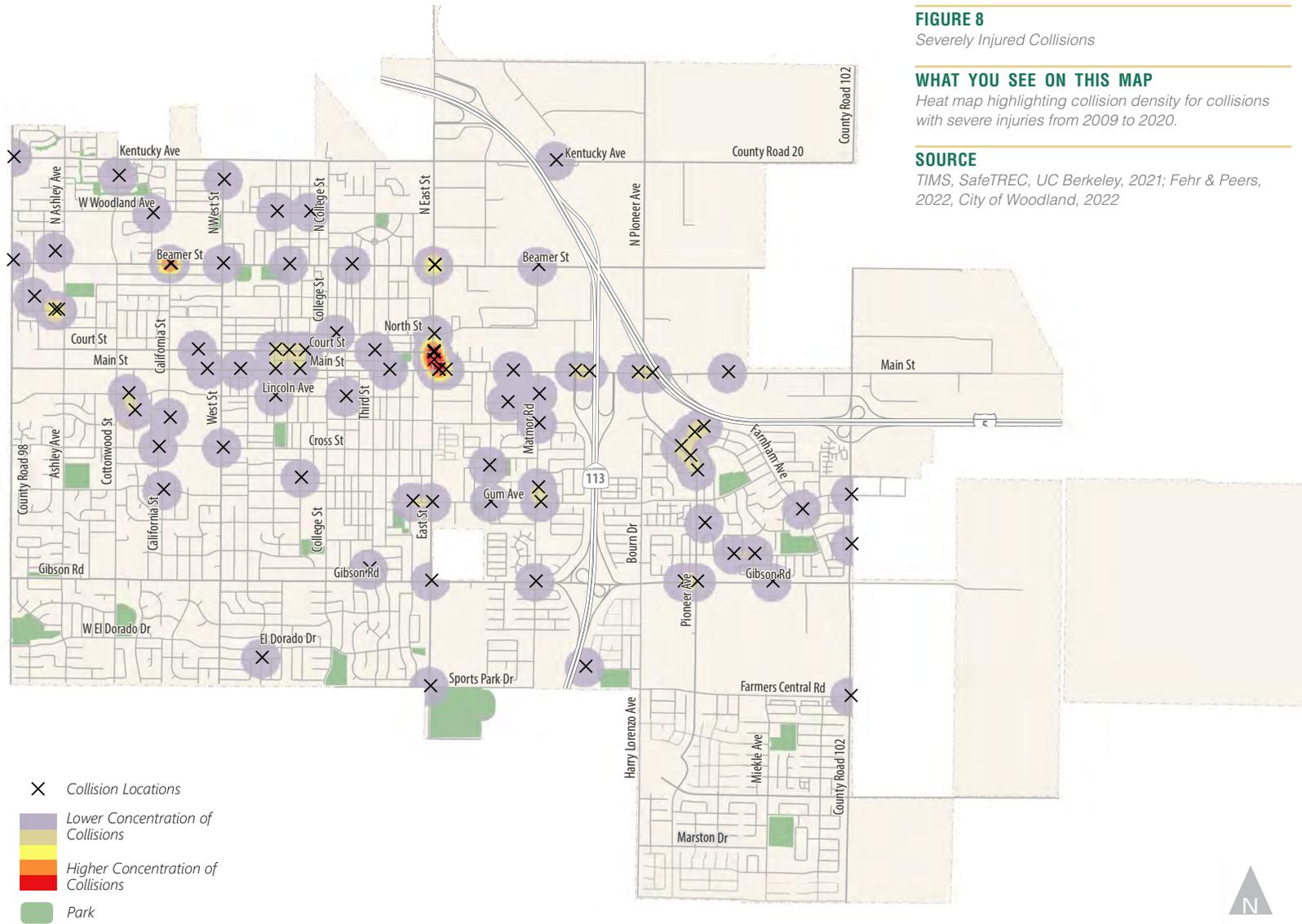
In addition, exposure data in the form of ADT volumes and length of roadway segments allowed for crash rates to be produced for the high-risk corridors identified later in this report. Crash rates are normalized values that express the frequency of collisions based on certain factors. According to the LRSM, roadway crash rates are based on ADT, the number of data years, and the length of the roadway segment. Intersection crash rates are based on the number of years of data and the traffic volumes entering the intersection on a daily basis. Crash rates permit for an enhanced safety comparison

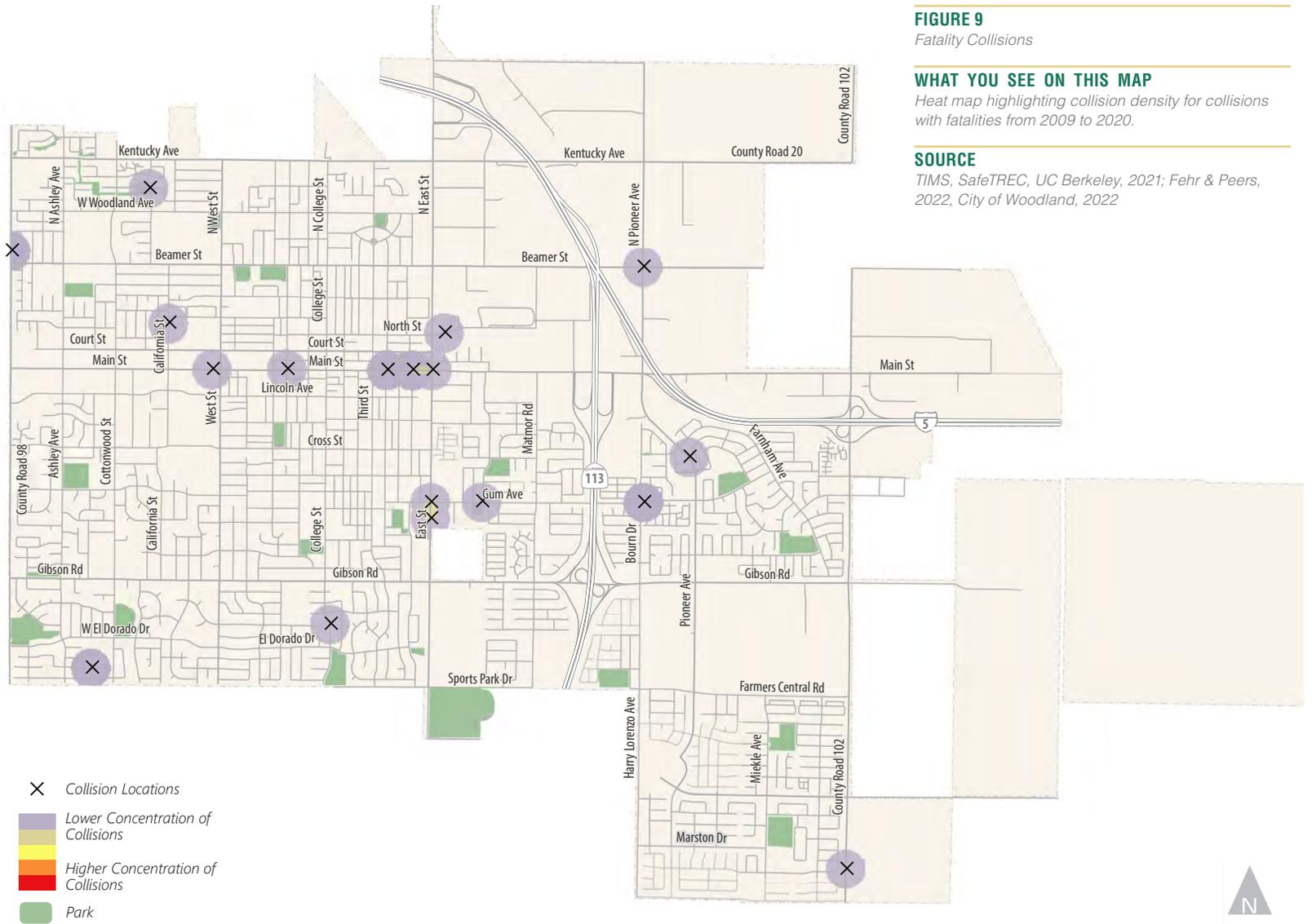
of roadways and intersections. Although one road or intersection may have more collisions than another, it may have a lower crash rate. Intersection and corridor crash rates are presented and discussed later in this report for ten high-risk corridors and many of the intersections contained therein.

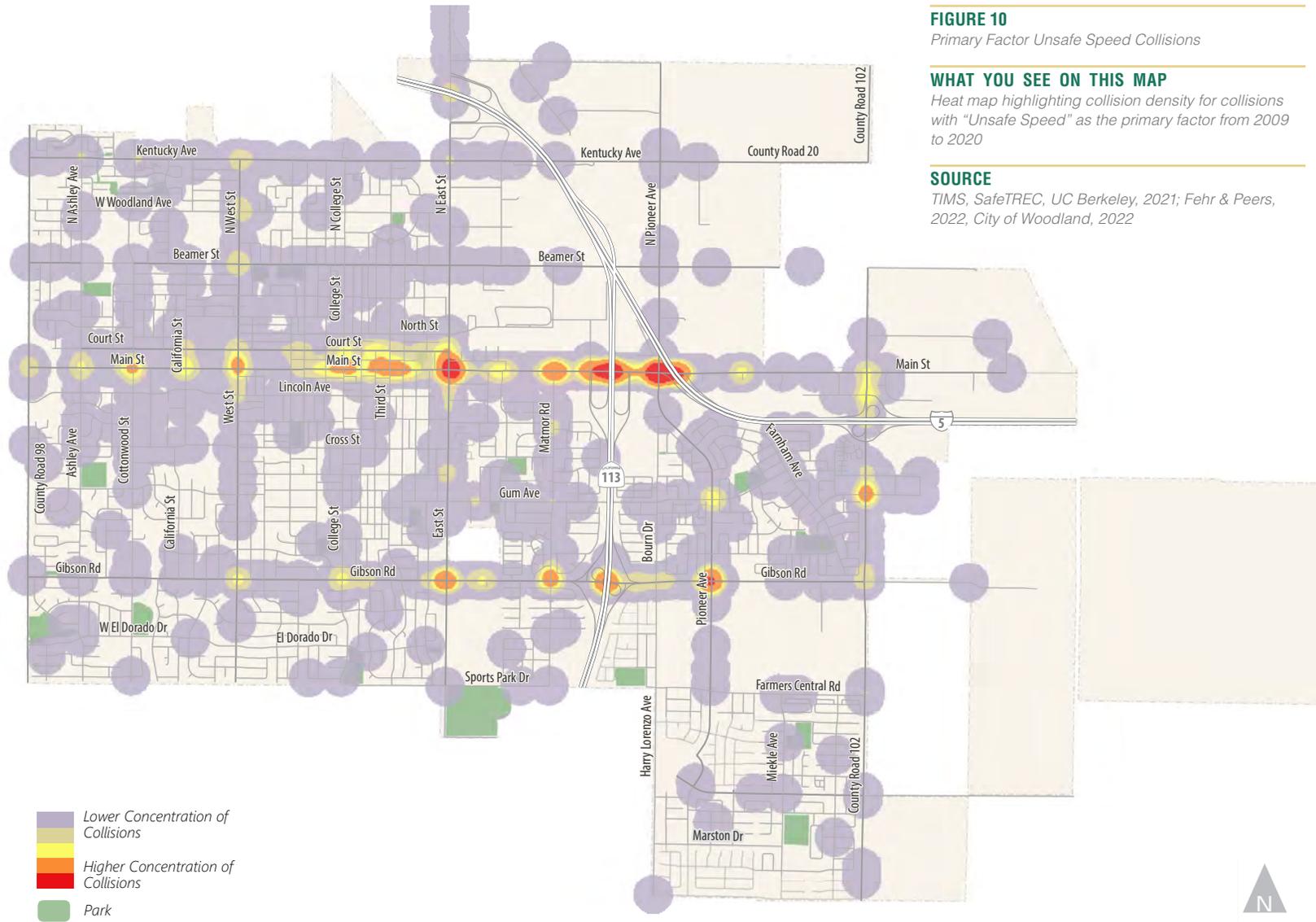




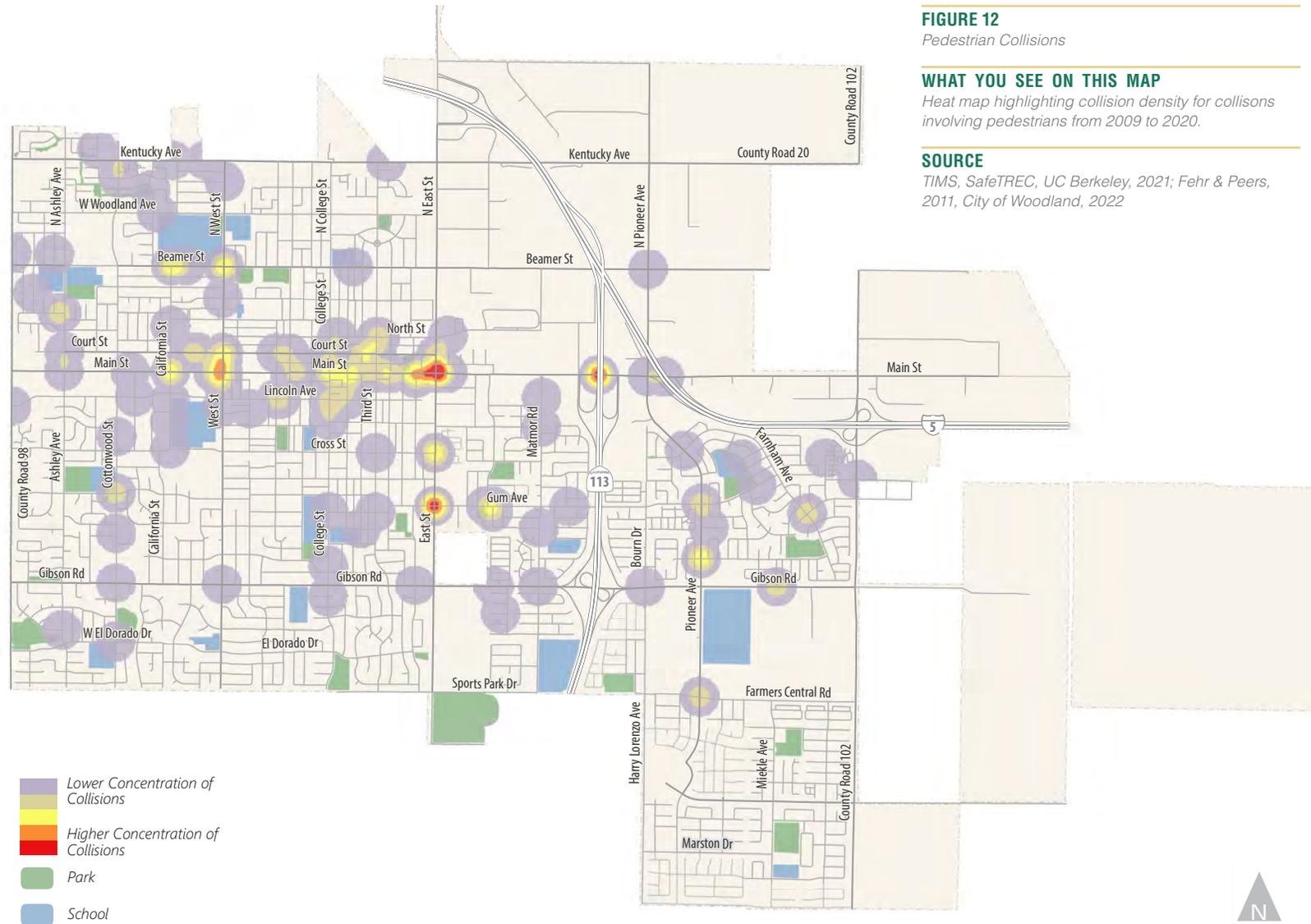




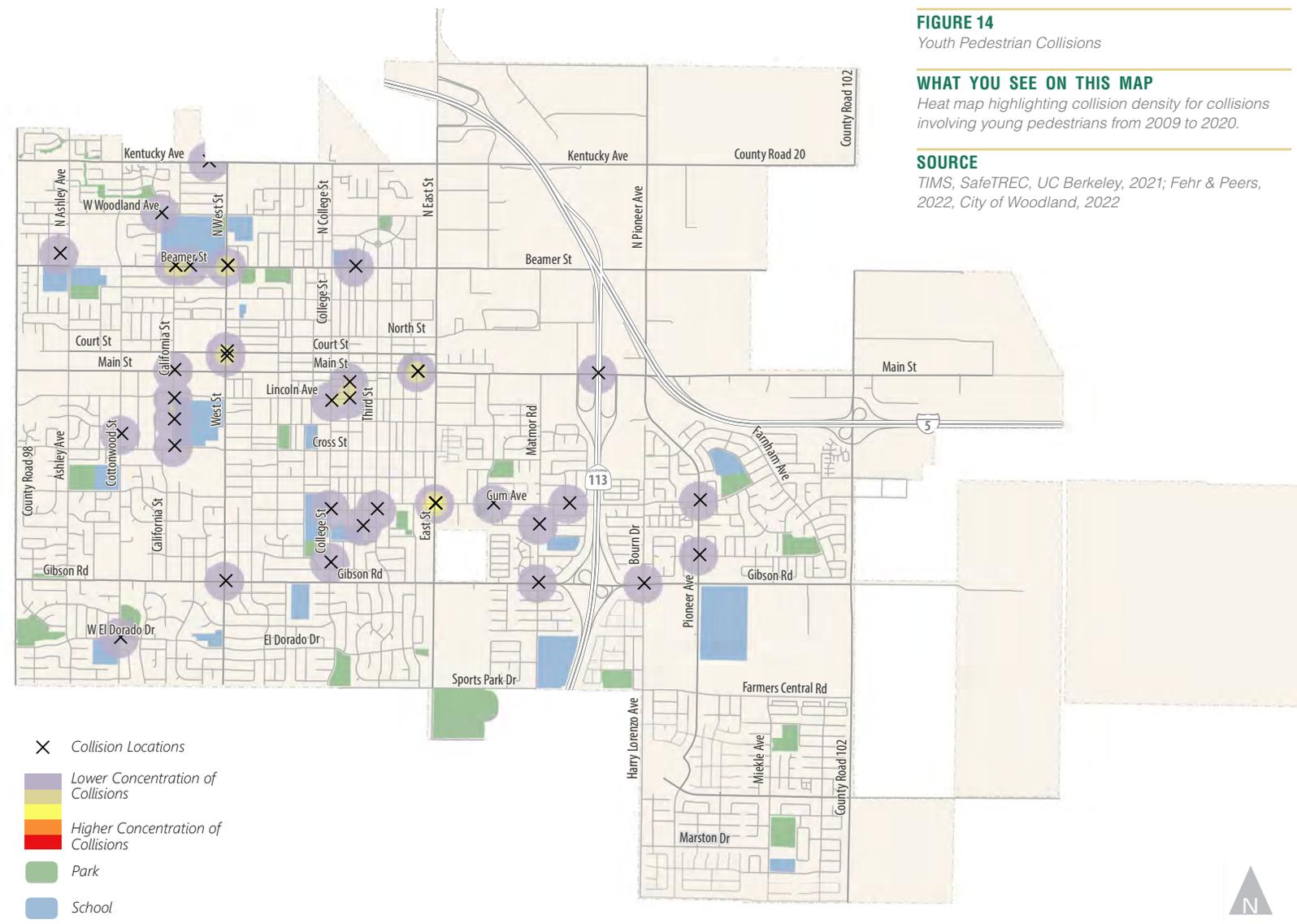












# HIGH-RISK CORRIDORS/INTERSECTIONS AND COUNTERMEASURES



This plan focuses on developing corridor profiles for 10 major corridors and their intersections. The profiles were completed through a context-specific analysis that identified important crash characteristics on each roadway.

As part of the update to the plan as an LRSP, five corridors received additional analysis. The City identified these top five corridors as having the most opportunity for implementation of safety improvements, considering collision history, geometry, and available right of way. These corridors are also highlighted as key corridors in the City General Plan. These top five corridors are:

- East Street – Kentucky Avenue to Main Street
- East Street – Main Street to Gibson Road
- West Street – Kentucky Avenue to Main Street
- West Street – Main Street to Gibson Road
- Main Street – West Street to East Street

The other five focus corridors are:

- Gibson Road – County Road 98 to College Street
- Gibson Road – College Street to Matmor Road
- Gibson Road – Matmor Road to County Road 102
- Main Street – East Street to Interstate 5 Northbound Off-Ramp



- Pioneer Avenue – Main Street to Gibson Road

Data for each analysis was taken from the Crossroads data provided by the City. Data was extracted so that only collisions occurring within 100 feet of each corridor were examined. The only exception was Gibson Road between County Road 98 and College Street, which looked at data within 150 feet of the corridor. In addition to analyzing the corridors generally, each intersection in the corridors was also evaluated using collision data at or within 100 feet of the intersection. This intersection-level analysis allowed for observations and conclusions to be crafted that were specific to intersection characteristics (signal timings, intersection layout, pedestrian facilities, etc.).

