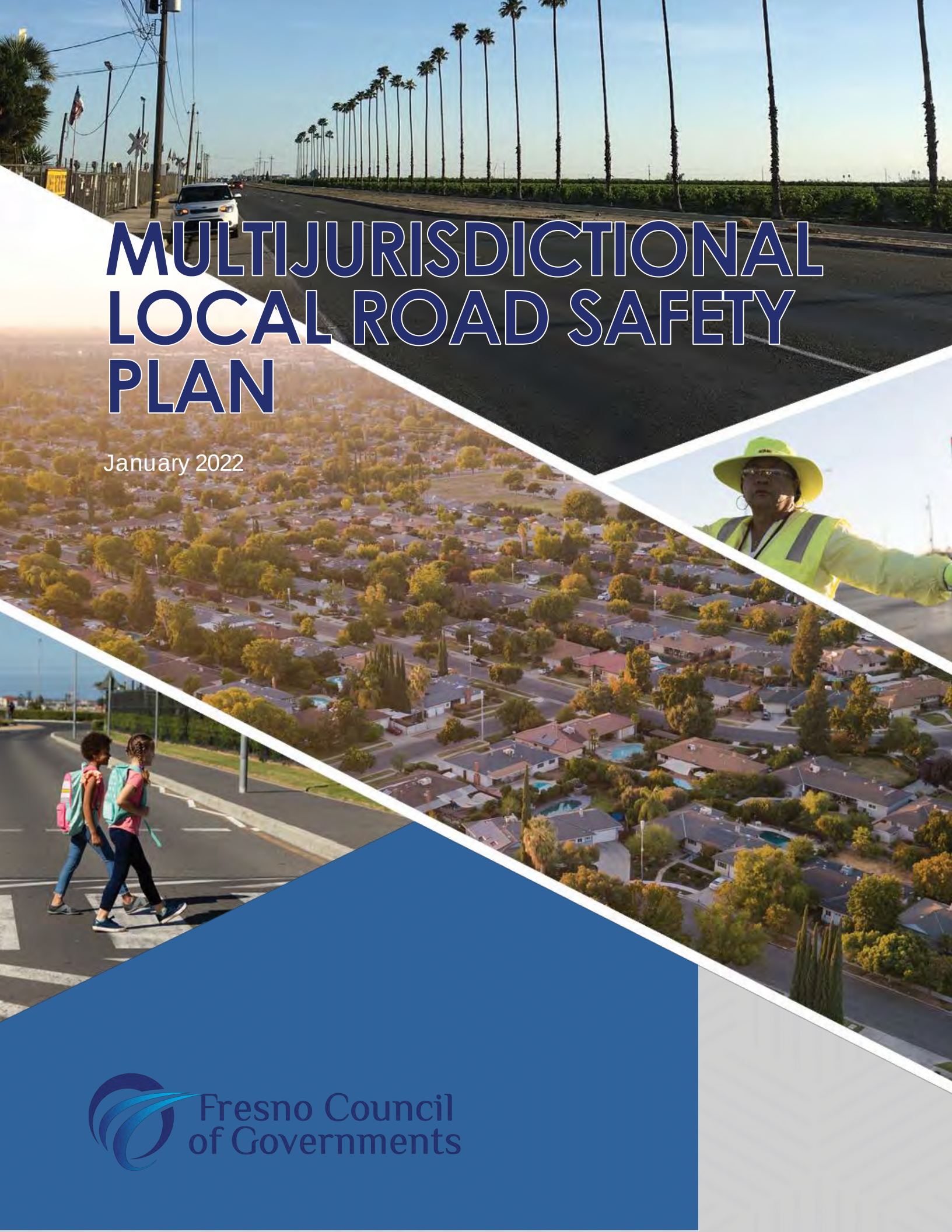




# MULTIJURISDICTIONAL LOCAL ROAD SAFETY PLAN

January 2022

STATEMENT OF PROTECTION OF DATA FROM DISCOVERY AND ADMISSIONS:  
Per Section 148 of Title 23, United States Code [23 U.S.C. §148(h) (4)] REPORTS  
DISCOVERY AND ADMISSION INTO EVIDENCE OF CERTAIN REPORTS, SURVEYS,  
AND INFORMATION—Notwithstanding any other provision of law, reports,  
surveys, schedules, lists, or data compiled or collected for any purpose  
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other data.

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# 1.0 INTRODUCTION

## PURPOSE AND SCOPE

The Multijurisdictional Local Road Safety Plan (MLRSP) was initiated by the Fresno Council of Governments (Fresno COG) and completed by Kittelson & Associates, Inc. (Kittelson) and Toole Design Group (TDG) to enable ten of the COG's local jurisdiction partners to prepare their first local road safety plans. The ten participating local jurisdictions are:

- City of Clovis
- City of Coalinga
- City of Firebaugh
- Fresno County (Unincorporated)
- City of Huron
- City of Kerman
- City of Mendota
- City of Orange Cove
- City of San Joaquin
- City of Selma

The focus of the MLRSP's development is to identify the following for each of the local jurisdictions:

- Crash patterns and trends
- Systemic engineering treatments to help reduce crash risk
- Education, enforcement, and/or emergency services strategies to help improve roadway safety
- High priority locations for projects with supporting design concepts
- Highway Safety Improvement Program (HSIP) grant applications to facilitate securing funding for high priority safety projects

This document presents the local road safety plans for each of the above local agencies. The local road safety plans were informed by technical analysis as well as input from key stakeholders and input from the general public. The following subsections describe the process used to develop the plans, the types of strategies identified for each local agency, and the COG's regional efforts to improve roadway safety. The subsequent sections of this report present each local jurisdiction's local road safety plan.

## PROCESS

The local road safety plans included in this MLRSP were informed by a crash data analysis, key agency stakeholder input, and broader community input from the general public regarding roadway safety concerns. The stakeholder input combined with the crash analysis were used to establish an understanding of existing roadway safety performance and priority locations for each local agency. Based on existing roadway safety performance, multidisciplinary strategies were identified to help improve roadway safety. The following subsections discuss the stakeholder engagement activities, summarize the data and analysis approach used, and identify types of strategies to improve roadway safety.

### Stakeholder Engagement Activities

The local road safety plans for the local jurisdictions were developed during the COVID-19 pandemic from approximately April 2021 through December 2021. Given the timing of their development, stakeholders were engaged through virtual meetings and web-based input. Engagement was organized into three sets of activities to engage a range of stakeholders over the course of the local road safety plans' development. These activities include:



**Local Working Groups** – Three local working groups were formed and comprised of one to three representatives from each of the ten participating local agencies. The local working groups each met three times during the local road safety plans' development to discuss existing conditions findings, vision and goals, recommendations, and the local road safety plans themselves. *Appendix A* includes the local working group rosters, meeting notes, and materials from those meetings.



**Web-Based Survey and Interactive Map** – A web-based survey and interactive map was used to reach the general public. The COG worked with local agencies to advertise the survey and interactive map through social media and other established communication channels. The web-based survey was used to gather input regarding people's general roadway safety concerns and understand the types of issues most frequently encountered. The interactive map was used to gather input on specific locations where community members had roadway safety concerns. *Appendix A* includes the summary of the input received.



**Focus Group Meetings** – One focus group meeting was conducted for each local agency. The participants were invited based on their role in the community and included representatives from local school districts, local decision-makers, city managers, representatives from local chamber of commerce, local law enforcement, transit service providers, state partners (e.g., Caltrans, California Highway Patrol), and other active local community members. Each of the ten focus group meetings discussed draft findings, shared input received from the general public, discussed draft vision and goals, and presented draft priorities as well as potential safety strategies. *Appendix A* includes the focus group participant lists, meeting notes, and meeting materials from each focus group meeting.



## Data Summary and Analysis Approach

Kittelsohn worked with Fresno COG to assemble crash data for each of the local jurisdictions. The crash data was obtained from the Statewide Integrated Traffic Records System (SWITRS) database and supplemented with location information from the Transportation Injury Mapping System (TIMS) database maintained by SafeTREC at the University of California, Berkeley. Throughout this report, crashes are associated with a jurisdiction based on the reporting officer's assessment of location.

The crash database represents the time period from January 1, 2015 through December 31, 2019 and includes reported crashes that occurred on public streets within each local jurisdiction. Crash severity is coded according to the highest degree of injury exhibited, and the data used for this analysis includes the following coded severity levels (listed in descending order):

- Fatal: death from injuries sustained in the crash.
- Severe Injury: Injuries include, for example, broken bones, severe lacerations, or other injuries that go beyond the reporting officer's assessment of "other visible injuries."
- Other visible injury: An injury, other than those described above, that is evident to observers at the scene of the crash. For example, bruises or minor lacerations.
- Complaint of pain: Internal or other non-visible injuries. For example, a person limps or seems incoherent.
- Property damage only (PDO): No injuries sustained.

For simplicity in presentation, in some cases Kittelson combined crashes coded as "other visible injury" or "complaint of pain" into a single "other injury" category.

The crash data was used for two types of analysis: (i) Descriptive analysis to identify crash patterns and trends; and (ii) Spatial analysis to identify high-injury networks and priority locations for safety improvements.

The data used for the descriptive analysis were sorted into jurisdictions based on the information available in the SWITRS and TIMS databases. This information is derived from a reporting officer's judgment and may be inconsistent with true boundaries, especially near city/county borders.

In the process of locating data into a geographic information system (GIS) for spatial analysis, Kittelson reviewed the available information and relocated some crashes to a more precise coordinate location. In so doing, Kittelson relocated some crashes to different jurisdictions than originally listed in the database. Thus, some disparities in total crash count by jurisdiction exist between the descriptive analysis and spatial analysis even though each is internally consistent. This subtle change in crash total per jurisdiction has a negligible effect on overall descriptive patterns.

## DESCRIPTIVE ANALYSIS

The descriptive analysis evaluates the crash data based on attributes recorded by police officers in crash reports. The attributes include items such as collision type, severity, cited primary collision factor, weather, and lighting. This analysis results in different charts, tables, and graphs summarizing statistics about recurring crash patterns and trends in the data. In some instances, a few of the local jurisdictions had too few reported crashes to do a descriptive analysis. In those instances, Kittelson summarized key attributes for each reported crash. The overall intent of the descriptive analysis is to identify jurisdiction-wide trends that may be addressed by systemic strategies or treatments.

For each agency LRSP a section is provided for descriptive data related to all road users, pedestrians, and bicyclists. These sections provide relevant information to statewide performance measure targets which specifically look for pedestrian- and bicycle-involved crashes.

## SPATIAL ANALYSIS

The spatial analysis takes into consideration the specific locations the reported crashes occurred. To aid in this analysis, Kittelson developed a linear referencing system of all public roadways using the Fresno County roadway centerline file. This dataset was updated to develop a measurement system based on the total road length (as determined by roadway name) to locate crashes to a specific mile point along the network. This allowed calculating *Highway Safety Manual* network screening performance measures using spatial statistics. Upon developing the roadway network, nodes were created for all intersections across the region and identified as signalized or unsignalized. Kittelson conducted quality control checks to ensure grade-separated crossings were appropriately modeled and address other inconsistencies in the roadway and intersection network.

Crashes were next identified as intersection or segment crashes. Based on Caltrans guidance, an intersection crash was defined as a crash that occurs within 250 feet of the intersection. These crashes were spatially joined and summarized in ArcGIS to calculate the total number of crashes by severity at each intersection. Where intersections were less than 500 feet from each other, crashes were assigned to the nearest of the two intersections. Crashes occurring more than 250 feet from any intersection were separated to be used in the segment analysis discussed below.

## ANALYSIS APPROACH

The following steps outline the basic analysis approach to assess countywide safety performance:

1. Establish the high-injury network database using the crash and roadway network data.
2. Evaluate the frequency and severity of reported crashes using Equivalent Property Damage Only (EPDO) and Excess Predicted Average Crash Frequency Using Method of Moments performance metrics and sliding window methodology from the *Highway Safety Manual*. Kittelson used weighting consistent with Caltrans Local Roadway Safety Manual crash costs guidance.
3. Map resulting performance metrics to display roadway safety performance for each local jurisdiction.

As a note, roadway segments and intersections in the resulting high-injury network maps are not weighted based on travel volumes or demand. Field-collected traffic volumes and travel demand model volumes can be useful tools in weighing and classifying roads differently based on their volume and demand. However, there are limits and challenges to this data which rendered it infeasible to apply to the high-injury network in a consistent manner that would allow for comparisons within a given jurisdiction. For example, consistent traffic volumes are not available for all roads that are being analyzed. Additionally, Fresno COG's travel demand model network does not cover all roads analyzed and is not able to be directly linked to the roadway network. Therefore, all analyzed roadway segments were evaluated without adjusting for travel volumes.

### *High-Injury Network*

In the existing conditions report, Kittelson identified high-injury networks for each local jurisdiction. A high-injury network includes the intersections and segments that have exhibited the most frequent and/or most severe crashes within a given jurisdiction. Kittelson mapped the results of the analysis and also presented the highest priority locations in a table format.

To identify the high-injury network and corresponding high priority locations, Kittelson used the same approach recently completed for Fresno COG's Regional Safety Plan (RSP). The following describes this approach which includes calculating crash severity scores, excess predicted average crash frequency, and the sliding window methodology.

### *Equivalent Property Damage Only (EPDO) to Generate Crash Severity Scores*

Kittelson used EPDO score performance measure from the *Highway Safety Manual*, which assigns weighting factors to crashes by severity relative to property damage only (PDO) crashes. The EPDO calculation was performed for all public intersections and roadway segments including state highway facilities. The EPDO performance measure is described below. Moving forward throughout this document, the EPDO performance measure is referred to as a "crash severity score."

The crash severity score assigns weight to individual crashes based on the crash severity and location of the crash (see table below). Weights, provided by the 2020 Caltrans' Manual *Local Roadway Safety*, are based on the cost of property-damage-only (PDO) crashes. Each crash is assigned a score relative to a PDO crash, as shown in Table 1.

Table 1: Crash Severity Scores

| Location Type             | Crash Weighting by Severity |               |                      |                   |                      |
|---------------------------|-----------------------------|---------------|----------------------|-------------------|----------------------|
|                           | Fatal                       | Severe Injury | Other Visible Injury | Complaint of Pain | Property Damage Only |
| Signalized Intersection   | 119.55                      | 119.55        | 10.70                | 6.08              | 1.00                 |
| Unsignalized Intersection | 190.23                      | 190.23        | 10.70                | 6.08              | 1.00                 |
| Roadway                   | 164.66                      | 164.66        | 10.70                | 6.08              | 1.00                 |

Source: Caltrans, *Local Roadway Safety: A manual for California's Local Road Owners (Version 1.5)*, 2020.

The weights prioritize fatal and severe injury crashes equally to recognize that a death versus a severe injury is often a function of the individual involved or of emergency response time. Therefore, both outcomes represent locations where the region may want to prioritize improvements. Crash weights vary by location types because of the relative costs associated with the crash severity at the location type. Specifically, unsignalized intersections have a higher cost for fatal and severe crashes because fatal and severe crashes at these locations tend to result in more severely injured persons on average.

The EPDO score is calculated by multiplying each crash severity total by its associated weight and summing the results, using the following formula:

EPDO Score = (Fatal weight \* # of fatal crashes) + (severe injury weight \* # of severe injury crashes) + (other visible injury weight \* # of other visible injury crashes) + (complaint of pain injury weight \* # of complaint of pain injury weight crashes) + (property damage only weight \* # of property damage only crashes)

The EPDO score is annualized by dividing the score by the number of years of crash data used in the analysis, which in this case is five years.

### *Excess Predicted Average Crash Frequency Using Method of Moments*

Kittelsohn also used the Excess Predicted Average Crash Frequency Using Method of Moments performance metrics to calculate the predicted excess crash frequency for each analysis segment and intersection. This method identifies the extent to which a location is exhibiting either more crashes or fewer crashes than one would expect based on how other similar locations are performing.

Mathematically, this method adjusts the observed crash frequency for a site based on the variance in the crash data and average crash frequencies for a site's reference population. Reference populations were established based on urban/rural designation, functional classification, and traffic control (for intersections only). The adjusted observed crash frequency is then compared to the average crash frequency for the reference population to calculate the excess predicted crashes for each location.

### *Sliding Window Methodology*

Kittelsohn used a Python-based script to segment the street network into one-half (1/2) mile segments, incrementing the segments by one-quarter (1/4) of a mile. The EPDO score was calculated per increment of each segment as the script "slides" along each roadway in the network. Crashes associated with intersections (i.e., crashes within 250 feet of the intersection) are ignored for the segment analysis and analyzed separately. This methodology helps to identify portions of roadways with the greatest potential for safety improvements. The scores were aggregated based on relative regional percentiles of the resulting crash severity and excess predicted crashes scores to map out regional safety performance and identify high injury locations.

### *Results*

The results of the above spatial analysis are presented for each local jurisdiction under the subsection titled "Existing Roadway Safety Performance." Grade-separated facilities were removed from the evaluation as they would not be a focus for the local agency. The results are a strong indication of which locations are most likely to be competitive for HSIP grant funding. The results were used to inform the selection of locations for HSIP grant applications.



## Strategy Types

Strategies to improve roadway safety were identified for each local agency based on that agency's existing roadway safety performance and the concerns identified by stakeholders as well as the general public. The safety strategies identify engineering strategies (i.e., countermeasures), education, emergency services, and enforcement strategies that can be used to reduce the risk of traffic fatalities and injuries on public roadways. The following briefly describes each type of strategy. Each agency's local road safety plan describes specific strategies aligned with the local agency's emphasis areas for road safety improvement.



### ENGINEERING STRATEGIES

Engineering strategies to improve roadway safety are often referred to as countermeasures. Countermeasures are generally geometric or operational changes to a roadway, intersection, or roadside (area immediately adjacent to the roadway) that reduce the likelihood of a crash occurring and/or reduce the likelihood of someone being killed or hurt if a crash does occur.

The Fresno COG 2021 Regional Safety Plan (RSP) includes a Countermeasures Toolbox, which is provided in *Appendix B* of this MLRSP. The toolbox is a resource for local agencies within the region. It is organized to help identify countermeasures that have been found to be effective at reducing crash risk. The engineering strategies included are likely to be eligible for grant funding through Caltrans' HSIP.

Specific to each local agency's road safety plan, countermeasures were prioritized based on the top three collision types and top three primary collision factors. The Fresno COG RSP Countermeasure Toolbox and Caltrans' Manual *Local Roadway Safety* were used to identify which collision types and primary collision factors a countermeasure is most effective at addressing. Using this information, countermeasures were prioritized as follows:

- If the collision type or primary collision factor was listed in the Top 3 Fatal/Severe Injury list for a jurisdiction, then the countermeasure was given high priority.
- If the collision type or primary collision factor was listed in the Top 3 Overall list for a jurisdiction (but not the Top 3 Fatal/Severe Injury list), then the countermeasure was given a medium priority.
- If the collision type or primary collision factor was not listed as Top 3 for a jurisdiction, then the countermeasure was given a low priority.

For countermeasures that address night crashes, the following prioritization process was used:

- If the proportion of fatal/severe injury crashes that occurred at night in a jurisdiction were greater than the countywide proportion of fatal/severe crashes that occurred at night (44 percent), then the countermeasure was given high priority.
- If the proportion of fatal/severe injury crashes that occurred at night in a jurisdiction were less than the countywide proportion of fatal/severe crashes that occurred at night, but greater than the countywide proportion of total crashes that occurred at night (32 percent), then the countermeasure was given medium priority.
- If the proportion of fatal/severe injury crashes that occurred at night in a jurisdiction were less than the countywide proportion of total crashes that occurred at night, then the countermeasure was given a low priority.

For countermeasures that address crashes involving pedestrians and bicyclists, the collision types, primary collision factors, and pedestrian actions that were associated with pedestrian and bicycle involved crashes informed countermeasure priorities. The following were also considered:

- If pedestrian and bicycle involved crashes in a jurisdiction exceeds statewide average shown in the SHSP, then the countermeasure was given high priority.
- If pedestrian and bicycle involved crashes in a jurisdiction do not exceed statewide average shown in the SHSP, then the countermeasure was given medium or low priority.

Additional factors, such as land use context (urban vs. rural land uses), estimated amount of crash reduction, and funding eligibility were also used to prioritize potential countermeasures for a given jurisdiction.



## EDUCATION STRATEGIES

Education strategies tend to refer to programs aimed at distributing educational messages and materials to the general public or specific groups within the broader population to bring awareness to the need for changes in road user behavior. These strategies focus on educating or sharing information that encourages safe choices on the behalf of all road users. Implementing these strategies often requires inter- and intra-agency coordination to achieve the desired outcomes of the program. Partners most frequently involved in developing and employing education strategies include public works department or division, transportation department or division, schools and school districts, community groups or community centers, public information offices of local agencies, and local law enforcement agencies. A transportation safety education program was created as part of the Fresno COG's 2021 Regional Safety Plan development. The COG's intent is to coordinate with local agencies across the County in deploying and using education materials. Each local agency's local road safety plan discusses opportunities to make the most of that education program as well as other related education strategies.



## EMERGENCY SERVICES STRATEGIES

Emergency services strategies are programs and/or policies that facilitate coordination with emergency/first responders to improve roadway safety. These types of strategies can include:

- Agreements for enhanced information sharing to better understand severity outcomes from crashes.
- Enhanced communication and coordination to help optimize response times to/from incidents and medical care.
- Increased trauma training for first responders particularly in rural areas where travel to a hospital will take longer so stabilization and treatment at the site of the crash is more critical.
- Increased training opportunities for the general public to assist victims at the scene of a crash.

These types of strategies are often coordinated at a regional level given the overlap in services and coverage across multiple local boundaries. Each local agency's local road safety plan highlights strategies that could be beneficial to coordinate with the COG and others regarding emergency services.



## ENFORCEMENT STRATEGIES

Enforcement strategies include programs or campaigns specifically focused on changing road user behavior through more visible and active enforcement of existing traffic laws.

Typically, the effectiveness of enforcement strategies is temporal, meaning they are effective at changing behavior for a discrete period of time, typically during and shortly after the increased enforcement activities.

If enforcement strategies are to improve overall safety in a community, traffic laws must be applied equitably and with sensitivity toward communities where there may be limited rapport with law enforcement. Enforcement strategies should be undertaken with due caution to avoid inequitable enforcement activities and evaluated to determine the strategy's impact. The following considerations can help lead to more successful outcomes for roadway safety enforcement strategies:

- Appropriately train police officers and periodically refresh police officers' training related to enforcement activities.
- Incorporate social equity considerations in camera placement for automated enforcement, such as red-light-running cameras.
- Dedicate a portion of enforcement revenue to outreach and engagement with community groups about roadway safety.
- Tailor enforcement campaigns to suit the needs of different neighborhoods and demographics and incorporate education as part of those campaigns.
- Conduct enforcement with staff support and awareness of the courts.
- Use warnings and flyers before moving on to issuing citations.

Crash data can help identify priority intersections and/or road segments and the times of day when certain behaviors may be more prevalent. This information can inform and help officers choose the most appropriate type of enforcement strategy for a given location and time period. The COG or local agency staff can also help monitor the impact of the enforcement strategy by coordinating with the respective agency's police department to obtain and analyze enforcement records and evaluate effectiveness and equity considerations.

## REGIONAL EFFORTS

The Fresno COG is committed to integrating safety into its transportation planning and funding processes. As part of that commitment, the COG has developed a Regional Safety Plan over the course of 2021. The Regional Safety Plan sets forth a roadway safety vision for the entire county and provides information and strategies to help the COG and its member agencies make decisions that will improve roadway safety through projects, policies, programs, and funding decisions. It was developed in partnership with COG member agencies through engagement with a Regional Safety Steering Committee.

In addition to providing a regional assessment of roadway safety, the Regional Safety Plan pinpoints areas where regionwide coordination on education, enforcement, data collection, data maintenance, and other strategies can benefit each local agency's progress towards achieving their local roadway safety vision and goals. The Regional Safety Plan is also a resource for local agencies to:

- Gauge how their roadway safety performance compares to regional trends
- Identify systemic engineering countermeasures from the Regional Safety Plan's Countermeasure Toolbox that can be applied to locations within their jurisdiction
- Obtain educational materials that are ready for use and can be distributed in various forums to promote safer behavior on the region's roadways
- Gather information on ways to coordinate further with local and state law enforcement
- Identify potential funding sources for improvements the local agencies have identified
- Gather information that can be used in support of grant funding pursuits

The content of the Regional Safety Plan was used to help inform the ten local road safety plans included in this document. Future updates to these or other local road safety plans within the region can also draw from the information in the Regional Safety Plan.

## 2.0 CITY OF CLOVIS

The City of Clovis has a population of 116,609.<sup>1</sup> The average daily vehicle miles traveled is 1,336,661 and the city has 669 total road miles. The main roadways in the city include State Route 180, State Route 168 (Sierra Freeway), Herndon Avenue, and Shaw Avenue, which all run east to west. Based on the review of crash data conducted as part of the LRSP, pedestrians and bicyclists are overrepresented in fatal and severe injury crashes. The top three fatal and severe injury collision types in Clovis are broadside, vehicle-pedestrian, and hit object crashes; the top three fatal and severe injury primary collision factors are pedestrian violation, driving under the influence, and unsafe speed. The LRSP provides potential engineering, education, emergency services, and enforcement strategies tailored to Clovis's crash history and local priorities, as well as performance measures to evaluate progress.

### VISION AND GOALS

The City's vision for roadway safety is:



Provide a quality transportation network by committing resources to activities that reduce the risk of fatal and injury crashes for people traveling on public roads.

The supporting goals to enable the visions are:

1. Regularly review data-informed analysis and community needs to identify and prioritize opportunities to reduce crash risk.
2. Reduce the number of annual fatal and severe injury crashes across all public City roadways.
3. Reduce the number of pedestrian and bicycle crashes on public City roadways.
4. Implement proven roadway safety countermeasures systemically to target common collision types.
5. Partner with other local agencies to promote roadway safety as a priority investment.
6. Provide opportunities for citizen engagement in identifying issues and developing solutions for roadway safety across the community.
7. Establish regular communication between first responders and City staff to discuss ideas, trends, and feedback related to emergency service operations on the roadway network.
8. Increase implementation of traffic safety education and equitable enforcement strategies.

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<sup>1</sup> 2018 population. Source: California Department of Finance



## SAFETY PARTNERS

A variety of agency staff and community partners were involved throughout the development of this LRSP and played an integral role in identifying priorities, providing local context, and reviewing the existing conditions analysis. Many of the strategies identified in this plan will require coordination with these partners and their support of the City's effort to create a culture of roadway safety. Clovis's goals reflect the importance of partnering with local agencies and engaging with citizens to identify issues and implement solutions. While additional partners may be identified in the future, those involved in development of the LRSP include:

- Caltrans
- City of Fresno
- Clovis Community College
- Clovis Department of Planning and Development Services
- Clovis Department of Public Utilities
- Clovis Fire Department
- Clovis Police Department
- Clovis Public Affairs and Information
- Clovis Transit
- Clovis Unified School District
- County of Fresno
- Fresno Area Express
- Fresno Council of Governments
- Fresno Cycling Club

## PERFORMANCE MEASURES

Performance measures are used to track progress and a key element of making data-informed decisions. Performance measures that support the City's vision, goals, and emphasis areas include:

- Annual number of crashes (city-wide and at each of the top twenty priority locations)
- Annual number of fatal and severe injury crashes (city-wide and at each of the top twenty priority locations)
- Annual number of pedestrian and bicycle crashes (city-wide and at each of the top twenty priority locations)
- Annual number of broadside crashes (city-wide)
- Annual number of hit object crashes (city-wide)
- Annual number of crashes with a primary collision factor of unsafe speed (city-wide)
- Annual number of crashes with a primary collision factor of driving or bicycling under the influence of alcohol or drugs (city-wide)
- Investments made in roadway safety countermeasures (e.g. dollars spent, grants pursued, partnerships developed)
- Investments made in education and enforcement strategies (e.g. dollars spent, grants pursued, partnerships developed)

- Coordination with other local agencies and/or safety partners (e.g. meetings held, projects pursued)
- Opportunities provided for citizen engagement (e.g. meetings held, public campaigns launched)
- Coordination between first responders and City staff (e.g. meetings held, programs implemented, strategies deployed)

As part of plan implementation, the City will identify a process for annually tracking these performance measures to support future updates to this roadway safety plan.

## DATA SUMMARY

The primary data used to inform the technical analyses for the City's local road safety plan were crash data sets and roadway network information. As noted below, future updates could incorporate traffic volume data if widely available for locations across the City. In addition, feedback from a publicly available survey was documented for consideration in identifying issues and improvement strategies.

## Public Survey Feedback

Toole Design Group worked with Fresno COG to develop an online survey and interactive webmap to provide the opportunity for public engagement on the LRSP. The goal was to collect both general and geographically specific feedback on safety problems, desired safety improvements in jurisdictions that are part of the MLRSP, as well as voluntary demographic information for Title IV reporting. Both activities were open from August 16, 2021 to September 20, 2021 and sought public feedback on spatial patterns of traffic safety concerns and desired improvements.

As the primary open public engagement opportunity during MLRSP development, the survey and interactive webmap served a crucial role in illuminating the community's traffic safety concerns and desired traffic safety improvements. Below is a summary of key findings from the online survey and interactive webmap specific to Clovis. More information on the methodology and overall findings of the survey are provided in *Appendix A*.

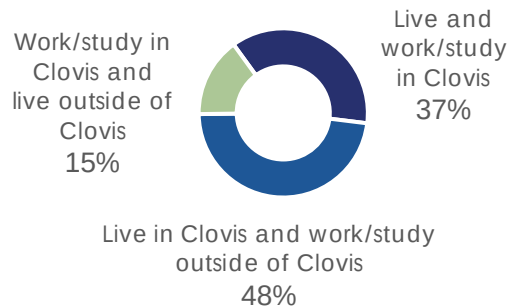


**92**  
PEOPLE  
RESPONDED



**16**  
LOCATIONS  
IDENTIFIED

#### WHERE PARTICIPANTS WORK AND LIVE



#### MOST COMMON SAFETY CONCERNS

- Lack of safe places to walk, bike, or wait for the bus
- Lack of safe opportunities to cross the street

- The survey asked respondents to provide input on the top road safety improvements needed in their communities. While the survey prompted participants to pick three improvements, some selected more than three responses. A total of 234 responses were received for Clovis from 92 participants, with the most common desired improvement types including:
  - o Maintenance of existing roads and streets (68 responses)
  - o Rural road improvements to prevent run-off-road crashes (33 responses)
  - o Speed enforcement (27 responses)
- Participants dropped points in the webmap in specific locations across Fresno County where they experienced road safety concerns. When leaving a point, participants could select from a list of traffic safety concerns and the kinds of travel impacted, with the ability to select as many responses as applicable. A text box gave participants the option to note what they think would make the location safer. A total of 16 locations were identified in Clovis. The most common traffic safety concerns noted for Clovis include:
  - o Lack of safe places to walk, bike, or wait for the bus (10 responses)
  - o Lack of safe opportunities to cross the street (10 responses)
- The survey asked participants where they live and work or study, with the option to select either outside of Fresno County or from a list of jurisdictions within the County. Clovis was the most commonly chosen location both for where participants live and where they work or study. The participants who selected Clovis included:
  - o 34 who live and work/study in Clovis
  - o 44 who live in Clovis and work/study outside of Clovis
  - o 14 who work/study in Clovis and live outside of Clovis

## Crash Data

Kittelson worked with Fresno COG to assemble crash data for the City of Clovis using the Statewide Integrated Traffic Records System (SWITRS) database, supplemented with location information from the Transportation Injury Mapping System (TIMS) database maintained by SafeTREC at the University of California, Berkeley. Throughout this report, crashes are associated with a jurisdiction based on the reporting officer's assessment of location.

The crash database represents the time period from January 1, 2015 through December 31, 2019 and includes reported crashes that occurred on public streets. Within the assembled regional crash database, a total of 3,507 reported crashes are located in Clovis.

Crash severity is coded according to the highest degree of injury exhibited, and the data used for this analysis includes the following coded severity levels (listed in descending order):

- Fatal: death from injuries sustained in the crash.
- Severe Injury: Injuries include, for example, broken bones, severe lacerations, or other injuries that go beyond the reporting officer's assessment of "other visible injuries."
- Other visible injury: An injury, other than those described above, that is evident to observers at the scene of the crash. For example, bruises or minor lacerations.
- Complaint of pain: Internal or other non-visible injuries. For example, a person limps or seems incoherent.
- Property damage only (PDO): No injuries sustained.

## Roadway Network Data

Kittelson developed a linear referencing system of all public roadways using the Fresno County roadway centerline file. This dataset was updated to develop a measurement system based on the total road length (as determined by roadway name) to locate crashes to a specific mile point along the network. The master roadway network for the County was used to spatially analyze and prioritize specific locations within each local jurisdiction.

## Traffic Volume Data

Traffic volume data was not consistently available at a sufficient level to be able to incorporate into the safety analysis. Future updates to the City's local road safety plan could incorporate traffic volume data, if available, to understand how crash frequency, severity, and type vary at different levels of traffic.

## EXISTING ROADWAY SAFETY PERFORMANCE

The findings in this section are based on the crash database, which includes reported crashes from January 1, 2015 through December 31, 2019. It is organized as follows:

- All Road Users
  - o Severity by Road User
  - o Year, Month, and Weather
  - o Collision Type
  - o Location, Collision Type, and Severity
  - o Primary Collision Factor
  - o Lighting
  - o Time of Day
- Pedestrian-involved Crash
  - o Year and Month
  - o Pedestrian Action and Location
  - o Lighting
- Bicyclist-involved Crashes
  - o Collision Type
  - o Primary Collision Factor
  - o Lighting

## All Road Users

This section includes analysis and findings for all reported crashes. Subsequent sections focus exclusively on crashes involving pedestrians and bicyclists.

### SEVERITY BY ROAD USER

Table 2 presents reported crashes, organized by severity level and road user. Notable trends include:

- Pedestrians are overrepresented in fatal and severe injury crashes. Pedestrians are involved in 3 percent of reported crashes but are involved in 27 percent of fatal/severe injury crashes.
- Bicyclists are also overrepresented in fatal and severe injury crashes. Bicyclists are involved in 3 percent of reported crashes but 9 percent of fatal/severe injury crashes.