In addition to looking at corridor/intersection traits and developing crash characteristics, the analysis also identified potential

countermeasures to address the safety issues. These recommendations are presented with the final collision profiles in this chapter.

Some countermeasures are proposed for intersections of local roads with freeway ramps and freeway overcrossings. These improvements will require Caltrans approval and action and are noted.

The statistics reported for each corridor use data from 2009 through 2016, as reported in the 2020 Woodland SSAR. The diagrams depicting collisions along each corridor have been updated to include collision data from 2017 to 2020. No significant changes in collision patterns were noted. Countermeasure recommendations from the first release of the plan have been updated to note completion or progress toward implementation.

For the top five corridors, statistics were updated to add 2017-2020 collision data.

# Gibson Road: County Road 98 to College Street

In an eight-year period, 117 collisions occurred along or near Gibson Road between County Road 98 and College Street. These collisions totaled 25 injured persons from 19 separate collisions, and zero fatalities.

The major collision factors included unsafe speed, auto right-of way violations, traffic signal or sign violations, and improper turning. Most collisions occurred at or within 100 feet of intersections, with most of those

collisions occurring (in descending order) at the Cottonwood Street, West Street, College Street, County Road 98, and Ashley Avenue intersections.

## Corridor Collision Profile

### Countermeasure Objectives:

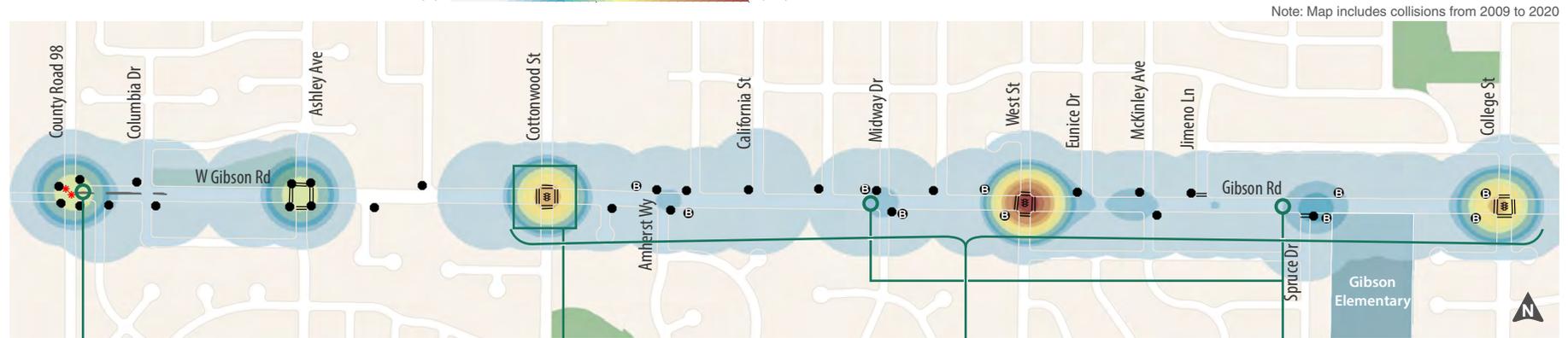
- Reduce speeding
- Enhance pedestrian safety
- Improve pedestrian connectivity

## What do we know about these collisions (2009-2016)?



In the Map:

- ⚡ Traffic Signal
  - Stop Sign
  - Crosswalk
  - Median
  - ★ Flashing Beacon
  - Ⓚ Bus Stop
- Low (1) **COLLISION INTENSITY** High (20)



## Countermeasures

### Crosswalk on east side of Gibson Rd/ County Road 98

A crosswalk on this corridor bookend would raise driver awareness of pedestrians and provide a safer north-south pedestrian connection along County Road 98.

The following countermeasures are estimated to be complete in 2022:

- Crosswalk on east side of Gibson Rd/County Road 98
- Signal timing modifications at Gibson Rd/ Cottonwood St
- Road diet between west of Cottonwood St and West St
- Lane width reduction from West St to College St
- Gibson Road crosswalk on west side of Midway Rd

### Signal timing modifications at Gibson Rd/ Cottonwood St

Signal timing modifications that reduce or eliminate conflict between southbound and northbound vehicles could decrease the number of collisions.

### Road diet between west of Cottonwood St and College St

This would include reducing to a three lane cross-section, including one eastbound lane, one westbound lane, and one two-way left-turn lane (TWLTL). The TWLTL would increase storage length for the westbound left-turn into Gibson Elementary School. Furthermore, a road diet would potentially allow for buffered bike lanes or provide additional on-street parking, such as across Gibson Elementary School or on the south side of Gibson road between Midway Drive and West Street. The implementation of a road diet would also eliminate collisions at Gibson Road/Cottonwood Street due to westbound through vehicles merging before, during, or after the intersection.

### Gibson Road crosswalk on west side of Midway Rd and Spruce Dr

A Midway Dr crosswalk would provide a north-south connection near an existing bus stop, while a Spruce Dr crosswalk would intersect the ½ mile distance between the College St and West St crosswalks. The following will be required:

- Completion of the road diet.
- Rectangular rapid flashing beacon (RRFB) with
  - High visibility crosswalks markings,
  - Parking restrictions on crosswalk approach
  - Adequate lighting,
  - Curb extensions, and
  - Pedestrian refuge islands.

# Gibson Road: College Street to Matmor Road

Between 2009 and 2016, 148 collisions occurred along or near Gibson Road between College Street and Matmor Road, resulting in 48 injuries from 34 separate incidents and in zero fatalities. The major collision causes

included unsafe speed, traffic signals or signs violations, improper turning, and automobile right-of-way violations. A large percentage of collisions occurred during weekday morning and evening peak hours, and three-fifths of

these were due to unsafe speed. Of all the intersections in this corridor, Gibson Road/East Street and Gibson Road/Matmor Road were the most prone to collisions.

## Corridor Collision Profile

### Countermeasure Objectives:

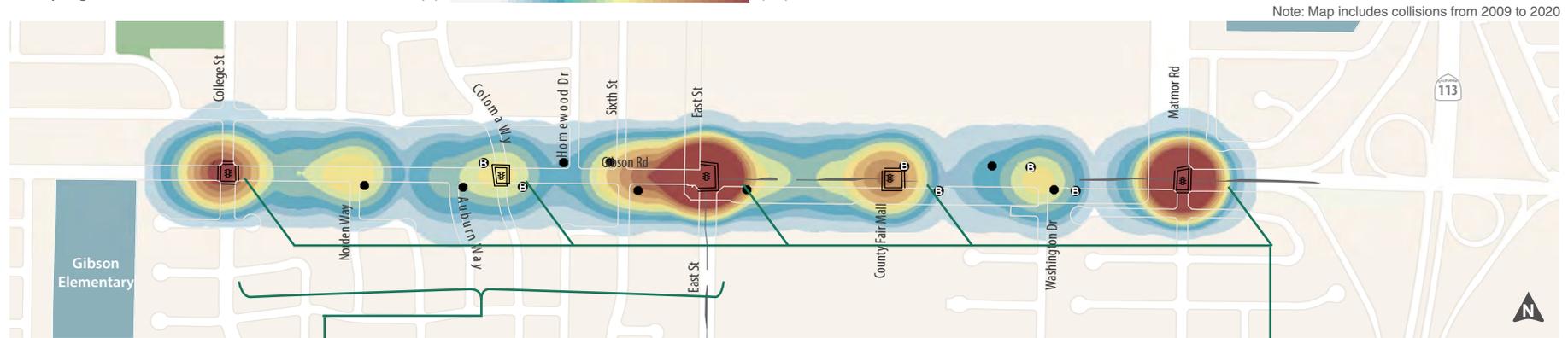
- Reduce speeding
- Reduce rear-end collisions
- Improve safety at major intersections

## What do we know about these collisions (2009-2016)?



### In the Map:

- Traffic Signal
  - Stop Sign
  - = Crosswalk
  - Median
  - \* Flashing Beacon
  - ⊙ Bus Stop
- Low (1) **COLLISION INTENSITY** High (20)



## Countermeasures

### Road diet between College St and East St

This would include reducing to a three lane cross-section, with one eastbound lane, one westbound lane, and one two-way left-turn lane (TWLTL). This road diet would connect to the recommended road diet west of College Street. It would serve to reduce collisions caused by unsafe speed, which is the leading cause of collisions on this corridor. In addition, there are four side streets on this section of Gibson Road that do not have ingress turn pockets, meaning that ingress vehicles must slow down or stop in through lanes as they wait for gaps to turn. A TWLTL would provide these vehicles with separation from through traffic. This road diet countermeasure is further discussed in the next report section.

### The following countermeasures are estimated to be complete by 2024:

- Lane width reduction between College St and East St
- Red time and/or yellow adjustment at all signalized intersections
- LPIs at all signalized intersections

### Red time and/or yellow adjustment at all signalized intersections

Thirty percent of the collisions at Gibson Road/East Street and Gibson Road/Matmor Road occur between vehicles that should not be crossing the intersection at the same time. Gibson Road/East Street currently provides 0 or 0.5 seconds of red time, depending on the phase. Gibson Road/Matmor Road has similar red time settings. Increasing the phase red times in a consistent manner would allow extra time for vehicles to clear intersections. In addition, speed surveys could be completed to establish more appropriate yellow times. For safety reasons, red times should be consistent at all signals in a corridor.

# Gibson Road: Matmor Road to County Road 102

Gibson Road between Matmor Road and County Road 102 contains Pioneer High School and one of the most crucial interchanges in the City. Over an eight-year period, there were 181 collisions along or near this corridor, resulting in 46 injuries from

33 separate incidents and in zero fatalities. Almost half of the collisions in this corridor were due to unsafe speed. The rest of the major collision causes included traffic signals or signs violations, improper turning, and automobile right-of-way violations. Due to the

presence of the high school, 23% of collisions involved a driver, bicyclist, or pedestrian age 18 years or under. 26 of these youth-involved collisions occurred between 7:00 AM and 4:00 PM on weekdays, with most being triggered by unsafe speeds.

## Corridor Collision Profile

### What do we know about these collisions (2009-2016)?

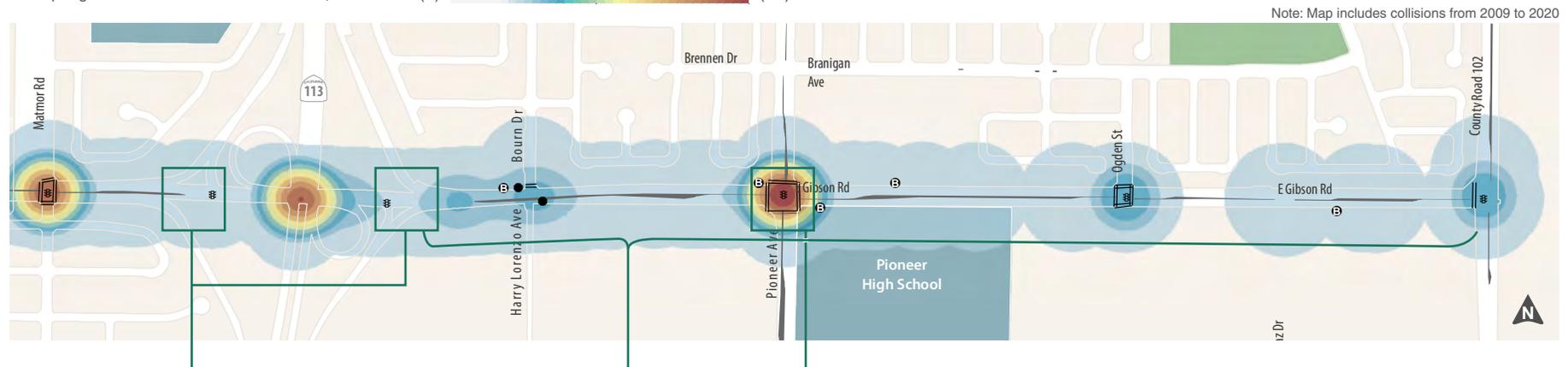


### Countermeasure Objectives:

- Reduce speeding
- Improve youth safety
- Make intersections safer for conflicting movements

In the Map:

- ⊠ Traffic Signal
  - ⊠ Stop Sign
  - Crosswalk
  - Median
  - ★ Flashing Beacon
  - ⊠ Bus Stop
- Low (1) **COLLISION INTENSITY** High (20)



### Countermeasures

#### Square up interchange intersections

Modify the ramp intersections to reduce vehicle speeds accessing or exiting SR 113. This could be accomplished by increasing the angle of approach for the ramps so that they are more perpendicular to Gibson Rd. Tightening turn radii would discourage higher speeds. In addition, this type of improvement at all the ramps would create a more pedestrian-friendly environment for teens traveling to and from Pioneer High School. As future development happens, consider bicycle and pedestrian facilities on the south side of Gibson Rd. It should be noted that the interchange is within Caltrans right-of-way. Therefore, Caltrans has authority over any improvements at the interchange intersections.

#### Lane width reduction between the SR 113 northbound ramp terminal intersection and County Road 102

This would include reducing inner through lanes to 10.5' and outer through lanes to 11'. This reduction could potentially allow for a 3-foot bike buffer.

#### Implement pedestrian improvements at Gibson Road/Pioneer Avenue

Given the large number of youth pedestrians crossing this intersection during school peak hours, consider special pedestrian settings to increase safety during these morning and afternoon school peak hours. Consider providing and evaluate need for extending pedestrian crossing times, pedestrian recall on all phases, advance stop bars, and implementing leading pedestrian intervals.

#### Red time and/or yellow time adjustment at all intersections

Thirty-one percent of the collisions at Gibson Road/Matmor Road occurred between vehicles that should not be crossing the intersection at the same time. The same thing occurred in 9 of the 12 collisions at Gibson Road/Ogden Road. Consider increasing phase red times to allow extra time for vehicles to clear intersections. In addition, speed surveys could be completed to establish more appropriate yellow times. For safety reasons, red times should be consistent at all signals in a corridor. It should be noted that Caltrans operates and maintains the interchange intersections. All signal timing countermeasures at those intersections would have to be implemented by Caltrans.

# East Street: Kentucky Avenue to Main Street

This portion of East Street borders primarily industrial and commercial land use on the east and railroad land use (backed primarily by industrial and commercial land use) on the west. Train tracks run parallel to East St to the west. From 2009 to 2020, there were 255

crashes along or near this corridor, including 7 severe injury collisions and 1 fatality. About 1/5 of all collisions were caused by auto right-of-way violations, 1/5 by unsafe speed, 1/6 by traffic signal/sign violations, and 1/6 improper turning. In total, there were 17 bicycle-related

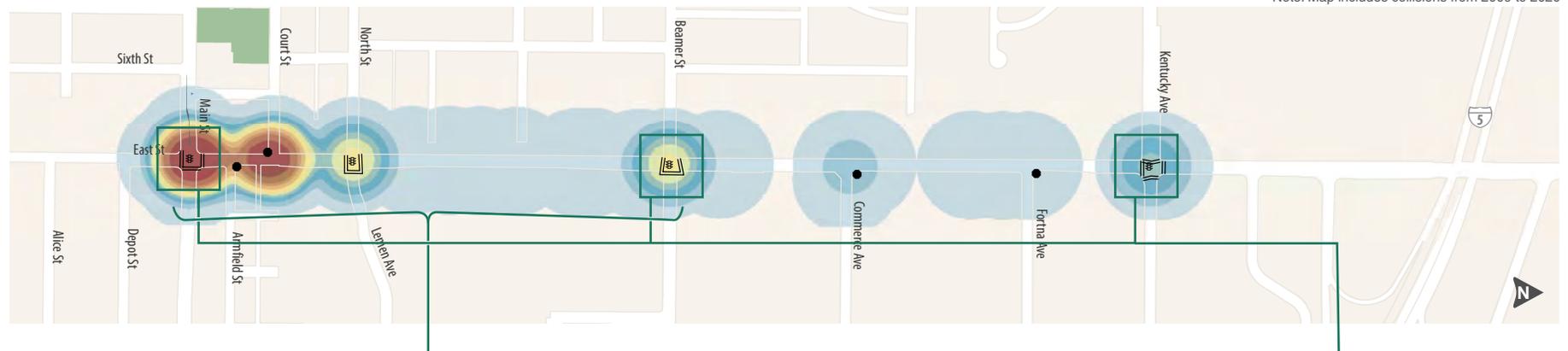
collisions, with 12 between Main St and Lemen Ave. Three of the 5 pedestrian-related collisions occurred at the East St/Main St intersection, and 3 more were either been pedestrian- or bicycle-related (data was conflicting).

## What do we know about these collisions (2009-2020)?



In the Map:

- Traffic Signal
  - Stop Sign
  - Crosswalk
  - Median
  - Flashing Beacon
  - Bus Stop
- Low (1) **COLLISION INTENSITY** High (20)



Note: Map includes collisions from 2009 to 2020

## Countermeasures

### Recent City intersection countermeasures

- In the latter part of 2012, Lemen Avenue was realigned to connect to North Street. The average number of collisions per year before the countermeasure was 2.3 collisions per year. This number dropped to 2.2 collisions per year after the countermeasure. The realignment also increased pedestrian safety by allowing for signalization and crosswalks on all intersection legs.
- The City prohibited eastbound left-turns at the East Street/Court Street intersection in mid-2012. Between the time this countermeasure was implemented and through 2016, the crash rate dropped to about 4.2 collisions per year. Between 2009 and mid-2012, the crash rate was about 8.5 collisions per year.

**Road diet between Main Street and Beamer Street** This would include reducing to a 3 lane cross-section, with 1 northbound lane, 1 southbound lane, and 1 two-way left-turn lane (TWLTL). This road diet could be extended to just north of Commerce Ave, where crash records indicate 3 unsafe speed rear-end collisions and 1 southbound left-turn vehicle colliding with a northbound through vehicle (i.e., 4 out of 6 collisions within 100 feet). This road diet would:

- Grant turning vehicles on East St separation from through traffic and allow them to focus on crossing only 1 opposing vehicle lane. For example, southbound left-turns into an East Street driveway would benefit from a road diet because they would be able to wait safely in the TWLTL and look for gaps in only 1 northbound vehicle lane, rather than stopping southbound through vehicles in their lane and waiting for a gap in 2 northbound vehicle lanes.
- Introduce two-stage gap acceptance, meaning that side street vehicles would only need to focus on 1 vehicle lane at a time when turning because they could pull into the TWLTL first and then merge with traffic.

A road diet traffic analysis was performed, which shows that consideration should be given to restricting northbound left-turns onto Court Street. This could be done through installation of a raised median. Since the mid-2012 countermeasure prohibiting eastbound left-turns at East St/Court St, there have been 13 collisions involving northbound left-turns, southbound left-turns, or illegal eastbound left-turns. A raised median would have likely prevented these collisions. The installation of a raised median would also enforce the existing eastbound left-turn prohibition. This road diet countermeasure is further discussed in the next section of the report.

## Corridor Collision Profile

### Countermeasure Objectives:

- Provide safer ingress and egress turning movements
- Make intersections safer for conflicting movements

### Red time and/or yellow time adjustment at all signalized intersections

At East Street/Lemen Avenue-North Street, 12 of the 17 post-realignment collisions that occurred within 100 feet of the intersection were between vehicles that should not be crossing the intersection at the same time. At East Street/Beamer Street, 17 of 25 collisions within 100 feet of the intersection occurred for the same reason. An additional 8 such collisions happened at Kentucky Avenue and 16 at East Street/Main Street. Consider increasing phase red times to allow extra time for vehicles to clear intersections. In addition, speed surveys could be completed to establish more appropriate yellow times. For safety reasons, red times should be consistent at all signals in a corridor.

# East Street: Main Street to Gibson Road

Between 2009 and 2020, 242 collisions occurred along or near East Street between Main Street and Gibson Road, resulting in 63 injuries from 53 separate incidents and in 3 fatalities. The major collision causes

included unsafe speed, traffic signals or signs violations, and automobile right-of-way violations. Almost 1/2 of all collisions were rear-end and more than 1/4 were broadside. There were 12 pedestrian-, 11 bicycle-, and

2 train- and 1 scooter-related collisions. Most collisions on this segment of East Street (93%) occurred within 100 feet of intersections, with 81% of these intersection collisions occurring within 100 feet of signalized intersections.