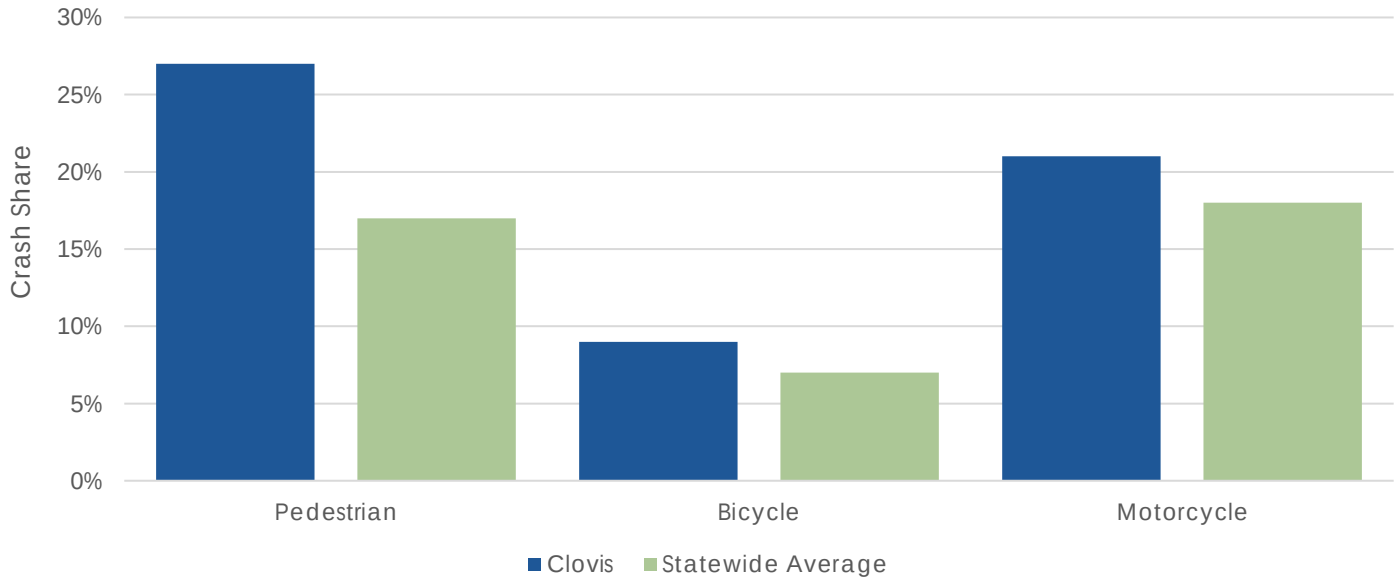
Table 2: Crash Severity by Road User Involved

| Road User Involved                   | Fatal (% of column) | Severe Injury (% of column) | Visible Injury (% of column) | Complaint of Pain (% of column) | Property Damage Only (% of column) | Total (% of column) |
|--------------------------------------|---------------------|-----------------------------|------------------------------|---------------------------------|------------------------------------|---------------------|
| Pedestrian Involved                  | 4 (40%)             | 11 (24%)                    | 25 (9%)                      | 41 (4%)                         | 9 (1%)                             | 90 (3%)             |
| Bicycle Involved                     | 1 (10%)             | 4 (9%)                      | 31 (11%)                     | 59 (6%)                         | 23 (1%)                            | 118 (3%)            |
| Vehicle Only or Vehicle-Fixed Object | 5 (50%)             | 31 (67%)                    | 221 (80%)                    | 941 (90%)                       | 2,101 (98%)                        | 3,299 (94%)         |
| Reported Crashes                     | 10 (100%)           | 46 (100%)                   | 277 (100%)                   | 1,041 (100%)                    | 2,133 (100%)                       | 3,507 (100%)        |
| Severity Share of Reported Crashes   | 1%                  | 1%                          | 8%                           | 30%                             | 60%                                | 100%                |

Source: SWITRS, TIMS, Kittelson, 2021.

The California's Strategic Highway Safety Plan (SHSP) includes 16 challenge areas to focus statewide resources and efforts. Three of those challenge areas are crashes involving pedestrians, bicyclists, and motorcyclists. The SHSP analyzed the share of fatal and severe injury crashes involving each of these road users. Figure 1 compares fatal and severe injury crash trends in Clovis to the statewide trends reported in the SHSP.

Figure 1: Fatal and Severe Injury Crash Shares by Road User Compared to Statewide Trends



Source: SHSP, SWITRS, TIMS, Kittelson, 2021.

As shown in the figure:

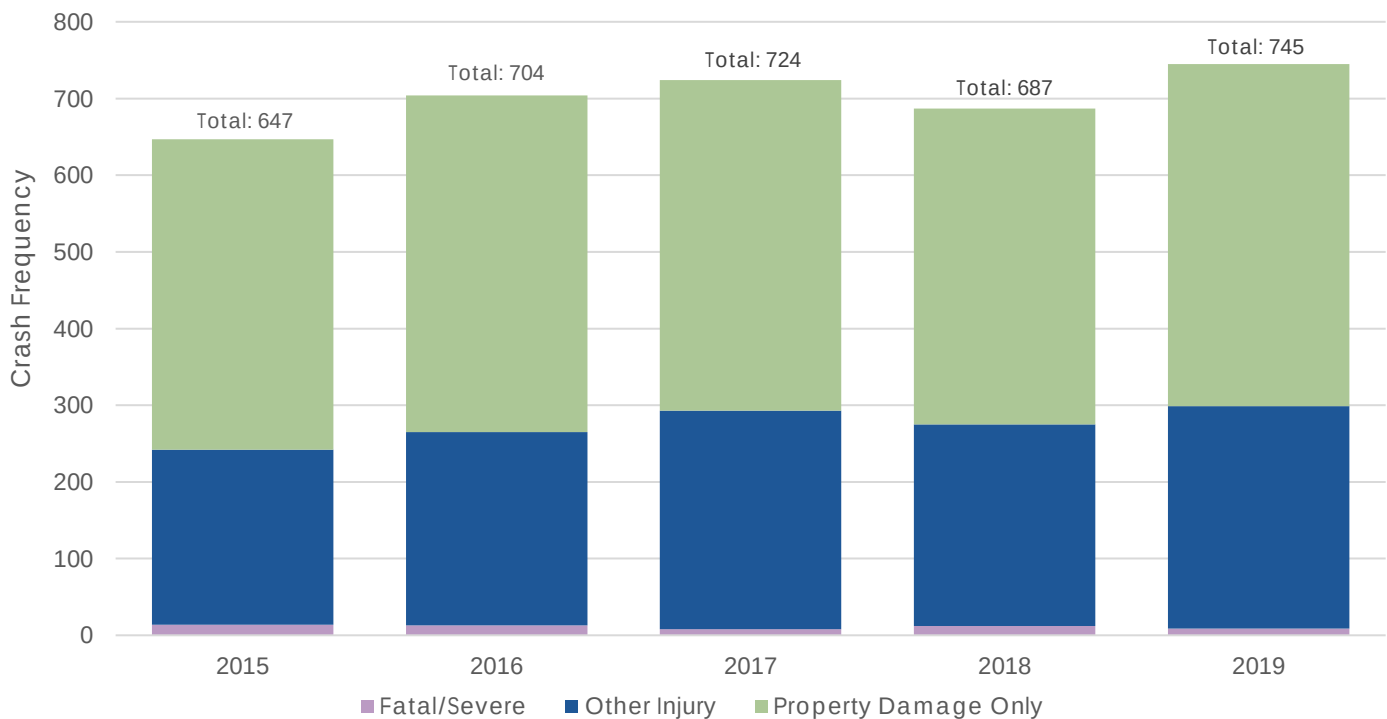
- Clovis has a higher share of fatal/severe injury crashes involving pedestrians than the statewide average.
- Clovis has a slightly higher share of fatal/severe injury crashes involving bicyclists than the statewide average.
- Clovis is the only jurisdiction among those included in this MLRSP that has a higher share of motorcyclists involved in fatal/severe injury crashes than the statewide average: 21 percent compared to 18 percent statewide.



## YEAR, MONTH, AND WEATHER

Figure 2 shows year-over-year trends in the data by severity. The totals reflect a relatively small but steady increase, with an average of 701 annual crashes and 11 fatal/severe injury crashes annually. Fluctuations from a single year to the next tend to represent the degree of randomness in crash occurrence and are not necessarily indicative of an overall trend.

Figure 2: Year-over-Year Trends in Crash Data by Severity

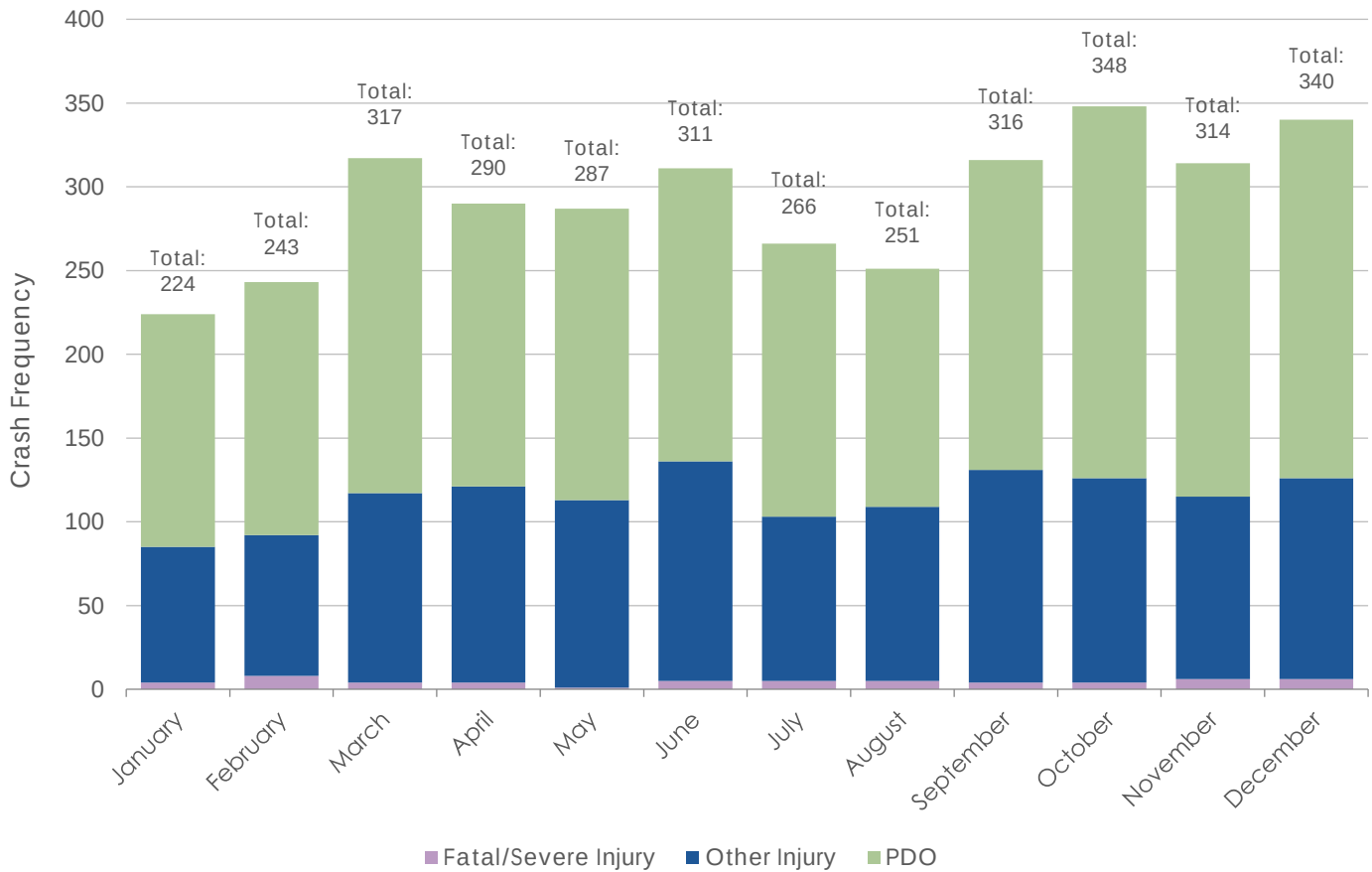


Source: SWITRS, TIMS, Kittelson, 2021.

Note: "Other injury" includes "Other visible injury" and "Complaint of pain" crashes.

Figure 3 presents the total crashes by month and severity for the crash database. On average, 292 crashes occurred per month. The lowest number of crashes occurred in January and in February, with a total of 224 crashes in January and 243 crashes in February. The highest number of crashes occurred in October, when 348 crashes occurred.

Figure 3: Crashes by Month and Severity



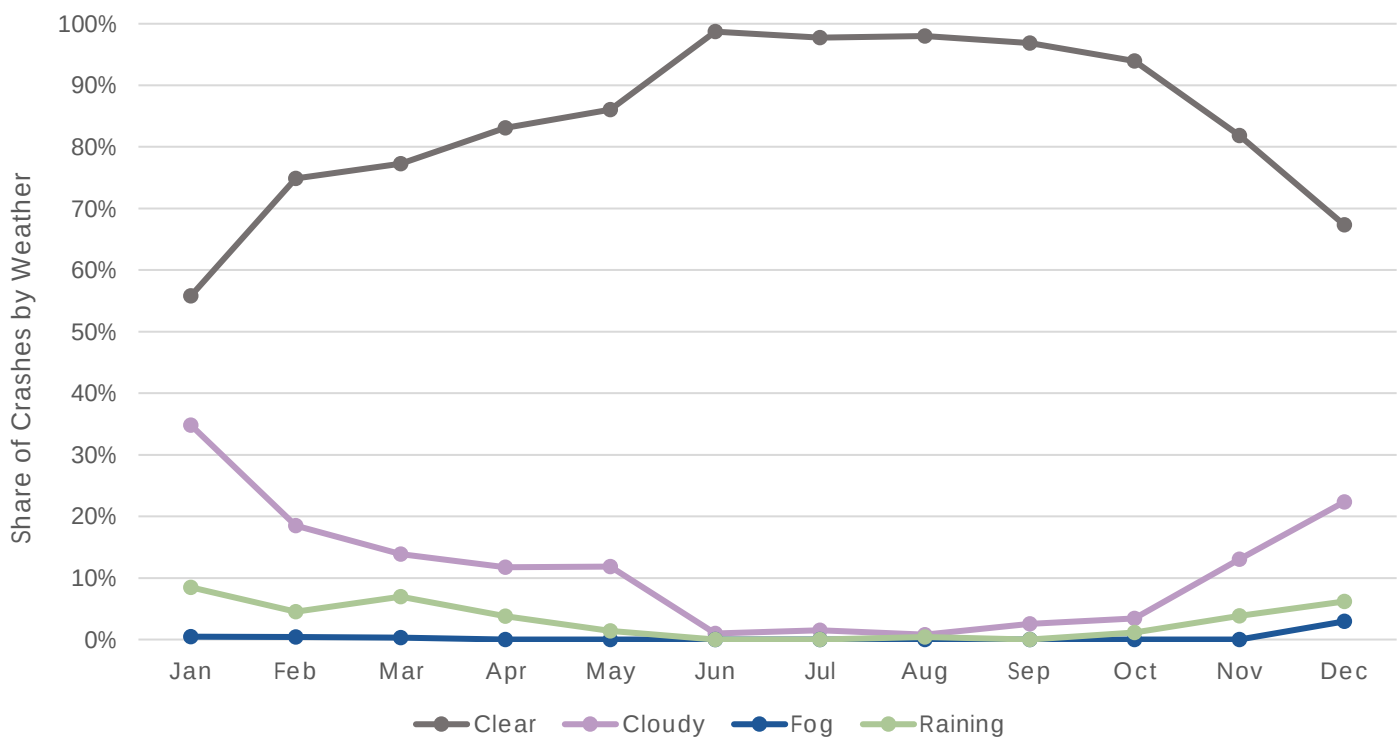
Source: SWITRS, TIMS, Kittelson, 2021.

Note: "Other injury" includes "Other visible injury" and "Complaint of pain" crashes. "PDO" = property damage only.

Figure 4 illustrates crashes by month and by weather condition for the full database. As shown in the figure:

- Crashes cited to have occurred during fog and/or rainy conditions are a larger portion of total crashes between the months of October and March.
- Crashes cited to have occurred during cloudy weather are a larger portion of total crashes between the months of November and May.

Figure 4: Crashes by Month and Weather Condition



Source: SWITRS, TIMS, Kittelson, 2021.

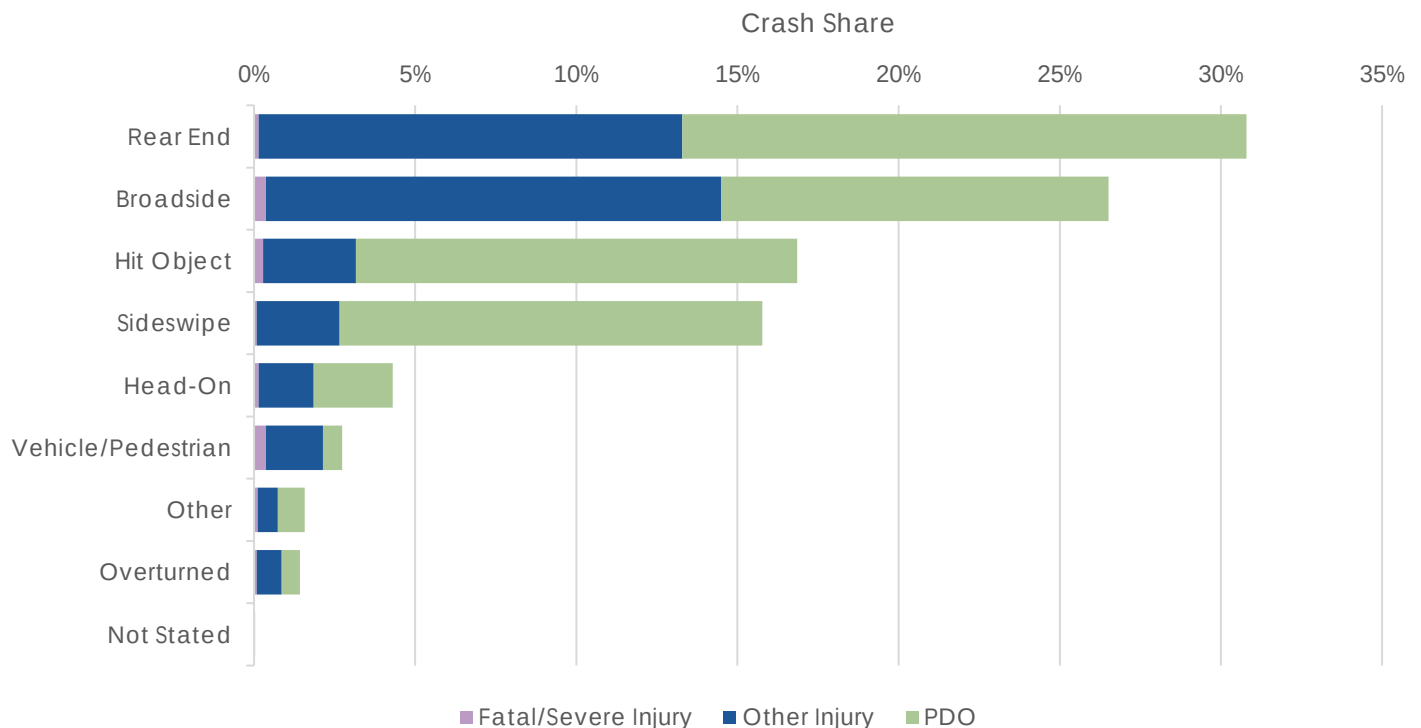
Note: Only select conditions shown to improve legibility. A small portion of crashes occurred in snowy or windy conditions.

## COLLISION TYPE

Reported collision type gives an indication of the movements most frequently involved in crashes and in severe outcomes. Figure 5 reports the most frequent reported collision types by severity. As shown in the figure:

- Among total reported crashes, the top three most frequent collision types are rear end (31 percent), broadside (27 percent), and hit object (17 percent). These three collision types account for 75 percent of reported crashes in the City.
- Among fatal/severe injury crashes, the top three most frequent collision types are broadside (23 percent), hit object (18 percent), and vehicle/pedestrian (23 percent). These three collision types account for 64 percent of reported fatal/severe injury crashes in the City.

Figure 5: Crashes by Collision Type and Severity



Source: SWITRS, TIMS, Kittelson, 2021

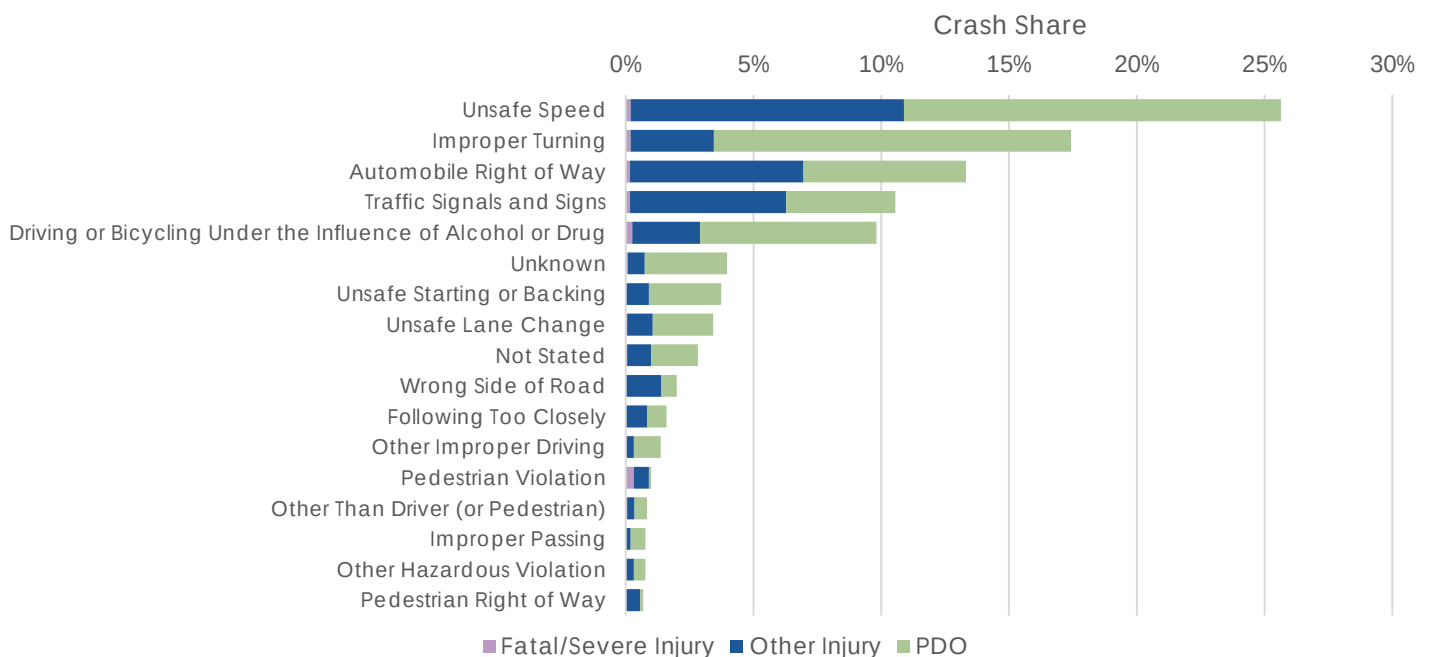
Note: "Other injury" includes "Other visible injury" and "Complaint of pain" crashes. "PDO" = property damage only.

## PRIMARY COLLISION FACTOR

Reporting officers identify a primary collision factor (PCF) for each crash. It is up to the officer's judgement and information available at the scene for them to select the factor that is most relevant. Officers select one from among a list of PCFs based on California Vehicle Code (CVC) and road user behavior. Figure 6 presents the most frequently cited PCFs in crashes in the City.

- The three most frequently reported PCFs among total reported crashes include unsafe speed<sup>2</sup> (26 percent), improper turning<sup>3</sup> (17 percent), and automobile right of way<sup>4</sup> (13 percent). These three PCFs account for 56 percent of reported crashes.
- The three PCFs most frequent among fatal/severe injury crashes are pedestrian violation<sup>5</sup> (20 percent), driving or bicycling under the influence of alcohol and drugs<sup>6</sup> (16 percent), and unsafe speed<sup>2</sup> (13 percent) – a total of 49 percent among all three.

Figure 6: Crashes by Reported PCF and Severity



Source: SWITRS, TIMS, Kittelson, 2021.

Notes: PCFs constituting <1% excluded from chart to enhance legibility. Those PCFs include other equipment, hazardous parking, impeding traffic, lights, and brakes.

"Other injury" includes "Other visible injury" and "Complaint of pain" crashes. "PDO" = property damage only.

<sup>2</sup> Reported PCF based on CVC violation indicating unsafe speeding on a highway.

<sup>3</sup> Reported PCF based on CVC violation indicating a failure while turning from a direct course without reasonable safety or not signaling appropriately.

<sup>4</sup> Reported PCF based on CVC violation indicating a driver turning failed to yield right-of-way to oncoming traffic.

<sup>5</sup> Reported PCF based on CVC violation indicating a pedestrian failure to yield the right of way to other vehicles.

<sup>6</sup> Reported PCF based on CVC violation indicating driver was under the influence of alcohol.

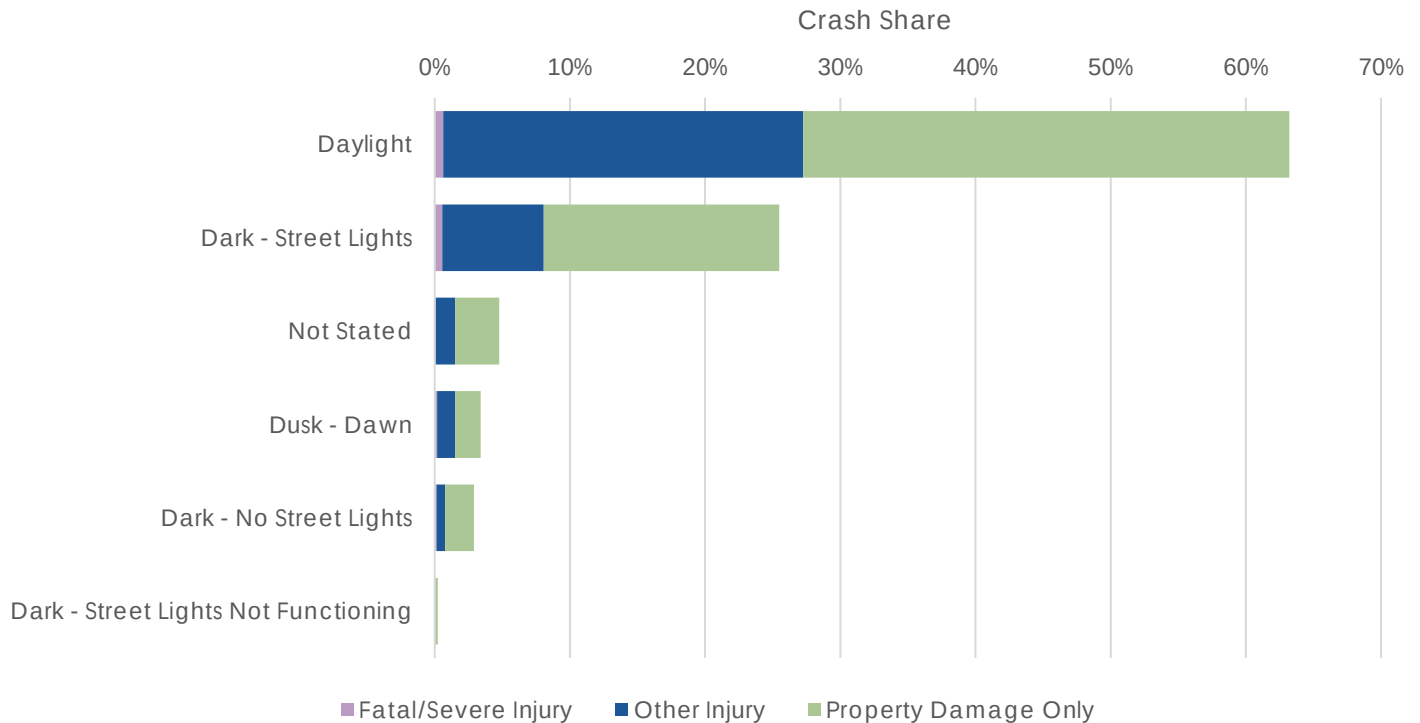


## LIGHTING

Figure 7 shows citywide crashes by reported lighting condition and severity.

- Crashes that occurred in dark conditions (i.e., the three coded categories that indicate “dark” conditions) make up 29 percent of total reported crashes but account for 45 percent of fatal and severe injury crashes.
- 26 fatal crashes occurred in dark conditions, of which six occurred where there were either no streetlights or streetlights were reported as not functioning.

Figure 7: Crash by Lighting and Severity



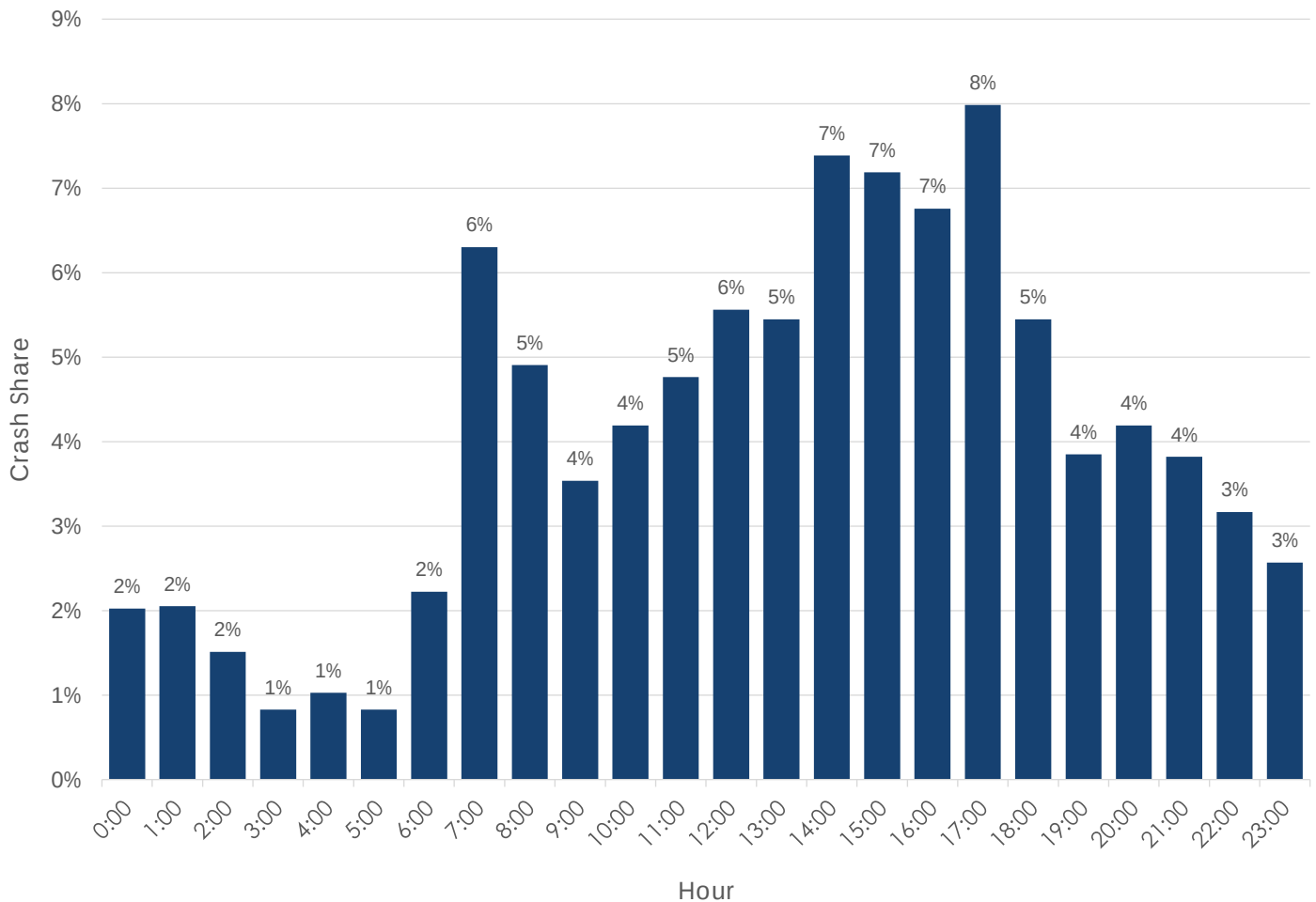
Source: SWITRS, TIMS, Kittelson, 2021.

Note: “Other injury” includes “Other visible injury” and “Complaint of pain” crashes.

## TIME OF DAY

Figure 8 shows crashes by time of day. The morning hour from 7 AM to 8 AM and afternoon hours from 2 PM to 6 PM show the greatest frequency of crashes.

Figure 8: Crash Share by Time of Day



Source: SWITRS, TIMS, Kittelson, 2021.

Note: 2% of crashes did not have a time of day reported.

## Pedestrians

This section focuses exclusively on reported crashes involving pedestrians. Table 3 shows the distribution of pedestrian crashes by severity. Of the 90 reported pedestrian crashes in Clovis, 16 percent resulted in death or severe injury. This share is more than eight times higher than the same share of total reported crashes (3 percent).

Table 3: Pedestrian Involved Crash by Severity

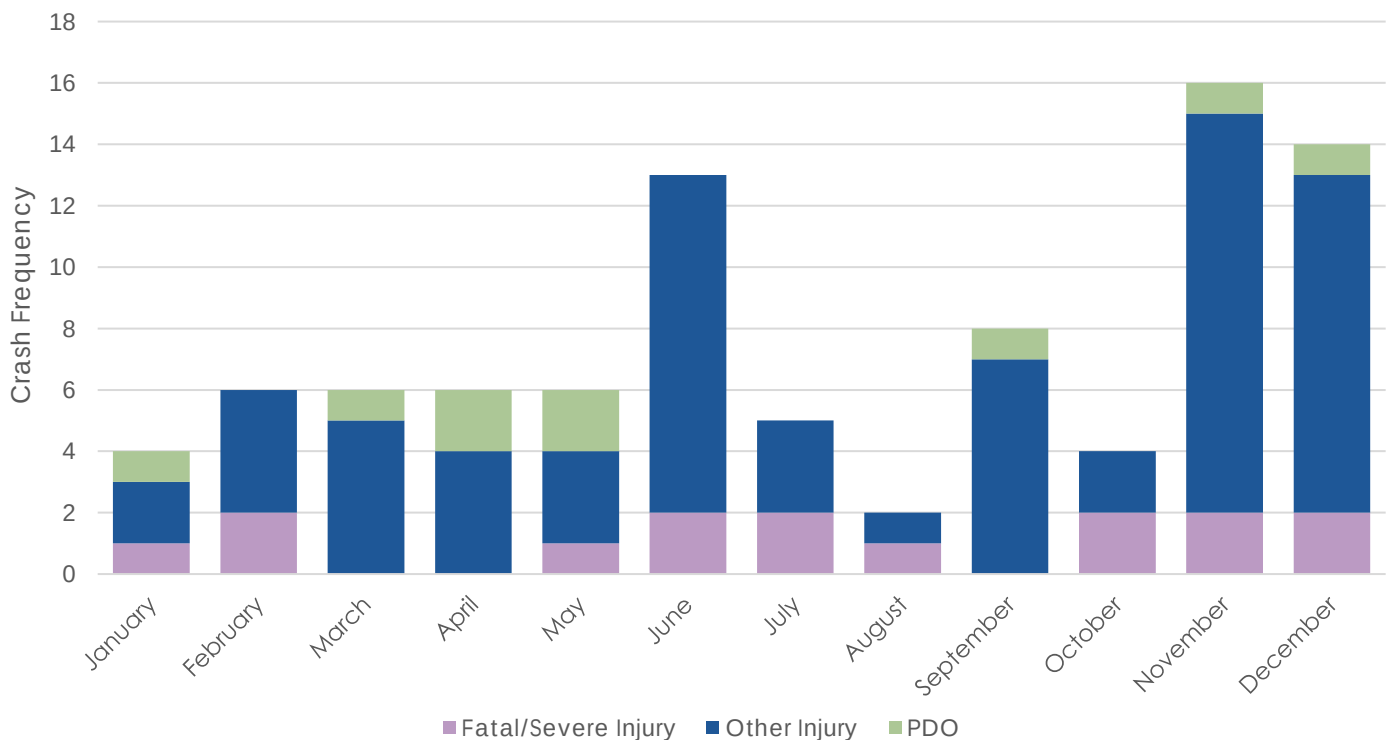
|                     | Fatal (%) | Severe Injury (%) | Visible Injury (%) | Complaint of Pain (%) | Property Damage Only (%) | Total (%) |
|---------------------|-----------|-------------------|--------------------|-----------------------|--------------------------|-----------|
| Pedestrian Involved | 4 (4%)    | 11 (12%)          | 25 (28%)           | 41 (46%)              | 9 (10%)                  | 90 (100%) |

Source: SWITRS, TIMS, Kittelson, 2021.

## SEVERITY AND MONTH

Figure 9 presents pedestrian crashes organized by month and severity. The highest number of monthly pedestrian crashes occurred in November, December, and June.

Figure 9: Pedestrian Crashes by Month and Severity



Source: SWITRS, TIMS, Kittelson, 2021.

Note: "Other injury" includes "Other visible injury" and "Complaint of pain" crashes. "PDO" = property damage only.

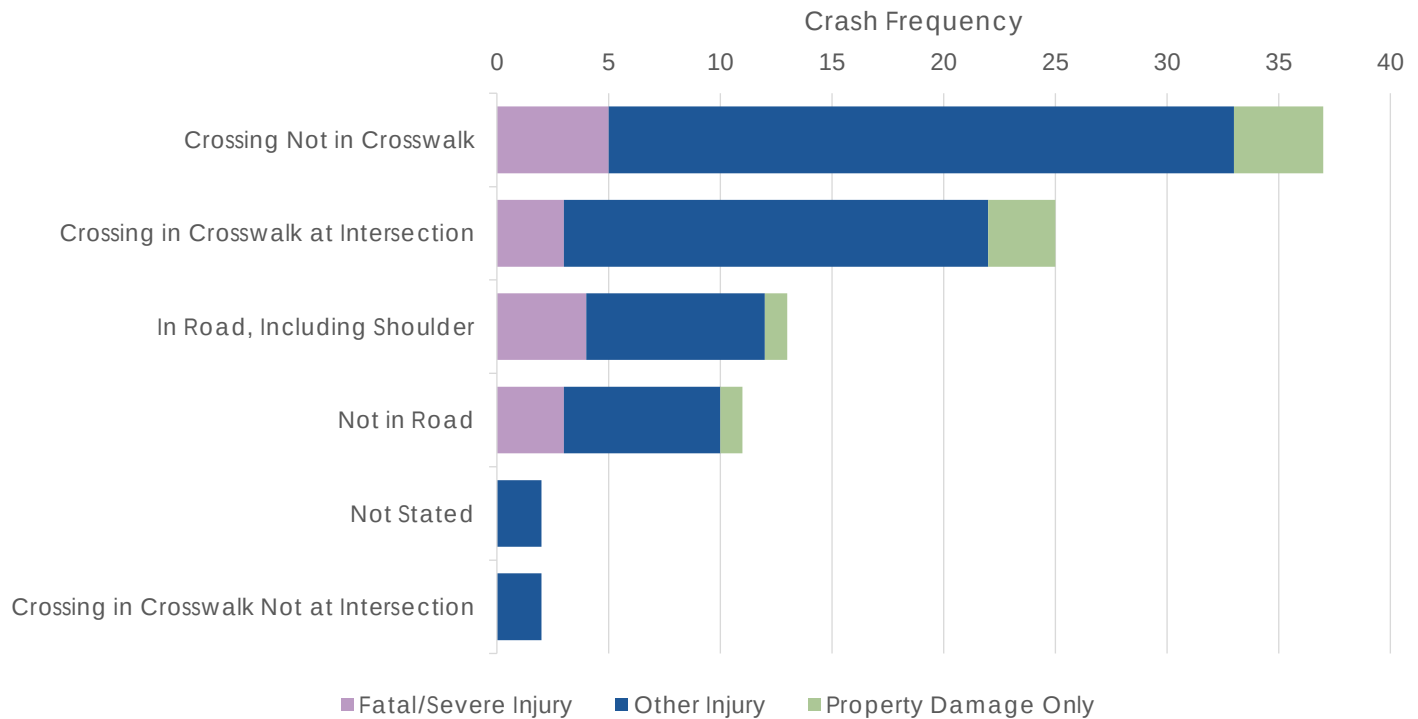


## PEDESTRIAN ACTION AND LOCATION

For pedestrian crashes, data are recorded that indicate the reporting officer's best judgment about the person's action and location preceding the crash. Figure 10 reports these trends in the City.

- The three most common pedestrian actions preceding a crash included crossing outside of a crosswalk (41 percent), crossing in a crosswalk at an intersection (28 percent), and walking in the road along the roadway, including shoulder (14 percent).
- 33 percent of the 15 fatal/severe injury pedestrian crashes occurred while a pedestrian was crossing a roadway outside a crosswalk.

Figure 10: Pedestrian Crashes by Reported Action/Location and Severity



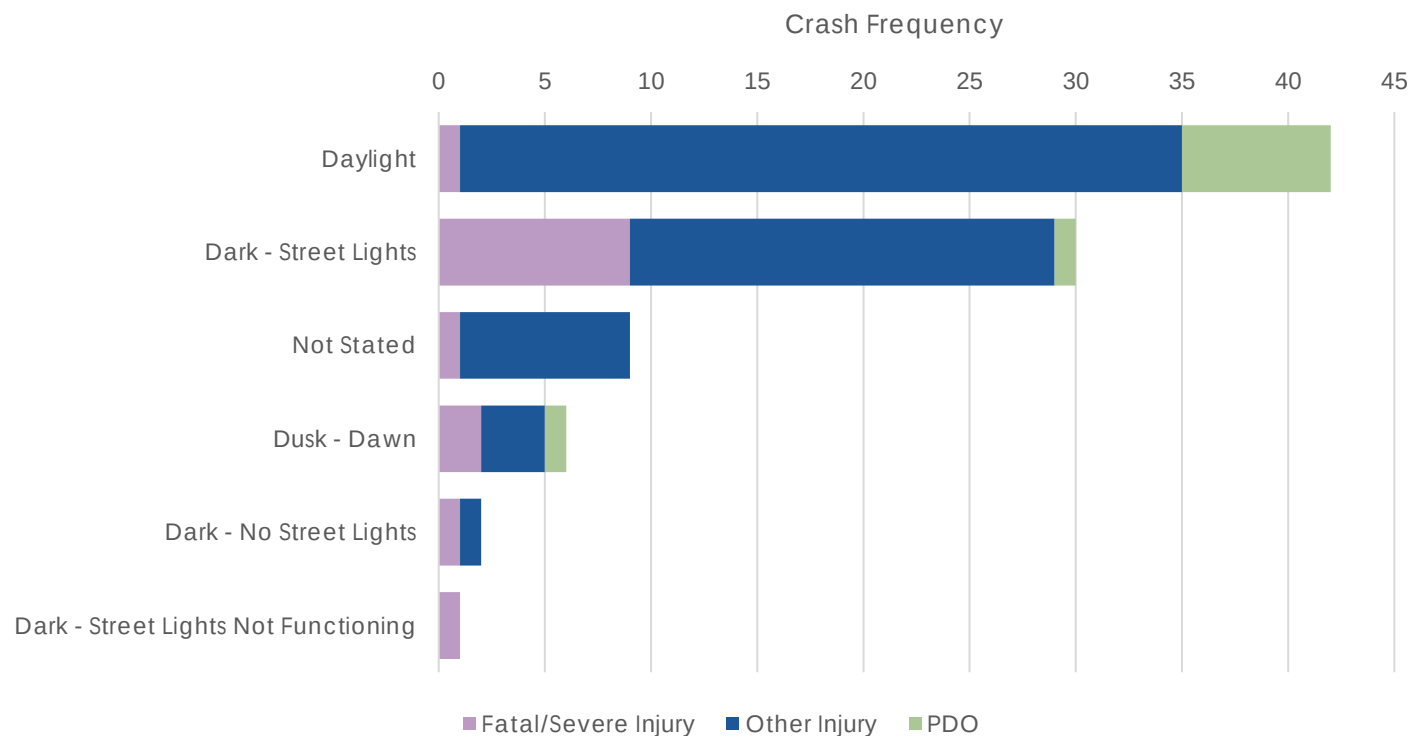
Source: SWITRS, TIMS, Kittelson, 2021.

Note: "Other injury" includes "Other visible injury" and "Complaint of pain" crashes. "PDO" = property damage only.

## LIGHTING

Figure 11 shows citywide pedestrian crashes by reported lighting condition and severity. Crashes that occurred during dark or dusk/dawn conditions had a higher proportion of fatal/severe injury crashes compared to crashes during daylight conditions.

Figure 11: Pedestrian Crashes by Lighting and Severity



Source: SWITRS, TIMS, Kittelson, 2021.

Note: "Other injury" includes "Other visible injury" and "Complaint of pain" crashes. "PDO" = property damage only.

## Bicyclists

This section focuses exclusively on reported crashes involving bicyclists. Table 4 presents bicyclist-involved crashes citywide organized by severity level. Of the reported 118 bicyclist crashes in the City, 4 percent resulted in death or severe injury. The majority resulted in some degree of injury.

Table 4: Bicycle User Involved Crashes by Severity

|                  | Fatal (%) | Severe Injury (%) | Visible Injury (%) | Complaint of Pain (%) | Property Damage Only (%) | Total (%)  |
|------------------|-----------|-------------------|--------------------|-----------------------|--------------------------|------------|
| Bicycle Involved | 1 (1%)    | 4 (3%)            | 31 (26%)           | 59 (50%)              | 23 (19%)                 | 118 (100%) |

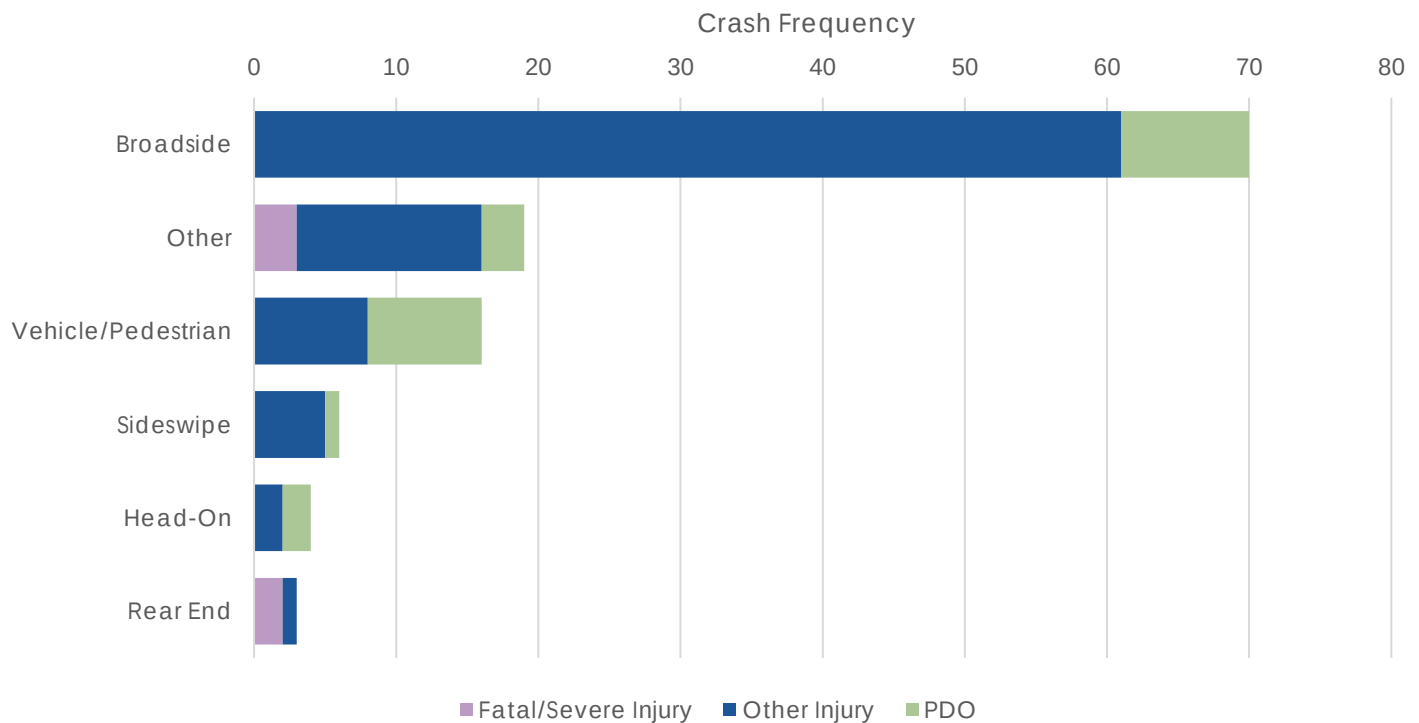
Source: SWITRS, TIMS, Kittelson, 2021.

## COLLISION TYPE

Figure 12 presents reported bicycle crashes, organized by collision type.

- The top three collision types among bicyclist crashes include broadside (59 percent), other (16 percent), and vehicle/pedestrian crashes (14 percent).
- While some bicycle-involved crashes likely do include pedestrians, the relatively high share of crashes coded as "other" or "vehicle/pedestrian" could indicate a lack of precision in crash reporting for bicycle crashes.

Figure 12: Bicycle Crashes by Collision Type and Severity



Source: SWITRS, TIMS, Kittelson, 2021.

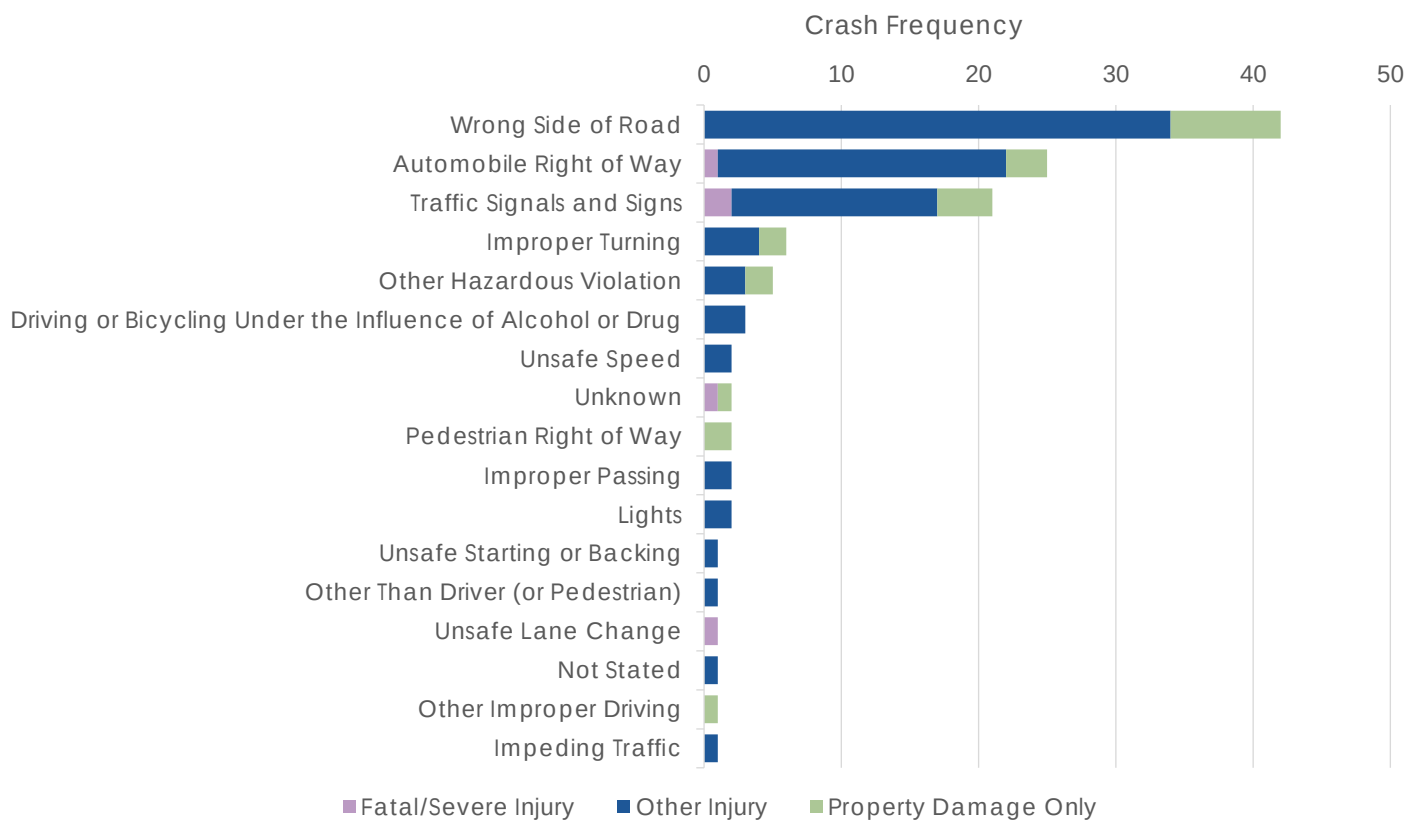
Notes: Low-frequency collision types excluded from chart to enhance legibility. Those types include: hit object, not stated, or overturned. "Other injury" includes "Other visible injury" and "Complaint of pain" crashes. "PDO" = property damage only.

## PRIMARY COLLISION FACTOR (PCF)

Figure 13 presents the reported PCF among bicycle crashes.

- The most frequently cited PCF was wrong side of road driving/riding<sup>7</sup> (36 percent). Information on whether these crashes indicate drivers or bicyclists were traveling on the wrong side of the road is not available. However, from anecdotal information, it is somewhat common for bicyclists to ride in the opposite direction from traffic along a shoulder or sidewalk depending on their options for crossing a street to access adjacent land uses.
- The other two most frequent PCFs among bicycle crashes include automobile right of way<sup>8</sup> (21 percent) and traffic signals and signs<sup>9</sup> (18 percent)

Figure 13: Bicycle Crashes by Primary Collision Factor and Severity



Source: SWITRS, TIMS, Kittelson, 2021.

Notes: Low-frequency PCFs excluded from chart to enhance legibility. Those PCFs include: hazardous parking, brakes, pedestrian violation, pedestrian or "other" under the influence of alcohol or drugs, following too closely, other equipment, and fell asleep.

"Other injury" includes "Other visible injury" and "Complaint of pain" crashes.

<sup>7</sup> Reported PCF based on CVC violation indicating the driver/rider was on the wrong side of the road.

<sup>8</sup> Reported PCF based on CVC violation indicating a driver turning failed to yield right-of-way to oncoming traffic.

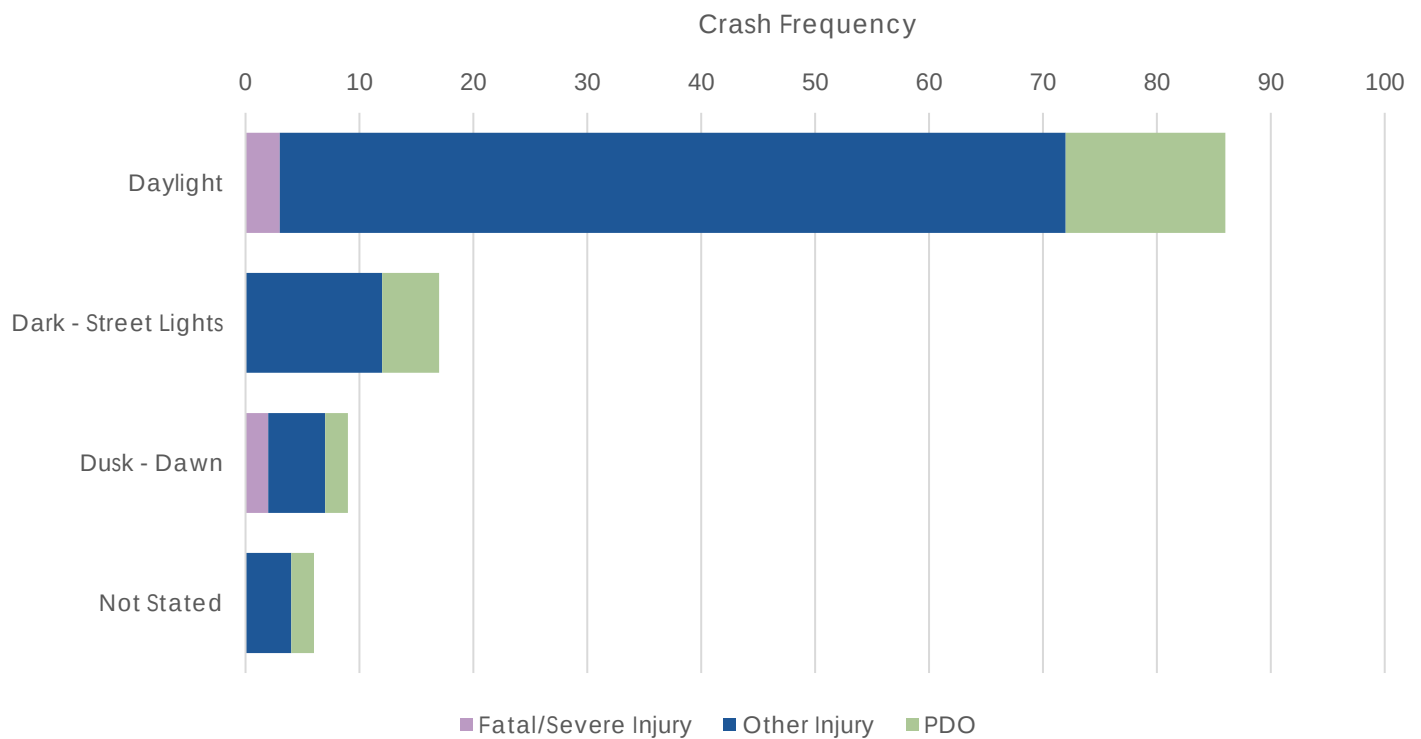
<sup>9</sup> Reported PCF based on CVC violation indicating running a red light or failure to stop at a stop sign.

## LIGHTING

Figure 14 presents bicycle crashes organized by lighting and severity. As shown:

- Most bicycle crashes (73 percent) occurred in daylight conditions.
- Bicycle crashes occurring in dusk/dawn conditions account for 8 percent of reported bicyclist crashes but account for two of the five fatal/severe injury crashes.

Figure 14: Bicycle Crashes by Lighting and Severity



Source: SWITRS, TIMS, Kittelson, 2021.

Note: "Other injury" includes "Other visible injury" and "Complaint of pain" crashes. "PDO" = property damage only.

## Priority Locations

Kittelson identified priority intersections and segments in Clovis using the annualized crash severity scores and excess predicted crashes described in the Data Summary and Analysis Approach sections (see the Introduction).

For intersection locations, the crash severity scores ranged from zero (no reported crashes during the five years) to 90.35. Figure 15 shows the results of the intersection crash severity scoring. Figure 16 shows excess predicted crash scores by percentiles for intersection locations. For the half-mile roadway segments, the crash severity scores ranged from zero to 33.13. Crash severity score results for roadway segments are shown in Figure 17. Excess predicted crash score results are shown in Figure 18. Intersections or segments shown as not falling within one of the percentile breaks indicates there were no reported crashes at that location.

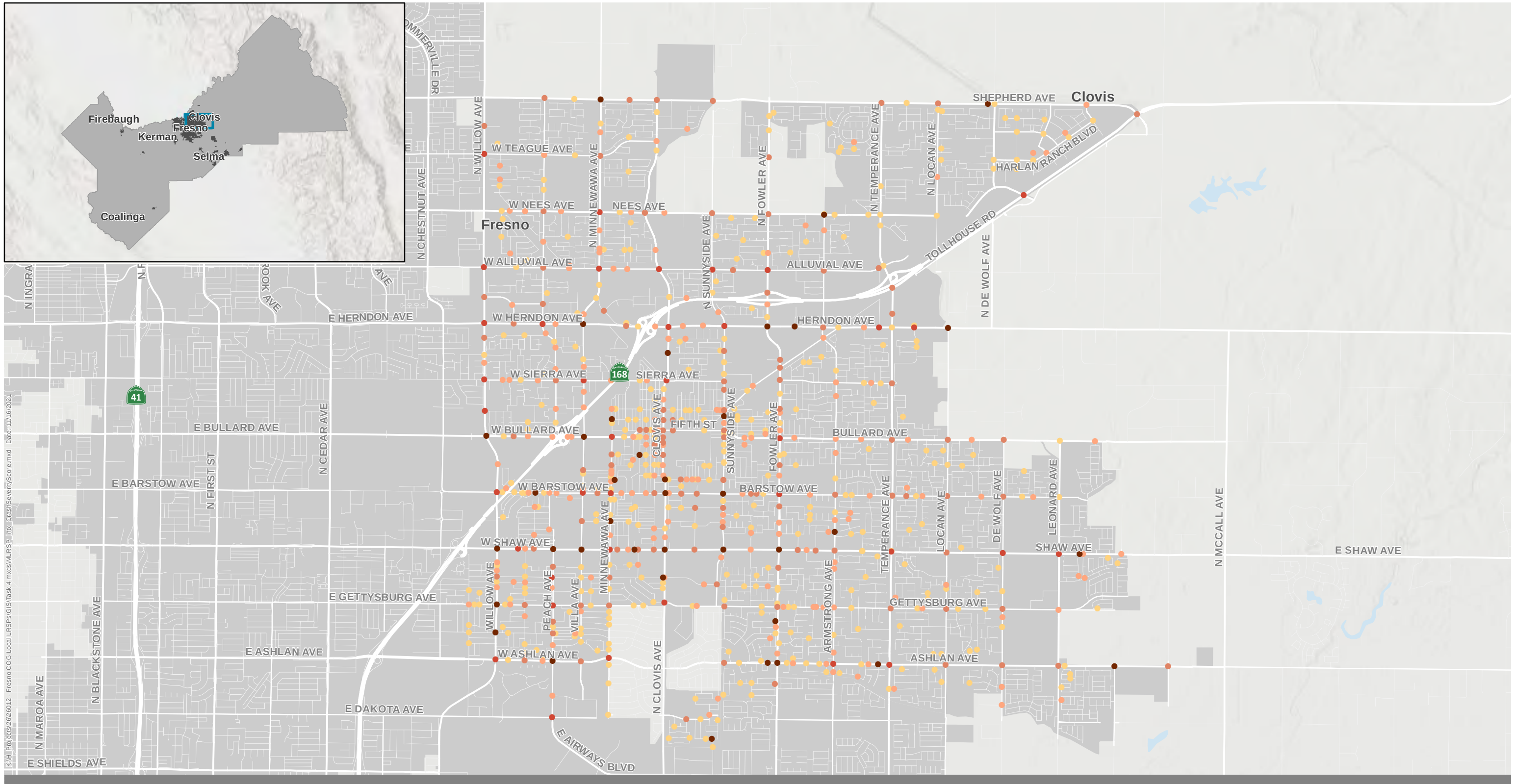
Table 5 presents the top twenty locations based on the highest crash severity scores.

Table 5. Top 20 Locations based on Crash Severity Score

| #  | Location                                     | Control Type | Crash Severity Score | Total Number of Crashes | Severity |               |                      |                   |     |
|----|----------------------------------------------|--------------|----------------------|-------------------------|----------|---------------|----------------------|-------------------|-----|
|    |                                              |              |                      |                         | Fatal    | Severe Injury | Other Visible Injury | Complaint of Pain | PDO |
| 1  | CLOVIS AVE & SANTA ANA AVE                   | Signalized   | 90.35                | 28                      | 0        | 2             | 1                    | 7                 | 18  |
| 2  | WILLOW AVE & SHAW AVE                        | Signal       | 85.66                | 94                      | 0        | 1             | 6                    | 31                | 56  |
| 3  | FOWLER AVE & SHAW AVE                        | Signal       | 74.88                | 38                      | 0        | 2             | 5                    | 10                | 21  |
| 4  | HERNDON AVE & FOWLER AVE                     | Signal       | 73.39                | 49                      | 0        | 2             | 1                    | 14                | 32  |
| 5  | ASHLAN AVE & FOWLER AVE                      | Signal       | 68.03                | 37                      | 0        | 2             | 0                    | 13                | 22  |
| 6  | CLOVIS AVE & BARSTOW AVE                     | Signal       | 64.63                | 26                      | 0        | 2             | 2                    | 8                 | 14  |
| 7  | BARSTOW AVE & SUNNYSIDE AVE                  | Signal       | 59.06                | 18                      | 0        | 2             | 1                    | 6                 | 9   |
| 8  | VILLA AVE & SHAW AVE                         | Signal       | 57.93                | 51                      | 0        | 1             | 4                    | 16                | 30  |
| 9  | PEACH AVE & SHAW AVE                         | Signal       | 51.27                | 38                      | 0        | 1             | 4                    | 12                | 21  |
| 10 | WILLOW AVE & BULLARD AVE                     | Signal       | 48.39                | 43                      | 0        | 1             | 2                    | 12                | 28  |
| 11 | BULLARD AVE & VILLA AVE                      | Signal       | 48.11                | 37                      | 1        | 0             | 3                    | 11                | 22  |
| 12 | MINNEWAWA AVE & SHEPHERD AVE                 | Signal       | 47.99                | 35                      | 1        | 0             | 0                    | 17                | 17  |
| 13 | SAN JOSE AVE & MINNEWAWA AVE                 | Unsignalized | 44.03                | 6                       | 0        | 1             | 1                    | 3                 | 1   |
| 14 | LOCAN AVE & HERNDON AVE                      | Unsignalized | 44.02                | 11                      | 0        | 1             | 1                    | 2                 | 7   |
| 15 | HOLLAND AVE & WILLOW AVE                     | Unsignalized | 43.62                | 9                       | 0        | 1             | 1                    | 2                 | 5   |
| 16 | CLOVIS AVE & PALO ALTO AVE                   | Unsignalized | 42.82                | 5                       | 0        | 1             | 1                    | 2                 | 1   |
| 17 | SUNNYSIDE AVE & FOURTH ST & GIBSON AVE       | Unsignalized | 41.68                | 9                       | 1        | 0             | 0                    | 2                 | 6   |
| 18 | SIERRA VISTA PKWY & SUNNYSIDE AVE & SHAW AVE | Signal       | 41.68                | 43                      | 0        | 0             | 5                    | 23                | 15  |
| 19 | ASHLAN AVE & HIGHLAND AVE                    | Unsignalized | 41.60                | 4                       | 1        | 0             | 1                    | 1                 | 1   |
| 20 | ASHLAN AVE & PEACH AVE                       | Signal       | 41.00                | 31                      | 0        | 1             | 1                    | 9                 | 20  |

Note: PDO = Property Damage Only





**Crash Severity Score**

- 95-100th Percentile
- 90-95th Percentile
- 75-90th Percentile
- 50-75th Percentile
- 0-50th Percentile

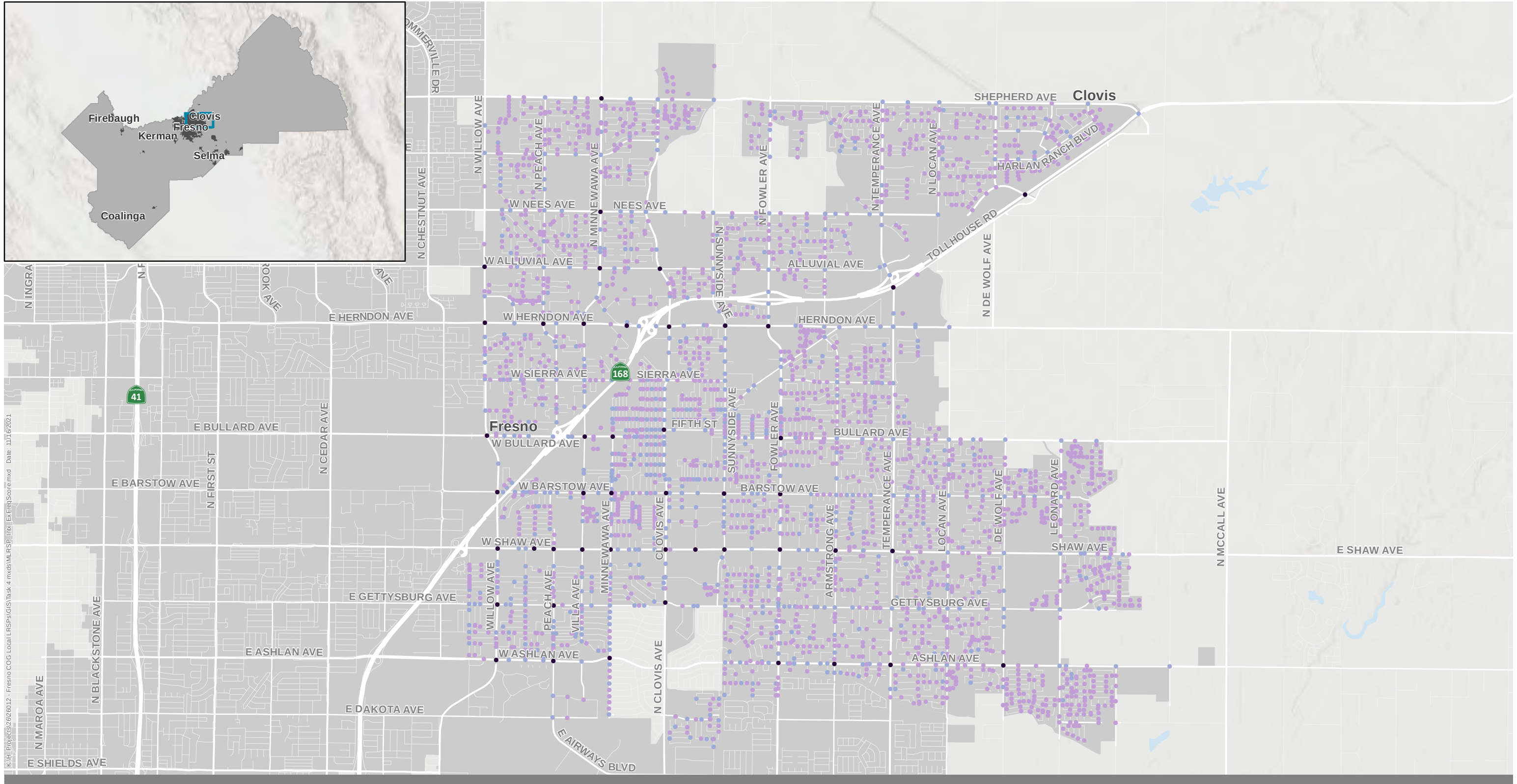
**City Limits**

**County Boundary**



Figure 15





**Excess Expected Frequency**

- 95-100th Percentile
- 90-95th Percentile

- 75-90th Percentile
- 50-75th Percentile
- 0-50th Percentile

- City Limits
- County Boundary









## EMPHASIS AREAS

Based on key trends in the crash data, emphasis areas for the City of Clovis include pedestrian and bicycle crashes, broadside crashes, and hit object crashes. Due to the prevalence of collision factors citing unsafe speed and driving under the influence, the City may also choose to focus on education and enforcement strategies aimed at encouraging safe driver behaviors. Each of these areas is further discussed below.

### Pedestrian and Bicycle Crashes

Pedestrian and bicycle crashes were identified as a focus area given the overrepresentation of pedestrians and bicyclists in fatal and severe crashes. Half of the ten fatal crashes involved a pedestrian or bicyclist and a third of the severe crashes involved a pedestrian or bicyclist. The most common pedestrian action preceding a crash was crossing the roadway outside a crosswalk, followed by crossing the roadway at an intersection crosswalk. The most frequently cited primary collision factor in bicycle crashes was wrong side of road driving/riding, which could indicate bicyclists riding in the opposite direction from traffic along a shoulder or sidewalk depending on their options for crossing a street to access adjacent land uses. These pedestrian actions and bicyclist behaviors suggest opportunities for improvements to pedestrian and bicycle infrastructure, as well as education for drivers, pedestrians, and bicyclists on rules of the road.

Pedestrians and bicyclists are identified as two of the six high priority challenge areas in the California SHSP. These challenge areas “were identified through historical data evaluations and feedback from traffic safety stakeholders across the state” (Caltrans SHSP). The high priorities represent “the greatest opportunity to reduce fatalities and serious injuries across the state” (Caltrans SHSP).