# Corridor Collision Profile

## Countermeasure Objectives:

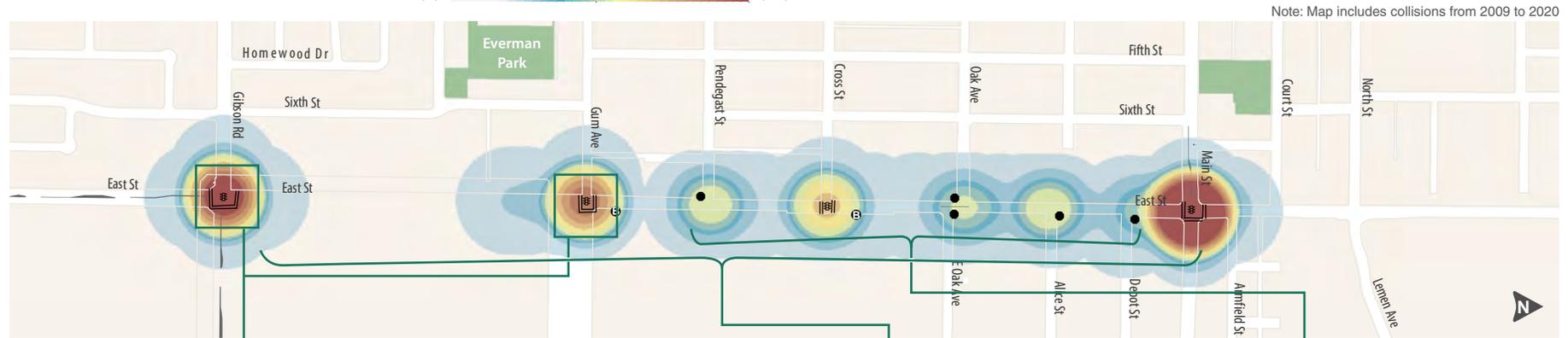
- Provide safe luminance
- Improve side-street safety
- Make intersections safer for conflicting movements

## What do we know about these collisions (2009-2020)?



In the Map:

- ⊠ Traffic Signal
- ⊠ Stop Sign
- Crosswalk
- Median
- ★ Flashing Beacon
- ⊠ Bus Stop



## Countermeasures

**Red time and/or yellow adjustment at East St/Gum Ave and East St/Gibson Rd**  
Thirteen percent of the collisions within 100 feet of East Street/Gibson Road occur between vehicles that should not be crossing the intersection at the same time. That percentage is 41% within 100 feet of East Street/Gum Avenue. In addition, Gibson Road/East Street currently provides either 0 or 0.5 seconds of red time between phases, depending on the phase. Increasing the phase red times in a consistent manner would allow extra time for vehicles to clear intersections. In addition, speed surveys could be completed to establish more appropriate yellow times. For safety reasons, red times should be consistent at all signals in a corridor.

**At all signalized intersections, yellow and red times should be calculated with the assumption that all vehicles stop behind the train tracks on red.**

**Road diet between Main St and south of Gibson Rd**  
This would include reducing to a three lane cross-section, with one northbound lane, one southbound lane, and one two-way left-turn lane (TWLTL) north of Gibson Road. South of Gibson Road, the medians and turn pockets could be maintained as they are, and the road diet would consist of one northbound lane and one southbound lane. A road diet would grant turning vehicles separation from through traffic and introduce two-stage gap acceptance. These would be beneficial to the side streets and driveways along this corridor. The medians at East Street/Oak Avenue could be maintained as they are. This road diet countermeasure is further discussed in the next report section.

**Evaluate luminance along East St between Depot St and Pendegast St**  
There were 19 non-DUI collisions that occurred on this segment during the night-time, dusk, or dawn. Of the 19 collisions, 16 involved southbound vehicles or bicyclists, and 7 occurred within 100' of East St/Cross St. Along East St, there are no street lights on the west side of the road between Main St and Pendegast St, with the exception of lights at Main St, Cross St, and Pendegast St. In addition, the land use adjacent to East St on the west side is likely to produce little ambient light. Luminance should be evaluated using the lighting design criteria published by Illuminating Engineering Society (IES). Alternatively, the City may use its own lighting design requirements.

# West Street: Kentucky Avenue to Main Street

This corridor is mostly residential north of Court St and commercial to the south, with Woodland High School along the west side between Woodland Ave and Beamer St. There were 243 collisions (2009-2020), resulting in 77 injuries

from 57 crashes. About 87% of collisions occurred within 100' of intersections. The leading causes were unsafe speed, auto right-of-way violations, improper turning, and traffic signal or sign violations. West St intersections

most prone to collisions within 100 feet were (in order) Beamer St, Main St, Court St, Woodland Ave and Kentucky Ave. Bike lanes were restriped and vehicle lanes narrowed on the northbound and southbound approaches in 2013, and on the westbound approach in late 2016.

# Corridor Collision Profile

## Countermeasure Objectives:

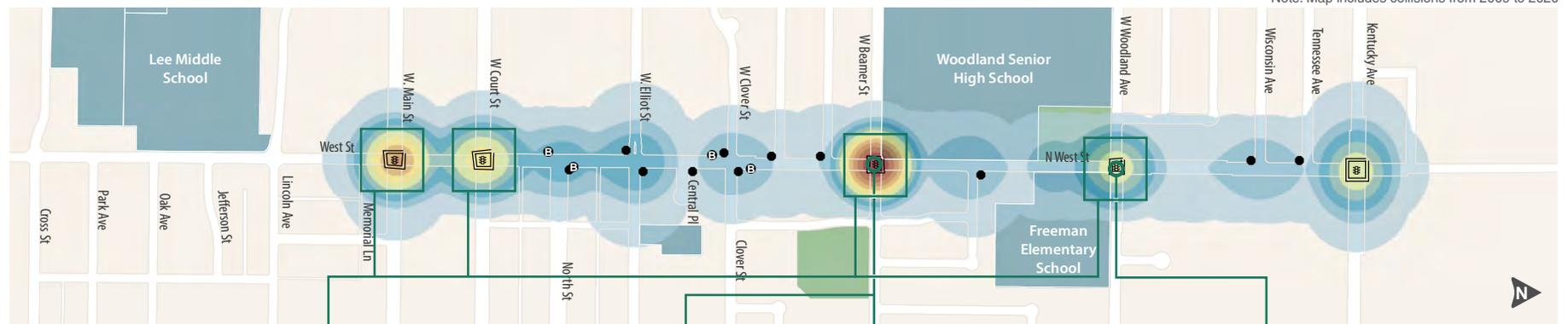
- Improve youth/pedestrian safety
- Make intersections safer for conflicting movements

## What do we know about these collisions (2009-2020)?



### In the Map:

- Traffic Signal
- Stop Sign
- Crosswalk
- Median
- Flashing Beacon
- Bus Stop



Note: Map includes collisions from 2009 to 2020

## Countermeasures

### Red time and/or yellow adjustment at West Street intersections with Woodland Avenue, Beamer Street, Court Street, and Main Street.

Between 15% and 40% of the collisions within 100 feet of these 4 intersections occur between vehicles that should not be crossing at the same time. Increasing the phase red times in a consistent manner would allow extra time for vehicles to clear intersections. In addition, speed surveys could be completed to establish more appropriate yellow times. For safety reasons, red times should be consistent at all signals in a corridor.

### Install bulbouts and/or dual curb ramps at West Street/Beamer Street intersection

In order to improve pedestrian safety, especially for teenagers walking to and from Woodland High School, bulbouts and/or dual curb ramps in combination with advance stop bars are recommended. Both of these countermeasures would serve to reduce pedestrian crossing distances and make drivers aware of which crosswalk pedestrians intend to use before they step out on the road.

### Implement pedestrian improvements at West Street/Beamer Street

Given this intersection's proximity to Woodland High School, consider special pedestrian settings to increase safety during morning and afternoon school peak hours. Consider providing and evaluate need for extending pedestrian crossing times, pedestrian recall on all phases, advance stop bars, and implementing leading pedestrian intervals.

### Convert left-turns to protected left-turn phasing at all approaches of the West St/Beamer St intersection

At least 41% of collisions within 100 feet of the West St/Beamer St intersection were due to the dynamics of permitted left-turns. This includes 22 collisions between left-turning vehicles and opposite-direction through vehicles. Switching to protected left-turns could eliminate the potential for these collisions. Restripe the approaches to have left-turn pockets with advance stop bars, add separate left-turn phases, and install new signal heads, poles, and mast arms

### Upgrade signal infrastructure to include a mast arm and second signal head on west and east legs of West St/Woodland Ave

It is recommended that a new pole with mast arm be used to better indicate permitted left-turn phasing. Mast arms are typically recommended at suburban intersections such as West St/Woodland Ave.

### Conversion to protected left-turn phasing on the north and south approaches of West St/Woodland Ave should be considered

At this intersection, about 29% of collisions were between northbound or southbound left-turning vehicles colliding with same- or opposite-direction through vehicles. This would require one of the following.

1. Restriping the two approaches to have left-turn pockets with advance stop bars, adding separate left-turn phases, and installing new signal heads, poles, and mast arms
2. Modifying signal timing to have split timing in the northbound and southbound directions. This may also require installation of new signal heads, poles, and mast arms.

# West Street: Main Street to Gibson Road

West Street is commercial between Main Street and Lincoln Avenue, but becomes residential south of Lincoln Avenue to Gibson Road. From 2009 to 2020, there were 142 collisions resulting in 35 injuries from 25

separate crashes. Five of the injuries resulted from pedestrian-involved collisions. The most common collision types were rear end, broadside, sideswipe, and hitting objects. The top collision causes were unsafe speed, traffic

signal/signs violations, improper turning, and auto right-of-way violations. There were nine youth collisions within 100 feet of this corridor during school hours, including one involving a youth bicyclist and one involving a youth pedestrian.

# Corridor Collision Profile

## Countermeasure Objectives:

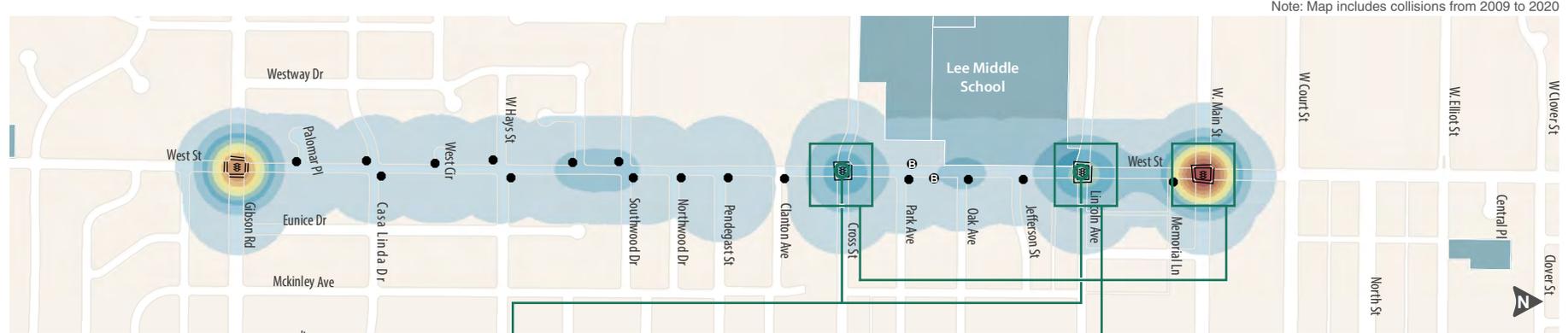
- Improve pedestrian safety
- Make intersections safer for conflicting movements

## What do we know about these collisions (2009-2020)?



In the Map:

- ⊠ Traffic Signal
  - Stop Sign
  - = Crosswalk
  - Median
  - \* Flashing Beacon
  - ⊙ Bus Stop
- Low (1) **COLLISION INTENSITY** High (20)



## Countermeasures

**The following countermeasures were recently implemented by the City**  
The City of Woodland narrowed vehicle travel lanes to 10-11 feet and restriped bike lanes on West Street between Main Street and Cross Street in 2013.

**Implement pedestrian improvements at West Street/Lincoln Avenue and West Street/Cross Street**  
Given these intersections' proximity to Lee Middle School, consider special pedestrian settings to increase safety during morning and afternoon school peak hours. Consider providing and evaluate need for extending pedestrian crossing times, pedestrian recall on all phases, advance stop bars, and implementing leading pedestrian intervals.

**Red time and/or yellow adjustment at West Street intersections with Main Street, Lincoln Avenue, and Cross Street**  
About 25% of all the collisions at these three intersections occurred between vehicles that should not be crossing at the same time. Increasing the phase red times in a consistent manner would allow extra time for vehicles to clear intersections. In addition, speed surveys could be completed to establish more appropriate yellow times. For safety reasons, red times should be consistent at all signals in a corridor.

# Main Street: West Street to East Street

Main Street from West Street to East Street contains an important part of Woodland's downtown core. The City has made efforts in recent years to address the bicycle- and pedestrian-related collisions on Main

Street, having implemented various safety measures such as sharrows and bulbouts. Countermeasures are outlined below. Between 2009 and 2020, there were 416 collisions, with most primarily caused by

unsafe speed, auto right-of-way violations, or improper turning. There were 89 total injuries from 76 separate incidents, and 4 fatalities (all from pedestrian collisions). About 43% of all collisions were rear-end and about 25% were broadside.

# Corridor Collision Profile

## Countermeasure Objectives:

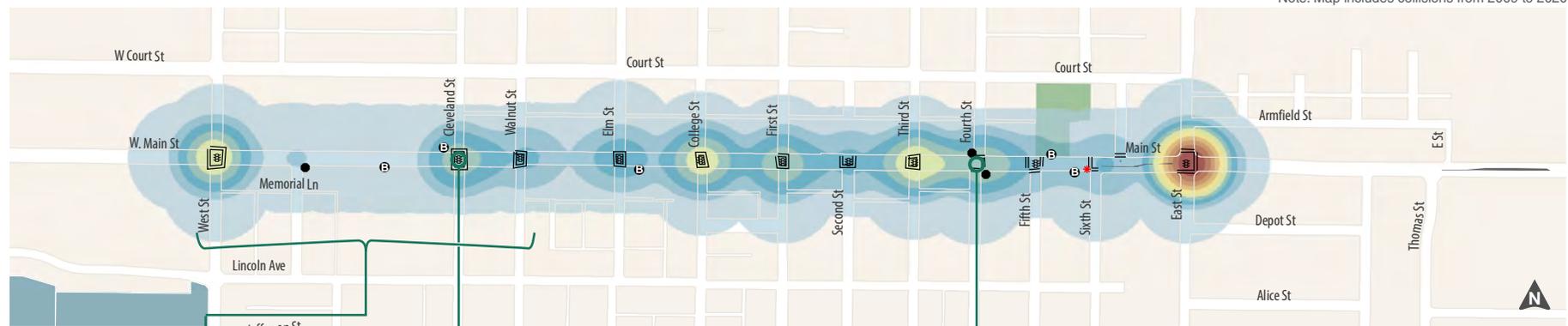
- Reduce speeding
- Make intersections safer for conflicting movements
- Improve pedestrian safety

## What do we know about these collisions (2009-2020)?



### In the Map:

- Traffic Signal
  - Stop Sign
  - = Crosswalk
  - Median
  - \* Flashing Beacon
  - ⊕ Bus Stop
- Low (1) **COLLISION INTENSITY** High (20)



42

## Countermeasures

### Road diet between West St and Walnut St

This would include reducing to a three lane cross-section, with one eastbound lane, one westbound lane, and the existing two-way left-turn lane (TWLTL). In addition, bike lanes would be added on both sides of Main Street, and there would be potential for new on-street parking where appropriate. This road diet countermeasure is further discussed in the next section of the report. In addition, the City's ongoing Main Street Feasibility Study is examining a potential road diet on Main Street east of West Street to Walnut Street.

### Red time and/or yellow time adjustment at Cleveland St

Sixteen collisions occurred between vehicles that should not be in the intersection at the same time. The signal infrastructure was upgraded in summer 2016 to include full mast arms and appropriate signal heads. Based on post-improvement signal timings, red time is 0.5 seconds. Consider increasing phase red times to allow extra time for vehicles to clear the intersection. Speed surveys could also be completed to establish more appropriate yellow times. Special consideration should be given to southbound vehicles because of potential corner sight distance issues related to River City Bank's proximity to the roadway. For safety reasons, red times should be consistent at all signals in a corridor.

### Realign 4th Street to allow safer turning movements or build a median to restrict through movements and certain turn movements

Seven collisions occurred in which side-street vehicles were trying to access or cross Main Street. Five of these collisions occurred when southbound through vehicles collided with eastbound vehicles.

### Add high visibility or textured treatments at Main St crosswalks, along with advance stop bars

This treatment would improve pedestrian safety and potentially aid in reducing unsafe speed collisions. An example of textured treatment in Woodland was implemented by the City at the crosswalks of Main Street/5th Street.

The following countermeasures were implemented by the City in mid-2015. (1) Bulbouts on SE, NW, and NE corners, and sharrows at Main St/Walnut St.; (2) sharrows, textured midblock crosswalk, choker and on-street parking on the north side, and chicane on south side on Main St between Walnut St and Elm St; (3) bulbouts on every corner and a sharrow at Main St/Elm St; (4) bulbout on SE corner of Main St/3rd St and sharrows; (5) bulbouts on SW, SE, and NE corners, sharrows, and an east-leg crosswalk at Main St/4th St; (6) signalization, bulbouts on all corners, sharrows, and textured crosswalks on all legs at Main St/5th St; (7) bulbout on SW quadrant and on north side of Main St west of 6th St (east), textured crosswalk on south leg, sharrow, and pedestrian flashing beacon on new, high-visibility west crosswalk. When looked in the aggregate, the data shows that the average number of collisions at these intersections reduced from 11.7 collisions per year to 11.3 collisions per year after countermeasures were implemented.

The following countermeasure was implemented by the City in late 2017. Leading pedestrian intervals at Cleveland St.

Additional countermeasures related to the East Street / Main Street intersection can be found in other corridor collision profiles in this report. The City's Main Street Feasibility Study will examine other countermeasures along the corridor from West St to Walnut St.

# Main Street: East Street to I-5 Northbound Off-Ramp

East of East St, Main St transitions from downtown area to a commercial/retail corridor with access to the SR 113 and I-5. From 2009 to 2016, there were 462 collisions, including 111 injuries from 82 separate crashes. Seven of the

injuries were "severe," and there was 1 fatality. Compared to the other corridors, a relatively low percentage of collisions (53%) occurred within 100' of intersections, mainly at Pioneer Avenue, East Street, and the SR 113 southbound

ramps. More than 1/2 of all collisions (55%) were rear-end and 23% were broadside. The leading collisions causes were unsafe speed (44%) and auto right-of-way violations (16%). There were 32 bicycle- or pedestrian-related collisions.

# Corridor Collision Profile

## Countermeasure Objectives:

- Reduce speeding
- Improve bicycle/pedestrian safety and connectivity
- Make intersections safer

## What do we know about these collisions (2009-2016)?



In the Map:

- ⊠ Traffic Signal
  - ⊠ Stop Sign
  - Crosswalk
  - Median
  - ★ Flashing Beacon
  - ⊕ Bus Stop
- Low (1) **COLLISION INTENSITY** High (20)



Note: Map includes collisions from 2009 to 2020

## Countermeasures

### Add an eastbound bike lane between East St and east of Matmor Rd

The E. Main Street Improvement project will include this bicycle lane. The draft project description also states that a bulbout will be built on the SE corner of Main St/Matmor Rd. This would eliminate the northbound free right-turn movement and acceleration lane, increasing safety for eastbound bicyclists.

### Build a lower-stress facility along the north side of Main St through this corridor\*

Even with an existing westbound bike lane, 8 bicycle collisions occurred due to wrong-side (contraflow) driving on the eastbound bike lane. Factors creating a higher-stress bike facility on the north side of Main St include:

- A westbound bike-lane gap between the I-5 northbound ramp and Pioneer Ave
- Dirt/gravel space adjacent to the bike lane

### Install raised median to prevent westbound left-turn into gas station.

and varying bike lane width

- The westbound bike lane ending 160' before reaching Main Street/East Street

The E. Main Street Improvement project will help ameliorate these issues by:

- Adding a multi-use, off-road pathway between Matmor Road and Pioneer Avenue on the north side of Main Street
- Closing the westbound bike-lane gap between the I-5 northbound off-ramp and Pioneer Ave. \*\*

### Red and/or yellow time adjustment at Industrial Wy/SR 113 SB ramps \*

Twelve collisions were between vehicles that should not be in intersections concurrently. Consider increasing phase red times to allow extra time for vehicles to clear intersections. In addition, speed surveys could be completed to establish more appropriate yellow times. For safety reasons, red times should be consistent at all signals in a corridor.

- Continuing the westbound bike lane to the East Street/Main Street intersection stop line \*\*
- Reducing vehicle lane widths, which would require restriping the bike lane. This would lower speeds and encourage use of the bike lane.

\*\* On the westbound approach of this intersection, green paint will be used to highlight the bike-vehicle conflicting area, bike lane, and bike box.

### Redesign northbound approaches at Thomas Street, Matmor Road, and Pioneer Avenue to help get bicycles to the north side of the road

At Thomas Street, this would include either a sharrow marking or restriping the northbound approach as 1 left-turn lane, a bike lane, and 1 right-turn lane. At Matmor Road, this would include a bike lane.

### Retime all signals to consider bicycle movements \*

This would be necessary if the other bicycle improvement recommendations are implemented.

\* Caltrans operates and maintains the interchange intersections. All signal timing and roadway modification countermeasures at those intersections would have to be implemented by Caltrans.