### Broadside Crashes

A broadside crash occurs when the front of one vehicle hits the side of another vehicle. Broadside crashes were selected as an emphasis area due to the frequency and severity of these collision types. Broadside crashes were the second most frequent collision type and represent 23 percent of fatal and severe injury crashes. As discussed below under Engineering Strategies, countermeasures are available targeted at broadside crashes.

## Hit Object Crashes

Hit object crashes were selected as an emphasis area due to their frequency in fatal crashes. They are the third most common collision type and comprise four of the ten fatal crashes and six of the 46 severe injury crashes. A variety of roadway countermeasures are available targeted at slowing traffic speeds, improving roadside conditions, and reducing hit object crashes.

The California SHSP includes lane departures as one of the six high priorities in California. As indicated in the Caltrans SHSP, “the Lane Departures Challenge Area includes head-on, hit object, and overturned crashes. This includes instances where a vehicle runs off the road or crosses into the opposing lane prior to the collision.” These crashes are a high priority due to their severity level.

## Unsafe Speed and Driving Under the Influence

Unsafe speed is the most frequently reported PCF among all reported crashes and the third most frequent in fatal/severe injury crashes. Driving or bicycling under the influence of alcohol and drugs is the third most common PCF cited in fatal/severe injury crashes. This suggests there are opportunities to address driver behavior through countermeasures that encourage lower speeds and education and enforcement.

The California SHSP identified impaired driving and speed management/aggressive driving as two of the six high priorities in California, reflecting the potential to reduce fatalities and serious injuries by addressing these challenge areas.

## STRATEGIES

The following subsections present engineering, education, emergency services, and enforcement strategies to help improve roadway safety within the City of Clovis.



### Engineering Strategies

The top three fatal and severe injury collision types in Clovis were broadside, vehicle-pedestrian, and hit object crashes; the top three fatal and severe injury primary collision factors were pedestrian violation, driving under the influence, and unsafe speed. High priority countermeasures to address these collision types and primary collision factors are shown in Table 6.

Table 6. High Priority Countermeasures

|                                    | Countermeasure Name                                                                            | ID           | Crashes Addressed                        |
|------------------------------------|------------------------------------------------------------------------------------------------|--------------|------------------------------------------|
| Roadway Countermeasures            | Street Lighting                                                                                | R01          | Crashes at night                         |
|                                    | Road Diet                                                                                      | R14          | Hit object, unsafe speed                 |
|                                    | Improve Pavement Friction (High Friction Surface Treatment)                                    | R21          | Hit object, unsafe speed                 |
|                                    | Install/Upgrade Signs with New Fluorescent Sheeting                                            | R22          | Hit object, unsafe speed                 |
|                                    | Install Dynamic/Variable Speed Warning Signs                                                   | R26          | Hit object, unsafe speed                 |
| Intersection Countermeasures       | Add Intersection Lighting at Intersections                                                     | S1/NS1       | Crashes at night                         |
|                                    | Improve Signal Hardware: Lenses, Backplates with Retroreflective Border, Mounting Size, Number | S2           | Broadside                                |
|                                    | Install Flashing Beacons as Advance Warning                                                    | S10/NS9      | Unsafe speed                             |
|                                    | Convert Intersection to Roundabout                                                             | NS4/NS5      | Broadside, unsafe speed                  |
|                                    | Install/Upgrade Stop Signs or Intersection Warning/Regulatory Signs                            | NS6          | Broadside                                |
|                                    | Upgrade Intersection Pavement Markings                                                         | NS7          | Broadside                                |
|                                    | Install Splitter Islands for Minor Street Approaches                                           | NS13         | Broadside                                |
| Pedestrian/Bicycle Countermeasures | Install Bike Lanes                                                                             | R32PB        | Overrepresented bicycle crashes          |
|                                    | Install Sidewalk/Pathway                                                                       | R34PB        | Pedestrian violation                     |
|                                    | Install/Upgrade Pedestrian Crossing with Enhanced Features                                     | R35PB        | Vehicle-pedestrian, pedestrian violation |
|                                    | Install Pedestrian Countdown Signal Heads                                                      | S17PB        | Pedestrian violation                     |
|                                    | Install Pedestrian Crossing                                                                    | S18PB/NS20PB | Vehicle-pedestrian                       |
|                                    | Install Raised Medians (or Refuge Islands)                                                     | NS19PB       | Vehicle-pedestrian, pedestrian violation |
|                                    | Bike Lane Extension Through Intersections                                                      | n/a          | Overrepresented bicycle crashes          |
|                                    | Bike Boxes                                                                                     | n/a          | Overrepresented bicycle crashes          |

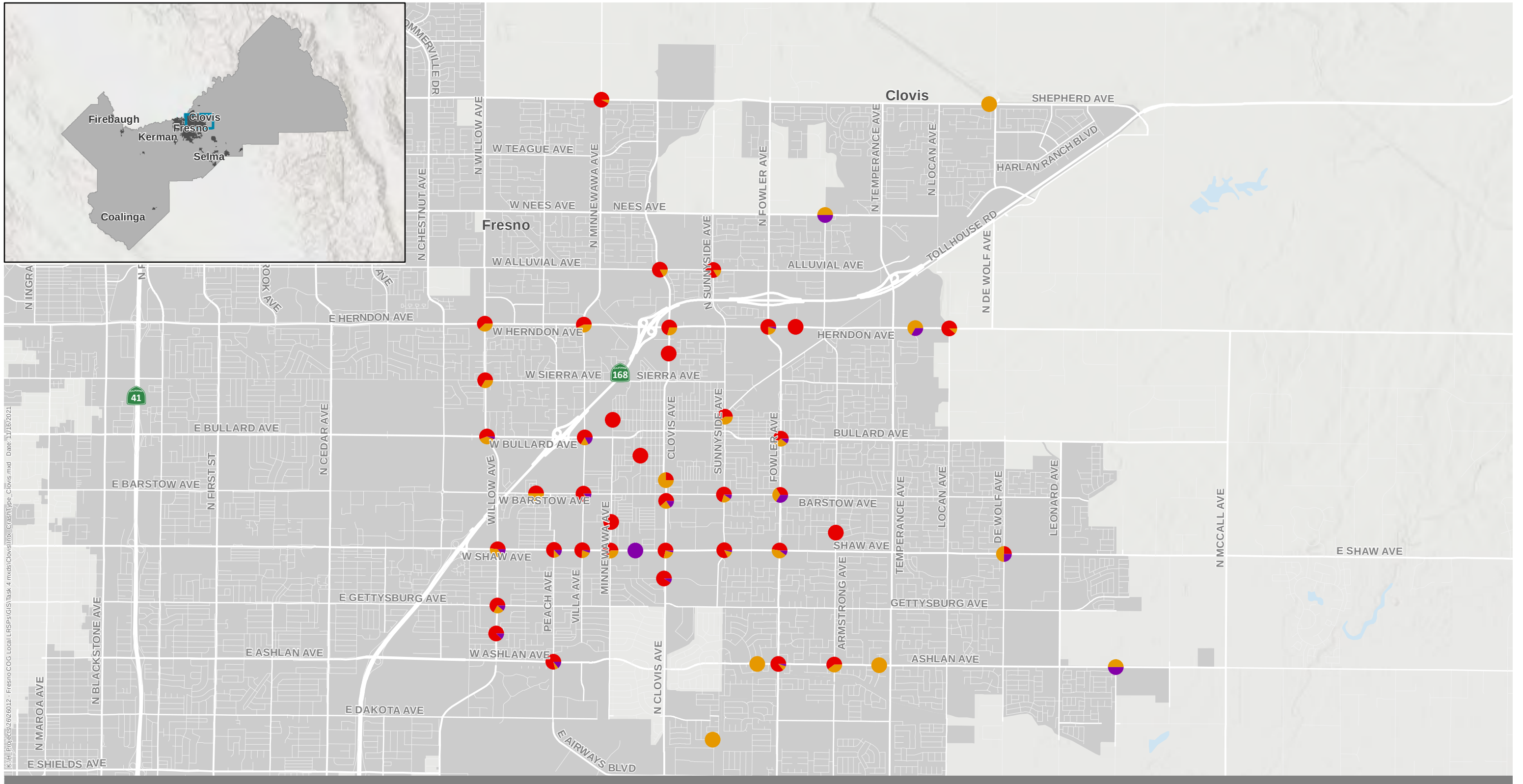
Note: The ID number references the Caltrans Manual Local Road Safety



*Appendix B* contains the regional Countermeasures Toolbox which includes more detailed information regarding the countermeasures listed above.

The following figures and tables provide data on collision types and factors for the intersections and roadways with the highest crash scores. The locations with the highest crash scores may be top priorities for implementing countermeasures and pursuing grants. Clovis can use the information about collision type and factors to identify potential countermeasures to apply, using the information in Table 6.

Figure 19 and Figure 20 present the top priority intersections and breakdown of the top collision types and primary collision factors, respectively. Figure 21 and Figure 22 present the top priority roadways and breakdown of the top collision types and primary collision factors, respectively.

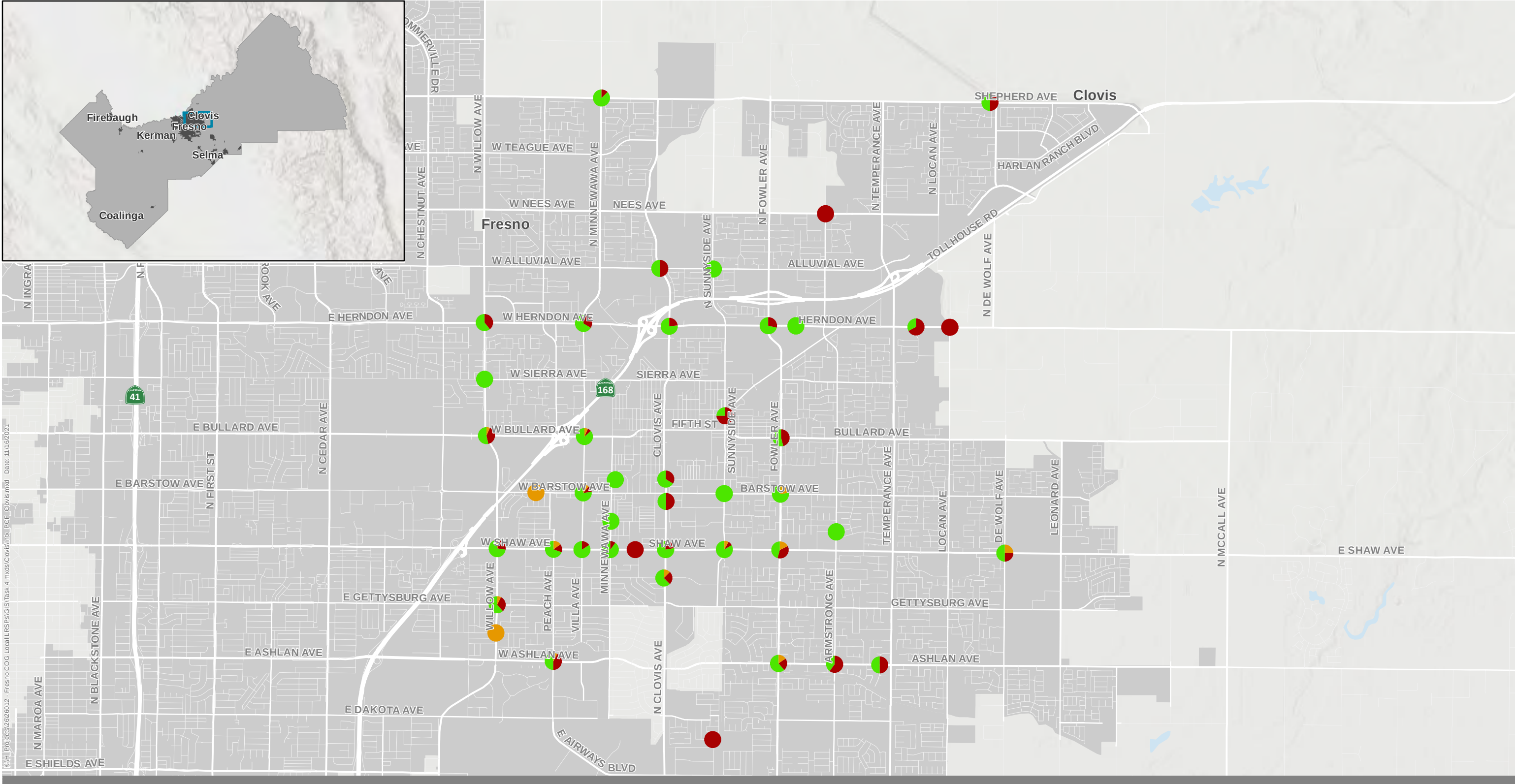


### Collision Type

- Broadside
- Vehicle/Pedestrian
- Hit Object

- City Limits
- County Boundary





**Primary Collision Factors**

- Unsafe Speed
- Driving Under the Influence
- Pedestrian Violation

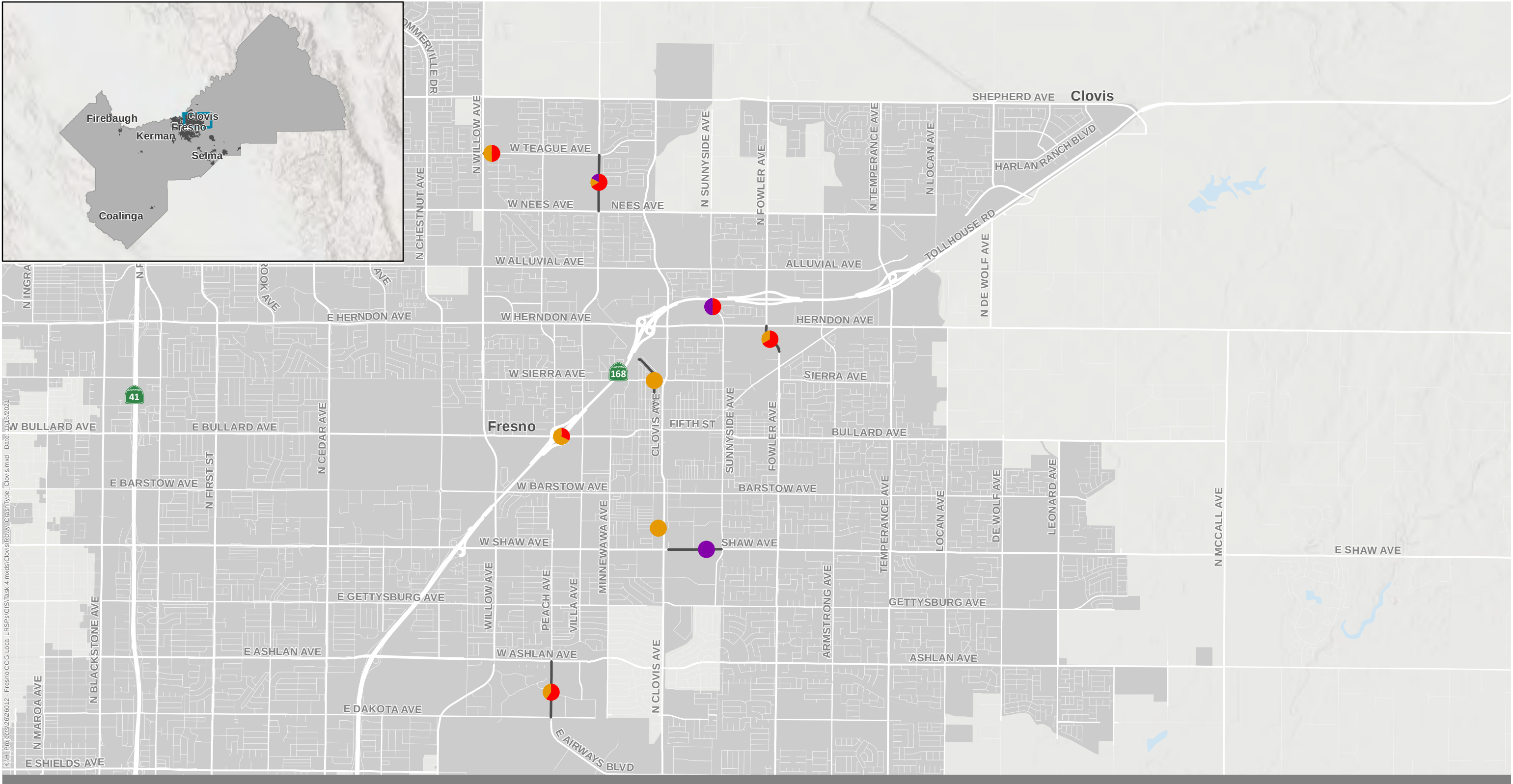
- City Limits
- County Boundary



**Top Fatal/Severe Injury Intersection Primary Collision Factors  
Jurisdiction Results: Clovis  
Fresno Council of Governments**

Figure 20





- Collision Type**
  - Broadside
  - Vehicle/Pedestrian
  - Hit Object
- City Limits
  - County Boundary



Figure 21  
**Top Fatal/Severe Injury Roadway Collision Types**  
**Jurisdiction Results: Clovis**  
**Fresno Council of Governments**

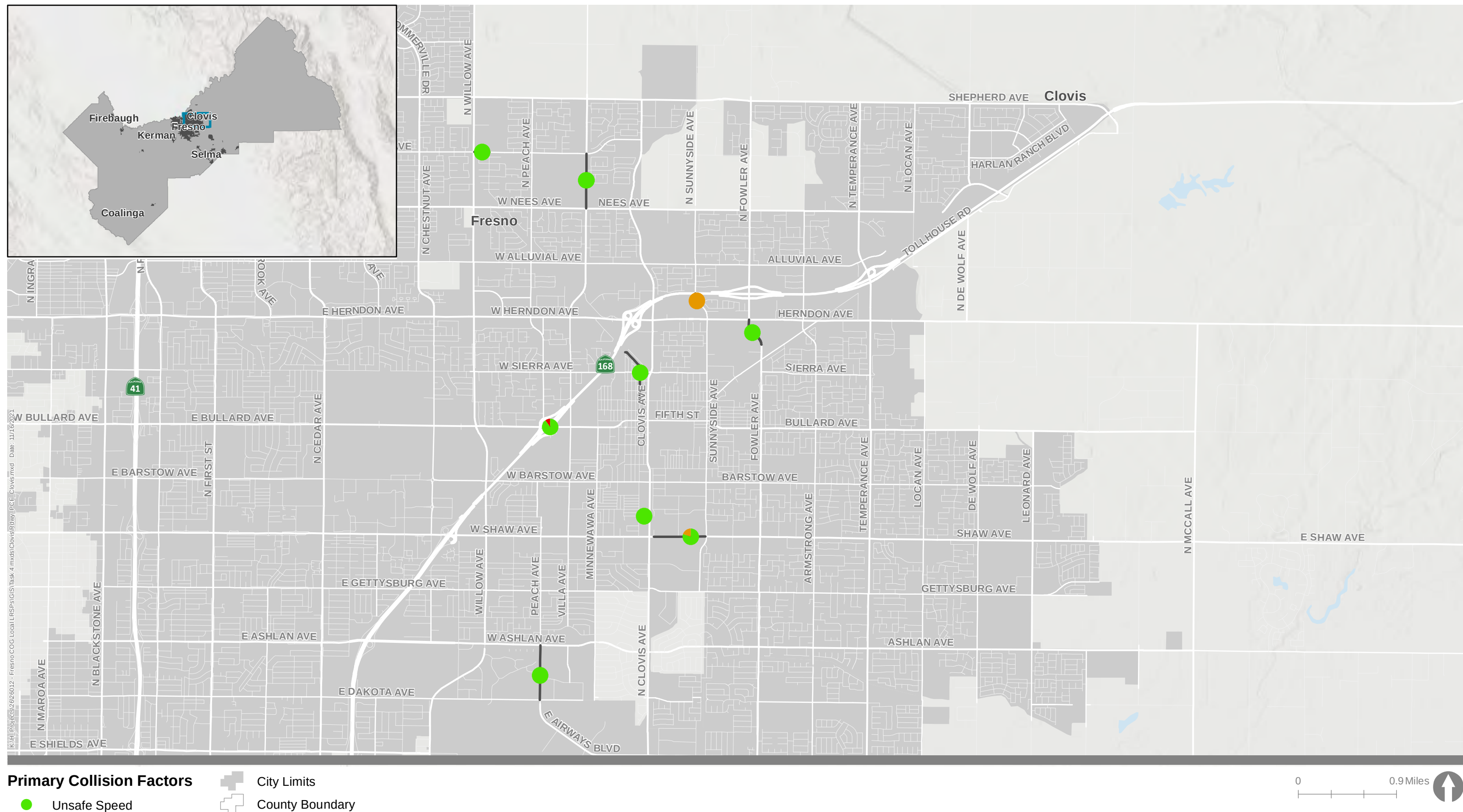


Figure 22

**Top Fatal/Severe Injury Roadway Primary Collision Factors  
Jurisdiction Results: Clovis  
Fresno Council of Governments**

Table 7 and Table 8 provide information for the top fifty intersection locations (based on crash severity score), including control type (signalized or unsignalized), crash severity score, and total number of crashes by collision type or primary collision factor.

Table 7. Priority Intersections with Collision Type based on Top 3 Fatal/Severe Injury Collision Types

| #  | Location                                     | Control Type | Crash Severity Score | Total Number of Crashes | Collision Type |               |            |       |
|----|----------------------------------------------|--------------|----------------------|-------------------------|----------------|---------------|------------|-------|
|    |                                              |              |                      |                         | Broadside      | Vehicle / Ped | Hit Object | Other |
| 1  | CLOVIS AVE & SANTA ANA AVE                   | Signal       | 90.35                | 28                      | 11             | 0             | 1          | 16    |
| 2  | WILLOW AVE & SHAW AVE                        | Signal       | 85.66                | 94                      | 14             | 11            | 4          | 65    |
| 3  | FOWLER AVE & SHAW AVE                        | Signal       | 74.88                | 38                      | 9              | 8             | 2          | 19    |
| 4  | HERNDON AVE & FOWLER AVE                     | Signal       | 73.39                | 49                      | 15             | 4             | 1          | 29    |
| 5  | ASHLAN AVE & FOWLER AVE                      | Signal       | 68.03                | 37                      | 18             | 2             | 1          | 16    |
| 6  | CLOVIS AVE & BARSTOW AVE                     | Signal       | 64.63                | 26                      | 8              | 3             | 2          | 13    |
| 7  | BARSTOW AVE & SUNNYSIDE AVE                  | Signal       | 59.06                | 18                      | 7              | 2             | 1          | 8     |
| 8  | VILLA AVE & SHAW AVE                         | Signal       | 57.93                | 51                      | 14             | 4             | 1          | 32    |
| 9  | PEACH AVE & SHAW AVE                         | Signal       | 51.27                | 38                      | 12             | 2             | 2          | 22    |
| 10 | WILLOW AVE & BULLARD AVE                     | Signal       | 48.39                | 43                      | 10             | 7             | 1          | 25    |
| 11 | BULLARD AVE & VILLA AVE                      | Signal       | 48.11                | 37                      | 8              | 2             | 2          | 25    |
| 12 | MINNEWAWA AVE & SHEPHERD AVE                 | Signal       | 47.99                | 35                      | 24             | 2             | 0          | 9     |
| 13 | SAN JOSE AVE & MINNEWAWA AVE                 | Unsignalized | 44.03                | 6                       | 3              | 0             | 0          | 3     |
| 14 | LOCAN AVE & HERNDON AVE                      | Unsignalized | 44.02                | 11                      | 8              | 1             | 0          | 2     |
| 15 | HOLLAND AVE & WILLOW AVE                     | Unsignalized | 43.62                | 9                       | 7              | 0             | 1          | 1     |
| 16 | CLOVIS AVE & PALO ALTO AVE                   | Unsignalized | 42.82                | 5                       | 3              | 0             | 0          | 2     |
| 17 | SUNNYSIDE AVE & FOURTH ST & GIBSON AVE       | Unsignalized | 41.68                | 9                       | 3              | 2             | 0          | 4     |
| 18 | SIERRA VISTA PKWY & SUNNYSIDE AVE & SHAW AVE | Signal       | 41.68                | 43                      | 19             | 3             | 1          | 20    |
| 19 | ASHLAN AVE & HIGHLAND AVE                    | Unsignalized | 41.60                | 4                       | 0              | 1             | 1          | 2     |
| 20 | ASHLAN AVE & PEACH AVE                       | Signal       | 41.00                | 31                      | 11             | 1             | 2          | 17    |
| 21 | VILLA AVE & HERNDON AVE                      | Signal       | 40.80                | 30                      | 4              | 3             | 0          | 23    |
| 22 | SHAW AVE & DARTMOUTH AVE                     | Unsignalized | 40.68                | 4                       | 0              | 0             | 1          | 3     |
| 23 | ARMSTRONG AVE & KEATS AVE                    | Unsignalized | 40.48                | 3                       | 2              | 0             | 0          | 1     |
| 24 | CLOVIS AVE & JEFFERSON AVE                   | Unsignalized | 39.86                | 5                       | 1              | 3             | 0          | 1     |
| 25 | BARSTOW AVE & SYLMAR AVE                     | Unsignalized | 39.66                | 4                       | 1              | 1             | 0          | 2     |
| 26 | SHAW AVE & CLOVIS AVE                        | Signal       | 39.51                | 52                      | 17             | 6             | 1          | 28    |
| 27 | ASHLAN AVE & RENN AVE                        | Unsignalized | 39.46                | 3                       | 0              | 2             | 0          | 1     |
| 28 | ARMSTRONG AVE & NEES AVE                     | Unsignalized | 39.26                | 2                       | 0              | 1             | 1          | 0     |
| 29 | SHEPHERD AVE & DE WOLF AVE                   | Signal       | 39.26                | 2                       | 0              | 2             | 0          | 0     |
| 30 | ASH AVE & HERNDON AVE                        | Unsignalized | 39.26                | 2                       | 1              | 0             | 0          | 1     |
| 31 | GETTYSBURG AVE & WILLOW AVE                  | Signal       | 38.78                | 25                      | 6              | 2             | 1          | 16    |
| 32 | PISTACHIO AVE & ASHLAN AVE                   | Unsignalized | 38.25                | 2                       | 0              | 1             | 0          | 1     |

| #  | Location                                       | Control Type | Crash Severity Score | Total Number of Crashes | Collision Type |               |            |       |
|----|------------------------------------------------|--------------|----------------------|-------------------------|----------------|---------------|------------|-------|
|    |                                                |              |                      |                         | Broadside      | Vehicle / Ped | Hit Object | Other |
| 33 | FEDORA AVE & DUKE AVE                          | Unsignalized | 38.25                | 2                       | 0              | 1             | 0          | 1     |
| 34 | FOWLER AVE (FRONTAGE) & DONNER AVE             | Unsignalized | 38.25                | 2                       | 0              | 0             | 0          | 2     |
| 35 | EIGHTH ST & DE WITT AVE                        | Unsignalized | 38.05                | 1                       | 1              | 0             | 0          | 0     |
| 36 | SHAW AVE & SOLEDAD AVE                         | Unsignalized | 38.05                | 1                       | 0              | 0             | 0          | 1     |
| 37 | MINNEWAWA AVE & FOURTH ST                      | Unsignalized | 38.05                | 1                       | 1              | 0             | 0          | 0     |
| 38 | CHERRY LN & ALY (B/W MINNEWAWA AVE & 10TH ST)  | Unsignalized | 38.05                | 1                       | 0              | 0             | 0          | 1     |
| 39 | FOWLER AVE & BARSTOW AVE                       | Signal       | 35.86                | 21                      | 2              | 2             | 2          | 15    |
| 40 | FOWLER AVE & BULLARD AVE                       | Signal       | 35.26                | 18                      | 6              | 3             | 1          | 8     |
| 41 | CLOVIS AVE & ALLUVIAL AVE                      | Signal       | 35.17                | 12                      | 5              | 1             | 0          | 6     |
| 42 | HERNDON AVE & CLOVIS AVE                       | Signal       | 34.30                | 56                      | 12             | 5             | 0          | 39    |
| 43 | ALLUVIAL AVE & SUNNYSIDE AVE                   | Signal       | 32.44                | 9                       | 5              | 1             | 0          | 3     |
| 44 | BARSTOW AVE & VILLA AVE                        | Signal       | 30.61                | 38                      | 12             | 1             | 2          | 23    |
| 45 | ASHLAN AVE & ARMSTRONG AVE                     | Signal       | 30.38                | 13                      | 3              | 2             | 0          | 8     |
| 46 | SHAW AVE & DE WOLF AVE                         | Signal       | 29.78                | 10                      | 1              | 2             | 1          | 6     |
| 47 | MINNEWAWA AVE & SHAW AVE                       | Signal       | 29.68                | 38                      | 13             | 6             | 0          | 19    |
| 48 | SIERRA AVE & WILLOW AVE                        | Signal       | 29.18                | 7                       | 2              | 1             | 0          | 4     |
| 49 | WILLOW AVE & HERNDON AVE                       | Signal       | 29.17                | 41                      | 13             | 8             | 0          | 20    |
| 50 | MEDICAL CENTER DR & HERNDON AVE & COVENTRY AVE | Signal       | 27.14                | 7                       | 0              | 2             | 1          | 4     |

Note: Other crashes include all crashes that are not coded as one of the top three collision types

Table 8. Priority Intersections with Primary Collision Factor based on Top 3 Fatal/Severe Injury Primary Collision Factors

| #  | Location                     | Control Type | Crash Severity Score | Total Number of Crashes | Primary Collision Factor |     |              |       |
|----|------------------------------|--------------|----------------------|-------------------------|--------------------------|-----|--------------|-------|
|    |                              |              |                      |                         | Pedestrian Violation     | DUI | Unsafe Speed | Other |
| 1  | CLOVIS AVE & SANTA ANA AVE   | Signal       | 90.35                | 28                      | 1                        | 2   | 5            | 20    |
| 2  | WILLOW AVE & SHAW AVE        | Signal       | 85.66                | 94                      | 3                        | 11  | 38           | 42    |
| 3  | FOWLER AVE & SHAW AVE        | Signal       | 74.88                | 38                      | 2                        | 4   | 5            | 27    |
| 4  | HERNDON AVE & FOWLER AVE     | Signal       | 73.39                | 49                      | 0                        | 4   | 10           | 35    |
| 5  | ASHLAN AVE & FOWLER AVE      | Signal       | 68.03                | 37                      | 2                        | 3   | 8            | 24    |
| 6  | CLOVIS AVE & BARSTOW AVE     | Signal       | 64.63                | 26                      | 0                        | 3   | 3            | 20    |
| 7  | BARSTOW AVE & SUNNYSIDE AVE  | Signal       | 59.06                | 18                      | 0                        | 0   | 3            | 15    |
| 8  | VILLA AVE & SHAW AVE         | Signal       | 57.93                | 51                      | 0                        | 3   | 16           | 32    |
| 9  | PEACH AVE & SHAW AVE         | Signal       | 51.27                | 38                      | 2                        | 2   | 9            | 25    |
| 10 | WILLOW AVE & BULLARD AVE     | Signal       | 48.39                | 43                      | 1                        | 6   | 8            | 28    |
| 11 | BULLARD AVE & VILLA AVE      | Signal       | 48.11                | 37                      | 1                        | 1   | 13           | 22    |
| 12 | MINNEWAWA AVE & SHEPHERD AVE | Signal       | 47.99                | 35                      | 0                        | 1   | 7            | 27    |
| 13 | SAN JOSE AVE & MINNEWAWA AVE | Unsignalized | 44.03                | 6                       | 0                        | 0   | 2            | 4     |



| #  | Location                                      | Control Type | Crash Severity Score | Total Number of Crashes | Primary Collision Factor |     |              |       |
|----|-----------------------------------------------|--------------|----------------------|-------------------------|--------------------------|-----|--------------|-------|
|    |                                               |              |                      |                         | Pedestrian Violation     | DUI | Unsafe Speed | Other |
| 14 | LOCAN AVE & HERNDON AVE                       | Unsignalized | 44.02                | 11                      | 0                        | 1   | 0            | 10    |
| 15 | HOLLAND AVE & WILLOW AVE                      | Unsignalized | 43.62                | 9                       | 1                        | 0   | 0            | 8     |
| 16 | CLOVIS AVE & PALO ALTO AVE                    | Unsignalized | 42.82                | 5                       | 0                        | 0   | 0            | 5     |
| 17 | SUNNYSIDE AVE & FOURTH ST & GIBSON AVE        | Unsignalized | 41.68                | 9                       | 0                        | 3   | 1            | 5     |
| 18 | SIERRA VISTA PKWY & SUNNYSIDE AVE & SHAW AVE  | Signal       | 41.68                | 43                      | 1                        | 1   | 10           | 31    |
| 19 | ASHLAN AVE & HIGHLAND AVE                     | Unsignalized | 41.60                | 4                       | 0                        | 0   | 0            | 4     |
| 20 | ASHLAN AVE & PEACH AVE                        | Signal       | 41.00                | 31                      | 1                        | 5   | 6            | 19    |
| 21 | VILLA AVE & HERNDON AVE                       | Signal       | 40.80                | 30                      | 0                        | 5   | 10           | 15    |
| 22 | SHAW AVE & DARTMOUTH AVE                      | Unsignalized | 40.68                | 4                       | 0                        | 1   | 0            | 3     |
| 23 | ARMSTRONG AVE & KEATS AVE                     | Unsignalized | 40.48                | 3                       | 0                        | 0   | 1            | 2     |
| 24 | CLOVIS AVE & JEFFERSON AVE                    | Unsignalized | 39.86                | 5                       | 0                        | 1   | 2            | 2     |
| 25 | BARSTOW AVE & SYLMAR AVE                      | Unsignalized | 39.66                | 4                       | 1                        | 0   | 0            | 3     |
| 26 | SHAW AVE & CLOVIS AVE                         | Signal       | 39.51                | 52                      | 0                        | 5   | 18           | 29    |
| 27 | ASHLAN AVE & RENN AVE                         | Unsignalized | 39.46                | 3                       | 0                        | 0   | 0            | 3     |
| 28 | ARMSTRONG AVE & NEES AVE                      | Unsignalized | 39.26                | 2                       | 0                        | 1   | 0            | 1     |
| 29 | SHEPHERD AVE & DE WOLF AVE                    | Signal       | 39.26                | 2                       | 0                        | 1   | 1            | 0     |
| 30 | ASH AVE & HERNDON AVE                         | Unsignalized | 39.26                | 2                       | 0                        | 0   | 1            | 1     |
| 31 | GETTYSBURG AVE & WILLOW AVE                   | Signal       | 38.78                | 25                      | 1                        | 4   | 8            | 12    |
| 32 | PISTACHIO AVE & ASHLAN AVE                    | Unsignalized | 38.25                | 2                       | 0                        | 1   | 1            | 0     |
| 33 | FEDORA AVE & DUKE AVE                         | Unsignalized | 38.25                | 2                       | 0                        | 1   | 0            | 1     |
| 34 | FOWLER AVE (FRONTAGE) & DONNER AVE            | Unsignalized | 38.25                | 2                       | 0                        | 0   | 0            | 2     |
| 35 | EIGHTH ST & DE WITT AVE                       | Unsignalized | 38.05                | 1                       | 0                        | 0   | 0            | 1     |
| 36 | SHAW AVE & SOLEDAD AVE                        | Unsignalized | 38.05                | 1                       | 0                        | 0   | 0            | 1     |
| 37 | MINNEWAWA AVE & FOURTH ST                     | Unsignalized | 38.05                | 1                       | 0                        | 0   | 0            | 1     |
| 38 | CHERRY LN & ALY (B/W MINNEWAWA AVE & 10TH ST) | Unsignalized | 38.05                | 1                       | 0                        | 0   | 1            | 0     |
| 39 | FOWLER AVE & BARSTOW AVE                      | Signal       | 35.86                | 21                      | 2                        | 0   | 7            | 12    |
| 40 | FOWLER AVE & BULLARD AVE                      | Signal       | 35.26                | 18                      | 0                        | 5   | 6            | 7     |
| 41 | CLOVIS AVE & ALLUVIAL AVE                     | Signal       | 35.17                | 12                      | 0                        | 2   | 2            | 8     |
| 42 | HERNDON AVE & CLOVIS AVE                      | Signal       | 34.30                | 56                      | 0                        | 4   | 13           | 39    |
| 43 | ALLUVIAL AVE & SUNNYSIDE AVE                  | Signal       | 32.44                | 9                       | 0                        | 0   | 2            | 7     |
| 44 | BARSTOW AVE & VILLA AVE                       | Signal       | 30.61                | 38                      | 2                        | 2   | 14           | 20    |
| 45 | ASHLAN AVE & ARMSTRONG AVE                    | Signal       | 30.38                | 13                      | 0                        | 3   | 2            | 8     |
| 46 | SHAW AVE & DE WOLF AVE                        | Signal       | 29.78                | 10                      | 1                        | 1   | 2            | 6     |
| 47 | MINNEWAWA AVE & SHAW AVE                      | Signal       | 29.68                | 38                      | 0                        | 1   | 9            | 28    |
| 48 | SIERRA AVE & WILLOW AVE                       | Signal       | 29.18                | 7                       | 0                        | 0   | 2            | 5     |
| 49 | WILLOW AVE & HERNDON AVE                      | Signal       | 29.17                | 41                      | 0                        | 7   | 11           | 23    |





| #  | Location                                       | Control Type | Crash Severity Score | Total Number of Crashes | Primary Collision Factor |     |              |       |
|----|------------------------------------------------|--------------|----------------------|-------------------------|--------------------------|-----|--------------|-------|
|    |                                                |              |                      |                         | Pedestrian Violation     | DUI | Unsafe Speed | Other |
| 50 | MEDICAL CENTER DR & HERNDON AVE & COVENTRY AVE | Signal       | 27.14                | 7                       | 0                        | 2   | 1            | 4     |

Notes: Other crashes include all crashes that are not coded as one of the top primary collision factors

DUI = Driving Under the Influence

Table 9 and Table 10 provide information for the top ten roadway segments (based on crash severity score), including roadway classification, crash severity score, and total number of crashes by collision type or primary collision factor.