## The following countermeasures are expected to be completed in 2022:

- Eastbound bike lane between East St and east of Matmor Rd
- Bike path on north side of Main St between Pioneer Rd and Matmor Rd
- Redesign of NB approach at Thomas St as left-turn lane/bike lane/right-turn lane
- Redesign of NB approach at Matmor Rd with bicycle detection
- Retiming of all signals to consider bicycle movements
- Implementation of LPI at all signalized intersections managed by City

## The following countermeasure is expected to be completed in 2024:

- Raised median between Matmor Rd and Industrial Wy

# Pioneer Avenue: Main Street to Gibson Road

From 2009 to 2016, there were 173 collisions on this corridor, resulting in 52 injuries from 36 separate incidents and 1 fatality. About 1/3 of collisions were caused by unsafe speed and another 1/3 by either improper

turning, traffic signals/signs violations, auto right-of-way violations, or wrong side of the road movements. The four major types of collisions were rear-end (43%), broadside (19%), sideswipe (13%), and hit object (13%).

Pioneer is a north-south arterial that is also a primary access road to Pioneer High School. There were 41 collisions involving youth drivers, bicyclists, or pedestrians, with 21 of these happening during school hours.

# Corridor Collision Profile

## Countermeasure Objectives:

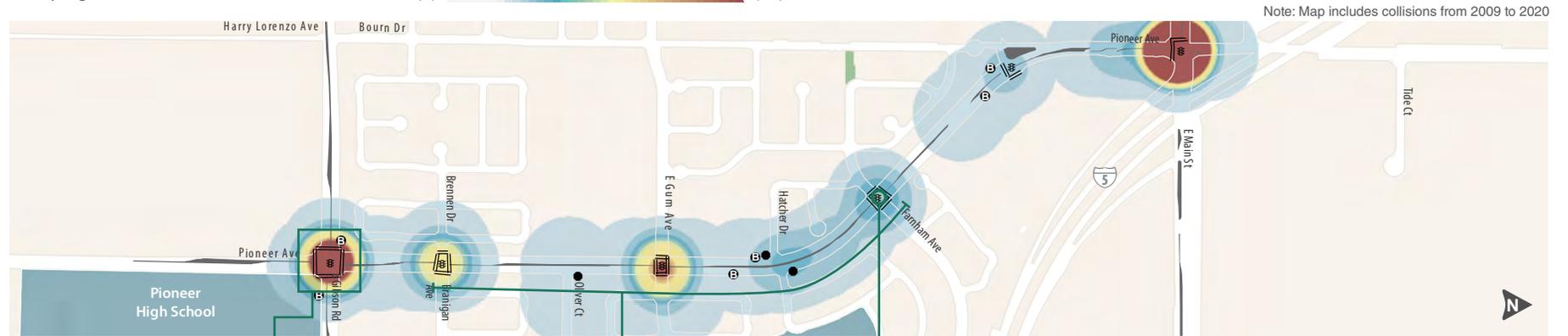
- Increase bicycle safety
- Make intersections safer
- Enhance youth safety

## What do we know about these collisions (2009-2016)?



### In the Map:

- ⚡ Traffic Signal
  - Stop Sign
  - = Crosswalk
  - Median
  - ★ Flashing Beacon
  - ⊕ Bus Stop
- Low (1) **COLLISION INTENSITY** High (20)



44

## Countermeasures

### Implement pedestrian improvements at Gibson Road/Pioneer Avenue

Given the large number of youth pedestrians crossing this intersection during school peak hours, consider special pedestrian settings to increase safety during these morning and afternoon school peak hours. Consider providing and evaluate need for extending pedestrian crossing times, pedestrian recall on all phases, installing advance stop bars, and implementing leading pedestrian intervals.

### Add buffered bike lanes from north of Farnham Avenue to south of Branigan Avenue

This would require lane width reduction of through lanes. Lane width reduction would have the added benefit of reducing vehicle speeds on this portion of Pioneer Avenue.

### Red time and/or yellow time adjustment at Pioneer Ave/Farnham Avenue

Three southbound drivers, including 1 bicyclist, collided with eastbound or westbound vehicles. These vehicle movements should not occur at the same time. Consider increasing phase red times to allow extra time for vehicles to clear the intersection. In addition, speed surveys could be completed to establish more appropriate yellow times. For safety reasons, red times should be consistent at all signals in a corridor.

## Road Diets

The proposed road diets outlined in the corridor profile pages were analyzed in terms of traffic operations and queuing in order to confirm their suitability. The intersections were analyzed using the Synchro/SimTraffic 9 software and included all signalized intersections along the following roadway segments.

- Main Street from West Street to Walnut Street
- East Street from Beamer Street to Gibson Road
- Gibson Road from Cottonwood Street to East Street (except for Gibson Road/Coloma Way) (completed in 2022)

In addition, due to its proximity to Main Street, the side-street stop controlled intersection at East Street/Court Street was also included in the analysis. Count data collected in 2017 or 2018 were used to establish existing conditions volumes, peak hour factors, heavy vehicle truck percentages, and level of pedestrian and bicycle activity at each of the intersections. Forecasts were prepared for 2027 (with and without the road diets implemented) using the travel demand forecasting model from the Woodland Technology/Research Park (WTRP) project. This model is based on the City of Woodland's General Plan base year model and includes approved land use and transportation network improvements in place by 2027, in addition to the full buildout of the WTRP and full access traffic operations at Gibson Road/

Harry Lorenzo Avenue-Bourn Drive. It does not include cumulative year land use growth. It also does not include 2027 background growth outside the City of Woodland.

The analysis showed that all study intersections would operate acceptably (LOS D or better) and manage queueing under existing and 2027 “without road diet” conditions. It was also shown that all proposed road diets could be accommodated in terms of delay and queueing under both existing and 2027 “with road diet” conditions, provided that certain improvements are in place. The specific findings are summarized by road diet in the following subsections.

A feasibility study for a road diet on Main Street between Walnut Street and East Street was started shortly before this plan was completed in 2022.



### **Main Street: West Street to Walnut Street**

The Main Street road diet would continue the downtown core cross-section with only one eastbound through lane and one westbound through lane. This roadway segment would differ from the downtown core in that it would maintain a two-way left-turn lane (TWLTL) due to higher driveway density.

This road diet would be expected to result in acceptable level of service (LOS) at all Main Street signalized intersections between West Street and Walnut Street, inclusive, under existing and 2027 conditions. This expectation is based on the operations analysis of “with road diet” conditions (existing and 2027). Despite acceptable LOS, the analysis showed

a potential queuing issue at Main Street/West Street. In order to prevent excessive queuing at this intersection under the “with road diet” scenarios, the eastbound left-turn pocket storage length would have to be increased.

### **East Street: Beamer Street to south of Gibson Road**

This portion of East Street is bordered primarily by railroad, industrial, and commercial land use throughout the corridor. The main exceptions are the Casa Del Sol community driveway opposite Cross Street and the County Fair Mall strip south of Gibson Road. A road diet would reduce the cross-section on this portion of East Street to three lanes, including one northbound lane, one southbound lane,

and a TWLTL. This would match East Street south of County Fair Mall by having only one northbound lane and one southbound lane.

East Street under “with road diet” conditions would operate well under the existing and 2027 scenarios south of Main Street. Yet, operations would be challenging between Main Street and Lemen Avenue-North Street. Given the current lane configurations and permitted movements at Court Street, the eastbound right-turn at Court Street would have an average delay of over three minutes and the southbound left-turn at Main Street/ East Street would block through traffic and cause a queue upstream to Lemen Avenue-North Street, all during the PM peak hour. Two potential mitigations to these issues are outlined as follows.



1. Extend the southbound left-turn pocket at East Street/Main Street and add a northbound left-turn pocket at East Street/Court Street. This would result in occasional queues that extend out of those turn pockets and block through traffic.
2. Eliminate the northbound left turn from East Street onto Court Street. This would allow for a longer southbound left-turn pocket at Main Street/East Street and prevent northbound left-turn vehicles from blocking through traffic at East Street/Court Street. The East Street/Court Street intersection would be transformed to right-in/right-out, operate at LOS C during the PM peak hour, and allow for increased safety for vehicular movements when compared to the case where northbound left-turns are permitted.

### **Gibson Road: Cottonwood Street to East Street (Partially completed 2022)**

The Gibson Road road diet countermeasure reduces the cross-section of Gibson Road to three lanes with a TWLTL between Cottonwood Street and East Street. This continues the current cross-section of Gibson Road west of Cottonwood Street. This road diet varies from those on Main Street and East Street in that Gibson Road has mainly residential land use fronting the road. The section from Cottonwood Street to West Street was completed in 2022.

The road diet operations analysis showed that additional eastbound/westbound turn pockets and/or turn pocket storage lengthening were required to provide acceptable LOS

and queuing at Gibson Road/West Street and Gibson Road/College Street. Split timing phasing was shown to be another option at Gibson Road/West Street given the short length of the left-turn pockets on the northbound and southbound approaches. In addition, two westbound and eastbound through lanes were necessary at Gibson Road/East Street to accommodate vehicle demand and prevent queueing to upstream intersections at County Fair Mall and Coloma Way. The westbound through movement merges to one lane west of Gibson Road/East Street while the eastbound movement expands to two through lanes on the eastbound approach at Gibson Road/East Street to provide additional storage for through vehicles.



## Countermeasure Options

The 2020 update to the LRSM included three new countermeasures that are appropriate for addressing the safety issues in Woodland:

- Leading pedestrian intervals (LPIs)
- Rectangular rapid flashing beacons (RRFBs)
- Separated bike lanes (separated bikeways)

Additionally, advance stop bars, included in both the previous and 2020 updates to the LRSM, have not previously been used widely in the City but are appropriate for use.

Lastly, the enactment of Assembly Bill 43 into law in 2021 has provided new options for lower speed limit setting.

### Leading Pedestrian Intervals

LPIs give pedestrians the opportunity to enter an intersection 3-7 seconds before vehicles are given a green indication. With this head start, pedestrians can better establish their presence in the crosswalk before vehicles have priority to turn left. According to the LRSM, LPIs provide

- increased visibility of crossing pedestrians,
- reduced conflicts between pedestrians and vehicles,
- increased likelihood of motorists yielding to pedestrians, and

- enhanced safety for pedestrians who may be slower to start into the intersection.

Signal controllers made in recent years can accommodate LPIs. Thus, costs can be very low, since only minor signal timing alteration is required.

The City of Woodland has increased its focus on vulnerable pedestrians and has already begun to use LPIs in areas with much pedestrian traffic, such as the intersection of Gibson Road and East Street adjacent to the County Fair Fashion Mall. As of April 2022,

- 16 signals have operating LPIs,
- 24 signals can accommodate LPIs but do not have them programmed, and
- 30 signals require controller upgrades before LPIs can be added to the signal timing.

Of the 30 signals that require upgrades, eight will be upgraded as part of the corridor projects planned for Gibson Road and E. Main Street in 2022.

LPIs have been added as recommended countermeasures at signalized intersections along the priority corridors identified in this plan.

### Rectangular Rapid Flashing Beacons

RRFBs include pedestrian-activated flashing lights and signage that enhance the visibility of marked crosswalks and alert motorists to

pedestrian crossings. They use an irregular flash pattern that is similar to emergency flashers on police vehicles. RRFBs may be installed at unsignalized intersections and mid-block pedestrian crossings.

According to the LRSM, RRFBs can enhance safety by increasing driver awareness of potential pedestrian conflicts and reducing crashes between vehicles and pedestrians at unsignalized intersections and mid-block pedestrian crossings. The addition of RRFBs may also increase the safety effectiveness of other treatments, such as crossing warning signs and markings. RRFBs are a lower cost alternative to traffic signals and pedestrian hybrid beacons.

The City of Woodland recently installed its first RRFBs at the intersections of Gibson Road and California Street as part of the safety improvements along the Gibson Road corridor. RRFBs have also been installed at the intersection of Main Street and Matmor Road and other locations in the City. The City is also planning to upgrade some yellow flashing beacons near schools to RRFBs, which can be more easily seen in lighting conditions at sunrise and sunset.

### Separated Bike Lanes

Separated bike lanes, also known as Class IV separated bikeways or cycle tracks, use vertical elements to create a separation between bike lanes and vehicle lanes. Separation types range from simple,

painted buffers and flexible delineators, to more substantial separation measures including raised curbs, grade separation, bollards, planters, and parking lanes. These options range in feasibility due to roadway characteristics, available space, and cost. In some cases, it may be possible to provide additional space in areas where pedestrian and bicyclists may interact, such as the parking buffer, or loading zones, or extra bike lane width for cyclists to pass one another.

Separated bike lanes provide increased safety and comfort for bicyclists beyond conventional bicycle lanes. By separating bicyclists from motor traffic, “protected” or physically separated bike lanes can offer a higher level of comfort and are attractive to a wider spectrum of the public.

The City of Woodland does not have any separated bike lanes at the time of the completion of this plan (2022). The FHWA Bikeway Selection Guide provides a useful framework for determining when to use separated bike lanes, as well as other types of bicycle facilities. Separated bikeways will be considered as the corridor improvements in this plan are further developed.

## Advance Stop Bars

An advanced stop bar is a horizontal stripe painted ahead of the crosswalk at stop signs and signals to indicate where drivers should stop. An advanced stop bar improves safety by reducing instances of vehicles encroaching

on the crosswalk. They reduce pedestrian and bicyclist collisions and may reduce right-of-way violations. Creating a wider stop bar or setting the stop bar further back may be appropriate for locations with known crosswalk encroachment issues.

## New Options for Speed Limit Setting

Assembly Bill 43, signed into law in October 2021, allows local governments to lower speed limits on roads in business and residential areas and other stretches identified as safety corridors without following the 85th percentile

rule. Under the 85th percentile standard set by Caltrans, before any speed limit is set or altered, a speed survey must be conducted to determine the speed at which 85 percent of cars there travel. That speed, rounded to the nearest five mph, is set as the speed limit. The AB43 law allows city governments to drop speed limits by five miles per hour and to set limits of 20 to 25 mph in business districts.

As Caltrans incorporates this new law into its guidance, the City should evaluate updates to its speed limit setting processes.



# HIGHEST OCCURRING CRASH TYPES AND COUNTERMEASURES

The collision landscape and high-risk corridor/intersections analyses brought several systemic issues to the surface. The major crash types identified through these analyses were rear-end and broadside collisions. In addition, bicyclist-specific wrong way riding collisions occurred on several corridors. With these prevalent crash types identified, systemic countermeasures were then identified to reduce crash type frequencies.

Rear-end collisions often paired with unsafe speed in the data. Between 2009 and 2016, there were 1,312 rear-end collisions and unsafe speed was the cause for 832 (63%) of them. In the same analysis period, there were 983 “unsafe speed” collisions, meaning that 85% of them resulted in rear-end crashes. In total, unsafe-speed rear-end collisions resulted in 185 injuries, including 5 severe injuries. Collisions due to unsafe speeds can be seen in Figure 10, which shows that hot spots are evident on several arterials and collectors. In order to address this systemic issue, the following countermeasures are recommended.

- Implement road diets where appropriate. Road diets have been shown to reduce vehicle speed differential and would allow more of the roadway to be dedicated to other users.
- Implement lane width reduction where appropriate. Lane width reductions could be used to reduce speed and would be a good alternative to road diets on corridors with high traffic volumes where

dieting would cause significant operations degradation or queuing.

Broadside collisions often occurred at intersections, where vehicles traveling in different directions collided with each other. Based on the Crossroads data received from the City, there were 1,140 broadside collisions between 2009 and 2016. Of these, 47% were caused by auto right-of-way violations, 26% by traffic signals/signs violations, and 10% by improper turning. The collisions due to these 3 turning-related causes can be seen in Figure 11, which shows that turning-related crashes occurred throughout the City’s roadway network. Various countermeasures that should be considered to address this systemic issue are as follows.

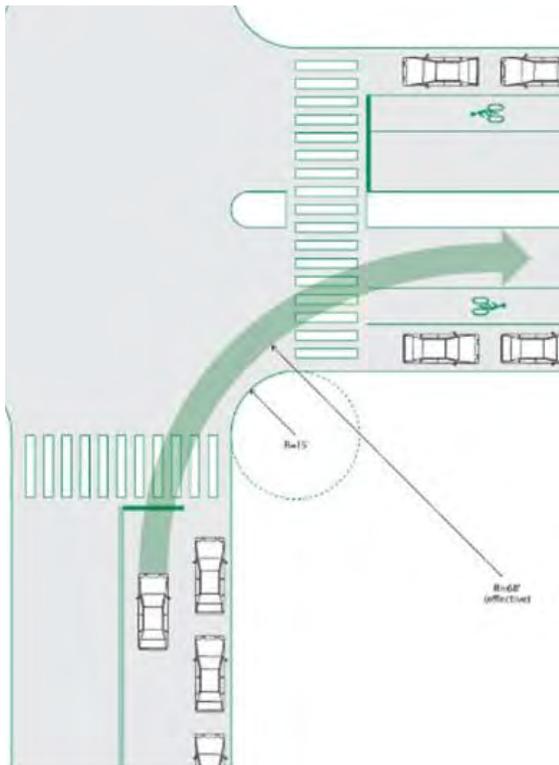
- Evaluate appropriateness of protected left-turn or split phasing at hotspots. A common theme in the high-risk corridors/intersections analysis was the presence of several collisions at a given intersection brought about by the dynamics of permitted left-turns. Protecting left-turns could help eliminate many of these collisions. Left-turn protection could happen via separate left-turn phases (which would require left-turn pockets and potentially longer pedestrian crossing distances) or split phasing. Both protected left-turn and split phasing would increase intersection delay compared to permitted left-turn phasing.

- Evaluate red time and yellow time on City corridors. Another major theme from the high-risk corridors/intersections analysis was the presence of several collisions at a given signalized intersection involving vehicles that should not have been in the intersection at the same time. Red times and yellow times should combine to provide safe transitions between different phases. Appropriate yellow times are typically determined via speed survey analysis. Red times should be consistent throughout a corridor, as drivers may incorrectly assume red time at a given intersection based on an experience at another signalized intersection nearby.

- Evaluate converting side-street stop control to all-way stop control or roundabout at appropriate intersections. If appropriate in a given roadway’s context, conversion to all-way stop control or roundabout could reduce the number of turning-related collisions by forcing all vehicles to either stop or slow down. This could be especially beneficial on collector streets where vehicles cross multiple side-street stop intersections without having to stop. Examples of such collectors could include El Dorado Drive or Cross Street.

An additional countermeasure that could be pertinent to both unsafe-speed rear-end collisions and broadside collisions is described as follows.

- Design (or re-design) corner curve radii with consideration of “effective” turning radius. While corner radius is based on intersection geometry, effective turn radius takes into account on-street parking, bicycle lanes, and other factors. This is illustrated in the figure from NACTO’s Urban Street Design Guide (2013) to the left. Although the radius shown was designed to be 15 feet, a northbound car is still able to make a right-turn on an



effective radius of 68 feet. Though the corner radius is small, the car would be able to make a right-turn at a potentially unsafe speed. At appropriate locations in Woodland, safety could be improved by designing or re-designing corners so that effective turning radius is minimized. The Urban Street Design Guide should be referenced for more detailed information.

Bicyclists in the City of Woodland were involved in 42 wrong way driving collisions during the analysis years. Wrong way driving occurs when bicycles are riding against the flow of traffic, whether in automobile or bicycle lanes. Of the 42 collisions, bicyclists were at fault (wrong way riding) 40 times. Wrong way riding collisions occurred chiefly on Main Street (50%), but also throughout the City, including on Pioneer Avenue, Gibson Road, East Street, Lincoln Avenue, California Street, etc. There were 26 injuries in total, including one severe injury, resulting from wrong way bicycle riding. Potential countermeasures to address this systemic issue, are outlined as follows.

- Provide sharrow markings. Where appropriate, sharrow road markings may discourage wrong way bicyclists. A research report for the City of San Francisco’s Department of Parking and Traffic (Alta Planning + Design, 2004) indicated that sharrows reduced the number of wrong-way bicycle riders by 80%.

- Install bicycle wrong way signs in areas with highest incidences of wrong-way riding. These signs can be used to reinforce riding in the correct direction, but should be used selectively to maintain rider attention and effectiveness on behavior.
- Provide equally attractive bicycle facilities on both sides of the road. On some corridors, such as roads around the City periphery, the quality of bike facilities varies from one side of the road to the other. If one side is far more convenient or attractive than the other, then it will induce wrong way riding.
- Adult education. Safety strides can be made through educating the public on safety issues incurred by wrong way bicycle riding. Education can take various forms and could be administered by the city, community college, police department, or local bicycle education/advocacy groups, such as The Bike Campaign.
- School education. Youth bicyclists can be better educated in the public school system. An emphasis can be made to include wrong way bicycle riding as part of other general school assemblies. The police department or bike advocacy groups could participate in such occasions.



# VIABLE PROJECT SCOPES AND PRIORITIZED LIST OF SAFETY PROJECTS

The proposed countermeasures presented for the ten high-risk corridors in the City of Woodland have potential to increase safety and reduce collision frequency or severity. In order to aid the City of Woodland in prioritizing future safety projects, a benefit-cost analysis was completed for the ten corridors. The analysis was performed using the Highway Safety Improvement Program (HSIP) Analyzer, a PDF-based software developed by Caltrans that evaluates the benefit to cost ratio (BCR) of countermeasures for safety enhancement projects. The tool has four major sections.