Table 9. Priority Roadways Segments with Collision Type based on Top 3 Fatal/Severe Injury Collision Types

| #  | Location                                               | Classification     | Crash Severity Score | Total Number of Crashes | Collision Type |              |            |       |
|----|--------------------------------------------------------|--------------------|----------------------|-------------------------|----------------|--------------|------------|-------|
|    |                                                        |                    |                      |                         | Broad-side     | Vehicle /Ped | Hit Object | Other |
| 1  | SR 168 (Owens Mountain Pkwy to N Dutch Ave)*           | Freeway            | 34.35                | 3                       | 0              | 1            | 0          | 2     |
| 2  | N Sunnyside Ave (SR 168 to Locust Ave)                 | Arterial/Collector | 33.13                | 2                       | 1              | 0            | 1          | 0     |
| 3  | N Pollasky Ave (N De Witt Ave to Third St)             | Local              | 32.93                | 1                       | 0              | 1            | 0          | 0     |
| 4  | Scott Ave (Pollasky Ave to Clovis Ave)                 | Local              | 32.93                | 1                       | 0              | 1            | 0          | 0     |
| 5  | W Bullard Ave (SR 168 SB on-ramp to SR 168 NB on-ramp) | Arterial/Collector | 10.85                | 15                      | 1              | 3            | 0          | 11    |
| 6  | Shaw Ave (Railroad Ave to Sunnyside Ave)               | Arterial/Collector | 7.41                 | 7                       | 0              | 0            | 1          | 6     |
| 7  | W Teague Ave (N Willow Ave to N Timmy Ave)             | Arterial/Collector | 7.41                 | 7                       | 1              | 1            | 0          | 5     |
| 8  | Peach Ave (W Ashlan Ave to E Dakota Ave)               | Arterial/Collector | 6.59                 | 8                       | 3              | 2            | 0          | 3     |
| 9  | N Fowler Ave (Herndon Ave to N of Los Altos Ave)       | Arterial/Collector | 6.10                 | 6                       | 2              | 1            | 0          | 3     |
| 10 | N Minnewawa Ave (W Teague Ave to W Nees Ave)           | Arterial/Collector | 5.57                 | 8                       | 4              | 1            | 1          | 2     |

\* Roadway segment is an at-grade Caltrans facility.

Note: Other crashes include all crashes that are not coded as one of the top three collision types

Table 10. Priority Roadways Segments with Primary Collision Factors based on Top 3 Fatal/Severe Injury Primary Collision Factors

| # | Location                                               | Classification     | Crash Severity Score | Total Number of Crashes | Primary Collision Factor |     |               |       |
|---|--------------------------------------------------------|--------------------|----------------------|-------------------------|--------------------------|-----|---------------|-------|
|   |                                                        |                    |                      |                         | Unsafe Speed             | DUI | Ped Violation | Other |
| 1 | SR 168 (Owens Mountain Pkwy to N Dutch Ave)*           | Freeway            | 34.35                | 3                       | 1                        | 0   | 0             | 2     |
| 2 | N Sunnyside Ave (SR 168 to Locust Ave)                 | Arterial/Collector | 33.13                | 2                       | 0                        | 0   | 1             | 1     |
| 3 | N Pollasky Ave (N De Witt Ave to Third St)             | Local              | 32.93                | 1                       | 1                        | 0   | 0             | 0     |
| 4 | Scott Ave (Pollasky Ave to Clovis Ave)                 | Local              | 32.93                | 1                       | 1                        | 0   | 0             | 0     |
| 5 | W Bullard Ave (SR 168 SB on-ramp to SR 168 NB on-ramp) | Arterial/Collector | 10.85                | 15                      | 11                       | 1   | 0             | 3     |
| 6 | Shaw Ave (Railroad Ave to Sunnyside Ave)               | Arterial/Collector | 7.41                 | 7                       | 4                        | 0   | 1             | 2     |
| 7 | W Teague Ave (N Willow Ave to N Timmy Ave)             | Arterial/Collector | 7.41                 | 7                       | 4                        | 0   | 0             | 3     |



| #  | Location                                         | Classification     | Crash Severity Score | Total Number of Crashes | Primary Collision Factor |     |               |       |
|----|--------------------------------------------------|--------------------|----------------------|-------------------------|--------------------------|-----|---------------|-------|
|    |                                                  |                    |                      |                         | Unsafe Speed             | DUI | Ped Violation | Other |
| 8  | Peach Ave (W Ashlan Ave to E Dakota Ave)         | Arterial/Collector | 6.59                 | 8                       | 1                        | 0   | 0             | 7     |
| 9  | N Fowler Ave (Herndon Ave to N of Los Altos Ave) | Arterial/Collector | 6.10                 | 6                       | 1                        | 0   | 0             | 5     |
| 10 | N Minnewawa Ave (W Teague Ave to W Nees Ave)     | Arterial/Collector | 5.57                 | 8                       | 1                        | 0   | 0             | 7     |

\* Roadway segment is an at-grade Caltrans facility.

Notes: Other crashes include all crashes that are not coded as one of the top three primary collision factors

DUI = Driving Under the Influence



## Education Strategies

Education strategies for Clovis are targeted at unsafe speed and driving or bicycling under the influence of drugs or alcohol. Unsafe speed is the most frequently reported PCF among all reported crashes and the third most frequent in fatal/severe injury crashes. Driving or bicycling under the influence of alcohol and drugs is the third most common PCF cited in fatal/severe injury crashes. In addition, pedestrian and bicycle crashes are an emphasis area that can be addressed with education strategies. Lastly, education strategies can speak to the need to be extra cautious during dark, cloudy, or foggy conditions, given the City's crash history in these conditions.

The Safe Roads Save Lives campaign is a marketing effort led by the Fresno COG, with the goals of:

- Educate all road users on safe transportation behaviors
- Increase safety for people walking and biking
- Highlight behaviors that cause the most crashes in Fresno County—speeding and distracted driving



The campaign includes branding, social media strategies, print materials, radio and video resources, school resources, and a campaign website. Clovis may find these materials helpful, especially those related to the dangers of speeding, looking out for pedestrians, not using the roadway while under the influence, and being extra cautious in lower visibility conditions.

The following activities are recommended for Clovis as they move forward on implementing the Safe Roads Save Lives campaign:

- Identify a team of staff appropriate to attend a presentation by a Fresno COG staff about the Safe Roads Save Lives campaign. Appropriate staff members include staff associated with transportation engineering and planning, communications, traffic enforcement, school transportation, and other jurisdictional staff who work with the roadway system.



- Identify a specific staff member to be the City's lead for the Safe Roads Save Lives campaign deployment. This lead should focus on the following tasks:
  - o Identify local transportation and public health advocacy groups that would be interested in helping to promote the Safe Roads Save Lives campaign. Meet with group leaders to better understand how they can participate in the campaign.
  - o Work with school districts to distribute print materials and offer school-related transportation resources. Ensure that school communications are in both English and Spanish.
  - o Work with public information staff to spread Safe Roads Save Lives materials throughout Clovis through the following channels:
    - Independently implement social media calendar and graphics through jurisdictional accounts. At minimum, repost Fresno COG posts.
    - Have print materials (flyers, bumper stickers, pins, and postcards) available at events and community festivals.
    - Print posters for posting at governmental buildings such as City Hall, libraries, DMVs, and other facilities that the public regularly uses.
    - Identify key outdoor locations in the community that would be effective for larger print advertisement, such as bus shelters, community parks, or billboard locations.
    - Create one or more radio public service announcements (PSAs) and record at least one of the PSAs in Spanish and air it on Spanish-language radio.
    - Have a direct link to Safe Roads Save Lives campaign website from the city's website.



## Emergency Services

Emergency service organizations depend on safe roadways and efficient communication processes to reach and effectively respond to emergencies. Each type of emergency services organization that serves Clovis – law enforcement, fire, emergency medical services (EMS), California Highway Patrol – work independently and collaboratively to develop procedures that allow them to respond to incidents in their own jurisdictions as well as support others as needed. The following recommendations may help improve emergency services response as the various organizations update procedures and policies and continue to partner on roadway safety efforts:

- All roadway safety projects should be vetted by emergency service organizations to ensure that their design does not hamper access.
- As new emergency service and response procedures are developed, roadway safety improvement opportunities should be identified and implications of changes to response times should be considered.
- Clovis staff should participate in periodic coordination calls between emergency response agencies to gather and share recent observations about crashes and hot spots, to

understand emergent safety issues that may not have led to policy reports or yet be available through statewide crash reporting systems.



## Enforcement

Enforcement strategies can include programs or campaigns specifically focused on changing road user behavior through more visible and active enforcement of existing traffic laws, as well as focusing enforcement in areas that have historically been shown to have higher-than-average crash rates. Typically, the effectiveness of enforcement strategies is temporal, meaning they are effective at changing behavior for a discrete period of time – during and shortly after the increased enforcement activities.

The following enforcement strategies should be considered for Clovis.

- Schedule heightened speed (or other behavior) enforcement checks during strategic times of the year, such as when students return to school or the beginning of fog season.
- Focus speed enforcement efforts in locations with high crash rates.
- Use automatic enforcement, such as red-light cameras or speed feedback signs, especially in school zones.
- Deploy speed feedback signs in areas with high crash rates or speeding citations.

The effectiveness of each strategy should be measured and evaluated, considering the number of staff hours and amount of resources needed. The results should be reviewed and used to refine future enforcement activities.

Enforcement strategies should be undertaken with due caution to avoid inequitable enforcement activities and evaluated to determine the strategy's impact. More details about equitable enforcement can be found on page 8 (Introduction).

## EVALUATION AND IMPLEMENTATION

A key part of achieving the City's vision is consistently evaluating roadway safety performance and tracking progress towards the City's goals. The City will develop a process to regularly collect data and information around the performance measures that can be used to assess changes city-wide and at the top priority locations.

As feasible, it is recommended that the City of Clovis update this LRSP every three to five years using updated crash data and the performance measures. Comparing the performance measures related to investments made with the crash data should provide a clear indication of the impact of the City's and safety partner's efforts. Future LRSPs may provide new emphasis areas and top priority locations that reflect progress made and new priorities based on trends in the data.

Activities for implementing the plan include:

- Identifying countermeasures and strategies for priority locations based on the crash data.
- Utilizing the Fresno COG Regional Safety Plan to implement regional strategies and share best practices.
- Exploring funding opportunities to implement priority strategies.
- Identifying key staff and activities to support the regional Safe Roads Save Lives campaign.
- Identifying enforcement strategies to implement and evaluate.
- Regularly coordinating with safety partner agencies to assess progress, identify opportunities to implement countermeasures and strategies, and identify opportunities for citizen involvement.
- Regularly collecting and organizing data to support evaluation of the LRSP.

## 3.0 CITY OF COALINGA

The City of Coalinga has an approximate population of 16,944.<sup>10</sup> The average daily vehicle miles traveled is 83,135, and the City maintains approximately 58 total roadway centerline miles. The main roadways in the City include California State Route 33, which runs north to south, and E Polk Street, which runs east to west. Based on the review of crash data conducted as part of the LRSP, pedestrians are overrepresented in fatal and severe injury crashes. The top fatal and severe injury collision types in Coalinga were rear end and vehicle-pedestrian crashes; the top fatal and severe injury primary collision factors were improper turning and automobile right of way. High priority countermeasures to address these collision types and primary collision factors are shown in Table 15. The LRSP provides potential engineering, education, emergency services, and enforcement strategies tailored to Coalinga's crash history and local priorities, as well as performance measures to evaluate progress.

### VISION AND GOALS

The City's vision for roadway safety is:



Enhance the existing roadway network in a cost-effective manner that promotes traffic safety, meets the needs of the community and enriches the lives of residents.

The City's goal in support of the vision are:

1. Have zero fatal and severe injury crashes on the City roadways by 2026.
2. Coordinate with Caltrans on implementing roadway network changes on the state routes that are within the City boundary
3. Regularly review data-informed analysis and community needs to identify and prioritize opportunities to reduce crash risk.
4. Implement low-cost engineering solutions to address common collision types
5. Participate in regional activities to promote roadway safety
6. Maintain a roadway system that provides a quality environment for all users

---

<sup>10</sup> 2018 population. Source: California Department of Finance

7. Coordinate with traffic safety stakeholders such as fire, police, schools, and parks to exchange information and ideas specific to enhancing roadway safety performance through engineering, enforcement and educational strategies.

## SAFETY PARTNERS

A variety of agency staff and community partners were involved throughout the development of this LRSP and played an integral role in identifying priorities, providing local context, and reviewing the existing conditions analysis. Many of the strategies identified in this plan will require coordination with these partners and their support of the City's effort to create a culture of roadway safety. Coalinga's goals reflect the importance of partnering with traffic safety stakeholders and participating in regional activities to enhance roadway safety performance. While additional partners may be identified in the future, those involved in development of the LRSP include:

- Coalinga Fire Department
- Coalinga Police Department
- Coalinga-Huron Unified School District
- Fresno Council of Governments
- Public Works and Utilities

## PERFORMANCE MEASURES

Performance measures are used to track progress and a key element of making data-informed decisions. Performance measures that support the City's vision, goals, and emphasis areas include:

- Annual number of crashes (city-wide and at each of the top twenty priority locations)
- Annual number of fatal and severe injury crashes (city-wide and at each of the top twenty priority locations)
- Annual number of pedestrian and bicycle crashes (city-wide and at each of the top twenty priority locations)
- Annual number of rear end crashes (city-wide)
- Annual number of crashes at intersections (city-wide)
- Investments made in roadway safety countermeasures (e.g. dollars spent, grants pursued, partnerships developed)
- Investments made in education and enforcement strategies (e.g. dollars spent, grants pursued, partnerships developed)
- Coordination with other local agencies and/or safety partners (e.g. meetings held, projects pursued)

As part of plan implementation, the City will identify a process for annually tracking these performance measures to support future updates to this roadway safety plan.

## DATA SUMMARY

The primary data sets used to inform the technical analyses for the City's local road safety plan were crash data and roadway network information. As noted below, future updates could incorporate traffic volume data if widely available for locations across the City. In addition, feedback from a publicly available survey was documented for consideration in identifying issues and improvement strategies.

### Public Survey Feedback

Toole Design Group worked with Fresno COG to develop an online survey and interactive webmap to provide the opportunity for public engagement on the LRSP. The goal was to collect both general and geographically specific feedback on safety problems, desired safety improvements in jurisdictions that are part of the MLRSP, as well as voluntary demographic information for Title IV reporting. Both activities were from August 16, 2021 to September 20, 2021 and sought public feedback on spatial patterns of traffic safety concerns and desired improvements.

As the primary open public engagement opportunity during MLRSP development, the survey and interactive webmap served a crucial role in illuminating the community's traffic safety concerns and desired traffic safety improvements. Below is a summary of key findings from the online survey and interactive webmap specific to Coalinga. More information on the methodology and overall findings of the survey are provided in *Appendix A*.



#### WHERE PARTICIPANTS WORK AND LIVE



#### MOST NEEDED SAFETY IMPROVEMENTS

- Pedestrian crossing improvements
- Speed enforcement
- Maintenance of existing roads and streets
- Rural road improvements to prevent run-off-road crashes

- The survey asked respondents to provide input on the top road safety improvements needed in their communities. While the survey prompted participants to pick three improvements, some selected more than three responses. A total of 23 responses were received for Coalinga from 6 participants, with the most common desired improvement types including:
  - o Pedestrian crossing improvements (4 responses)
  - o Speed enforcement (4 responses)
  - o Maintenance of existing roads and streets (3 responses)
  - o Rural road improvements to prevent run-off-road crashes (3 responses)
  - o Sidewalks (3 responses)
- Participants dropped points in the webmap in specific locations across Fresno County where they experienced road safety concerns. No locations were identified in Coalinga.
- The survey asked participants where they live and work or study, with the option to select either outside of Fresno County or from a list of jurisdictions within the County. The participants who selected Coalinga included:
  - o 2 who live and work/study in Coalinga
  - o None who live in Coalinga and work/study outside of Coalinga
  - o 4 who work/study in Coalinga and live outside of Coalinga

## Crash Data

Kittelsohn worked with Fresno COG to assemble crash data for the City of Clovis using the Statewide Integrated Traffic Records System (SWITRS) database, supplemented with location information from the Transportation Injury Mapping System (TIMS) database maintained by SafeTREC at the University of California, Berkeley. Throughout this report, crashes are associated with a jurisdiction based on the reporting officer's assessment of location.

The crash database represents the time period from January 1, 2015 through December 31, 2019 and includes reported crashes that occurred on public streets. Within the assembled regional crash database, a total of 378 reported crashes are located in Coalinga. Crash severity is coded according to the highest degree of injury exhibited, and the data used for this analysis includes the following coded severity levels (listed in descending order):

- Fatal: death from injuries sustained in the crash.
- Severe Injury: Injuries include, for example, broken bones, severe lacerations, or other injuries that go beyond the reporting officer's assessment of "other visible injuries."
- Other visible injury: An injury, other than those described above, that is evident to observers at the scene of the crash. For example, bruises or minor lacerations.
- Complaint of pain: Internal or other non-visible injuries. For example, a person limps or seems incoherent.
- Property damage only (PDO): No injuries sustained.



## Roadway Network Data

Kittelton developed a linear referencing system of all public roadways using the Fresno County roadway centerline file. This dataset was updated to develop a measurement system based on the total road length (as determined by roadway name) to locate crashes to a specific mile point along the network. The master roadway network for the County was used to spatially analyze and prioritize specific locations within each local jurisdiction.

## Traffic Volume Data

Traffic volume data was not consistently available at a sufficient level to be able to incorporate into the safety analysis. Future updates to the City's local road safety plan could incorporate traffic volume data, if available, to understand how crash frequency, severity, and type vary at different levels of traffic.

## EXISTING ROADWAY SAFETY PERFORMANCE

The findings in this section are based on the crash database, which includes reported crashes from January 1, 2015 through December 31, 2019. It is organized as follows:

- All Road Users
  - Severity by Road User
  - Year, Month, and Weather
  - Collision Type
  - Location, Collision Type, and Severity
  - Primary Collision Factor
  - Lighting
  - Time of Day
- Pedestrian-involved Crashes
  - Year and Month
  - Pedestrian Action and Location
  - Lighting
- Bicyclist-involved Crashes
  - Collision Type
  - Primary Collision Factor
  - Lighting

## All Road Users

This section includes analysis and findings for all reported crashes. Subsequent sections focus exclusively on crashes involving pedestrians and bicyclists.

### SEVERITY BY ROAD USER

Table 11 summarizes number of reported crashes by road user and severity of those crashes. Notable trends include:

- Pedestrians are overrepresented in fatal and severe injury crashes. Pedestrians are involved in 4 percent of reported crashes but are involved in 22 percent of fatal/severe injury crashes.
- Of the nine reported severe injury crashes, pedestrians were involved in two and a motorcyclist in one.

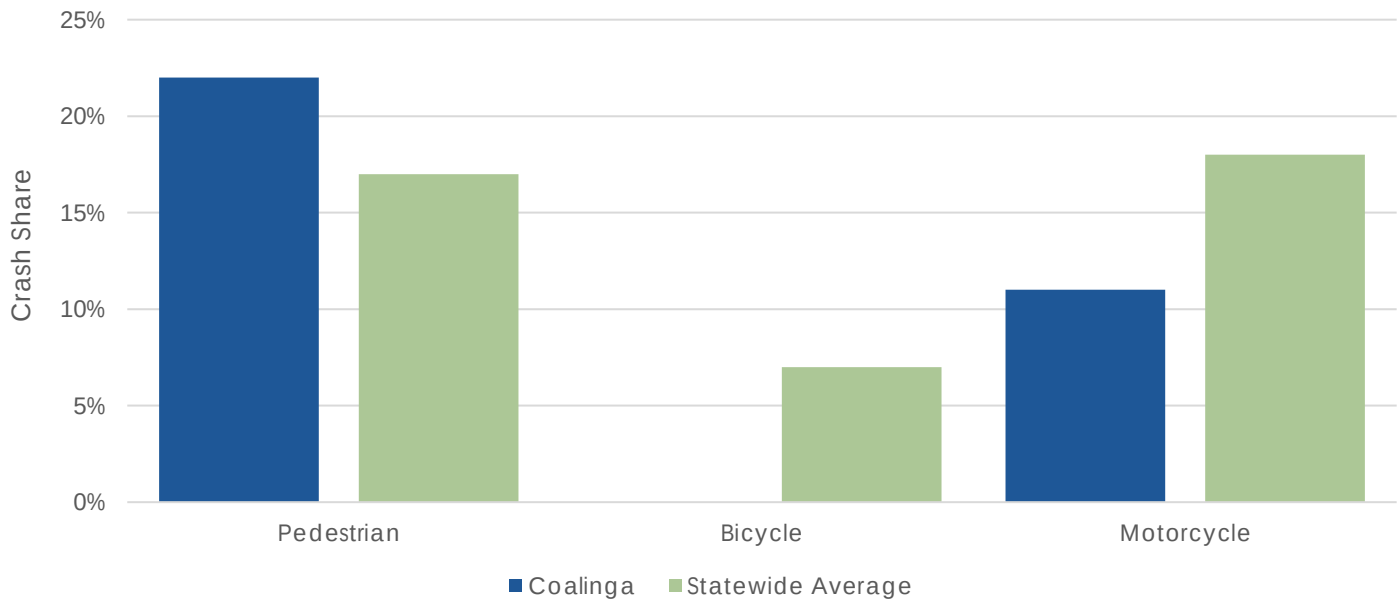
Table 11: Crash Severity by Road User Involved

| Road User Involved                      | Fatal<br>(% of column) | Severe Injury<br>(% of column) | Visible Injury<br>(% of column) | Complaint of<br>Pain<br>(% of column) | Property<br>Damage Only<br>(% of column) | Total<br>(% of column) |
|-----------------------------------------|------------------------|--------------------------------|---------------------------------|---------------------------------------|------------------------------------------|------------------------|
| Pedestrian Involved                     | 0 (0%)                 | 2 (22%)                        | 7 (23%)                         | 5 (13%)                               | 1 (0%)                                   | 15 (4%)                |
| Bicycle Involved                        | 0 (0%)                 | 0 (0%)                         | 4 (13%)                         | 1 (3%)                                | 0 (0%)                                   | 5 (1%)                 |
| Vehicle Only or<br>Vehicle-Fixed Object | 0 (0%)                 | 7 (78%)                        | 19 (63%)                        | 34 (85%)                              | 298 (100%)                               | 358 (95%)              |
| Reported Crashes                        | 0 (0%)                 | 9 (100%)                       | 30 (100%)                       | 40 (100%)                             | 299 (100%)                               | 378 (100%)             |
| Severity Share of<br>Reported Crashes   | 0%                     | 2%                             | 8%                              | 11%                                   | 79%                                      | 100%                   |

Source: SWITRS, TIMS, Kittelson, 2021.

The California's Strategic Highway Safety Plan (SHSP) includes 16 challenge areas to focus statewide resources and efforts. Three of those challenge areas are crashes involving pedestrians, bicyclists, and motorcyclists. The SHSP analyzed the share of fatal and severe injury crashes involving each of these road users. Figure 23 compares crash trends in the City of Coalinga to the statewide trends reported in California's Strategic Highway Safety Plan. City of Coalinga has a higher share of pedestrian crashes among fatal/severe crashes compared to the statewide average.

Figure 23: Fatal and Severe Injury Crash Shares by Road User Compared to Statewide Trends

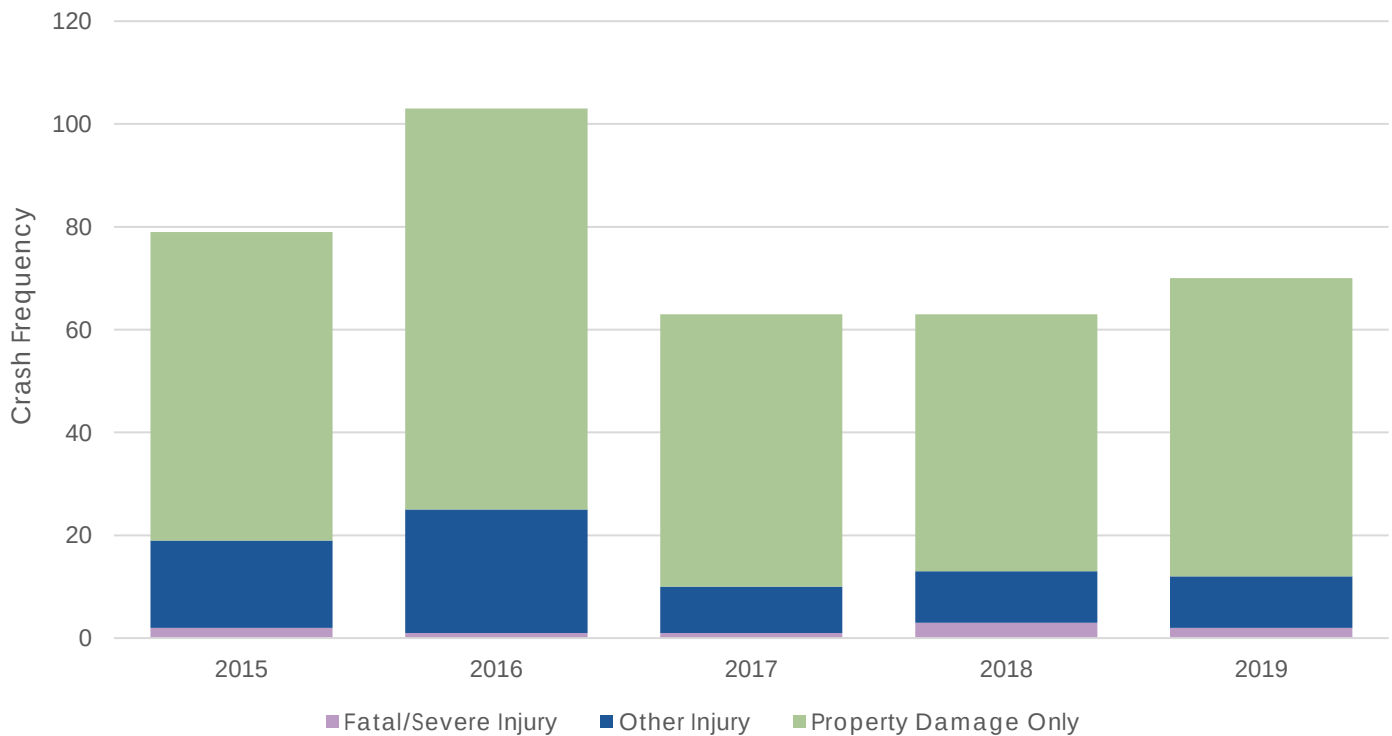


Source: SHSP, SWITRS, TIMS, Kittelson, 2021.

## YEAR, MONTH, AND WEATHER

Figure 24 shows year-over-year trends in the data, by severity. The data does not show a consistent trend over time. On average, 76 total crashes and two fatal/severe injury crashes occurred each year. The highest number of crashes were reported in 2016.

Figure 24: Year-over-Year Trends in Crash Data by Severity

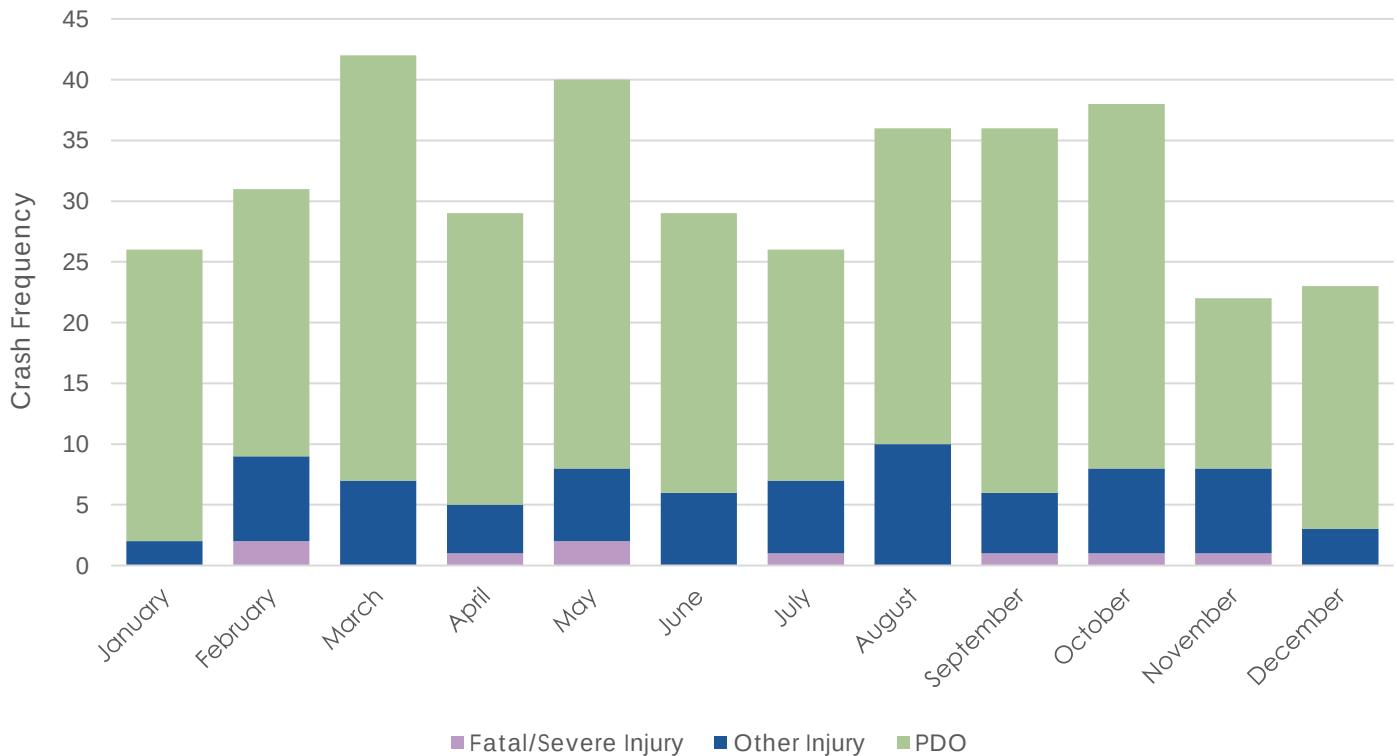


Source: SWITRS, TIMS, Kittelson, 2021.

Note: "Other injury" includes "Other visible injury" and "Complaint of pain" crashes.

Figure 25 presents the total crashes by month and severity for the crash database. On average, 32 crashes occurred per month. November and December are notably lower than the monthly average and March and May notably higher than the monthly average.

Figure 25: Crashes by Month and Severity



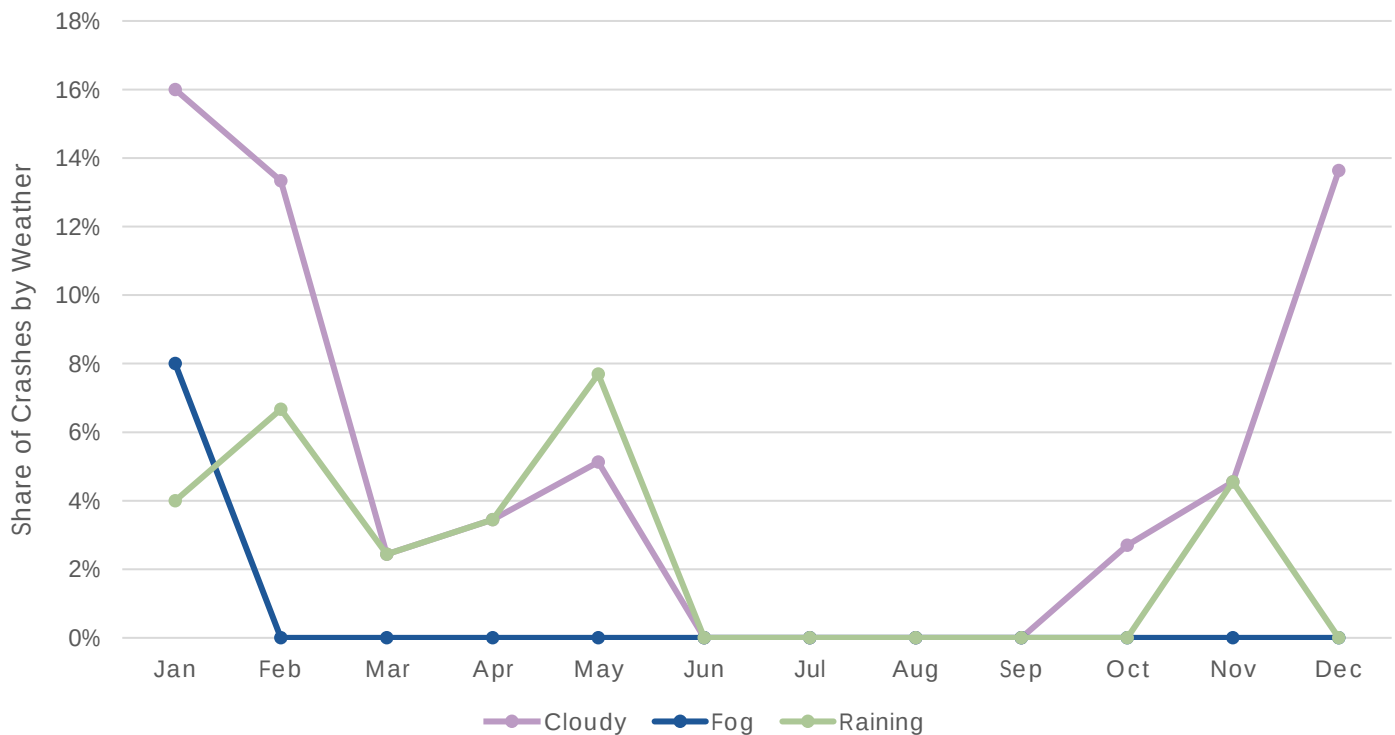
Source: SWITRS, TIMS, Kittelson, 2021.

Note: "Other injury" includes "Other visible injury" and "Complaint of pain" crashes. "PDO" = property damage only.

Figure 26 illustrates crashes by month and by weather conditions. The most common weather condition, clear weather, is not shown in the chart below to highlight weather's factor on crash trends. As shown in the figure:

- Crashes recorded to have occurred under or during fog, cloudy, and/or raining are shown to be at their lowest in the months of June to September and increase through October to May.
- Crashes reported as occurring in cloudy conditions peak through the months of December through February. Crashes occurring in foggy conditions show a spike in January, constituting 8 percent of reported crashes; they are a negligible share in other months.

Figure 26: Crashes by Month and Weather Condition



Source: SWITRS, TIMS, Kittelson, 2021.

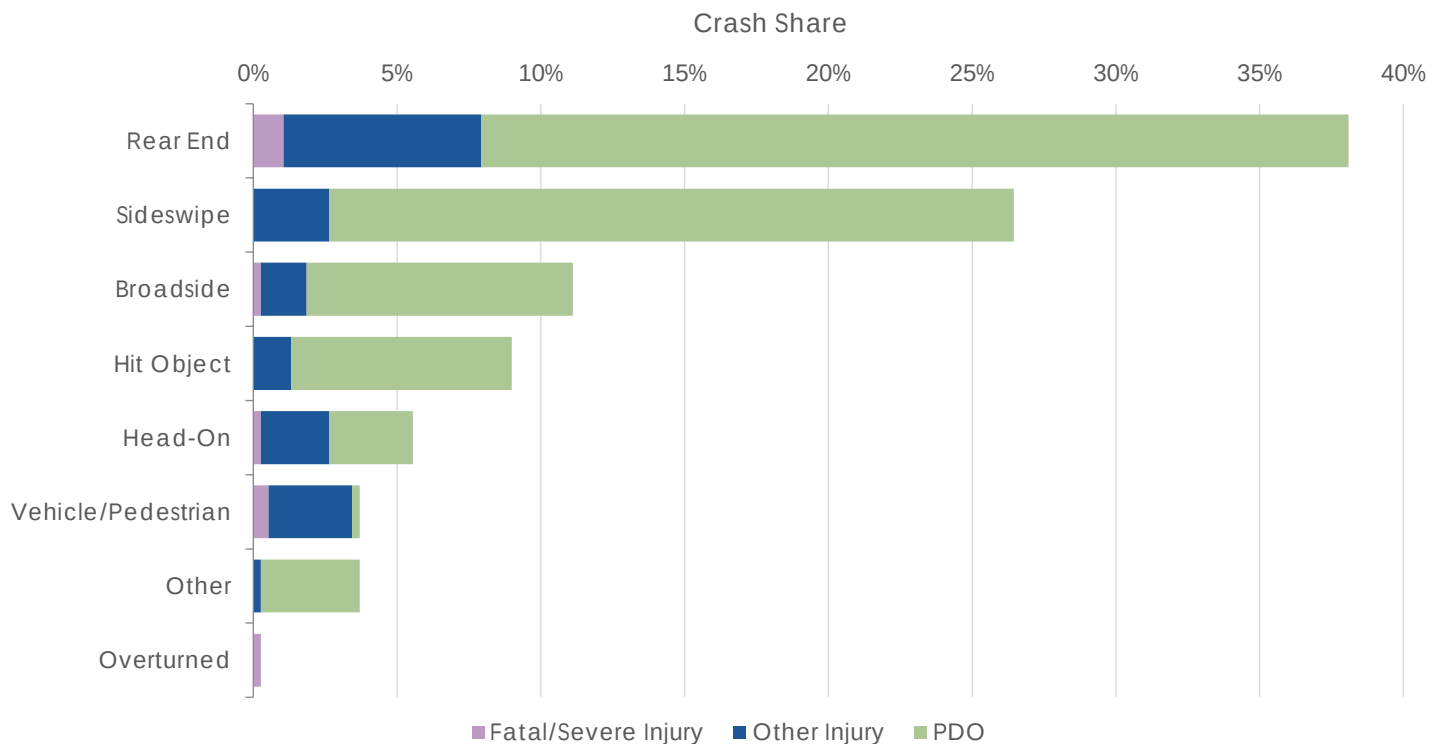
Note: Only select conditions shown to improve legibility for less frequent weather conditions.

## COLLISION TYPE

Figure 27 reports the most frequent reported collision types by severity.

- Among total reported crashes, the top three most frequent collision types are rear end (38 percent), sideswipe (26 percent), and broadside crashes (11 percent). These three collision types account for 75 percent of reported crashes citywide.
- Among fatal/severe injury crashes, the top two collision types are rear end (44 percent), and vehicle/pedestrian (22 percent). Broadside, head-on, and overturned crashes each accounted for one severe injury crash.

Figure 27: Crashes by Collision Type and Severity



Source: SWITRS, TIMS, Kittelson, 2021.

Note: "Other injury" includes "Other visible injury" and "Complaint of pain" crashes. "PDO" = property damage only.

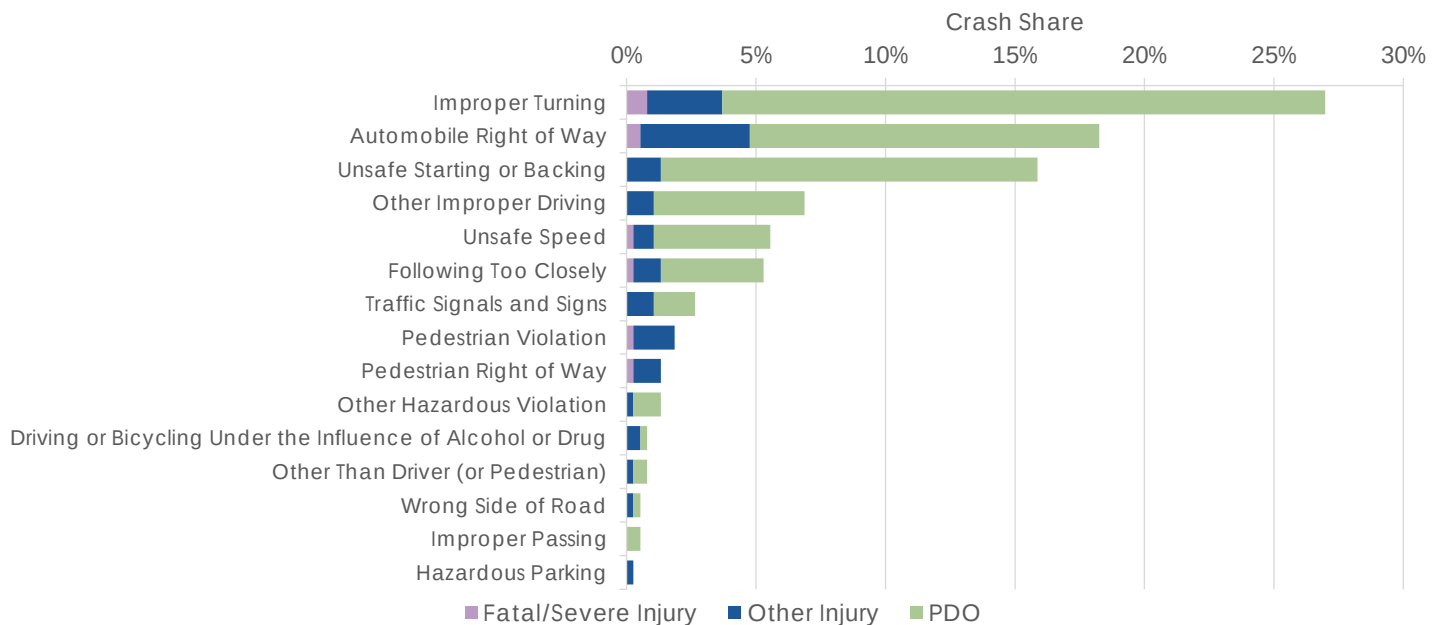


## PRIMARY COLLISION FACTOR

Reporting officers identify a primary collision factor (PCF) for each crash. It is up to the officer's judgement and information available at the scene for them to select the factor that is most relevant. Officers select one from among a list of PCFs based on California Vehicle Code (CVC) and road user behavior. Figure 28 presents the most frequently cited PCFs.

- Among total reported crashes, the three most frequently reported PCFs are improper turning<sup>11</sup> (27 percent), automobile right of way<sup>12</sup> (18 percent), and unsafe starting or backing<sup>13</sup> (16 percent). These three account for 61 percent of reported crashes.
- Among fatal/severe injury crashes, the two most frequently reported PCFs are improper turning<sup>11</sup> (33 percent) and automobile right of way<sup>12</sup> (22 percent). Unsafe speed<sup>14</sup>, following too closely, pedestrian right of way, and pedestrian violation<sup>15</sup> were each reported in one fatal/severe injury crash.

Figure 28: Crashes by Reported PCF and Severity



Source: SWITRS, TIMS, Kittelson, 2021.

Notes: PCFs constituting <1% excluded from chart to enhance legibility. Those PCFs include other equipment, impeding traffic, lights, and brakes.

"Other injury" includes "Other visible injury" and "Complaint of pain" crashes. "PDO" = property damage only.

<sup>11</sup> Reported PCF based on CVC violation indicating a failure while turning from a direct course without reasonable safety or not signaling appropriately.

<sup>12</sup> Reported PCF based on CVC violation indicating a driver turning failed to yield right-of-way to oncoming traffic.

<sup>13</sup> Reported PCF based on CVC violation indicating unsafe starting or backing of the vehicle.

<sup>14</sup> Reported PCF based on CVC violation indicating unsafe speeding on a highway.

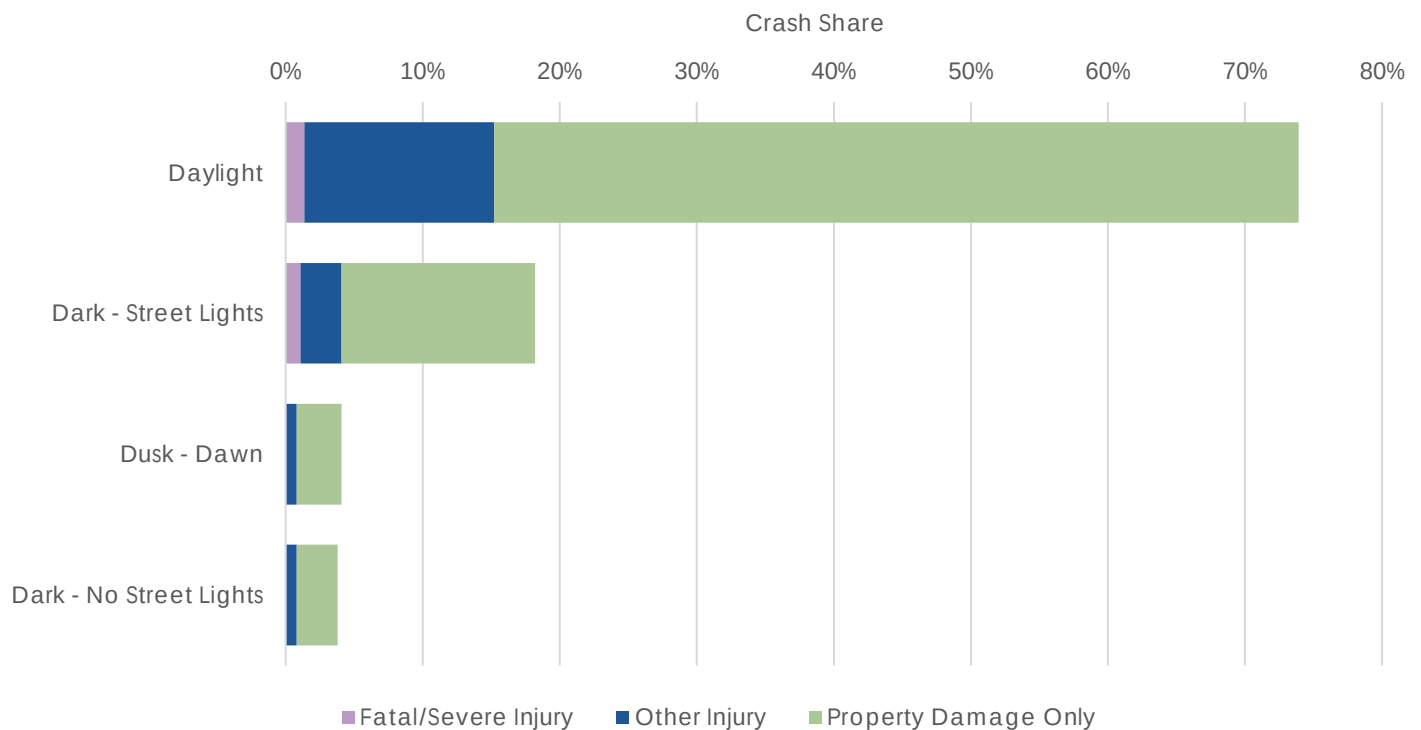
<sup>15</sup> Reported PCF based on CVC violation indicating a pedestrian failure to yield the right of way to other vehicles.

## LIGHTING

Figure 29 shows citywide crashes by reported lighting and severity.

- Crashes that occurred in daylight conditions make up 72 percent of total reported crashes, and account for four of the nine reported fatal/severe injury crashes.
- Approximately 18 percent of crashes occurred at night under streetlights reported to be working. Of those crashes, four resulted in death or severe injury.

Figure 29: Crashes by Lighting and Severity



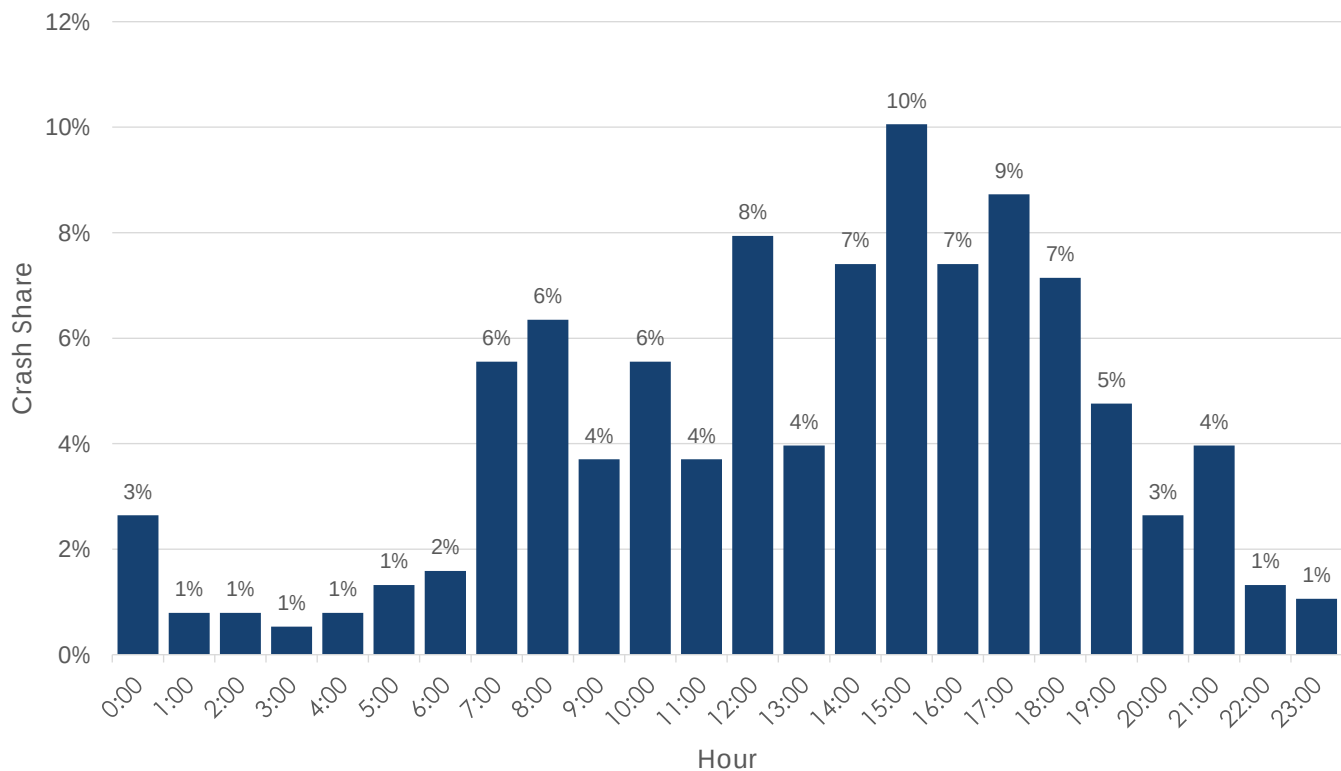
Source: SWITRS, TIMS, Kittelson, 2021

Notes: "Other injury" includes "Other visible injury" and "Complaint of pain" crashes.  
10 crashes were reported as not stated.

## TIME OF DAY

Figure 30 shows crashes by time of day. In the morning, crashes peak from 7 AM to 9 AM. Afternoon crashes are highest from 2 PM to 6 PM with a peak from 3 PM to 4 PM.

Figure 30: Crash Share by Time of Day



Source: SWITRS, TIMS, Kittelson, 2021.

## Pedestrians

Table 12 shows reported pedestrian crashes by severity. Of the 15 reported pedestrian crashes, two crashes resulted in a severe injury. There were no reported fatalities.

Table 12: Pedestrian Involved Crashes by Severity

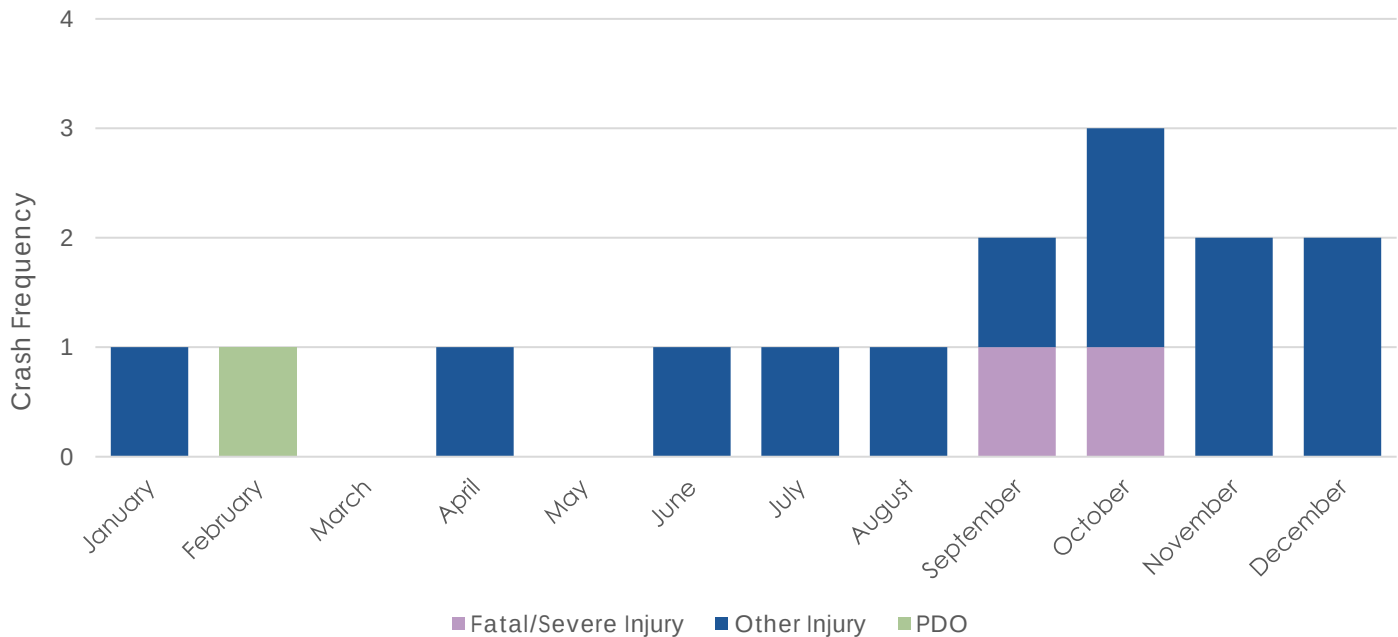
|                     | Fatal<br>(% of Total) | Severe Injury<br>(% of Total) | Visible Injury<br>(% of Total) | Complaint of<br>Pain<br>(% of Total) | Property<br>Damage Only<br>(% of Total) | Total     |
|---------------------|-----------------------|-------------------------------|--------------------------------|--------------------------------------|-----------------------------------------|-----------|
| Pedestrian Involved | 0 (0%)                | 2 (13%)                       | 7 (47%)                        | 5 (33%)                              | 1 (7%)                                  | 15 (100%) |

Source: SWITRS, TIMS, Kittelson, 2021.

### SEVERITY AND MONTH

Figure 31 presents pedestrian crashes organized by month and severity with an average rate of one crash per month. The months between September and December show an increase in frequency with the most reported crashes in October. These trends should be interpreted with caution given the limited number of total reported crashes.

Figure 31: Pedestrian Crashes by Month and Severity



Source: SWITRS, TIMS, Kittelson, 2021

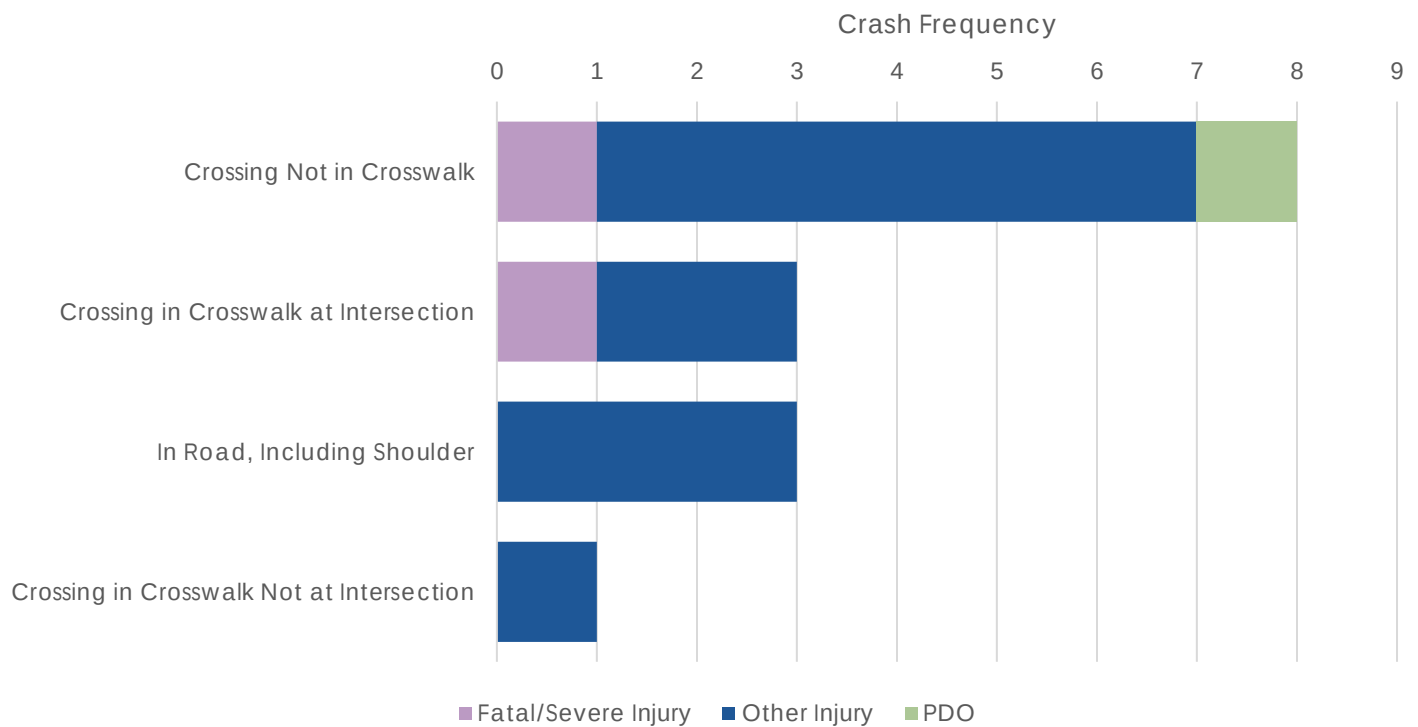
Note: "Other injury" includes "Other visible injury" and "Complaint of pain" crashes. "PDO" = property damage only.

## PEDESTRIAN ACTION AND LOCATION

For pedestrian crashes, data are coded according to the reporting officer's judgment about the pedestrian's action and location preceding the crash. Figure 32 reports these trends for the City.

- The most commonly cited pedestrian action and location was when a pedestrian was crossing not in crosswalk (53 percent).
- The second and third most common pedestrian actions preceding a crash included crossing in a crosswalk at an intersection (20 percent) and walking in the road, including along the shoulder (20 percent).

Figure 32: Pedestrian Crashes by Reported Action/Location and Severity



Source: SWITRS, TIMS, Kittelson, 2021.

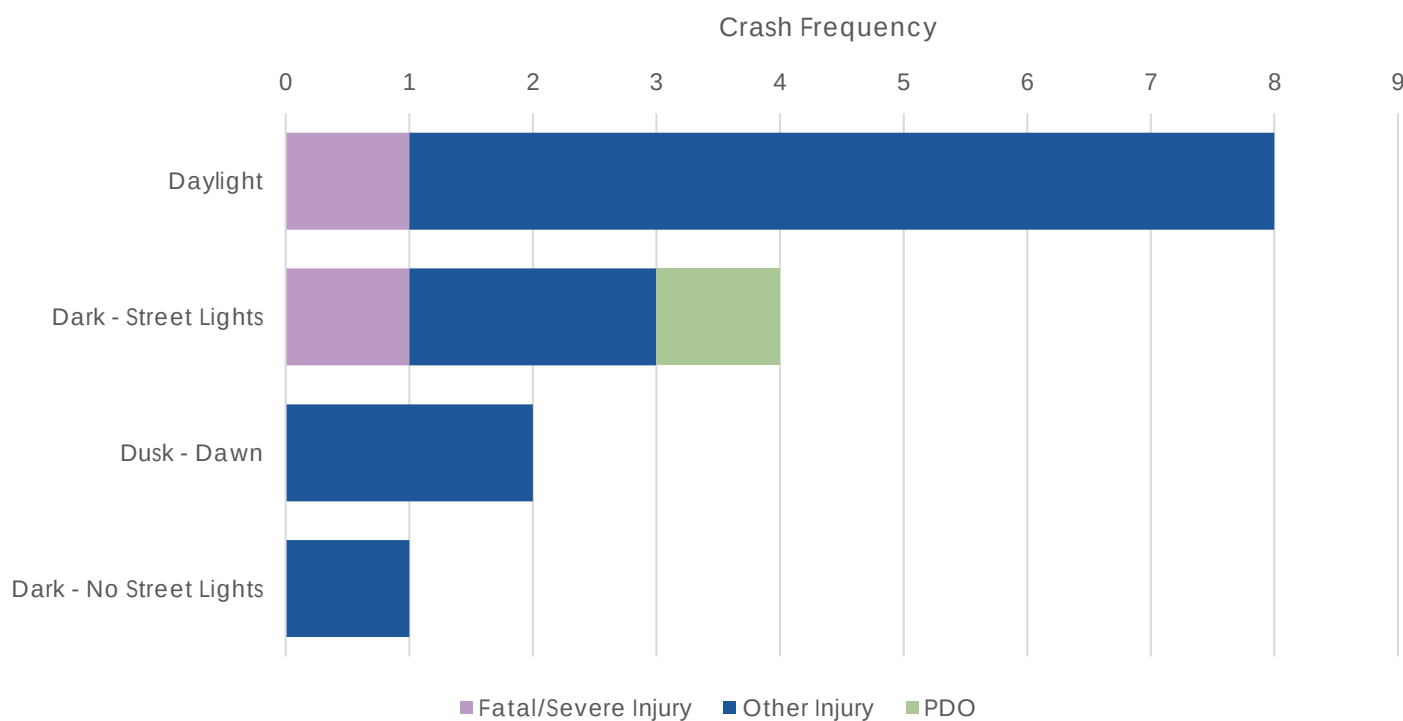
Note: "Other injury" includes "Other visible injury" and "Complaint of pain" crashes. "PDO" = property damage only.

## LIGHTING

Figure 33 shows citywide pedestrian crashes by reported lighting condition and severity.

- Approximately half of crashes occurred during daylight and half under dark or low light conditions.
- Four of the 15 reported pedestrian crashes (and one of the two fatal/severe injury crashes) occurred in dark conditions under streetlights.

Figure 33: Pedestrian Crashes by Lighting and Severity



Source: SWITRS, TIMS, Kittelson, 2021.

Note: "Other injury" includes "Other visible injury" and "Complaint of pain" crashes. "PDO" = property damage only.

## Bicyclists

This section focuses exclusively on reported crashes involving bicyclists. Table 13 presents reported bicyclist-involved crashes citywide organized by severity level. Of the five bicyclist crashes in the City, there were no reported fatal or severe injuries. The five crashes resulted in either visible injury or complaint of pain.

Table 13: Bicycle User Involved Crashes by Severity

|                  | Fatal<br>(% of total) | Severe Injury<br>(% of total) | Visible Injury<br>(% of total) | Complaint of<br>Pain<br>(% of total) | Property<br>Damage Only<br>(% of total) | Total<br>(% of total) |
|------------------|-----------------------|-------------------------------|--------------------------------|--------------------------------------|-----------------------------------------|-----------------------|
| Bicycle Involved | 0 (0%)                | 0 (0%)                        | 4 (80%)                        | 1 (20%)                              | 0 (0%)                                  | 5 (100%)              |

Source: SWITRS, TIMS, Kittelson, 2021.

## COLLISION TYPE

There were five reported bicycle crashes and among those three were recorded as rear end crashes with visible injuries. One crash was a vehicle/pedestrian crash with the bicyclist at fault and one crash was reported as other; these likely indicate a lack of precision in crash reporting for bicycle-involved crashes.

## PRIMARY COLLISION FACTOR (PCF)

The PCF for these bicycle crashes were evenly distributed, with one crash each reported improper turning<sup>16</sup>, automobile right of way<sup>17</sup> (with the motorist at fault), other improper driving<sup>18</sup>, traffic signals and signs<sup>19</sup>, wrong side of the road<sup>20</sup>.

## LIGHTING

Three of the bicycle crashes occurred during the day and the remaining two crashes occurred in the dark with working streetlights.

<sup>16</sup> Reported PCF based on CVC violation indicating a failure while turning from a direct course without reasonable safety or not signaling appropriately.

<sup>17</sup> Reported PCF based on CVC violation indicating a driver turning failed to yield right-of-way to oncoming traffic.

<sup>18</sup> Reported PCF based on CVC violation indicating driving from a direct course without reasonable safety or not signaling appropriately.

<sup>19</sup> Reported PCF based on CVC violation indicating running a red light or failure to stop at a stop sign.

<sup>20</sup> Reported PCF based on CVC violation indicating the driver/rider was on the wrong side of the road.



## Priority Locations

Kittelson identified priority intersections and segments in Coalinga using the annualized crash severity scores and excess predicted crashes described in the Data Summary and Analysis Approach sections (see the Introduction).

For intersection locations, the crash severity scores ranged from zero (no reported crashes during the five years) to 44.02. Figure 34 shows the results of the crash severity scoring. Figure 35 shows excess predicted crash scores by percentiles for intersection locations. For the half-mile roadway segments, the crash severity scores ranged from zero to 35.27. Crash severity score results for roadway segments are shown in Figure 36. Excess predicted crash score results are shown in Figure 37. Intersections or segments shown as not falling within one of the percentile breaks indicates there were no reported crashes at that location.

Table 14 presents the top twenty locations with the highest crash severity scores.