Section I consists of construction cost estimate and a cost breakdown of three countermeasures for a project. It also recognizes countermeasures that are not eligible to be used in project benefit calculation, and notes progress between the 2020 SSAR analysis and the creation of this LRSP. Section II provides the cost estimate for the entire project including “soft” costs such as plan, specification, and estimate (PS&E); environmental; construction engineering; etc. Maximum HSIP funding to be requested can also be calculated here using the input from Section I. The following cost assumptions were made when populating the first two sections.

- Contingencies, mobilization, and miscellaneous items were assumed to be 40% of the total construction cost.
- Environmental cost is assumed to be an additional cost equal to 5% of total construction costs.
- PS&E cost is assumed to be an additional cost equal to 10% of total construction costs.

- Construction management/engineering cost is assumed to be an additional cost equal to 15% of total construction costs.

Section III consists of countermeasure information, such as location and crash data. The list of potential countermeasures that could be analyzed was determined by the location types, which include S (signalized intersections), NS (non-signalized intersections) and R (roadways).

Countermeasures for each corridor were divided into multiple groups depending on location in the corridor and the applicable control type. For the top five corridors, crash data spanning from January 1, 2016 to December 31, 2020 (for the other five corridors January 1, 2012 to December 31, 2016) was entered for each group. The specific crash data used depended on the countermeasures themselves. Per guidance from the HSIP Analyzer manual, the following criteria was used to select appropriate crash data.

- For pedestrian enhancements, only pedestrian and bicycle crashes were considered.
- For intersection enhancements, only crashes within 250 feet of the intersection were considered.
- For roadway segments, only crashes within the influence area were considered. Influence area was generally assumed to be within 100 feet.

The final section of the PDF tool displayed the resulting total cost, total expected benefit, and

BCR for individual countermeasures (up to three per corridor) and for each corridor as a whole (based on the three countermeasures). The full set of inputs and results can be found in a stand-alone document provided to the City.

The following table presents the BCR results by corridor, as well as an indication of community priority based on feedback from the public. The table is color-coded with Figure 15, which assigns a color to each of the ten corridors. The table also presents collision severity by corridor, top collision causes, top collision types, and the countermeasures used in the BCR analysis for each corridor.

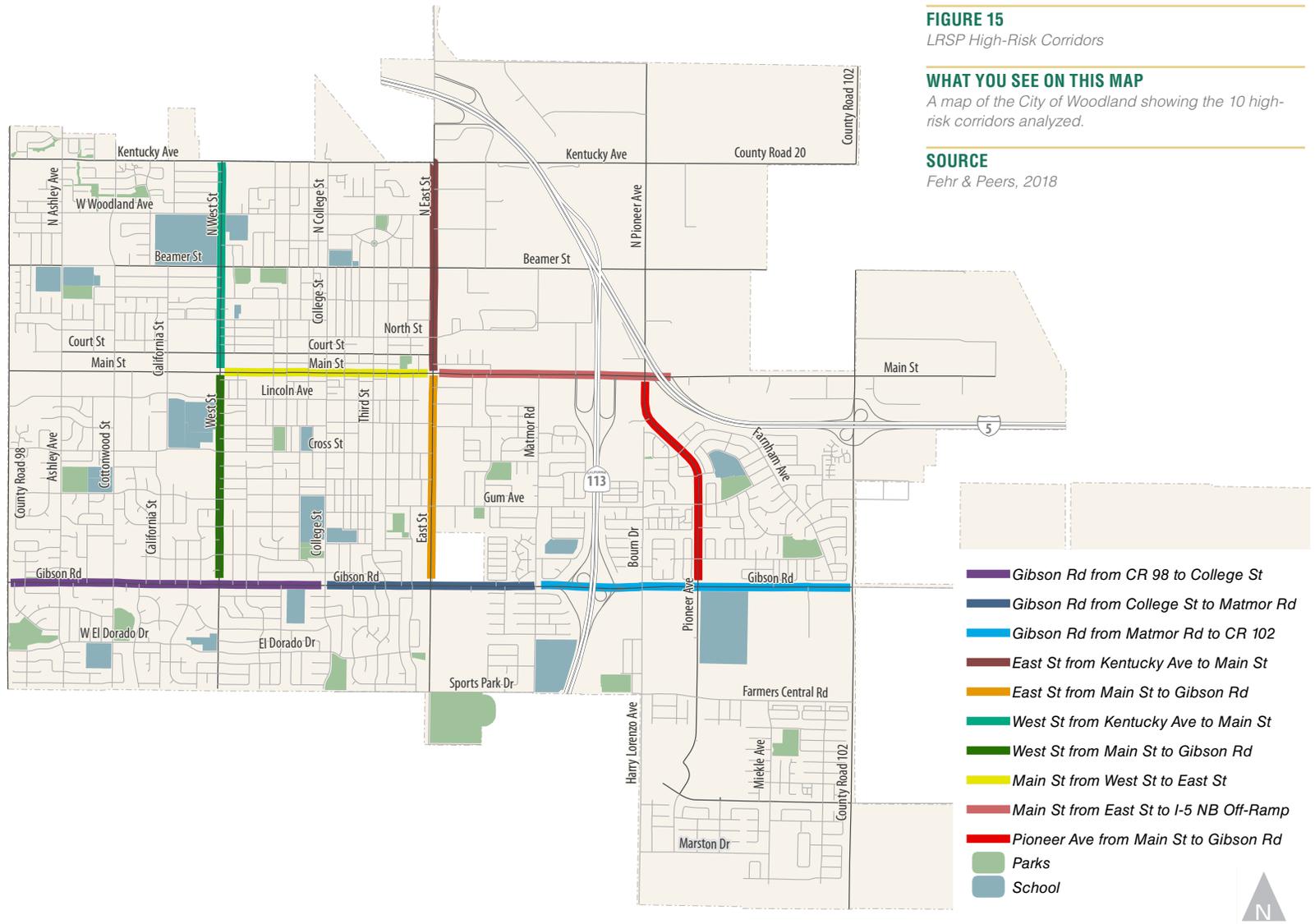
The collision severity values shown in the BCR table are the corridor crash rates, measured in collisions per 100 million vehicle-miles traveled. Based on the original SSAR analysis, for the ten study corridors, these rates vary from about 221 to 647, with an average of 436. The city-wide average crash rate is about 177 collisions per 100 million vehicle-miles traveled, indicating that the ten corridors’ crash rates are between 25% and 366% higher than the city-wide average. Figure 16 displays a visual representation of the corridor crash rates for the ten high-risk corridors and provides a 1-through-10 ranking, with the 1 indicating the highest crash rate. In addition, Figure 16 also graphically displays intersection collision rates for the intersections along the 10 corridors for which data was available. The figure shows that the intersections of Court Street/ East Street, West Street/Beamer Street, and East Street/Gum Avenue have the highest intersection crash rates, measured in number of collisions per million entering vehicles.

**Table 3: LRSP High-Risk Corridors**

Color Code	Corridor	Top Collision Causes <sup>1</sup>	Top Collision Types <sup>1</sup>	Collision Severity <sup>2</sup>	Project	Countermeasures (HSIP Code, Crash Reduction Factor)	Overall BCR	Community Priority
	Gibson Road: County Road 98 to College Street	<ul style="list-style-type: none"> <li>- Unsafe Speed</li> <li>- Auto Right-Of-Way Violation</li> <li>- Traffic Signal/Sign Violation</li> </ul>	<ul style="list-style-type: none"> <li>- Broadside</li> <li>- Rear-End</li> <li>- Sideswipe</li> </ul>	220.81	- Provide a marked crosswalk on the east leg of Gibson Rd/County Road 98 (estimated completion 2023)	Install pedestrian crossing at uncontrolled location (NS20PB, 0.25 CRF)	1.11	High
					- Road diet between west of Cottonwood Street and College Street (initially will be road diet from County Road 98 to West Street and lane width reduction only from West Street to College Street, estimated completion 2023)	Road diet (reduce travel lanes, and add a two-way left-turn lane and bike lanes) (R14, 0.3 CRF)		
					- Signal timing modifications at Gibson/Cottonwood (estimated completion 2023)	Improve signal timing (S03, 0.15 CRF)		
					- LPI at Gibson/Cottonwood (estimated completion 2023)	Implement LPI (S21PB, 0.6 CRF) (See note 4)		
	Gibson Road: College Street to Matmor Road	<ul style="list-style-type: none"> <li>- Unsafe Speed</li> <li>- Traffic Signal/Sign Violation</li> <li>- Improper Turning</li> </ul>	<ul style="list-style-type: none"> <li>- Rear-End</li> <li>- Broadside</li> <li>- Sideswipe</li> </ul>	249.43	- Signal timing modifications at all signalized intersections (estimated completion 2023)	Improve signal timing (S03, 0.15 CRF)	6.17	Medium
					- LPI at all signalized intersections (estimated completion 2023)	Implement LPI (S21PB, 0.6 CRF) (See note 4)		
					- Road diet between College Street and East Street (initially will be lane width reduction only, estimated completion 2023)	Road diet (reduce travel lanes, and add a two-way left-turn lane and bike lanes) (R14, 0.3 CRF)		
	Gibson Road: Matmor Road to County Road 102	<ul style="list-style-type: none"> <li>- Unsafe Speed</li> <li>- Traffic Signal/Sign Violation</li> <li>- Improper Turning</li> </ul>	<ul style="list-style-type: none"> <li>- Rear-End</li> <li>- Broadside</li> <li>- Sideswipe</li> </ul>	220.87	- Implement pedestrian improvements at Gibson Road/Pioneer Avenue.	Improve signal timing (S3, 0.15 CRF)	7.54	High
					- Make red time and/or yellow time adjustments at all intersections			
					- LPI at all signalized intersections	Implement LPI (S21PB, 0.6 CRF) (See note 4)		
					- Lane width reduction and bike buffer between SR 113 NB ramp intersection and County Road 102	Install bike lanes (R32PB, 0.35 CRF)		
					- Square up (tighten turning radii) SR 113 ramp terminal intersections at Gibson Road <sup>3</sup>	See note 3		

Color Code	Corridor	Top Collision Causes <sup>1</sup>	Top Collision Types <sup>1</sup>	Collision Severity <sup>2</sup>	Project	Countermeasures (HSIP Code, Crash Reduction Factor)	Overall BCR	Community Priority
	East Street: Kentucky Avenue to Main Street	<ul style="list-style-type: none"> <li>- Auto Right-Of-Way Violation</li> <li>- Unsafe Speed</li> <li>- Traffic Signal/Sign Violation</li> </ul>	<ul style="list-style-type: none"> <li>- Broadside</li> <li>- Rear-End</li> <li>- Sideswipe</li> </ul>	467.29	- Red time and/or yellow time adjustment at all signalized intersections	Improve signal timing (03, 0.15 CRF)	32.98	Low
					- Implement LPI at all signalized intersections	Implement LPI (S21PB, 0.6 CRF) (See note 4)		
					- Road diet between Main Street and Beamer Street	Road diet (reduce travel lanes, and add a two-way left-turn lane and bike lanes) (R14, 0.3 CRF)		
					- Raised median at East Street/Court Street	Install raised median (R08, 0.25 CRF)		
	East Street: Main Street to Gibson Road	<ul style="list-style-type: none"> <li>- Unsafe Speed</li> <li>- Auto Right-Of-Way Violation</li> <li>- Traffic Signal/Sign Violation</li> </ul>	<ul style="list-style-type: none"> <li>- Rear-End</li> <li>- Broadside</li> <li>- Hit Object</li> </ul>	551.51	- Red time and/or yellow adjustment at East Street/Gum Avenue and East Street/Gibson Road	Improve signal timing (S03, 0.15 CRF)	2.36	Low
					- Implement LPI at all signalized intersections	Implement LPI (S21PB, 0.6 CRF) (See note 4)		
					- Road diet between Main Street and south of Gibson Road	Road diet (reduce travel lanes, and add a two-way left-turn lane and bike lanes) (R14, 0.3 CRF)		
					- Lighting between Depot Street and Pendegast Street	Add segment lighting (R01, 0.35 CRF)		
	West Street: Kentucky Avenue to Main Street	<ul style="list-style-type: none"> <li>- Unsafe Speed</li> <li>- Auto Right-Of-Way Violation</li> <li>- Improper Turning</li> </ul>	<ul style="list-style-type: none"> <li>- Rear-End</li> <li>- Broadside</li> <li>- Head-On, Sideswipe</li> </ul>	616.00	- Implement pedestrian improvements at West Street/Beamer Street	Improve signal timing (S03, 0.15 CRF)	7.22	Low
					- Make red time and/or yellow time adjustments at West Street/Woodland Avenue, West Street/Beamer Street, West Street/Court Street, and West Street/Main Street			
					- Implement LPI at all signalized intersections			
	West Street: Main Street to Gibson Road	<ul style="list-style-type: none"> <li>- Unsafe Speed</li> <li>- Traffic Signal/Sign Violation</li> <li>- Auto Right-Of-Way Violation</li> </ul>	<ul style="list-style-type: none"> <li>- Rear-End</li> <li>- Broadside</li> <li>- Sideswipe</li> </ul>	322.41	- Add left-turn lane and protected left-turn phase at West Street/Beamer Street and West Street/Woodland Avenue. This would require new signal poles and mast arms.	Install left-turn lane and add turn phase (S06, 0.55 CRF)	13.54	Low
					- Implement pedestrian improvements at West Street/Lincoln Avenue and West Street/Cross Street			
					- Make red time and/or yellow time adjustments at West Street/Main Street, West Street/Lincoln Avenue, and West Street/Cross Street			
					- Implement LPI at all signalized intersections	Implement LPI (S21PB, 0.6 CRF) (See note 4)		

Color Code	Corridor	Top Collision Causes <sup>1</sup>	Top Collision Types <sup>1</sup>	Collision Severity <sup>2</sup>	Project	Countermeasures (HSIP Code, Crash Reduction Factor)	Overall BCR	Community Priority
Yellow	Main Street: West Street to East Street	- Unsafe Speed - Auto Right-Of-Way Violation - Traffic Signal/ Sign Violation	- Rear-End - Broadside - Sideswipe	647.32	- Install raised median at 4th Street	Install raised median (R08, 0.35 CRF)	6.01	High
					- Road diet between West Street and Walnut Street	Road diet (reduce travel lanes, and add a two-way left-turn lane and bike lanes) (R14, 0.3 CRF)		
					- Add high visibility crosswalks/ textured treatments at Main Street signalized intersections, and include advanced stop bars	Install advance stop bar before crosswalk (Bicycle Box) (S20PB, 0.15 CRF)		
					- Implement LPI at all signalized intersections	Implement LPI (S21PB, 0.6 CRF) (See note 4)		
Red	Main Street: East Street to I-5 NB Off-Ramp	- Unsafe Speed - Auto Right-Of-Way Violation - Traffic Signal/ Sign Violation	- Rear-End - Broadside - Sideswipe	547.93	- Install raised median at Main Street/ Matmor Road (will be from Matmor Road to Industrial Way, estimated completion 2024 with parcel development)	Install raised median (R08, 0.25 CRF)	2.62	Medium
					- Add eastbound bike lanes between East Street and Matmor Road - Redesign northbound approaches at Thomas Street, Matmor Road and Pioneer Avenue (completed 2022)	Install bike lanes (R32PB, 0.35 CRF)		
					- Retime signals at Main/East, Main/Thomas, Main/Matmor, and Main/Pioneer to consider bicycle movement (completed 2022)	Improve signal timing (S03, 0.15 CRF)		
					- Implement LPI at all signalized intersections (completed 2022)	Implement LPI (S21PB, 0.6 CRF) (See note 4)		
Red	Pioneer Avenue: Main Street to Gibson Avenue	- Unsafe Speed - Improper Turning - Traffic Signal/ Sign Violation	- Rear-End - Broadside - Hit Object, Sideswipe	522.65	- Implement pedestrian improvements at Pioneer Avenue/Gibson Road - Make red time and/or yellow time adjustments at Pioneer Avenue/ Farnham Avenue	Improve signal timing (S03, 0.15 CRF)	13.97	Medium
					- Implement LPI at all signalized intersections	Implement LPI (S21PB, 0.6 CRF) (See note 4)		
					- Lane width reduction and buffered bike lane from north of Farnham Avenue to south of Branigan Avenue- Brennen Drive	Install bike lanes (R362PB 0.35 CRF)		
<p>Notes: <sup>1</sup> Listed in descending order.  <sup>2</sup> Collisions per 100 million vehicle-miles traveled.  <sup>3</sup> The benefit-cost ratio calculations for this improvement are not included because this project would lie within Caltrans right-of-way.  <sup>4</sup> Added as countermeasure in 2022, not included in BCR calculation.</p>								





**FIGURE 16**

Corridor and Intersection Collision Rates and Rankings

**WHAT YOU SEE ON THIS MAP**

Intersection and corridor collision rates based on 1 million entering vehicles and 100 million vehicle-miles of travel, respectively. In addition, intersections and corridors are ranked against each other based on collision rates.

**SOURCE**

TIMS, SafeTREC, UC Berkeley, 2018; Fehr & Peers, 2018, City of Woodland, 2017



# IMPLEMENTATION

Implementation of the LRSP is a vital step in the process of executing identified strategies and projects. Partnerships, trust, funding, and coordination need to be managed proactively to implement programs and projects successfully. Successful implementation requires continuous coordinated support from key stakeholders, elected officials, and City staff.

## Vision

The City of Woodland has a vision to eliminate fatalities and serious injuries on its roadways by 2050. Caltrans, which is responsible for I-5 and SR 113 as they pass through the city, has a similar vision with the same target year (described in Director's Policy DP-36, dated February 15, 2022). This vision will be used to determine and prioritize future safety actions.

This vision, and the overall goals and strategies for this plan, are based upon the Safe System approach. The Safe System approach acknowledges that humans make mistakes, but seeks to ensure that those mistakes do not result in serious injuries for any road user. Knowing that the human body is vulnerable, it seeks to limit the kinetic energy transferred in a crash to a level a body can withstand when designing and operating a transportation network.

The Safe System approach incorporates five elements of a safe transportation system – safe road users, safe vehicles, safe speeds, safe roads, and post-crash care. This approach means that responsibility for road safety is not born solely by road users. While road users are responsible for their own behavior and abiding by laws and regulations, safety is a shared responsibility with those who design, operate, and maintain the transportation network, including the automotive industry, law enforcement, elected officials, and government bodies.

## Oversight & Accountability

This plan was developed with input and oversight from a team of stakeholders in Woodland traffic safety. The stakeholders that helped develop this LRSP in 2022 included:

- City Council Infrastructure Subcommittee
- Public Works staff



### The Safe System Approach

Source: Fehr & Peers for FHWA

- Community Development Department Staff
- City Manager
- Woodland Police Community Relations Commander
- Woodland Fire Department Chief
- Representatives from Bike Campaign and Outta Sight (advocates for the visually impaired)

This group reviewed and supported the overall objectives of the plan, and provided input to its development. They also reviewed the draft plan prior to release.

To ensure effective delivery of safety projects and programs, it is recommended that this group continue as an oversight committee to meet biannually, evaluate collision data regularly, and report results to the City Council and the public.

The Woodland City Council Infrastructure Subcommittee will be a core part of this team, along with public works and community development staff. The oversight committee may add or change members as the plan is implemented and evolves. Other potential members include but are not limited to Caltrans, California Highway Patrol, public health, and local schools. Routine collaboration between stakeholders and partners will ensure that City-led engineering countermeasures are supported by coordinated enforcement, education, and engagement programs.

Coordination, communication, and partnership among the committee members will be essential for effective project delivery. Duties and strategies include:

- Sharing safety information, progress toward goals, and key milestones on a regular bases through briefings and presentations and public-facing scorecards and reports;
- Consulting partner agencies early on in the implementation process to gather suggestions and feedback; and
- Finding opportunities for partnership via project bundling (e.g., integrating countermeasures identified in the LRSP with pavement resurfacing and maintenance projects, future Caltrans projects, or transportation improvements constructed with development projects).

Continued communication and transparency with stakeholders and community members can allow for greater trust and support of the LRSP goals. Strategies include:

- Communication across diverse channels (e.g., updated web page, news, and social media);
- Actively addressing community concerns;
- Publishing regularly updated fact sheets on plan progress; and
- Hosting regular public meetings using effective community engagement techniques.

## Development and Design Standards

The City should review development applications for safety impacts and funding opportunities and assess design standards and new project designs for kinetic energy and conflict risk. Transportation impact study guidelines could be developed for the City that includes safety impacts (along with vehicle miles traveled, LOS, and other standards).

The City's development and design standards should incorporate safety measures where appropriate and provide clear direction as to when safety measures should be required with future projects. A review and update may consider features including, but not limited to, roadway and intersection lighting, sidewalks and/or wide shoulders, and site access management. Many improvements, for example roadway restriping, may be included as roadway infrastructure projects are completed, either with development projects or as standalone infrastructure projects.