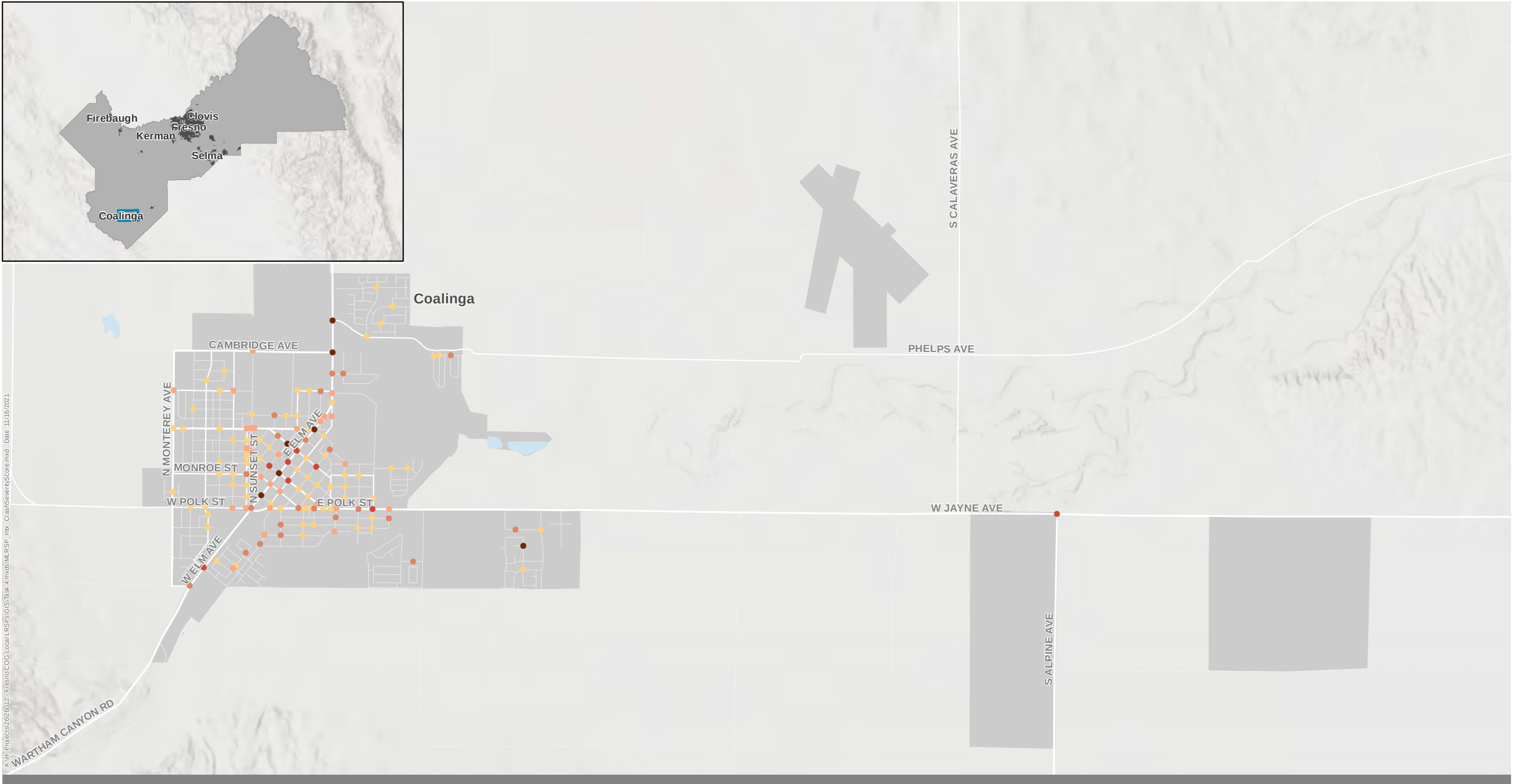
Table 14. Top 20 Locations based on Crash Severity Score

| #  | Location                                                                       | Type         | Crash Severity Score | Total Number of Crashes | Severity |               |                      |                   |     |
|----|--------------------------------------------------------------------------------|--------------|----------------------|-------------------------|----------|---------------|----------------------|-------------------|-----|
|    |                                                                                |              |                      |                         | Fatal    | Severe Injury | Other Visible Injury | Complaint of Pain | PDO |
| 1  | ELM AVE & SEVENTH ST                                                           | Unsignalized | 44.02                | 11                      | 0        | 1             | 1                    | 2                 | 7   |
| 2  | ELM AVE & FIFTH ST                                                             | Unsignalized | 41.78                | 10                      | 0        | 1             | 1                    | 0                 | 8   |
| 3  | ELM AVE & CAMBRIDGE AVE                                                        | Unsignalized | 40.58                | 4                       | 0        | 1             | 1                    | 0                 | 2   |
| 4  | ELM AVE & FIRST ST & VAN NESS ST                                               | Unsignalized | 39.65                | 9                       | 0        | 1             | 0                    | 0                 | 8   |
| 5  | LONGHOLLOW WAY & POPPY MEADOW CT                                               | Unsignalized | 38.25                | 2                       | 0        | 1             | 0                    | 0                 | 1   |
| 6  | POLK STREET FROM HAYES ST TO HACHMAN ST                                        | Segment      | 35.27                | 3                       | 0        | 1             | 1                    | 0                 | 1   |
| 7  | DURIAN AVE & THIRD ST                                                          | Unsignalized | 38.25                | 2                       | 0        | 1             | 0                    | 0                 | 1   |
| 8  | SR 198 FROM LUCILLE AVE TO 7TH ST                                              | Segment      | 33.33                | 3                       | 0        | 1             | 0                    | 0                 | 2   |
| 9  | ELM AVE & PHELPS AVE & OIL CITY RD                                             | Signalized   | 27.45                | 9                       | 0        | 1             | 1                    | 0                 | 7   |
| 10 | FOREST AVE & FIFTH ST                                                          | Unsignalized | 7.79                 | 14                      | 0        | 0             | 1                    | 3                 | 10  |
| 11 | JAYNE AVE FROM QUAIL CREEK RD TO ALPINE AVE                                    | Segment      | 6.47                 | 16                      | 0        | 0             | 1                    | 5                 | 10  |
| 12 | JAYNE AVE FROM PLEASANT VALLEY STATE PRISON TO COALINGA DEPT OF STATE HOSPITAL | Segment      | 5.77                 | 9                       | 0        | 0             | 1                    | 2                 | 6   |
| 13 | ELM AVE & FOURTH ST                                                            | Unsignalized | 5.36                 | 12                      | 0        | 0             | 1                    | 1                 | 10  |
| 14 | POLK ST & GARFIELD ST                                                          | Unsignalized | 5.25                 | 11                      | 0        | 0             | 0                    | 3                 | 8   |
| 15 | GLENN AVE & THIRD ST                                                           | Unsignalized | 3.56                 | 3                       | 0        | 0             | 1                    | 1                 | 1   |
| 16 | DURIAN AVE & FIFTH ST                                                          | Unsignalized | 3.54                 | 8                       | 0        | 0             | 1                    | 0                 | 7   |
| 17 | ELM AVE & THIRD ST                                                             | Unsignalized | 3.43                 | 7                       | 0        | 0             | 0                    | 2                 | 5   |
| 18 | ELM AVE & PACIFIC ST                                                           | Unsignalized | 2.94                 | 5                       | 0        | 0             | 1                    | 0                 | 4   |
| 19 | ALPINE AVE & JAYNE AVE                                                         | Unsignalized | 2.94                 | 5                       | 0        | 0             | 1                    | 0                 | 4   |
| 20 | FOREST AVE & SACRAMENTO ST                                                     | Unsignalized | 2.83                 | 4                       | 0        | 0             | 0                    | 2                 | 2   |

Note: PDO = Property Damage Only



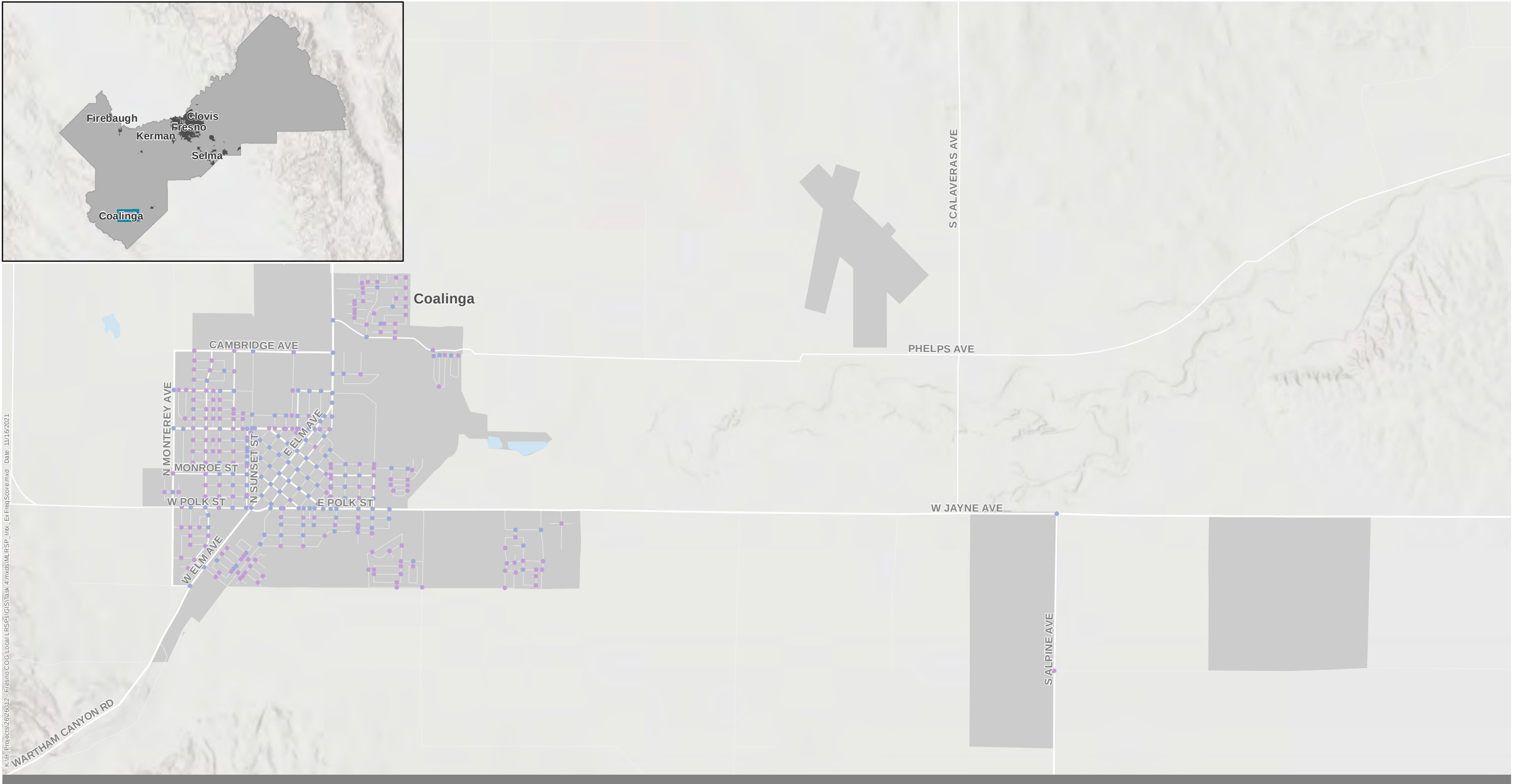




- Crash Severity Score**
- 95-100th Percentile
  - 75-90th Percentile
  - 50-75th Percentile
  - 0-50th Percentile
- City Limits
- County Boundary



Figure 34



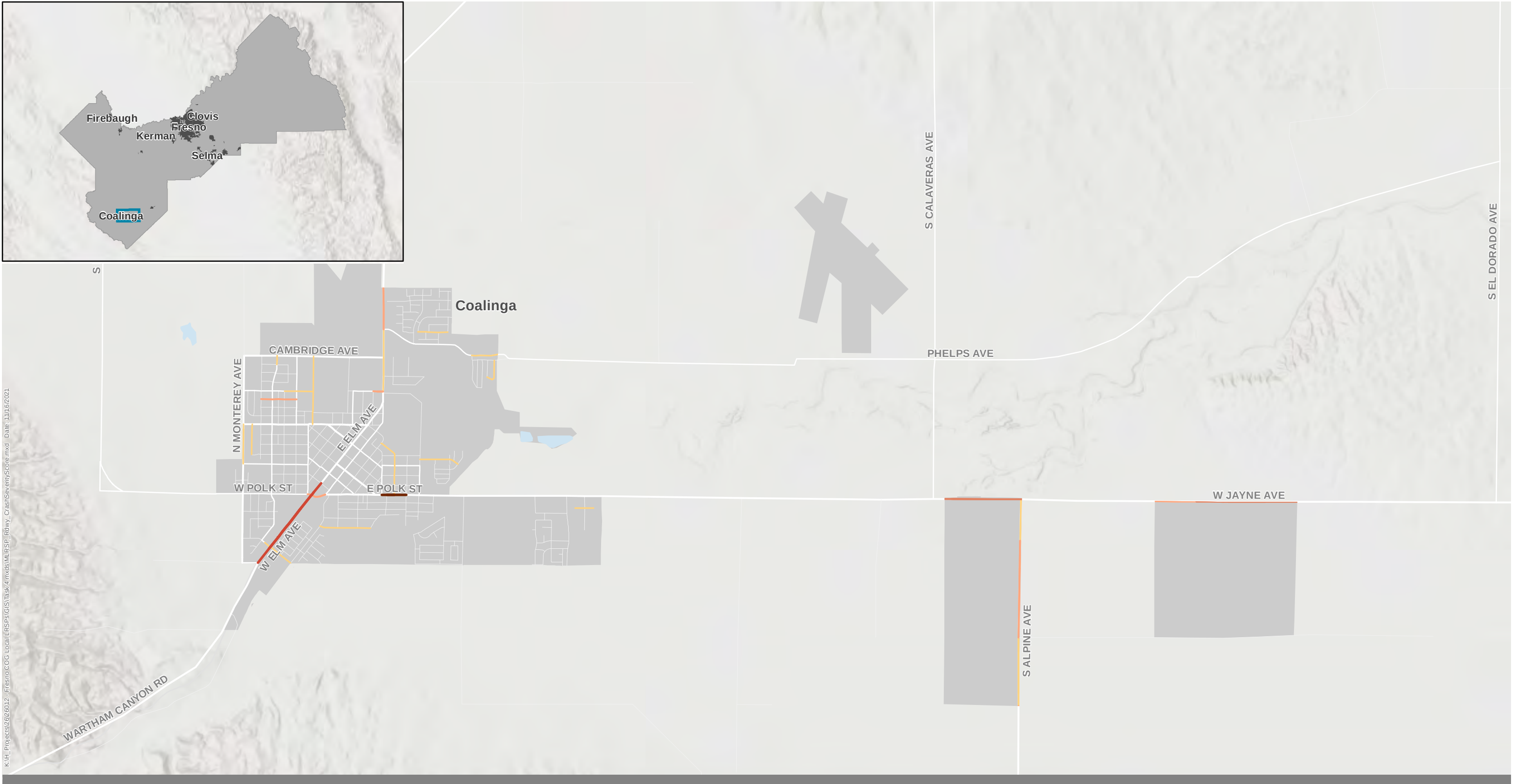
- Excess Expected Frequency**

  - 95-100th Percentile
  - 90-95th Percentile
- 75-90th Percentile
  - 50-75th Percentile
  - 0-50th Percentile
- City Limits
  - County Boundary



Excess Predicted Average Crash Frequency Using Method of Moments  
 Jurisdiction Results: Coalinga  
 Fresno Council of Governments

Figure 35



- Crash Severity Scores**

75-90th Percentile
  50-75th Percentile
  90-95th Percentile
  0-50th Percentile

City Limits
  County Boundary



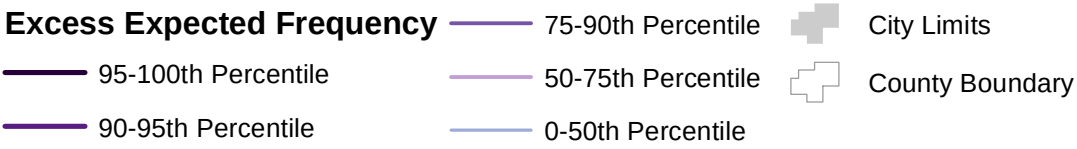
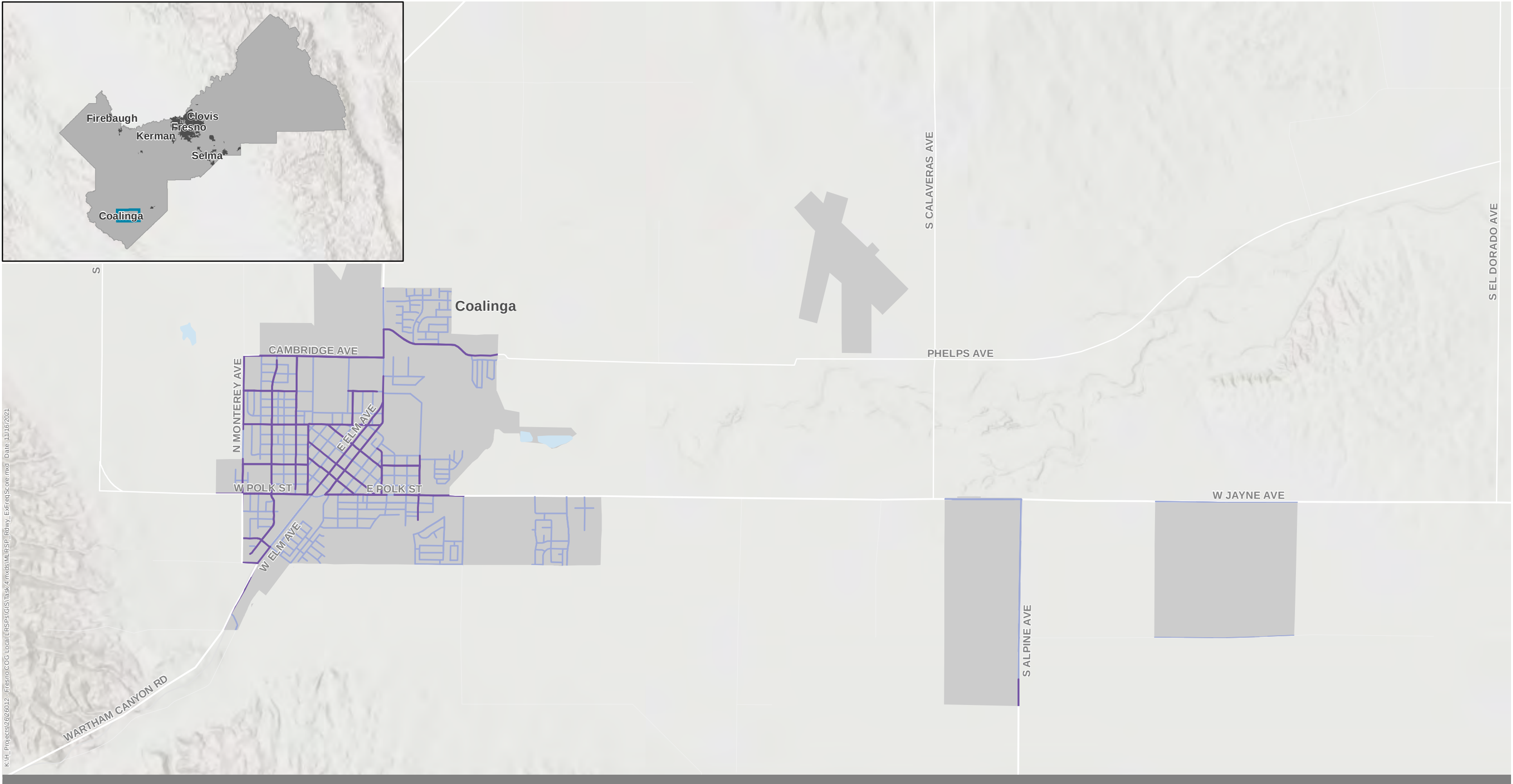


Figure 37

**Roadway Excess Predicted Average Crash Frequency Using Method of Moments  
Jurisdiction Results: Coalinga  
Fresno Council of Governments**



## EMPHASIS AREAS

Based on key trends in the crash data, emphasis areas for the City of Coalinga include rear end crashes, pedestrian crashes, and intersection control and approach.

### Rear End Crashes

Rear end crashes were identified as a focus area given their prevalence in reported crashes. Rear end crashes are the most common collision type, cited in 38 percent of all crashes. Four of the nine severe injury crashes are rear end crashes as are 26 of the 70 other injury crashes, making rear end crashes the most common collision type in injury crashes. As discussed below under Engineering Strategies, countermeasures are available targeted at rear end crashes.

### Pedestrian Crashes

Pedestrian crashes were identified as a focus area given the overrepresentation of pedestrians in fatal and severe crashes. Two of the nine severe crashes involved a pedestrian. The most common pedestrian action preceding a crash was crossing the roadway outside a crosswalk, followed by crossing the roadway at a crosswalk. This suggests opportunities for improvements to pedestrian infrastructure.

Pedestrians are identified as one of the six high priority challenge areas in the California SHSP. These challenge areas “were identified through historical data evaluations and feedback from traffic safety stakeholders across the state” (Caltrans SHSP). The high priorities represent “the greatest opportunity to reduce fatalities and serious injuries across the state” (Caltrans SHSP).

### Intersection Control and Approach

The top three fatal and severe injury primary collision factors of improper turning, automobile right of way, and unsafe starting and backing were primarily cited in rear end (83 crashes), sideswipe (64 crashes), broadside (37 crashes), and hit object crashes (11 crashes). These collectively indicate that drivers are not properly following indications provided on roadways and at intersections in the City.

The California SHSP includes intersections as one of the six high priorities in California. These crashes are a high priority due to their severity level often as a result of rear-end, broadside, and hit object collision types. “Intersections significantly increase driver workload because they are a natural point of conflict. If present, traffic control devices help to mitigate that workload by providing clear rules of right-of-way” (Caltrans SHSP). As discussed below under Engineering Strategies, several roadway and intersection countermeasures are available targeted at improving driver awareness and expectation as well as improving the roadway to minimize risk of crashes.

## STRATEGIES

The following subsections present engineering, education, emergency services, and enforcement strategies to help improve roadway safety within the City of Coalinga.



### Engineering Strategies

The top two fatal and severe injury collision types in Coalinga were rear end and vehicle-pedestrian crashes, and sideswipe was a frequently reported collision type. The top three fatal and severe injury primary collision factors were improper turning and automobile right of way, and unsafe starting and backing was a frequently reported primary collision factor. High priority countermeasures to address these collision types and primary collision factors are shown in Table 15.

Table 15. High Priority Countermeasures

|                                    | Countermeasure Name                                                                            | ID      | Crashes Addressed                    |
|------------------------------------|------------------------------------------------------------------------------------------------|---------|--------------------------------------|
| Roadway Countermeasures            | Street Lighting                                                                                | R1      | Crashes at night                     |
|                                    | Install Raised Median                                                                          | R8      | Improper turning                     |
|                                    | Widen Shoulder                                                                                 | R15     | Sideswipe                            |
|                                    | Improve Pavement Friction (High Friction Surface Treatment)                                    | R21     | Rear end                             |
|                                    | Install/Upgrade Signs with New Fluorescent Sheeting                                            | R22     | Sideswipe                            |
|                                    | Install Centerline Rumble Strips/Stripes                                                       | R30     | Sideswipe                            |
| Intersection Countermeasures       | Add Intersection Lighting at Intersections                                                     | S1/NS1  | Crashes at night                     |
|                                    | Improve Signal Hardware: Lenses, Backplates with Retroreflective Border, Mounting Size, Number | S2      | Rear end                             |
|                                    | Provide Advanced Dilemma-Zone Detection                                                        | S4      | Rear end                             |
|                                    | Install Flashing Beacons as Advance Warning                                                    | S10/NS9 | Rear end                             |
|                                    | No Right-Turn on Red                                                                           | n/a     | Vehicle-pedestrian, improper turning |
|                                    | Convert Intersection to Roundabout                                                             | NS4/NS5 | All                                  |
|                                    | Install/Upgrade Stop Signs or Intersection Warning/Regulatory Signs                            | NS6     | All                                  |
|                                    | Upgrade Intersection Pavement Markings                                                         | NS7     | All                                  |
|                                    | Install Splitter Islands for Minor Street Approaches                                           | NS13    | Rear end                             |
| Pedestrian/Bicycle Countermeasures | Install Sidewalk/Pathway                                                                       | R34PB   | Vehicle-pedestrian                   |
|                                    | Install/Upgrade Pedestrian Crossing with Enhanced Features                                     | R35PB   | Vehicle-pedestrian                   |
|                                    | Install Raised Medians (or Refuge Islands)                                                     | NS19PB  | Vehicle-pedestrian                   |
|                                    | Install/Upgrade Pedestrian Crossing at Uncontrolled Locations (with Enhanced Safety Features)  | NS21PB  | Vehicle-pedestrian                   |

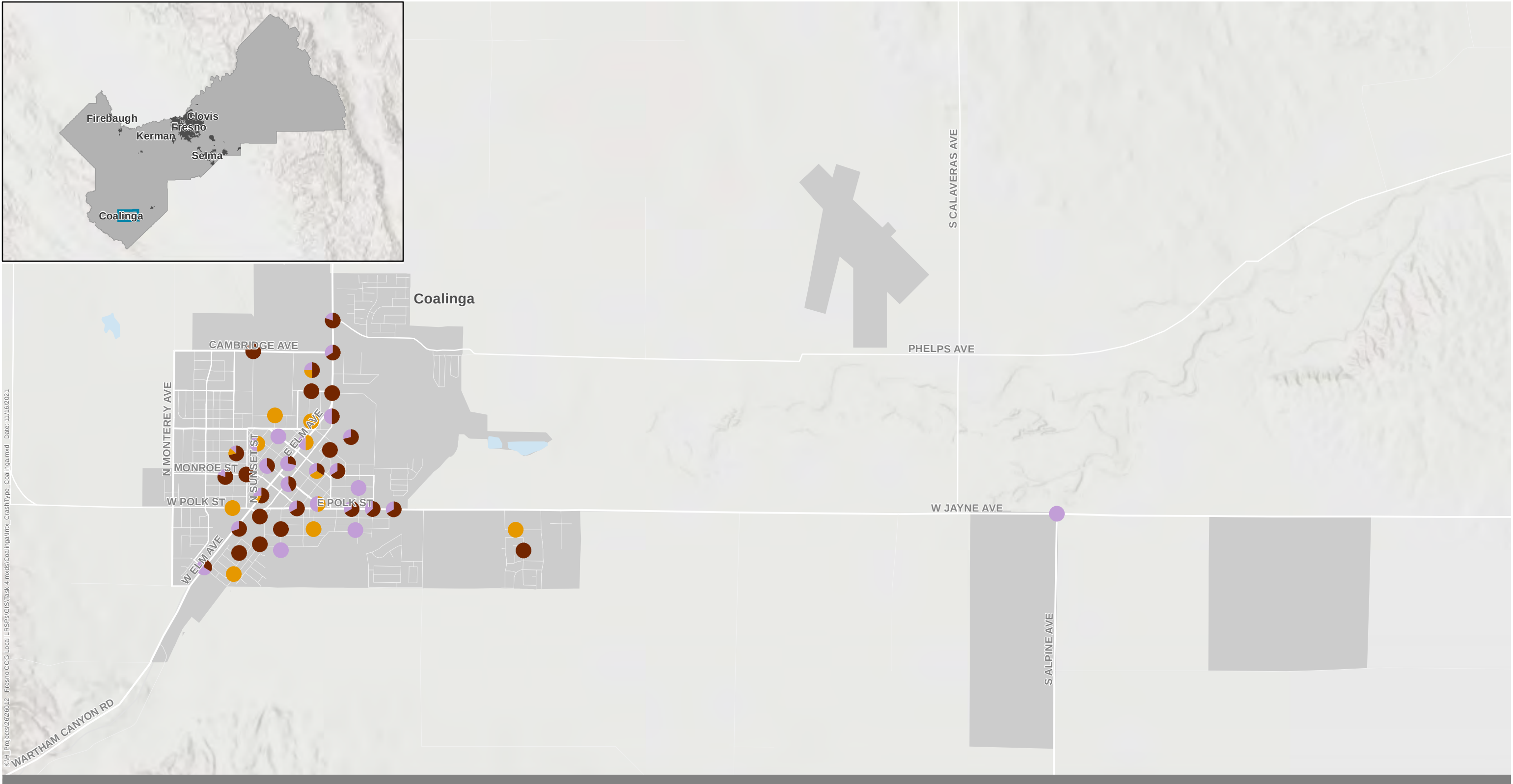
Note: The ID number references the Caltrans Manual Local Road Safety

Appendix B contains the regional Countermeasures Toolbox which includes more detailed information regarding the countermeasures listed above.



The following figures and tables provide data on collision types and factors for the intersections and roadways with the highest crash scores. The locations with the highest crash scores may be top priorities for implementing countermeasures and pursuing grants. Coalinga can use the information about collision type and factors to identify potential countermeasures to apply, using the information in Table 15.

Figure 38 and Figure 39 present the top fifty priority intersections and breakdown of the top collision types and primary collision factors, respectively. Figure 40 and Figure 41 present the top priority roadways and breakdown of the top collision types and primary collision factors, respectively.



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### Collision Type

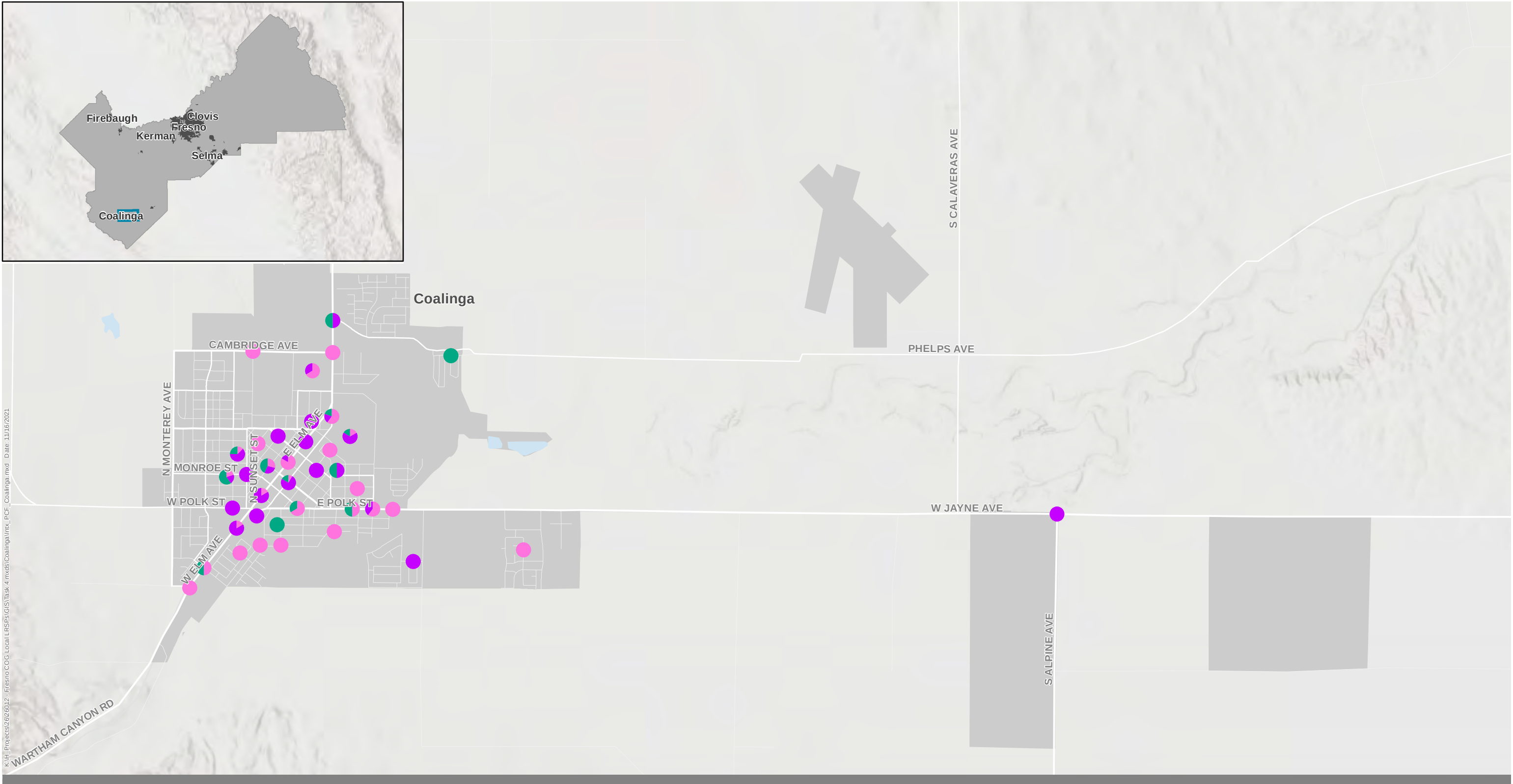
- Rear End
- Vehicle-Pedestrian
- Sideswipe

- City Limits
- County Boundary



Figure 38  
**Top Fatal/Severe Injury Intersection Collision Types  
Jurisdiction Results: Coalinga  
Fresno Council of Governments**





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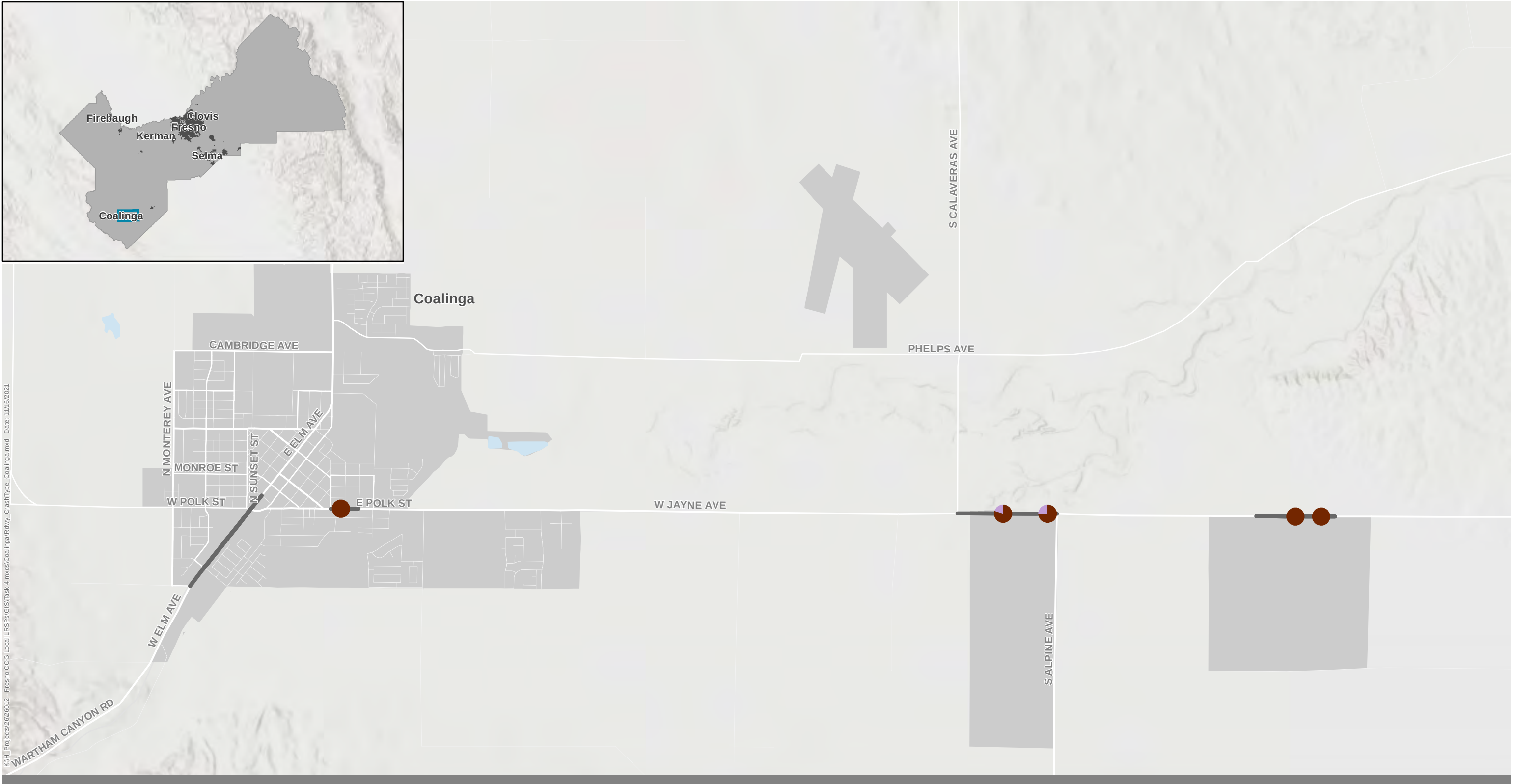
**Primary Collision Factors**

- Improper Turning
- Automobile Right of Way
- Unsafe Starting or Backing

- City Limits
- County Boundary



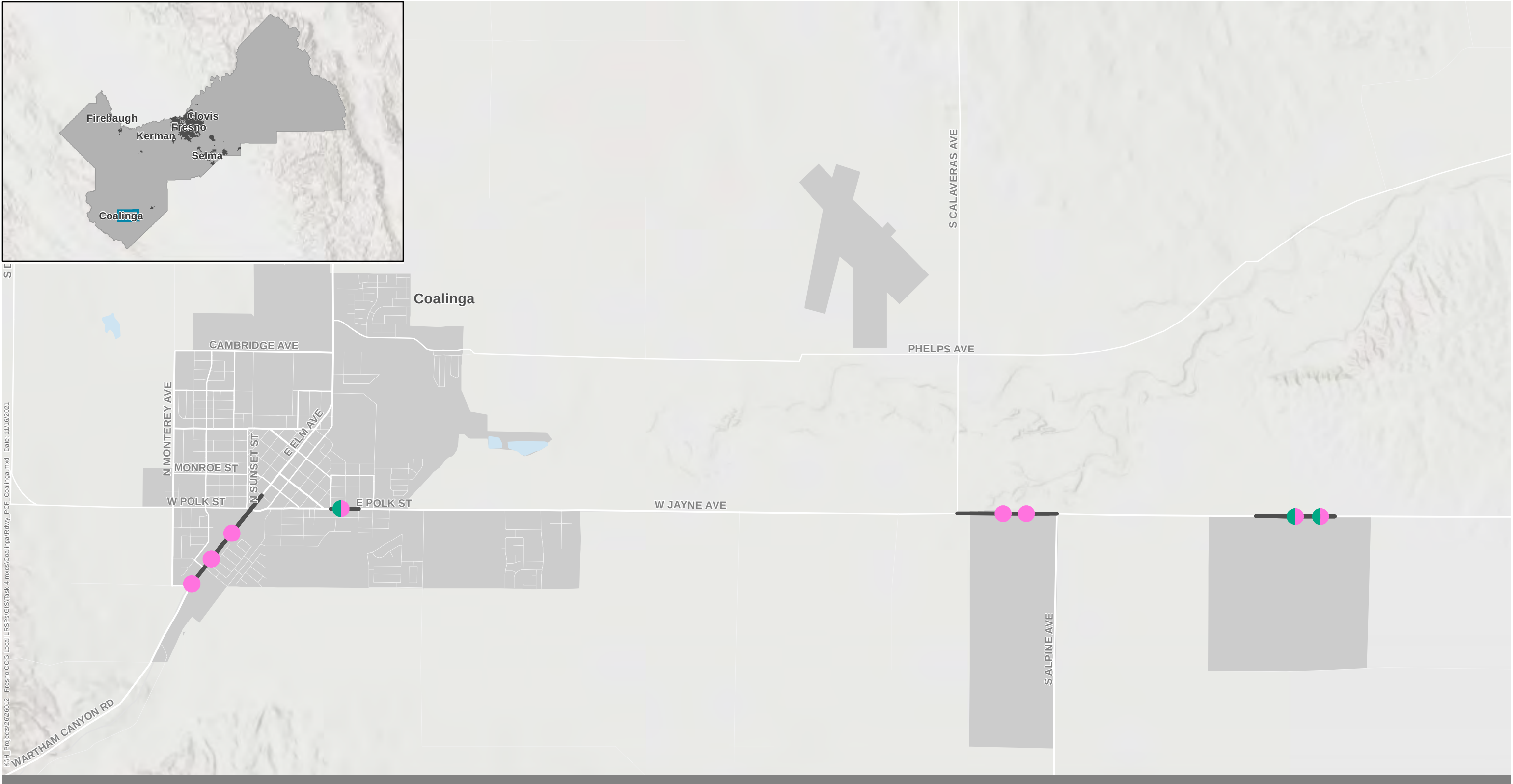
Figure 39  
**Top Fatal/Severe Injury Intersection Primary Collision Factors  
Jurisdiction Results: Coalinga  
Fresno Council of Governments**



- Collision Type**
  - Rear End
  - Sideswipe
  - Priority Roadways
- City Limits
  - County Boundary

Figure 40

**Top Fatal/Severe Injury Roadway Collision Types**  
**Jurisdiction Results: Coalinga**  
**Fresno Council of Governments**



**Primary Collision Factors**

- Improper Turning
- Unsafe Starting or Backing

Priority Roadways

- City Limits
- County Boundary



Figure 41  
**Top Fatal/Severe Injury Roadway Primary Collision Factors  
 Jurisdiction Results: Coalinga  
 Fresno Council of Governments**

Table 16 and Table 17 provide information for the top fifty intersection locations (based on crash severity score), including control type (signalized or unsignalized), crash severity score, and total number of crashes by collision type or primary collision factor.