The City may also develop policy and procedures to facilitate needed trade-off approaches for vulnerable road user safety (for example, level of service vs. pedestrian access and delay).

## Construction

Priority projects may be implemented in coordination with other projects proposed for the City's Capital Improvement Plan. Projects may also be implemented during routine maintenance, such as repaving. For the priority projects, the City will actively seek funding to achieve implementation in the next five years. Other projects will be addressed and reevaluated with LRSP updates in five to ten years. The City may also consider quick build implementation for high priority projects while funding is secured or to conduct public outreach before permanent implementation.

## Evaluation

Ongoing evaluation provides an opportunity for the City to understand its progress towards achieving its safety goals and then reprioritize those goals as new areas of concern arise. Updates could be made to the oversight committee discussed above. Recommendations for evaluating implementation of the LRSP include:

### SAFETY SCORECARD

Regular measurement of goal progress in reducing emphasis area collision types should be performed at least annually. Safety scorecards can be a powerful tool for measuring effectiveness, highlighting areas that need further attention and resources, and

identifying tasks and deadlines for responsible stakeholder parties. A scorecard may include:

- Collision statistics, maps, trends, and analysis conclusions
- The number of safety infrastructure improvements completed
- Before/after analysis of safety improvements
- Public engagement, safety complaints, and response to non-infrastructure countermeasures
- Data on speeds
- Data on near misses

### MONITORING

The City may consider use of new technologies to monitor before and after performance or proactively identify hot spots. Technologies are now available to assess near misses and incidences of hard braking from vendors including Street Simplified, Transoft, and WeJo. The City may also measure prevailing vs. target speeds and use the greater flexibility permitted by AB 43 to adjust speed limits.

### CONTINUED COMMUNITY ENGAGEMENT

The City may consider conducting pre- and post-implementation surveys with community members to measure how their actions and views have shifted after engagement about traffic safety. Local partners can help

disseminate pre- and post-project surveys to residents. Surveys should evaluate whether respondents express a shift in behavior and attitude after participating in traffic safety programming. The metrics for evaluation can be developed in partnership with local partners to ensure accessibility for the public.

### FUTURE LRSP UPDATES

As projects are completed and their results are tracked, and as the City grows and evolves, safety needs and priorities will also change. Periodic updates to the LRSP, approximately every five years, will ensure that the plan continues to serve the City.

## Funding

Funding is often a hurdle to implementation of safety projects. The committee or task force or City staff should frequently review the list of current capital improvement projects to determine which LRSP projects could overlap for possible project bundling.

City staff should also monitor and seek grant opportunities and regularly submit applications for competitive projects and secure local funds for safety improvements whenever possible. Potential local, state, and federal funding sources are discussed in the following sections.

## State and Federal Funding Sources

### HIGHWAY SAFETY IMPROVEMENT PROGRAM (HSIP)

The HSIP is a core federal-aid program with the purpose of achieving a significant reduction in traffic fatalities and serious injuries on all public roads, including non-state-owned roads and roads on tribal land. The HSIP is allotted funding via Fixing America's Surface Transportation (FAST) Act; each state is apportioned a lump sum, which is then divided among apportioned programs. Caltrans administers this program in California.

### SENATE BILL (SB) 1 FUNDING

California SB 1, also known as the Road Repair and Accountability Act of 2017, is a landmark transportation investment to rebuild California by fixing neighborhood streets, freeways, and bridges in communities across California and target funding toward transit and congested trade and commute corridor improvements. The largest portion of SB 1 funding goes to California's

State-maintained transportation infrastructure. With this funding, Caltrans has a goal of repairing or replacing 17,000 miles of pavement in 10 years, spending \$250 million annually for congestion solutions and over \$700 million for better transit commutes and supporting freight improvements. The other portion of SB 1 funding will go to local roads, transit agencies, and expanding the state's

pedestrian and cycle routes. SB 1 funds various grants:

- Local Streets and Roads Program (LSRP) – SB 1 has dedicated funds appointed by the State Controller to cities and counties for basic road maintenance, rehabilitation, and critical safety projects on local streets and roads. Cities and counties must submit a proposed project list adopted at a regular meeting by their council or board that is then submitted to the California Transportation Commission. Once reviewed and adopted by the Commission, eligible cities and counties receive funding from the Controller. An Annual Project Expenditure Report is sent to the Commission to maintain transparency regarding program funding received and expended.
- Local Partnership Program (LPP) – The LPP's purpose is to provide local and regional transportation agencies that have passed sales tax measures, developer fees, or other imposed transportation fees with funding from the Road Maintenance and Rehabilitation Account for aging infrastructure, road conditions, active transportation, and health and safety benefits projects. LPP funds are distributed through a 50 percent statewide competitive component and a 50 percent formulaic component. Both programs are eligible to jurisdictions with voter approved taxes, tolls, and fees dedicated solely to transportation and the competitive program. LPP also provides the opportunity for local governments to

partner with Caltrans for enhancements on State facilities.

### ACTIVE TRANSPORTATION PROGRAM (ATP)

The goals of the ATP include increasing the proportion of trips accomplished by walking and biking, increasing the safety and mobility of non-motorized users, advancing efforts of regional agencies to achieve greenhouse gas reduction goals, enhancing public health, and providing a broad spectrum of projects to benefit many types of users, including disadvantaged communities. The ATP consolidates existing federal and state transportation programs, including the Transportation Alternatives Program (TAP), Bicycle Transportation Account (BTA), and State Safe Routes to School (SRTS), into a single program with a focus to make California a national leader in active transportation. Cycle 6, the 2022 ATP Call for Projects, has funding of approximately \$650 million made up of federal, SB 1, and State Highway Account funds.

### CALTRANS SUSTAINABLE TRANSPORTATION PLANNING GRANTS

The Sustainable Transportation Planning Grants include two parts:

- Sustainable Communities Grants are intended to encourage local and regional planning goals and best practices cited in the Regional Transportation Plan Guidelines.

- Strategic Partnership Grants are intended to identify and address statewide, interregional, or regional transportation deficiencies on the State highway system in partnership with Caltrans.

This process has been announced for Fiscal Year 2023-24, and applications will be due in October 2022. Grant announcements are anticipated in Spring 2023.

### STATE TRANSPORTATION IMPROVEMENT PROGRAM (STIP)

The STIP is a five-year capital improvement program that is updated by the California Transportation Commission every two years. It is funded with revenues from the Transportation Investment Fund and other sources.

### REBUILDING AMERICAN INFRASTRUCTURE WITH SUSTAINABILITY AND EQUITY (RAISE) GRANTS

The U.S. Department of Transportation (DOT) is committed to creating high-quality jobs, improving safety, protecting our environment, and generating equitable economic opportunity for all Americans with RAISE grants. Projects will be evaluated based on merit criteria that includes safety, environmental sustainability, quality of life, economic competitiveness, state of good repair, innovation, and partnership. RAISE grants are one of the few DOT discretionary programs for which regional and local

governments can directly compete for multimodal transportation funding.

### AFFORDABLE HOUSING AND SUSTAINABLE COMMUNITIES PROGRAM (AHSC)

The AHSC Program, administered by the Strategic Growth Council and implemented by the Department of Housing and Community Development (HCD), funds land use, housing, transportation, and land preservation projects to support infill and compact development that reduces greenhouse gas (GHG) emissions.

This program assists project areas by providing grants, loans, or any combination thereof that will achieve GHG emission reductions and benefit disadvantaged communities, low-income communities, and low-income households through increased accessibility of affordable housing, employment centers, and key destinations via low-carbon transportation. This program results in fewer vehicle miles traveled through shortened or reduced trip lengths or mode shifts from single occupancy vehicles to use of transit, bicycling, or walking. The project areas this funding is geared toward are transit-oriented development (TOD) project areas, integrated connectivity project (ICP) areas, or rural innovation project areas (RIPA).

### CALIFORNIA OFFICE OF TRAFFIC SAFETY (OTS) GRANT PROGRAMS

OTS administers traffic safety grants in the following areas: alcohol impaired driving,

distracted driving, drug-impaired driving, emergency medical services, motorcycle safety, occupant protection, pedestrian and bicycle safety, police traffic services, public relations, advertising, and roadway safety and traffic records.

### TRANSFORMATIVE CLIMATE COMMUNITIES (TCC) PROGRAM

The TCC Program funds community-led development and infrastructure projects that strive to make major advances in environmental, health, and economic benefits in California's most disadvantaged communities. Eligible improvements for this funding source include active transportation and public transit projects, transit ridership programs and passes for low-income riders, and education and planning activities to promote increased use of active modes of transportation.

### SAFE STREETS AND ROADS FOR ALL (SS4A) GRANT PROGRAM

In 2022, the Bipartisan Infrastructure Law (BIL) established the SS4A discretionary program with \$5 billion in appropriated funds over the next five years. In fiscal year 2022, up to \$1 billion is available. The SS4A program funds regional, local, and Tribal initiatives through grants to prevent roadway deaths and serious injuries. The SS4A program supports the National Roadway Safety Strategy and the

Department of Transportation's goal of zero deaths and serious injuries on the nation's roadways.

## Local Funding Sources

### CITY OF WOODLAND MEASURE F

In November 2016, the Woodland voters approved Measure F (MSF), which extended the one-half cent supplemental sales tax collected within boundaries of and for the benefit of the City of Woodland. The 12 year approval of MSF, a General Tax, includes funding for general city services such as street maintenance, parks and facility improvements, public safety and promotion of economic development. \$2.5M per year is allocated to the road program and used for local road projects and match funding for state and federal grants.

### TRAFFIC IMPACT MITIGATION FEE

California law allows local governments to establish and charge a fee on residential and non-residential development to fund public facilities and to service population growth. A Traffic Impact Mitigation Fee, typically based on development type and size, can be used for a variety of public facilities, including local roadways. The City may allocate fees to roadway improvements that will improve safety on local roads.



# APPENDIX A - PUBLIC INPUT

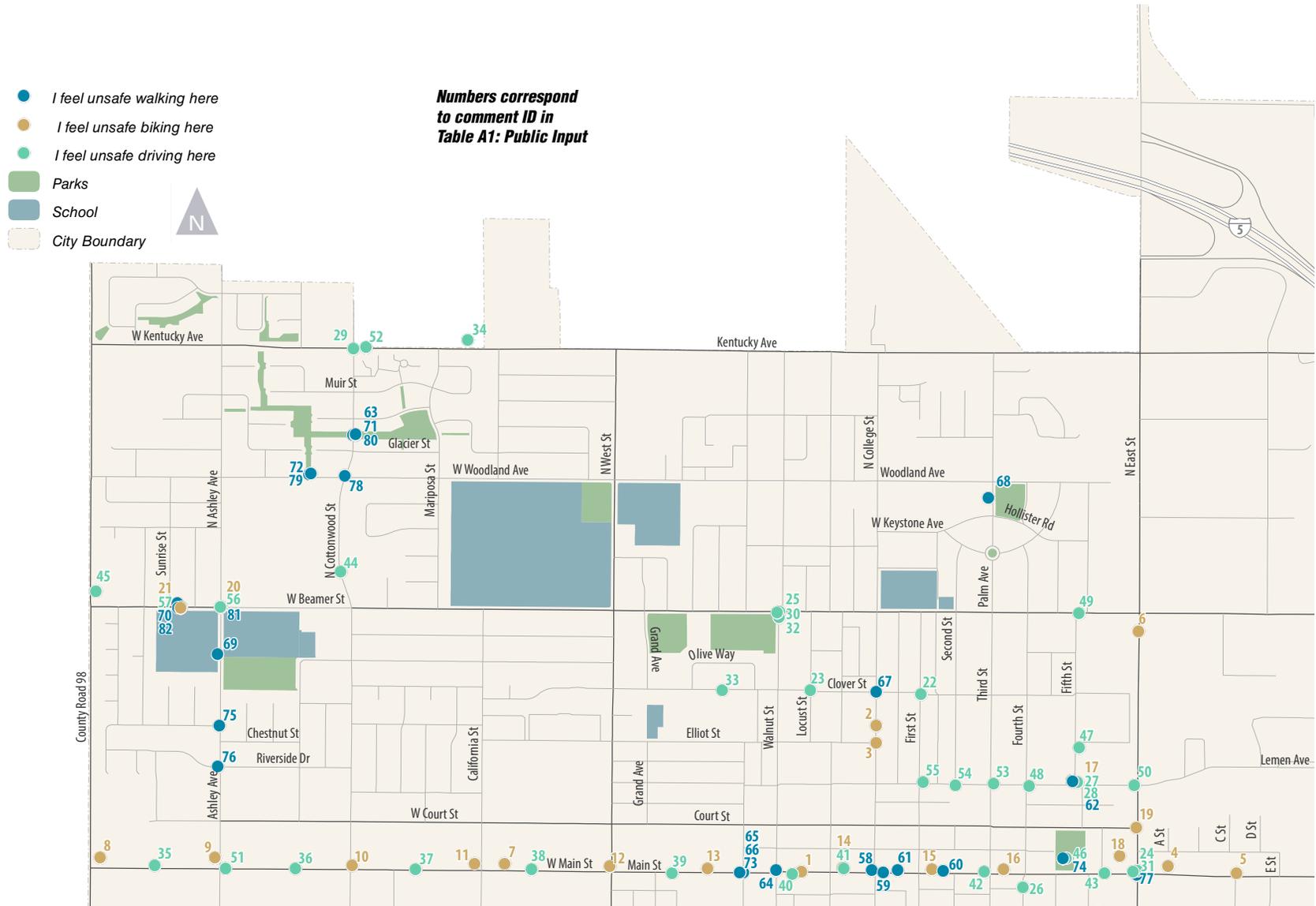


Table A1: Public Input

ID	Type	Unsafe Behavior Observed	Infrastructure Problem Observed	Comment
1	I feel unsafe biking here	Drivers not yielding/ stopping	Add/improved bike lane	Lanes too narrow at the theatre for vehicle & bike
2	I feel unsafe biking here	Drivers speeding	Add traffic calming to slow cars	
3	I feel unsafe biking here	Drivers speeding		many infrastructure problems, no speeding enforcement
4	I feel unsafe biking here	Other/Personal safety concern	Traffic signal issue	main street
5	I feel unsafe biking here	Other/Personal safety concern	Traffic signal issue	main street
6	I feel unsafe biking here		Add/improved bike lane	from Kentucky to Gibson
7	I feel unsafe biking here		Add/improved bike lane	West Main Street
8	I feel unsafe biking here		Add/improved bike lane	West Main Street
9	I feel unsafe biking here		Add/improved bike lane	West Main Street
10	I feel unsafe biking here		Add/improved bike lane	West Main Street
11	I feel unsafe biking here		Add/improved bike lane	West Main Street
12	I feel unsafe biking here		Add/improved bike lane	West Main Street
13	I feel unsafe biking here		Add/improved bike lane	West Main Street
14	I feel unsafe biking here		Add/improved bike lane	West Main Street
15	I feel unsafe biking here		Add/improved bike lane	West Main Street
16	I feel unsafe biking here		Add/improved bike lane	West Main Street
17	I feel unsafe biking here		Other infrastructure problem	vehicles going way over the speed limit, 50-100 mph in a 25 zone on 5th street and North Street.

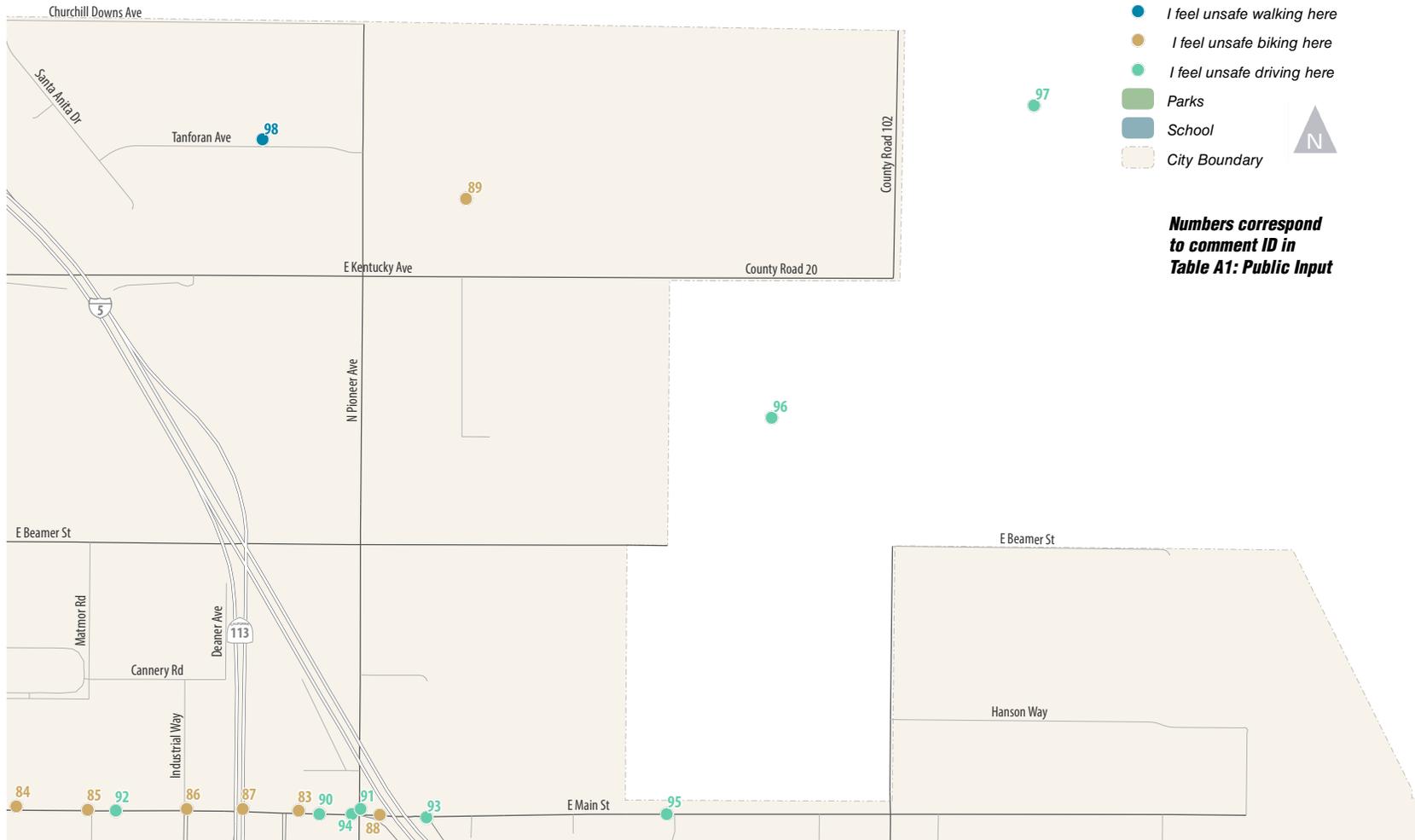
ID	Type	Unsafe Behavior Observed	Infrastructure Problem Observed	Comment
18	I feel unsafe biking here			
19	I feel unsafe biking here			
20	I feel unsafe biking here			
21	I feel unsafe biking here			
22	I feel unsafe driving here	Drivers not yielding/ stopping	Other infrastructure problem	This four way intersection really needs stop signs. Clover on one side does not align with Clover on the other side, making it difficult to see who may be speeding by.
23	I feel unsafe driving here	Drivers not yielding/ stopping	Other infrastructure problem	This four way intersection really needs stop signs. Clover on one side does not align with Clover on the other side, making it difficult to see who may be speeding by.
24	I feel unsafe driving here	Drivers not yielding/ stopping	Other infrastructure problem	East & Main heading west on Main, two lanes should split (i.e. left lane goes straight and right lane ONLY turns right)
25	I feel unsafe driving here	Drivers not yielding/ stopping	Traffic signal issue	This intersection is extremely hazardous when traffic is busy
26	I feel unsafe driving here	Drivers speeding	Add traffic calming to slow cars	
27	I feel unsafe driving here	Drivers speeding	Add traffic calming to slow cars	vehicles going way over the speed limit, 50-100 mph in a 25 zone on 5th street and North Street.
28	I feel unsafe driving here	Drivers speeding	Add/improved lighting	There should more cops patrolling the streets and seriously give out tickets on people driving recklessly.
29	I feel unsafe driving here	Drivers speeding	Other infrastructure problem	We need a All way stop at this intersection. It is very busy with all the county buildings and businesses off of Cottonwood

ID	Type	Unsafe Behavior Observed	Infrastructure Problem Observed	Comment
30	I feel unsafe driving here	Other/Personal safety concern	Other infrastructure problem	This intersection needs a stop sign on Beamer. When there is a game at the park the cars line the road parking making it nearly impossible to see oncoming traffic when you are on walnut.
31	I feel unsafe driving here	Other/Personal safety concern	Other infrastructure problem	need a longer eb turn lane (at SB east st. to Main) or a dual eb turn lane to E Main
32	I feel unsafe driving here	Other/Personal safety concern	Traffic signal issue	Traffic signal would be ideal, or at least stop signs on Beamer are needed. Difficult to see oncoming traffic due to parked cars. You just have to "hope" you make it when crossing Beamer on Walnut!
33	I feel unsafe driving here	Other/Personal safety concern	Upkeep/repair needed	Clover St., especially between West and College, has been in VERY poor condition for years. It is the worst street in town.
34	I feel unsafe driving here	Other/Personal safety concern	Upkeep/repair needed	very bad potholes and no bike lane
35	I feel unsafe driving here		Upkeep/repair needed	West Main St
36	I feel unsafe driving here		Upkeep/repair needed	West Main St
37	I feel unsafe driving here		Upkeep/repair needed	West Main St
38	I feel unsafe driving here		Upkeep/repair needed	West Main St
39	I feel unsafe driving here		Upkeep/repair needed	West Main St
40	I feel unsafe driving here		Upkeep/repair needed	West Main St
41	I feel unsafe driving here		Upkeep/repair needed	West Main St
42	I feel unsafe driving here		Upkeep/repair needed	West Main St

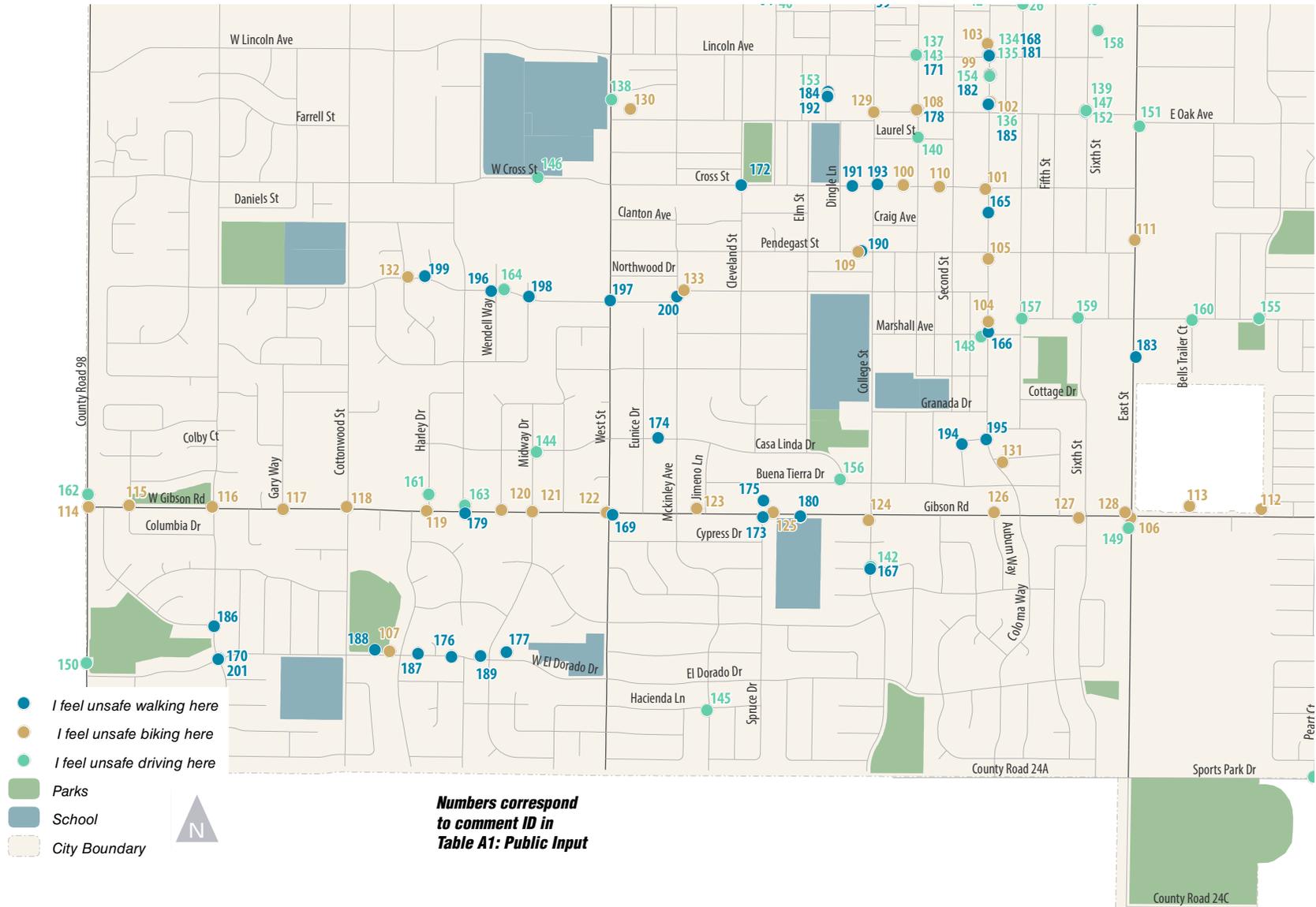
ID	Type	Unsafe Behavior Observed	Infrastructure Problem Observed	Comment
43	I feel unsafe driving here		Upkeep/repair needed	West Main St
44	I feel unsafe driving here			A lot of jay walking and illegal u-turns
45	I feel unsafe driving here			Turning on to 98 from Beamer
46	I feel unsafe driving here			
47	I feel unsafe driving here			
48	I feel unsafe driving here			
49	I feel unsafe driving here			
50	I feel unsafe driving here			
51	I feel unsafe driving here			
52	I feel unsafe driving here			
53	I feel unsafe driving here			
54	I feel unsafe driving here			
55	I feel unsafe driving here			
56	I feel unsafe driving here			
57	I feel unsafe driving here			
58	I feel unsafe walking here	Bicycles not yielding/ stopping	Other infrastructure problem	Bicycles riding on Sidewalk
59	I feel unsafe walking here	Bicycles not yielding/ stopping	Other infrastructure problem	Bicycles riding on Sidewalk

ID	Type	Unsafe Behavior Observed	Infrastructure Problem Observed	Comment
60	I feel unsafe walking here	Bicycles not yielding/ stopping	Other infrastructure problem	Bicycles riding on Sidewalk
61	I feel unsafe walking here	Bicycles riding wrong way against traffic	Add/improved bike lane	Bikes frequently on sidewalk
62	I feel unsafe walking here	Drivers not yielding/ stopping	Add/improved lighting	vehicles going way over the speed limit, 50-100 mph in a 25 zone on 5th street and North Street.
63	I feel unsafe walking here	Drivers not yielding/ stopping	Add/improved sidewalk or crossing	There is no crosswalk or signs warning that someone might be crossing on foot or bike on the bike path. I have seen many close calls there.
64	I feel unsafe walking here	Drivers not yielding/ stopping	Add/improved sidewalk or crossing	A blinking cross walk would help this area
65	I feel unsafe walking here	Drivers not yielding/ stopping	Add/improved sidewalk or crossing	This area really needs a more prominent cross walk or added stop sign
66	I feel unsafe walking here	Drivers not yielding/ stopping	Add/improved sidewalk or crossing	Adding a blinking crosswalk would help
67	I feel unsafe walking here	Drivers speeding	Other infrastructure problem	Add stop sign at intersection
68	I feel unsafe walking here	Drivers speeding		I live across from the park. People speed down Palm all day - often more than 20 mph over the limit. I am very worried about the safety of kids, bikers and people trying to park.
69	I feel unsafe walking here	Other/Personal safety concern	Parking issue	parents are parking in the no parking area near and sometimes IN the crosswalk
70	I feel unsafe walking here	Pedestrians not crossing safely	Add/improved sidewalk or crossing	Crossing area for kids walking to school and entering side gate at driver drop off zone.

ID	Type	Unsafe Behavior Observed	Infrastructure Problem Observed	Comment
71	I feel unsafe walking here	Pedestrians not crossing safely	Add/improved sidewalk or crossing	Crossing area for green belt between parks.
72	I feel unsafe walking here	Pedestrians not crossing safely	Add/improved sidewalk or crossing	Heavy use pedestrian crossing area for county workers and residents entering green belt
73	I feel unsafe walking here	Pedestrians not crossing safely	Add/improved sidewalk or crossing	Can an additional or bigger crosswalk be added so pedestrians can safely get to Nugget? Drivers never stop at night for peds as they are difficult to see here, maybe add more lighting?
74	I feel unsafe walking here			Homeless People. Can not use the park.
75	I feel unsafe walking here			No crosswalk
76	I feel unsafe walking here			No crosswalk
77	I feel unsafe walking here			
78	I feel unsafe walking here			
79	I feel unsafe walking here			
80	I feel unsafe walking here			
81	I feel unsafe walking here			
82	I feel unsafe walking here			



ID	Type	Unsafe Behavior Observed	Infrastructure Problem Observed	Comment
83	I feel unsafe biking here	Other/Personal safety concern	Traffic signal issue	main street
84	I feel unsafe biking here	Other/Personal safety concern	Traffic signal issue	main street
85	I feel unsafe biking here	Other/Personal safety concern	Traffic signal issue	main street
86	I feel unsafe biking here	Other/Personal safety concern	Traffic signal issue	main street
87	I feel unsafe biking here	Other/Personal safety concern	Traffic signal issue	main street
88	I feel unsafe biking here	Other/Personal safety concern	Traffic signal issue	main street
89	I feel unsafe biking here			
90	I feel unsafe driving here	Other/Personal safety concern	Other infrastructure problem	Eb Lane on ramp to SB I-5 conflict with rt turns (sb) @ Pioneer for drivers that try to go to I-5 SB
91	I feel unsafe driving here	Other/Personal safety concern	Other infrastructure problem	better advanced pavement markings needed for Lanesturning onto Pioneer, 113 & I-5
92	I feel unsafe driving here			Exiting Mc Donalds & Black Bear diner, unsafe left turn
93	I feel unsafe driving here			Sometimes exiting traffic is stopped and you are stuck in the intersection.
94	I feel unsafe driving here			The lane disappears in to the freeway
95	I feel unsafe driving here			
96	I feel unsafe driving here			
97	I feel unsafe driving here			
98	I feel unsafe walking here			



ID	Type	Unsafe Behavior Observed	Infrastructure Problem Observed	Comment
99	I feel unsafe biking here	Drivers not yielding/ stopping	Add traffic calming to slow cars	
100	I feel unsafe biking here	Drivers not yielding/ stopping	Add traffic calming to slow cars	
101	I feel unsafe biking here	Drivers not yielding/ stopping	Add/improved bike lane	Bicyclists not obeying traffic laws
102	I feel unsafe biking here	Drivers not yielding/ stopping	Add/improved bike lane	Bicyclists not obeying traffic laws
103	I feel unsafe biking here	Drivers not yielding/ stopping	Add/improved bike lane	Bicyclists not obeying traffic laws
104	I feel unsafe biking here	Drivers not yielding/ stopping	Add/improved bike lane	Bicyclists not obeying traffic laws
105	I feel unsafe biking here	Drivers not yielding/ stopping	Add/improved bike lane	Bicyclists not obeying traffic laws
106	I feel unsafe biking here	Drivers not yielding/ stopping	Add/improved bike lane	There is no safe way to cross East street on bike. Start by creating a safe crossing near the Community Center, which could also lead to a 113 overpass.
107	I feel unsafe biking here	Drivers not yielding/ stopping		
108	I feel unsafe biking here	Drivers not yielding/ stopping		
109	I feel unsafe biking here	Drivers speeding	Add traffic calming to slow cars	Drivers floor it through here, speed bumps are needed badly
110	I feel unsafe biking here	Drivers speeding	Add/improved bike lane	Excessive speed between elm and third, bikes cannot safely travel here

ID	Type	Unsafe Behavior Observed	Infrastructure Problem Observed	Comment
111	I feel unsafe biking here	Drivers speeding	Add/improved bike lane	no bike lanes, fast drivers
112	I feel unsafe biking here	Other/Personal safety concern	Add/improved bike lane	Gibson road
113	I feel unsafe biking here	Other/Personal safety concern	Add/improved bike lane	Gibson road
114	I feel unsafe biking here	Other/Personal safety concern	Parking issue	no parking needs to be extended to provide adequate bike lane width. Additional & better no parking signage needed.
115	I feel unsafe biking here	Other/Personal safety concern	Parking issue	no parking needs to be extended to provide adequate bike lane width. Additional & better no parking signage needed.
116	I feel unsafe biking here	Other/Personal safety concern	Parking issue	no parking needs to be extended to provide adequate bike lane width. Additional & better no parking signage needed.
117	I feel unsafe biking here	Other/Personal safety concern	Parking issue	no parking needs to be extended to provide adequate bike lane width. Additional & better no parking signage needed.
118	I feel unsafe biking here	Other/Personal safety concern	Parking issue	no parking needs to be extended to provide adequate bike lane width. Additional & better no parking signage needed.
119	I feel unsafe biking here	Other/Personal safety concern	Parking issue	no parking needs to be extended to provide adequate bike lane width. Additional & better no parking signage needed.
120	I feel unsafe biking here	Other/Personal safety concern	Parking issue	no parking needs to be extended to provide adequate bike lane width. Additional & better no parking signage needed.
121	I feel unsafe biking here	Other/Personal safety concern	Parking issue	no parking needs to be extended to provide adequate bike lane width. Additional & better no parking signage needed.

ID	Type	Unsafe Behavior Observed	Infrastructure Problem Observed	Comment
122	I feel unsafe biking here	Other/Personal safety concern	Parking issue	no parking needs to be extended to provide adequate bike lane width. Additional & better no parking signage needed.
123	I feel unsafe biking here	Other/Personal safety concern	Parking issue	no parking needs to be extended to provide adequate bike lane width. Additional & better no parking signage needed.
124	I feel unsafe biking here	Other/Personal safety concern	Parking issue	no parking needs to be extended to provide adequate bike lane width. Additional & better no parking signage needed.
125	I feel unsafe biking here	Other/Personal safety concern	Parking issue	no parking needs to be extended to provide adequate bike lane width. Additional & better no parking signage needed.
126	I feel unsafe biking here	Other/Personal safety concern	Parking issue	no parking needs to be extended to provide adequate bike lane width. Additional & better no parking signage needed.
127	I feel unsafe biking here	Other/Personal safety concern	Parking issue	no parking needs to be extended to provide adequate bike lane width. Additional & better no parking signage needed.
128	I feel unsafe biking here	Other/Personal safety concern	Parking issue	no parking needs to be extended to provide adequate bike lane width. Additional & better no parking signage needed.
129	I feel unsafe biking here		Add/improved bike lane	
130	I feel unsafe biking here			
131	I feel unsafe biking here			
132	I feel unsafe biking here			
133	I feel unsafe biking here			

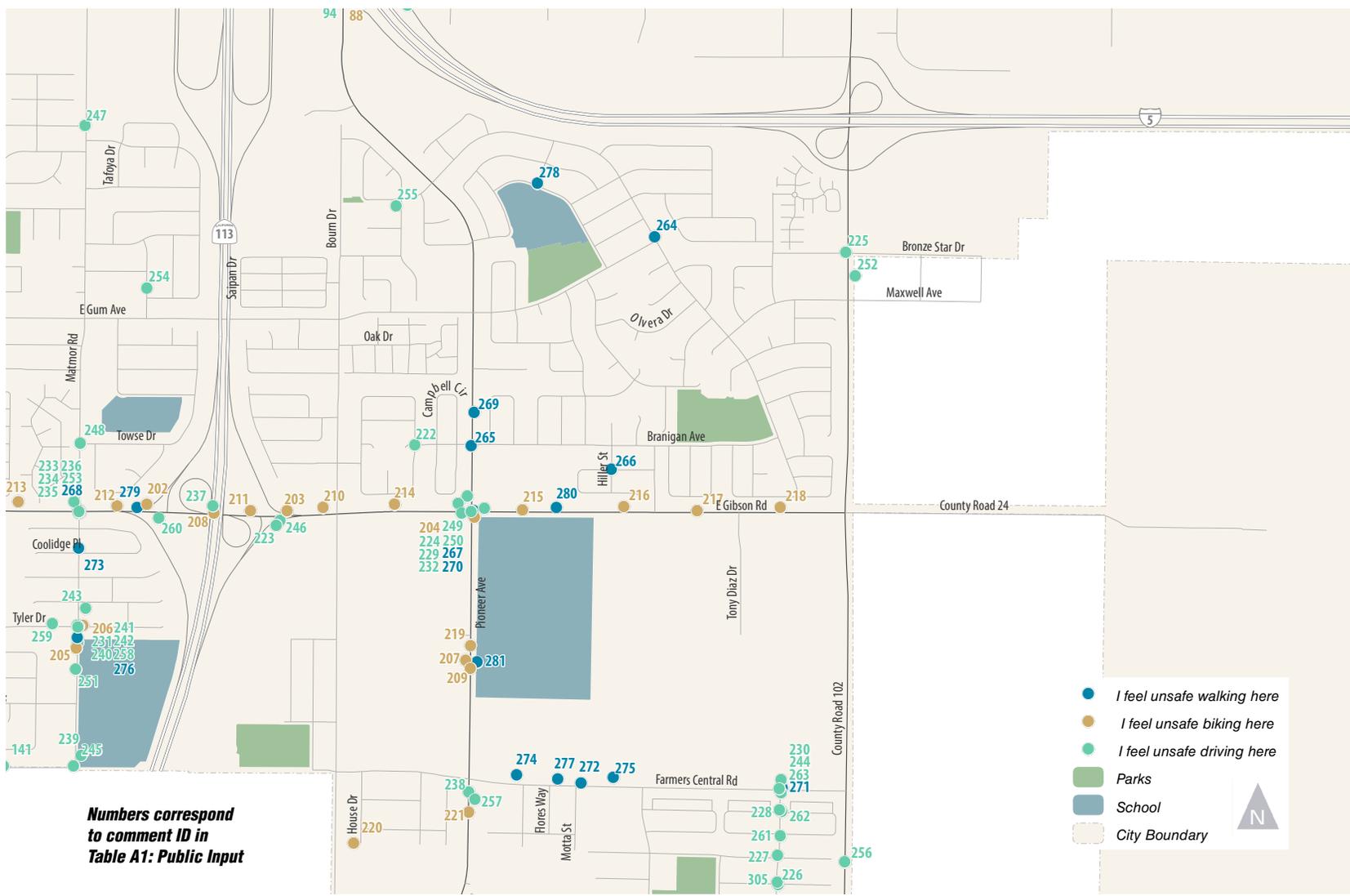
ID	Type	Unsafe Behavior Observed	Infrastructure Problem Observed	Comment
134	I feel unsafe driving here	Bicycles not yielding/ stopping	Other infrastructure problem	
135	I feel unsafe driving here	Bicycles riding wrong way against traffic	Add/improved bike lane	
136	I feel unsafe driving here	Drivers not yielding/ stopping	Add traffic calming to slow cars	cars drive through 4-wqy stop and speed from main to gibson. Can we have speed bumps?
137	I feel unsafe driving here	Drivers not yielding/ stopping	Add traffic calming to slow cars	blind intersection for people traveling NS. Nee stop signs for E/W traffic .
138	I feel unsafe driving here	Drivers not yielding/ stopping	Other infrastructure problem	Need to make it so cars can not turn left into or out of the parking lot at Lee Middle School. People cut each other off or drive in the bike lanes to pass cars waiting to turn left from West Street.
139	I feel unsafe driving here	Drivers not yielding/ stopping	Other infrastructure problem	cross traffic does not stop
140	I feel unsafe driving here	Drivers not yielding/ stopping	Traffic signal issue	Intersection at Laurel and 1st St needs Stop sign to control traffic in at least 1 direction. Traffic on 1st seems to ignore the uncontrolled crossinf of Laurel. Several accidents occur here annual
141	I feel unsafe driving here	Drivers speeding	Add traffic calming to slow cars	speeding occuring on Sprts Park Drive, install a 3-way stop to slow down the speeders.
142	I feel unsafe driving here	Drivers speeding	Add traffic calming to slow cars	There is a solar light but it doesn't work in the morning. The curve in the road doesn't allow cars when speeding to see kids crossing in time to stop.
143	I feel unsafe driving here	Drivers speeding	Add/improved lighting	consider 4 way stops, consider portable stop signs on Lincoln during events like food trucks

ID	Type	Unsafe Behavior Observed	Infrastructure Problem Observed	Comment
144	I feel unsafe driving here	Drivers speeding		
145	I feel unsafe driving here	Drivers speeding		
146	I feel unsafe driving here	Drivers speeding		
147	I feel unsafe driving here	Drivers speeding		
148	I feel unsafe driving here	Other/Personal safety concern	Other infrastructure problem	Students need to be picked up at school so that the entire neighborhood does not become a random pickup and dropoff zone
149	I feel unsafe driving here	Other/Personal safety concern	Other infrastructure problem	This is unsafe, rear bumper of a longer vehicle is about 5 feet from a passing train. should stop all vehicles west of tracks.
150	I feel unsafe driving here	Other/Personal safety concern	Other infrastructure problem	nb lane on Rd 98 is very close to Rd 98 curb line. Con. wall on Rd 98 blocks SB vision. Vehicle trying to turn SB to Rd 98 has potential conflict w NB vehicle.
151	I feel unsafe driving here	Other/Personal safety concern		Drivers cut through parking lot to make illegal left turn
152	I feel unsafe driving here	Pedestrians not crossing safely		
153	I feel unsafe driving here	Pedestrians walking in roadway/shoulder	Upkeep/repair needed	Wheelchairs wont travel on sidewalk. Ped walk on street.
154	I feel unsafe driving here		Parking issue	
155	I feel unsafe driving here			Potholes make it difficult to drive
156	I feel unsafe driving here			Should be a stop sign not a yield
157	I feel unsafe driving here			This street is narrow and difficult to drive down

ID	Type	Unsafe Behavior Observed	Infrastructure Problem Observed	Comment
158	I feel unsafe driving here			
159	I feel unsafe driving here			
160	I feel unsafe driving here			
161	I feel unsafe driving here			
162	I feel unsafe driving here			
163	I feel unsafe driving here			
164	I feel unsafe driving here			
165	I feel unsafe walking here	Drivers not yielding/stopping	Add traffic calming to slow cars	Street Lighting (at night) seems inadequate; several sidewalks have tree root damage, exposed cracks
166	I feel unsafe walking here	Drivers not yielding/stopping	Add traffic calming to slow cars	Speeding, drag racing on Marshall
167	I feel unsafe walking here	Drivers not yielding/stopping	Add traffic calming to slow cars	The solar light does not work in morning nor detours cars from slowing or stopping as needed.
168	I feel unsafe walking here	Drivers not yielding/stopping	Add/improved lighting	
169	I feel unsafe walking here	Drivers not yielding/stopping	Add/improved sidewalk or crossing	
170	I feel unsafe walking here	Drivers not yielding/stopping		Drivers regularly roll this 4-way stop sign
171	I feel unsafe walking here	Drivers not yielding/stopping		

ID	Type	Unsafe Behavior Observed	Infrastructure Problem Observed	Comment
172	I feel unsafe walking here	Drivers not yielding/ stopping		
173	I feel unsafe walking here	Drivers not yielding/ stopping		
174	I feel unsafe walking here	Drivers speeding	Add traffic calming to slow cars	
175	I feel unsafe walking here	Drivers speeding	Add traffic calming to slow cars	
176	I feel unsafe walking here	Drivers speeding	Add traffic calming to slow cars	
177	I feel unsafe walking here	Drivers speeding	Add traffic calming to slow cars	
178	I feel unsafe walking here	Drivers speeding	Add traffic calming to slow cars	1st & Laurel needs a stop sign
179	I feel unsafe walking here	Drivers speeding	Add traffic calming to slow cars	Hard to cross due to 4 lanes of traffic
180	I feel unsafe walking here	Drivers speeding	Add traffic calming to slow cars	
181	I feel unsafe walking here	Drivers speeding	Add/improved bike lane	
182	I feel unsafe walking here	Drivers speeding	Add/improved lighting	
183	I feel unsafe walking here	Drivers speeding	Add/improved sidewalk or crossing	fast drivers, narrow sidewalk
184	I feel unsafe walking here	Drivers speeding	Other infrastructure problem	Very small width of street for school pickup
185	I feel unsafe walking here	Drivers speeding	Parking issue	
186	I feel unsafe walking here	Drivers speeding		I've encouraged WPD to engaged in speed limit enforcement here for years now. No response.
187	I feel unsafe walking here	Drivers speeding		

ID	Type	Unsafe Behavior Observed	Infrastructure Problem Observed	Comment
188	I feel unsafe walking here	Drivers speeding		
189	I feel unsafe walking here	Drivers speeding		
190	I feel unsafe walking here	Other/Personal safety concern	Add/improved lighting	Very dark at night, street lights needed
191	I feel unsafe walking here	Pedestrians not crossing safely	Add/improved sidewalk or crossing	
192	I feel unsafe walking here		Add/improved sidewalk or crossing	Sidewalk and curb too steep and broken. unsafe
193	I feel unsafe walking here		Upkeep/repair needed	Sidewalks are uneven and unsafe
194	I feel unsafe walking here			Cars cut through here speeding
195	I feel unsafe walking here			Cars speed
196	I feel unsafe walking here			
197	I feel unsafe walking here			
198	I feel unsafe walking here			
199	I feel unsafe walking here			
200	I feel unsafe walking here			
201	I feel unsafe walking here			



ID	Type	Unsafe Behavior Observed	Infrastructure Problem Observed	Comment
202	I feel unsafe biking here	Drivers not yielding/ stopping	Add traffic calming to slow cars	Cycling through the on/off ramps on the 113 -Gibson overpass is dangerous. Drivers exiting 113 enter Gibson at excessive speed and are not looking for bikes crossing their path on Gibson.
203	I feel unsafe biking here	Drivers not yielding/ stopping	Add traffic calming to slow cars	113-Gibson ramps allow cars to enter Gibson at excessive speeds. Cars are not looking for bikes on Gibson crossing the ramps.
204	I feel unsafe biking here	Drivers not yielding/ stopping	Add/improved bike lane	
205	I feel unsafe biking here	Drivers not yielding/ stopping	Parking issue	So many cars parked on Matmor that its difficult to see oncoming traffic when entering from side streets
206	I feel unsafe biking here	Drivers speeding	Add traffic calming to slow cars	
207	I feel unsafe biking here	Other/Personal safety concern	Add/improved bike lane	There is a very narrow bike lane, <2 feet. And even THAT disappears.
208	I feel unsafe biking here	Other/Personal safety concern	Add/improved bike lane	There is no safe way to cross 113 south of Gum. We need an overpass that doesn't have on-/ off-ramps (even if it includes cars). I suggest one that connects Community Center and Pioneer High School.
209	I feel unsafe biking here	Other/Personal safety concern	Add/improved bike lane	Bike lane dead ends in middle of street from Gibson to Farmers Central on Pioneer. I was in a bike accident and broke my elbow when the bike lane ended and i was crowded by cars into gravel and crashe
210	I feel unsafe biking here	Other/Personal safety concern	Add/improved bike lane	Gibson road
211	I feel unsafe biking here	Other/Personal safety concern	Add/improved bike lane	Gibson road

ID	Type	Unsafe Behavior Observed	Infrastructure Problem Observed	Comment
212	I feel unsafe biking here	Other/Personal safety concern	Add/improved bike lane	Gibson road
213	I feel unsafe biking here	Other/Personal safety concern	Add/improved bike lane	Gibson road
214	I feel unsafe biking here	Other/Personal safety concern	Add/improved bike lane	Gibson road
215	I feel unsafe biking here	Other/Personal safety concern	Add/improved bike lane	Gibson road
216	I feel unsafe biking here	Other/Personal safety concern	Add/improved bike lane	Gibson road
217	I feel unsafe biking here	Other/Personal safety concern	Add/improved bike lane	Gibson road
218	I feel unsafe biking here	Other/Personal safety concern	Add/improved bike lane	Gibson road
219	I feel unsafe biking here	Other/Personal safety concern	Add/improved bike lane	Biking south along Pioneer is awkward. In front of high school, there is a narrow bike lane that disappears futher south, bikes pushed into car lane.
220	I feel unsafe biking here	Other/Personal safety concern	Other infrastructure problem	Bike lanes on Gibson between Pioneer and East street are consistantly covered with gravel and broken glass. Section between Pioneer and Matmor is the worst area.
221	I feel unsafe biking here			Evening racing of cars
222	I feel unsafe driving here	Drivers not yielding/ stopping	Add traffic calming to slow cars	Drivers frequently speed around the corner of Brennan and Duncan/ Powers circle. We need a 4
223	I feel unsafe driving here	Drivers not yielding/ stopping	Add traffic calming to slow cars	Stop sign is necessary as so often cars coming off 113 do not yield but fly onto Gibson
224	I feel unsafe driving here	Drivers not yielding/ stopping	Add traffic calming to slow cars	Drivers often run red lights

ID	Type	Unsafe Behavior Observed	Infrastructure Problem Observed	Comment
225	I feel unsafe driving here	Drivers not yielding/ stopping	Add traffic calming to slow cars	many do not stop when making a right turn onto Bronze Star drive, need STOP WHEN RED sign or YIELD WHEN RED. Dangerous!
226	I feel unsafe driving here	Drivers not yielding/ stopping	Add traffic calming to slow cars	Vehicles Drive down side streets and do not stop to see if there is traffic on Campos
227	I feel unsafe driving here	Drivers not yielding/ stopping	Add traffic calming to slow cars	Vehicles Drive down side streets and do not stop to see if there is traffic on Campos
228	I feel unsafe driving here	Drivers not yielding/ stopping	Add traffic calming to slow cars	Vehicles Drive down side streets and do not stop to see if there is traffic on Campos
229	I feel unsafe driving here	Drivers not yielding/ stopping	Other infrastructure problem	vehicles running red lights, unsafe
230	I feel unsafe driving here	Drivers not yielding/ stopping	Other infrastructure problem	stop sign is set back so one has to slowly move onto Farmers Central, cars parked on west make it difficult to see from the west. makee this a three way stop
231	I feel unsafe driving here	Drivers not yielding/ stopping	Other infrastructure problem	I would like a stop sign here. People speed down Matmor and I have problems turning left/north onto Matmor from Gibson in the morning during school. I have almost been hit several times.
232	I feel unsafe driving here	Drivers not yielding/ stopping	Traffic signal issue	At 3:20 p.m. M-F, cars turning left onto Pioneer from eastbound Gibson cross at red light and block the intersection. There are too many cars on Pioneer for them to get across. It is a regular occur
233	I feel unsafe driving here	Drivers not yielding/ stopping	Traffic signal issue	Either side of Matmor needs a turn signal to turn onto Gibson

ID	Type	Unsafe Behavior Observed	Infrastructure Problem Observed	Comment
234	I feel unsafe driving here	Drivers not yielding/ stopping	Traffic signal issue	have red lights stay red ot avoid crashes. hig traffic at the intersection durin gthe rush to and from school. consider allowing the traffic from elementary school to take left turns
235	I feel unsafe driving here	Drivers not yielding/ stopping	Traffic signal issue	I think this intersection needs a protected left turn light for people turning onto Gibson from Matmor in both directions. I see many near accidents and problems with people turning.
236	I feel unsafe driving here	Drivers not yielding/ stopping		Lack of left turn signal is a big problem at the intersection of Gibson Rd. and Matmor
237	I feel unsafe driving here	Drivers not yielding/ stopping		
238	I feel unsafe driving here	Drivers speeding	Add traffic calming to slow cars	
239	I feel unsafe driving here	Drivers speeding	Add traffic calming to slow cars	speeding traffic from Matmor to Sports Park Drive and vice versa, cars doing donuts, crashing, etc
240	I feel unsafe driving here	Drivers speeding	Add traffic calming to slow cars	high rate of speed at all times on matmor drive toward the school and community center
241	I feel unsafe driving here	Drivers speeding	Add traffic calming to slow cars	speeding on mtmore from Gibson road to sports park drive, install 4 way stop on Tyler to break the speed
242	I feel unsafe driving here	Drivers speeding	Add/improved sidewalk or crossing	Tyler Drive exit to Matmor blocked by parents dropping and picking up students. Need no parking (at least one space) on Matmor be fore street entrance on tyler both sides. Visibility issue!
243	I feel unsafe driving here	Drivers speeding	Other infrastructure problem	lack of 4 way stop on Matmor and Tyler Drive area. Will slow traffic and allow side street traffic to turn onto Matmor during heavy traffic

ID	Type	Unsafe Behavior Observed	Infrastructure Problem Observed	Comment
244	I feel unsafe driving here	Drivers speeding	Traffic signal issue	Poor visibility to see cross traffic
245	I feel unsafe driving here	Other/Personal safety concern	Add traffic calming to slow cars	popular place for donuts, causing crashes. install speed bumps in both directions
246	I feel unsafe driving here	Other/Personal safety concern	Other infrastructure problem	The angle of this off ramp makes it extremely difficult to check for traffic as you merge onto Pioneer. Unless you come to a complete stop (dangerous), you have to look nearly backward while driving.
247	I feel unsafe driving here	Other/Personal safety concern	Other infrastructure problem	concern with sight distance coming from E. Oak onto Matmor
248	I feel unsafe driving here	Other/Personal safety concern		It is difficult to see oncoming traffic from the left when turning onto Matmore
249	I feel unsafe driving here	Pedestrians not crossing safely	Add/improved sidewalk or crossing	high school students from Pioneer high not crossing safely, add police and school patrol and education.
250	I feel unsafe driving here	Pedestrians not crossing safely	Other infrastructure problem	students not following traffic signals, sometimes bumping into cars at light
251	I feel unsafe driving here	Pedestrians not crossing safely	Other infrastructure problem	Families should not be able to park across from the street from the school and cross Matmor. Often they cross without looking
252	I feel unsafe driving here	Pedestrians walking in roadway/shoulder	Add traffic calming to slow cars	Drivers run the red light going into the plaza from the I5 side of 102
253	I feel unsafe driving here		Traffic signal issue	Matmor needs a left turn signal. I have witnessed near misses many times, especially when there is school traffic.
254	I feel unsafe driving here			Cars race night.
255	I feel unsafe driving here			I also feel unsafe living on the corner as vehicles trying to avoid the traffic on

ID	Type	Unsafe Behavior Observed	Infrastructure Problem Observed	Comment
256	I feel unsafe driving here			Many accidents
257	I feel unsafe driving here			Weekend evening racing of vehicles.
258	I feel unsafe driving here			
259	I feel unsafe driving here			
260	I feel unsafe driving here			
261	I feel unsafe driving here			
262	I feel unsafe driving here			
263	I feel unsafe driving here			
264	I feel unsafe walking here	Drivers not yielding/ stopping	Add traffic calming to slow cars	
265	I feel unsafe walking here	Drivers not yielding/ stopping	Traffic signal issue	dedicated left turn signal may make it safer, although may increase general traffic
266	I feel unsafe walking here	Drivers not yielding/ stopping	Traffic signal issue	Please add stop sign, I've lived here for less than 6 months and had various close-calls as a pedestrian and driver. Thank you
267	I feel unsafe walking here	Drivers not yielding/ stopping		cars run red turn light
268	I feel unsafe walking here	Drivers not yielding/ stopping		cars run red turn signal

ID	Type	Unsafe Behavior Observed	Infrastructure Problem Observed	Comment
269	I feel unsafe walking here	Drivers not yielding/ stopping		When trying to cross Pioneer at all 4 of these corners of Pioneer and Branigan people in cars do not yield to walkers crossing in the crosswalks. I've witnessed kids crossing over Pioneer almost hit.
270	I feel unsafe walking here	Drivers not yielding/ stopping		
271	I feel unsafe walking here	Drivers not yielding/ stopping		
272	I feel unsafe walking here	Drivers speeding	Add traffic calming to slow cars	Crosswalk at the corner of Motta St & Farmer's Central Rd isn't safe. Speed of 35 makes it dangerous to use. Recommend reduce speed limit to 30 & undulations.
273	I feel unsafe walking here	Drivers speeding	Add traffic calming to slow cars	Cars tend to race down this street and make donuts, very dangerous for when people go out on bike rides or out out for walks. Not to mention teh fact that there are two school on Matmore.
274	I feel unsafe walking here	Drivers speeding	Add traffic calming to slow cars	
275	I feel unsafe walking here	Drivers speeding	Add traffic calming to slow cars	
276	I feel unsafe walking here	Drivers speeding	Add traffic calming to slow cars	So many cars parked on Matmor that its difficult to see oncoming traffic when entering from side streets
277	I feel unsafe walking here	Drivers speeding		
278	I feel unsafe walking here	Other/Personal safety concern	Add/improved sidewalk or crossing	there should be a painted crosswalk for the school kids

ID	Type	Unsafe Behavior Observed	Infrastructure Problem Observed	Comment
279	I feel unsafe walking here	Pedestrians walking in roadway/ shoulder	Add/improved sidewalk or crossing	Crossing four freeway ramps is not a safe route to school
280	I feel unsafe walking here			Not enough buses to Davis. The County Fair Mall is a 45 min. walk.
281	I feel unsafe walking here			Not enough buses, County Fair Mall is 50 min. walk.



- I feel unsafe walking here
  - I feel unsafe biking here
  - I feel unsafe driving here
  - Parks
  - School
  - City Boundary
- 

**Numbers correspond to comment ID in Table A1: Public Input**

ID	Type	Unsafe Behavior Observed	Infrastructure Problem Observed	Comment
282	I feel unsafe biking here	Drivers not yielding/ stopping	Traffic signal issue	There should be a signal here for allowing of safe crossing for pedestrians and bikers, especially when the elementary school opens. Also, Miekle is not wide enough for bike lanes.
283	I feel unsafe biking here	Other/Personal safety concern	Add/improved bike lane	No bike lanes and driveways coming into street so not a safe way for young children to get to the new school
284	I feel unsafe biking here	Other/Personal safety concern	Add/improved sidewalk or crossing	The green belt path needs to be connected across Heritage to allow for safe access to the new park and elementary school, especially as Miekle has no bike lanes and driveways.
285	I feel unsafe biking here	Other/Personal safety concern	Add/improved sidewalk or crossing	Same as pedestrian need to cross Heritage.
286	I feel unsafe biking here		Add/improved bike lane	
287	I feel unsafe biking here			
288	I feel unsafe biking here			
289	I feel unsafe driving here	Drivers not yielding/ stopping	Add traffic calming to slow cars	Change to 4-way stop, and install pedestrian crossing to the west. A lot of cars traveling N-S think the E-W cars ALREADY have a stop sign. (N-S cars stop, then go, even if an E-W car is coming.)
290	I feel unsafe driving here	Drivers not yielding/ stopping	Add traffic calming to slow cars	Vehicles Drive down side streets and do not stop to see if there is traffic on Campos
291	I feel unsafe driving here	Drivers not yielding/ stopping	Add traffic calming to slow cars	Vehicles Drive down side streets and do not stop to see if there is traffic on Campos
292	I feel unsafe driving here	Drivers not yielding/ stopping	Add traffic calming to slow cars	Vehicles Drive down side streets and do not stop to see if there is traffic on Campos

ID	Type	Unsafe Behavior Observed	Infrastructure Problem Observed	Comment
293	I feel unsafe driving here	Drivers not yielding/ stopping	Add traffic calming to slow cars	Heritage and Campos should become a 4-way stop
294	I feel unsafe driving here	Other/Personal safety concern	Parking issue	Street is too narrow
295	I feel unsafe driving here		Other infrastructure problem	
296	I feel unsafe driving here			Many Head on accidents
297	I feel unsafe driving here			Narrow passing between Diggs and Marston. Not enough room to pass if cars parked on both side of the street. If so you have to cross the divider line.
298	I feel unsafe driving here			Speed limit is high. very sharp turn.
299	I feel unsafe driving here			While driving on Harry Lorenzo, between Diggs and Marston. The road is so narrow. When residential cars are park on the street there is no enough room to pass without coming to the center divider.
300	I feel unsafe driving here			
301	I feel unsafe driving here			
302	I feel unsafe driving here			
303	I feel unsafe driving here			
304	I feel unsafe driving here			
305	I feel unsafe driving here			
306	I feel unsafe walking here	Drivers not yielding/ stopping	Add traffic calming to slow cars	Spring Lake Elementary School - concern with morning traffic and student conflicts at intersection.

ID	Type	Unsafe Behavior Observed	Infrastructure Problem Observed	Comment
307	I feel unsafe walking here	Drivers not yielding/ stopping	Traffic signal issue	Concerned for increased foot traffic with new elementary school. Need signal for children crossing on foot and bicycles
308	I feel unsafe walking here	Other/Personal safety concern	Add/improved sidewalk or crossing	Walking/biking for elem school
309	I feel unsafe walking here	Other/Personal safety concern	Add/improved sidewalk or crossing	There is a HUGE missed opportunity to create a pedestrian-friendly crossing across Heritage. It would connect two greenbelts, including one leading to a school.
310	I feel unsafe walking here	Other/Personal safety concern	Add/improved sidewalk or crossing	connect greenbelt across Heritage between Miekle and Campos
311	I feel unsafe walking here	Pedestrians walking in roadway/ shoulder	Add/improved sidewalk or crossing	Spring Lake Elementary School - disconnected green belt will put students at risk.
312	I feel unsafe walking here		Parking issue	
313	I feel unsafe walking here			Not enough bus service to Davis
314	I feel unsafe walking here			
315	I feel unsafe walking here			



# APPENDIX B - UPDATES TO 2020 SSAR

This LRSP is based on the City of Woodland SSAR that was approved in 2020. The SSAR was expanded to include guidance from the LRSM and to reflect work completed since the development and release of the SSAR.

- Added stakeholder team consultation and inputs
- Added description of SS4A program

Notable updates from the SSAR are listed below:

- Updated all maps to reflect changes to roadway network
- Updated speed limits
- Added background on local road safety plans
- Updated commuting trend information
- Added discussion of stakeholders
- Added collision data for the years 2017-2020
- Updated OTS rankings
- Updated information on police department safety efforts
- Noted completed safety improvements and progress towards completion, where appropriate
- Added new countermeasures from the 2020 update to the LRSM
- Added description of AB 43
- Identified top five priority corridors and expanded analysis and recommendations for them
- Added implementation chapter