Table 16. Priority Intersections with Collision Type based on Top 3 Fatal/Severe Injury Collision Types

| #  | Location                               | Control Type | Crash Severity Score | Total Number of Crashes | Collision Type |                     |           |       |
|----|----------------------------------------|--------------|----------------------|-------------------------|----------------|---------------------|-----------|-------|
|    |                                        |              |                      |                         | Rear End       | Vehicle/ Pedestrian | Sideswipe | Other |
| 1  | ELM AVE & SEVENTH ST                   | Unsignalized | 44.02                | 11                      | 4              | 1                   | 2         | 4     |
| 2  | ELM AVE & FIFTH ST                     | Unsignalized | 41.78                | 10                      | 5              | 1                   | 1         | 3     |
| 3  | ELM AVE & CAMBRIDGE AVE                | Unsignalized | 40.58                | 4                       | 2              | 0                   | 1         | 1     |
| 4  | ELM AVE & FIRST ST & VAN NESS ST       | Unsignalized | 39.65                | 9                       | 5              | 0                   | 2         | 2     |
| 5  | LONGHOLLOW WAY & POPPY MEADOW CT       | Unsignalized | 38.25                | 2                       | 1              | 0                   | 0         | 1     |
| 6  | DURIAN AVE & THIRD ST                  | Unsignalized | 38.25                | 2                       | 0              | 1                   | 1         | 0     |
| 7  | ELM AVE & PHELPS AVE & OIL CITY RD     | Signal       | 27.45                | 9                       | 4              | 0                   | 1         | 4     |
| 8  | FOREST AVE & FIFTH ST                  | Unsignalized | 7.79                 | 14                      | 3              | 0                   | 4         | 7     |
| 9  | ELM AVE & FOURTH ST                    | Unsignalized | 5.36                 | 12                      | 2              | 0                   | 5         | 5     |
| 10 | POLK ST & GARFIELD ST                  | Unsignalized | 5.25                 | 11                      | 7              | 0                   | 4         | 0     |
| 11 | GLENN AVE & THIRD ST                   | Unsignalized | 3.56                 | 3                       | 1              | 1                   | 1         | 0     |
| 12 | DURIAN AVE & FIFTH ST                  | Unsignalized | 3.54                 | 8                       | 2              | 0                   | 3         | 3     |
| 13 | ELM AVE & THIRD ST                     | Unsignalized | 3.43                 | 7                       | 4              | 0                   | 2         | 1     |
| 14 | ELM AVE & PACIFIC ST                   | Unsignalized | 2.94                 | 5                       | 1              | 0                   | 2         | 2     |
| 15 | ALPINE AVE & JAYNE AVE                 | Unsignalized | 2.94                 | 5                       | 0              | 0                   | 1         | 4     |
| 16 | FOREST AVE & SACRAMENTO ST             | Unsignalized | 2.83                 | 4                       | 2              | 0                   | 0         | 2     |
| 17 | POLK ST & HACHMAN ST                   | Unsignalized | 2.83                 | 4                       | 2              | 0                   | 1         | 1     |
| 18 | POLK ST & SIXTH ST & HAWTHORNE AVE     | Unsignalized | 2.74                 | 4                       | 2              | 0                   | 1         | 1     |
| 19 | ELM AVE & LUCILLE AVE                  | Unsignalized | 2.34                 | 2                       | 0              | 0                   | 0         | 2     |
| 20 | LOUISIANA ST & HOUSTON ST              | Unsignalized | 2.34                 | 2                       | 0              | 0                   | 2         | 0     |
| 21 | THOMPSON ST & VALLEY ST                | Unsignalized | 2.34                 | 2                       | 0              | 0                   | 0         | 2     |
| 22 | WARTHAN ST & VALLEY ST                 | Unsignalized | 2.34                 | 2                       | 0              | 0                   | 1         | 1     |
| 23 | GLENN AVE & PINE ST                    | Unsignalized | 2.34                 | 2                       | 1              | 0                   | 0         | 1     |
| 24 | ELM AVE & SECOND ST                    | Unsignalized | 2.34                 | 2                       | 0              | 1                   | 1         | 0     |
| 25 | ELM AVE & WALNUT AVE                   | Unsignalized | 2.22                 | 6                       | 2              | 1                   | 1         | 2     |
| 26 | ELM AVE & POLK ST                      | Signal       | 2.20                 | 11                      | 7              | 0                   | 3         | 1     |
| 27 | CHARDONNAY LN & BURGANDY WAY           | Unsignalized | 2.14                 | 1                       | 0              | 0                   | 0         | 1     |
| 28 | HALIBURTON WAY & BOARDAGARY LN         | Unsignalized | 2.14                 | 1                       | 1              | 0                   | 0         | 0     |
| 29 | COYOTE SPRINGS ST & WILLOW SPRINGS AVE | Unsignalized | 2.14                 | 1                       | 0              | 1                   | 0         | 0     |
| 30 | LOUISIANA ST & PLEASANT ST             | Unsignalized | 2.14                 | 1                       | 1              | 0                   | 0         | 0     |

| #  | Location                          | Control Type | Crash Severity Score | Total Number of Crashes | Collision Type |                     |           |       |
|----|-----------------------------------|--------------|----------------------|-------------------------|----------------|---------------------|-----------|-------|
|    |                                   |              |                      |                         | Rear End       | Vehicle/ Pedestrian | Sideswipe | Other |
| 31 | ALFRED ST & POLK ST & IVY AVE     | Unsignalized | 2.14                 | 1                       | 0              | 1                   | 0         | 0     |
| 32 | MONROE ST & SUNSET ST & CEDAR AVE | Unsignalized | 2.14                 | 1                       | 1              | 0                   | 0         | 0     |
| 33 | CEDAR AVE & THIRD ST              | Unsignalized | 2.14                 | 1                       | 0              | 0                   | 1         | 0     |
| 34 | FILLMORE ST & BAKER ST            | Unsignalized | 2.14                 | 1                       | 0              | 1                   | 0         | 0     |
| 35 | GRANT ST & CHERRY LN              | Unsignalized | 2.14                 | 1                       | 1              | 0                   | 0         | 0     |
| 36 | WALNUT AVE & MAPLE ST             | Unsignalized | 2.14                 | 1                       | 0              | 0                   | 0         | 1     |
| 37 | MEADOW ST & CAMBRIDGE AVE         | Unsignalized | 2.14                 | 1                       | 0              | 0                   | 0         | 1     |
| 38 | THOMPSON ST & POLK ST             | Unsignalized | 2.02                 | 5                       | 2              | 0                   | 1         | 2     |
| 39 | BAKER ST & TRUMAN LN              | Unsignalized | 2.02                 | 5                       | 1              | 0                   | 1         | 3     |
| 40 | ELM AVE & CHERRY LN               | Unsignalized | 1.82                 | 4                       | 3              | 0                   | 0         | 1     |
| 41 | POLK ST & CALIFORNIA ST           | Unsignalized | 1.62                 | 3                       | 0              | 1                   | 0         | 2     |
| 42 | ELM AVE & SIXTH ST                | Unsignalized | 1.62                 | 3                       | 3              | 0                   | 0         | 0     |
| 43 | WARTHAN ST & POLK ST              | Unsignalized | 1.42                 | 2                       | 0              | 0                   | 2         | 0     |
| 44 | IVY AVE & FIFTH ST                | Unsignalized | 1.42                 | 2                       | 0              | 1                   | 1         | 0     |
| 45 | ELM AVE & GRANT ST                | Unsignalized | 1.42                 | 2                       | 0              | 1                   | 0         | 1     |
| 46 | MONTEREY AVE & HARVARD AVE        | Unsignalized | 1.42                 | 2                       | 0              | 0                   | 0         | 2     |
| 47 | SUNSET ST & CAMBRIDGE AVE         | Unsignalized | 1.42                 | 2                       | 1              | 0                   | 0         | 1     |
| 48 | DURIAN AVE & SIXTH ST             | Unsignalized | 1.40                 | 7                       | 4              | 0                   | 1         | 2     |
| 49 | HALIBURTON WAY & COX LN           | Unsignalized | 1.22                 | 1                       | 0              | 1                   | 0         | 0     |
| 50 | WARTHAN ST & TACHE ST             | Unsignalized | 1.22                 | 1                       | 0              | 0                   | 0         | 1     |

Note: Other crashes include all crashes that are not coded as one of the top three collision types

Table 17. Priority Intersections with Primary Collision Factor based on Top 3 Fatal/Severe Injury Primary Collision Factors

| #  | Location                           | Type         | Crash Severity Score | Total Number of Crashes | Primary Collision Factor |          |                            |       |
|----|------------------------------------|--------------|----------------------|-------------------------|--------------------------|----------|----------------------------|-------|
|    |                                    |              |                      |                         | Improper Turning         | Auto ROW | Unsafe Starting or Backing | Other |
| 1  | ELM AVE & SEVENTH ST               | Unsignalized | 44.02                | 11                      | 1                        | 5        | 0                          | 5     |
| 2  | ELM AVE & FIFTH ST                 | Unsignalized | 41.78                | 10                      | 1                        | 5        | 2                          | 2     |
| 3  | ELM AVE & CAMBRIDGE AVE            | Unsignalized | 40.58                | 4                       | 2                        | 0        | 0                          | 2     |
| 4  | ELM AVE & FIRST ST & VAN NESS ST   | Unsignalized | 39.65                | 9                       | 1                        | 4        | 1                          | 3     |
| 5  | LONGHOLLOW WAY & POPPY MEADOW CT   | Unsignalized | 38.25                | 2                       | 1                        | 0        | 0                          | 1     |
| 6  | DURIAN AVE & THIRD ST              | Unsignalized | 38.25                | 2                       | 1                        | 0        | 0                          | 1     |
| 7  | ELM AVE & PHELPS AVE & OIL CITY RD | Signal       | 27.45                | 9                       | 0                        | 1        | 1                          | 7     |
| 8  | FOREST AVE & FIFTH ST              | Unsignalized | 7.79                 | 14                      | 1                        | 9        | 2                          | 2     |
| 9  | ELM AVE & FOURTH ST                | Unsignalized | 5.36                 | 12                      | 5                        | 1        | 0                          | 6     |
| 10 | POLK ST & GARFIELD ST              | Unsignalized | 5.25                 | 11                      | 3                        | 2        | 0                          | 6     |

| #  | Location                               | Type         | Crash Severity Score | Total Number of Crashes | Primary Collision Factor |          |                            |       |
|----|----------------------------------------|--------------|----------------------|-------------------------|--------------------------|----------|----------------------------|-------|
|    |                                        |              |                      |                         | Improper Turning         | Auto ROW | Unsafe Starting or Backing | Other |
| 11 | GLENN AVE & THIRD ST                   | Unsignalized | 3.56                 | 3                       | 0                        | 2        | 0                          | 1     |
| 12 | DURIAN AVE & FIFTH ST                  | Unsignalized | 3.54                 | 8                       | 2                        | 2        | 3                          | 1     |
| 13 | ELM AVE & THIRD ST                     | Unsignalized | 3.43                 | 7                       | 0                        | 2        | 2                          | 3     |
| 14 | ELM AVE & PACIFIC ST                   | Unsignalized | 2.94                 | 5                       | 2                        | 0        | 2                          | 1     |
| 15 | ALPINE AVE & JAYNE AVE                 | Unsignalized | 2.94                 | 5                       | 0                        | 3        | 0                          | 2     |
| 16 | FOREST AVE & SACRAMENTO ST             | Unsignalized | 2.83                 | 4                       | 2                        | 0        | 0                          | 2     |
| 17 | POLK ST & HACHMAN ST                   | Unsignalized | 2.83                 | 4                       | 1                        | 0        | 1                          | 2     |
| 18 | POLK ST & SIXTH ST & HAWTHORNE AVE     | Unsignalized | 2.74                 | 4                       | 2                        | 0        | 1                          | 1     |
| 19 | ELM AVE & LUCILLE AVE                  | Unsignalized | 2.34                 | 2                       | 2                        | 0        | 0                          | 0     |
| 20 | LOUISIANA ST & HOUSTON ST              | Unsignalized | 2.34                 | 2                       | 1                        | 0        | 0                          | 1     |
| 21 | THOMPSON ST & VALLEY ST                | Unsignalized | 2.34                 | 2                       | 0                        | 0        | 0                          | 2     |
| 22 | WARTHAN ST & VALLEY ST                 | Unsignalized | 2.34                 | 2                       | 1                        | 0        | 0                          | 1     |
| 23 | GLENN AVE & PINE ST                    | Unsignalized | 2.34                 | 2                       | 1                        | 0        | 0                          | 1     |
| 24 | ELM AVE & SECOND ST                    | Unsignalized | 2.34                 | 2                       | 0                        | 1        | 0                          | 1     |
| 25 | ELM AVE & WALNUT AVE                   | Unsignalized | 2.22                 | 6                       | 2                        | 1        | 0                          | 3     |
| 26 | ELM AVE & POLK ST                      | Signal       | 2.20                 | 11                      | 1                        | 5        | 0                          | 5     |
| 27 | CHARDONNAY LN & BURGANDY WAY           | Unsignalized | 2.14                 | 1                       | 0                        | 1        | 0                          | 0     |
| 28 | HALIBURTON WAY & BOARDAGARY LN         | Unsignalized | 2.14                 | 1                       | 1                        | 0        | 0                          | 0     |
| 29 | COYOTE SPRINGS ST & WILLOW SPRINGS AVE | Unsignalized | 2.14                 | 1                       | 0                        | 0        | 0                          | 1     |
| 30 | LOUISIANA ST & PLEASANT ST             | Unsignalized | 2.14                 | 1                       | 0                        | 0        | 1                          | 0     |
| 31 | ALFRED ST & POLK ST & IVY AVE          | Unsignalized | 2.14                 | 1                       | 0                        | 0        | 0                          | 1     |
| 32 | MONROE ST & SUNSET ST & CEDAR AVE      | Unsignalized | 2.14                 | 1                       | 0                        | 1        | 0                          | 0     |
| 33 | CEDAR AVE & THIRD ST                   | Unsignalized | 2.14                 | 1                       | 0                        | 1        | 0                          | 0     |
| 34 | FILLMORE ST & BAKER ST                 | Unsignalized | 2.14                 | 1                       | 0                        | 0        | 0                          | 1     |
| 35 | GRANT ST & CHERRY LN                   | Unsignalized | 2.14                 | 1                       | 0                        | 0        | 0                          | 1     |
| 36 | WALNUT AVE & MAPLE ST                  | Unsignalized | 2.14                 | 1                       | 0                        | 0        | 0                          | 1     |
| 37 | MEADOW ST & CAMBRIDGE AVE              | Unsignalized | 2.14                 | 1                       | 0                        | 0        | 1                          | 0     |
| 38 | THOMPSON ST & POLK ST                  | Unsignalized | 2.02                 | 5                       | 2                        | 0        | 0                          | 3     |
| 39 | BAKER ST & TRUMAN LN                   | Unsignalized | 2.02                 | 5                       | 3                        | 1        | 1                          | 0     |
| 40 | ELM AVE & CHERRY LN                    | Unsignalized | 1.82                 | 4                       | 0                        | 0        | 0                          | 4     |
| 41 | POLK ST & CALIFORNIA ST                | Unsignalized | 1.62                 | 3                       | 0                        | 1        | 0                          | 2     |
| 42 | ELM AVE & SIXTH ST                     | Unsignalized | 1.62                 | 3                       | 0                        | 2        | 0                          | 1     |
| 43 | WARTHAN ST & POLK ST                   | Unsignalized | 1.42                 | 2                       | 0                        | 0        | 0                          | 2     |
| 44 | IVY AVE & FIFTH ST                     | Unsignalized | 1.42                 | 2                       | 0                        | 0        | 0                          | 2     |
| 45 | ELM AVE & GRANT ST                     | Unsignalized | 1.42                 | 2                       | 0                        | 1        | 0                          | 1     |





| #  | Location                   | Type         | Crash Severity Score | Total Number of Crashes | Primary Collision Factor |          |                            |       |
|----|----------------------------|--------------|----------------------|-------------------------|--------------------------|----------|----------------------------|-------|
|    |                            |              |                      |                         | Improper Turning         | Auto ROW | Unsafe Starting or Backing | Other |
| 46 | MONTEREY AVE & HARVARD AVE | Unsignalized | 1.42                 | 2                       | 0                        | 0        | 0                          | 2     |
| 47 | SUNSET ST & CAMBRIDGE AVE  | Unsignalized | 1.42                 | 2                       | 1                        | 0        | 0                          | 1     |
| 48 | DURIAN AVE & SIXTH ST      | Unsignalized | 1.40                 | 7                       | 1                        | 1        | 3                          | 2     |
| 49 | HALIBURTON WAY & COX LN    | Unsignalized | 1.22                 | 1                       | 0                        | 0        | 0                          | 1     |
| 50 | WARTHAN ST & TACHE ST      | Unsignalized | 1.22                 | 1                       | 1                        | 0        | 0                          | 0     |

Note: Other crashes include all crashes that are not coded as one of the top three primary collision factors

Table 18 and Table 19 provide information for the top eight roadway segments (based on crash severity score), including roadway classification, crash severity score, and total number of crashes by collision type or primary collision factor.

Table 18. Priority Roadways Segments with Collision Type based on Top 3 Fatal/Severe Injury Collision Types

| # | Location                                                      | Classification     | Crash Severity Score | Total Number of Crashes | Collision Type |                     |            |       |
|---|---------------------------------------------------------------|--------------------|----------------------|-------------------------|----------------|---------------------|------------|-------|
|   |                                                               |                    |                      |                         | Rear End       | Vehicle/ Pedestrian | Side-swipe | Other |
| 1 | E Polk St (N Hayes St to N Pine St)                           | Arterial/Collector | 35.27                | 3                       | 2              | 0                   | 0          | 1     |
| 2 | E Polk St (S Warthan St to S Hachman St)                      | Arterial/Collector | 35.27                | 3                       | 2              | 0                   | 0          | 1     |
| 3 | W Elm Ave (N 7th St to Cheney Ln)                             | Arterial/Collector | 33.33                | 3                       | 0              | 0                   | 0          | 3     |
| 4 | W Elm St (W Polk St to Pacific St)                            | Arterial/Collector | 33.33                | 3                       | 0              | 0                   | 0          | 3     |
| 5 | W Elm St (W Pleasant St to W Lucille Ave)                     | Arterial/Collector | 32.93                | 1                       | 0              | 0                   | 0          | 1     |
| 6 | W Jayne Ave (S Calaveras Ave to west of S Alpine Ave)         | Arterial/Collector | 6.47                 | 12                      | 8              | 0                   | 2          | 2     |
| 7 | W Jayne Ave (east of S Calaveras Ave to S Alpine Ave)         | Arterial/Collector | 6.47                 | 12                      | 8              | 0                   | 2          | 2     |
| 8 | W Jayne Ave (east of S Alpine Ave to west of S El Dorado Ave) | Arterial/Collector | 5.77                 | 9                       | 5              | 0                   | 0          | 4     |

Note: Other crashes include all crashes that are not coded as one of the top three collision types

Table 19. Priority Roadways Segments with Primary Collision Factors based on Top 3 Fatal/Severe Injury Primary Collision Factors

| # | Location                                 | Type               | Crash Severity Score | Total Number of Crashes | Primary Collision Factor |                   |                            |       |
|---|------------------------------------------|--------------------|----------------------|-------------------------|--------------------------|-------------------|----------------------------|-------|
|   |                                          |                    |                      |                         | Improper Turning         | Auto Right of Way | Unsafe Starting or Backing | Other |
| 1 | E Polk St (N Hayes St to N Pine St)      | Arterial/Collector | 35.27                | 3                       | 1                        | 0                 | 1                          | 1     |
| 2 | E Polk St (S Warthan St to S Hachman St) | Arterial/Collector | 35.27                | 3                       | 1                        | 0                 | 1                          | 1     |
| 3 | W Elm Ave (N 7th St to Cheney Ln)        | Arterial/Collector | 33.33                | 3                       | 3                        | 0                 | 0                          | 0     |

| # | Location                                                      | Type               | Crash Severity Score | Total Number of Crashes | Primary Collision Factor |                   |                            |       |
|---|---------------------------------------------------------------|--------------------|----------------------|-------------------------|--------------------------|-------------------|----------------------------|-------|
|   |                                                               |                    |                      |                         | Improper Turning         | Auto Right of Way | Unsafe Starting or Backing | Other |
| 4 | W Elm St (W Polk St to Pacific St)                            | Arterial/Collector | 33.33                | 3                       | 3                        | 0                 | 0                          | 0     |
| 5 | W Elm St (W Pleasant St to W Lucille Ave)                     | Arterial/Collector | 32.93                | 1                       | 1                        | 0                 | 0                          | 0     |
| 6 | W Jayne Ave (S Calaveras Ave to west of S Alpine Ave)         | Arterial/Collector | 6.47                 | 12                      | 3                        | 0                 | 0                          | 9     |
| 7 | W Jayne Ave (east of S Calaveras Ave to S Alpine Ave)         | Arterial/Collector | 6.47                 | 12                      | 3                        | 0                 | 0                          | 9     |
| 8 | W Jayne Ave (east of S Alpine Ave to west of S El Dorado Ave) | Arterial/Collector | 5.77                 | 9                       | 1                        | 0                 | 1                          | 7     |

Note: Other crashes include all crashes that are not coded as one of the top three primary collision factors



## Education Strategies

Education strategies for Coalinga are targeted at unsafe speed, distracted driving, and pedestrian awareness. Unsafe speed was the primary collision factor in one of the nine severe injury crashes and the primary collision factor in 21 crashes overall. One of the highest complaints from the City's call-in line is speeding in neighborhoods. In the stakeholder focus groups, distracted driving was noted as a large issue, even if it did not show up in the crash data. Pedestrian crashes are an emphasis area, given the overrepresentation of pedestrians in fatal and severe crashes.

The Safe Roads Save Lives campaign is a marketing effort led by the Fresno COG, with the goals of:

- Educate all road users on safe transportation behaviors
- Increase safety for people walking and biking
- Highlight behaviors that cause the most crashes in Fresno County—speeding and distracted driving



The campaign includes branding, social media strategies, print materials, radio and video resources, school resources, and a campaign website. Coalinga may find these materials helpful, especially those related to speeding, distracted driving, and watching out for pedestrians.

The following activities are recommended for Coalinga as they move forward on implementing the Safe Roads Save Lives campaign:

- Identify staff appropriate to attend a presentation by Fresno COG staff about the Safe Roads Save Lives campaign. Appropriate staff members include staff associated with transportation engineering and planning, communications, traffic enforcement, school transportation, and other jurisdictional staff who work with the roadway system.



- Work with school districts to distribute print materials and offer school-related transportation resources. Ensure that school communications are in both English and Spanish.
- Work with public information or communications staff to spread Safe Roads Save Lives materials throughout Coalinga through the following channels:
  - o Repost and link to Fresno COG posts that refer to the Safe Roads Save Lives campaign.
  - o Have print materials (flyers, bumper stickers, pins, and postcards) available at events and community festivals.
  - o Print posters for posting at governmental buildings such as City Hall, libraries, DMVs, and other facilities that the public regularly uses.
  - o Work with the Fresno COG to identify a radio station to air a Safe Roads Save Lives radio public service announcement (PSA).
  - o Have a direct link to Safe Roads Save Lives campaign website from the city website.



## Emergency Services

Emergency service organizations depend on safe roadways and efficient communication processes to reach and effectively respond to emergencies. Each type of emergency services organization that serves Coalinga – law enforcement, fire, emergency medical services (EMS), California Highway Patrol – work independently and collaboratively to develop procedures that allow them to respond to incidents in their own jurisdictions as well as support others as needed. The following recommendations may help improve emergency services response as the various organizations update procedures and policies and continue to partner on roadway safety efforts:

- All roadway safety projects should be vetted by emergency service organizations to ensure that their design does not hamper access.
- As new emergency service and response procedures are developed, roadway safety improvement opportunities should be identified and implications of changes to response times should be considered.
- Coalinga staff should participate in periodic coordination calls between emergency response agencies to gather and share recent observations about crashes and hot spots, to understand emergent safety issues that may not have led to policy reports or yet be available through statewide crash reporting systems.



## Enforcement

Enforcement strategies can include programs or campaigns specifically focused on changing road user behavior through more visible and active enforcement of existing traffic laws, as well as focusing enforcement in areas that have historically been shown to have higher-than-average crash rates. Typically, the effectiveness of enforcement strategies is temporal, meaning they are effective at changing behavior for a discrete period of time – during and shortly after the increased enforcement activities.

The following enforcement strategies should be considered for Coalinga:

- Schedule heightened speed (or other behavior) enforcement checks during strategic times of the year, such as when students return to school or the beginning of fog season. Coalinga currently conducts heightened enforcement events and has found them effective.
- Focus speed enforcement efforts in locations with high crash rates.
- Use automatic enforcement, such as red-light cameras or speed feedback signs, especially in school zones. Coalinga does have traffic cameras with license plate readers it can use.
- Deploy speed feedback signs in areas with high crash rates or speeding citations.

The effectiveness of each strategy should be measured and evaluated, considering the number of staff hours and amount of resources needed. The results should be reviewed and used to refine future enforcement activities.

Enforcement strategies should be undertaken with due caution to avoid inequitable enforcement activities and evaluated to determine the strategy's impact. More details about equitable enforcement can be found on page 8 (Introduction).

## EVALUATION AND IMPLEMENTATION

A key part of achieving the City's vision is consistently evaluating roadway safety performance and tracking progress towards the City's goals. The City will develop a process to regularly collect data and information around the performance measures that can be used to assess changes city-wide and at the top priority locations.

As feasible, it is recommended that the City of Coalinga update this LRSP every three to five years using updated crash data and the performance measures. Comparing the performance measures related to investments made with the crash data should provide a clear indication of the impact of the City's and safety partner's efforts. Future LRSPs may provide new emphasis areas and top priority locations that reflect progress made and new priorities based on trends in the data.

Activities for implementing the plan include:

- Identifying countermeasures and strategies for priority locations based on the crash data.
- Utilizing the Fresno COG Regional Safety Plan to implement regional strategies and share best practices.
- Exploring funding opportunities to implement priority strategies.
- Identifying key staff and activities to support the regional Safe Roads Save Lives campaign.
- Identifying enforcement strategies to implement and evaluate.
- Regularly coordinating with safety partner agencies to assess progress, identify opportunities to implement countermeasures and strategies, and identify opportunities for citizen involvement.
- Regularly collecting and organizing data to support evaluation of the LRSP.

## 4.0 CITY OF FIREBAUGH

The City of Firebaugh has an approximate population of 7,980.<sup>21</sup> The average daily vehicle miles traveled is 33,939, and the City maintains approximately 22 total roadway centerline miles. The main arterial roadways that connect the City to other jurisdictions include N Street, which runs northwest to southeast, 12th Street/W Nees Avenue, which runs west from N Street, and 13th Street, which runs east from N Street. Based on the review of crash data conducted as part of the LRSP, pedestrians are overrepresented in fatal and severe injury crashes. The three collision types reported in fatal and severe injury crashes were vehicle-pedestrian, head on, and hit object crashes. The primary collision factors reported for fatal and severe injury crashes include pedestrian violation and other improper driving. Among all reported crashes, the most commonly reported primary collision factor is automobile right of way. High priority countermeasures to address these collision types and primary collision factors are shown in Table 23. The LRSP provides potential engineering, education, emergency services, and enforcement strategies tailored to Firebaugh's crash history and local priorities, as well as performance measures to evaluate progress.

### VISION AND GOALS

The City's vision for roadway safety is:



Create a roadway network that provides a comfortable environment for all modes of transportation within the City.

The City's goals in support of the vision are:

1. Have zero fatal and severe injury crashes on the City roadways by 2026.
2. Systemically implement safety countermeasures proven to reduce fatal and severe crashes across the City's public roadways.
3. Enhance pedestrian facilities and crossings within the City limits and collaborate with Caltrans on modifications proposed to state route roadways within the City limits.
4. Participate in regional activities to promote roadway safety as a priority investment.

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<sup>21</sup> 2018 population. Source: California Department of Finance

## SAFETY PARTNERS

A variety of agency staff and community partners were involved throughout the development of this LRSP and played an integral role in identifying priorities, providing local context, and reviewing the existing conditions analysis. Many of the strategies identified in this plan will require coordination with these partners and their support of the City's effort to create a culture of roadway safety. Firebaugh's goals reflect the importance of participating in regional activities to promote roadway safety. While additional partners may be identified in the future, those involved in development of the LRSP include:

- Firebaugh Fire Department
- Firebaugh Police Department
- Firebaugh Public Works Department
- Firebaugh-Las Deltas Unified School District
- Fresno Council of Governments

## PERFORMANCE MEASURES

Performance measures are used to track progress and a key element of making data-informed decisions. Performance measures that support the City's vision, goals, and emphasis areas include:

- Annual number of crashes (city-wide and at each of the top twenty priority locations)
- Annual number of fatal and severe injury crashes (city-wide and at each of the top twenty priority locations)
- Annual number of pedestrian and bicycle crashes (city-wide and at each of the top twenty priority locations)
- Annual number of head on crashes (city-wide)
- Annual number of hit object crashes (city-wide)
- Annual number of crashes at intersections (city-wide)
- Investments made in roadway safety countermeasures (e.g. dollars spent, grants pursued, partnerships developed)
- Investments made in education and enforcement strategies (e.g. dollars spent, grants pursued, partnerships developed)
- Coordination with other local agencies and/or safety partners (e.g. meetings held, projects pursued)
- Coordination on crash data processes and reporting (e.g. meetings held, changes made)

As part of plan implementation, the City will identify a process for annually tracking these performance measures to support future updates to this roadway safety plan.

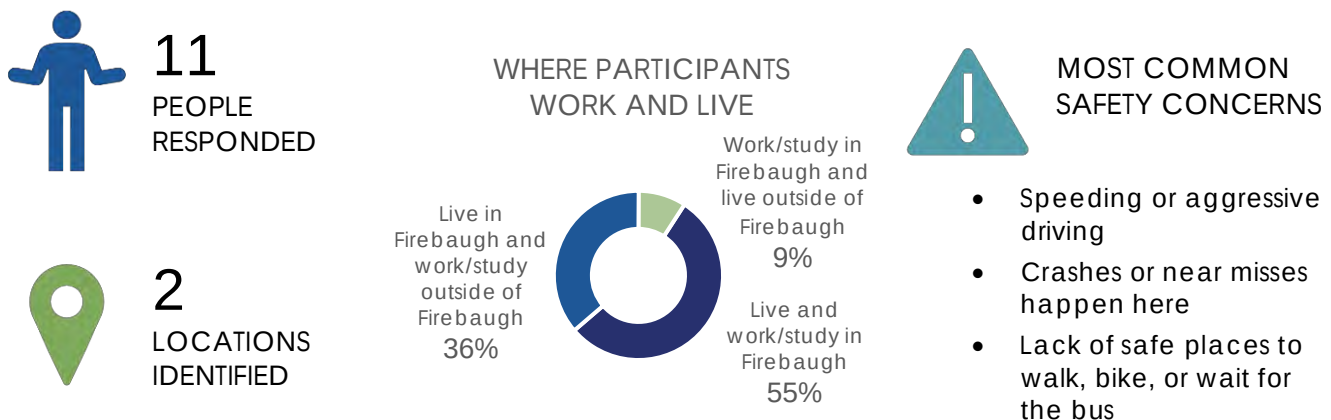
## DATA SUMMARY

The primary data sets used to inform the technical analyses for the City's local road safety plan were crash data and roadway network information. As noted below, future updates could incorporate traffic volume data if widely available for locations across the City. In addition, feedback from a publicly available survey was documented for consideration in identifying issues and improvement strategies.

### Public Survey Feedback

Toole Design Group worked with Fresno COG to develop an online survey and interactive webmap to provide the opportunity for public engagement on the LRSP. The goal was to collect both general and geographically specific feedback on safety problems, desired safety improvements in jurisdictions that are part of the MLRSP, as well as voluntary demographic information for Title IV reporting. Both activities were open from August 16, 2021 to September 20, 2021 and sought public feedback on spatial patterns of traffic safety concerns and desired improvements.

As the primary open public engagement opportunity during MLRSP development, the survey and interactive webmap served a crucial role in illuminating the community's traffic safety concerns and desired traffic safety improvements. Below is a summary of key findings from the online survey and interactive webmap specific to Firebaugh. More information on the methodology and overall findings of the survey are provided in *Appendix A*.



- The survey asked respondents to provide input on the top road safety improvements needed in their communities. While the survey prompted participants to pick three improvements, some selected more than three responses. A total of 35 responses were received for Firebaugh from 11 participants, with the most common desired improvement types including:
  - o Maintenance of existing roads and streets (7 responses)

- o Pedestrian crossing improvements (5 responses)
- o Traffic signals (5 responses)
- o Rural road improvements to prevent run-off-road crashes (4 responses)
- o Speed enforcement (4 responses)
- Participants dropped points in the webmap in specific locations across Fresno County where they experienced road safety concerns. When leaving a point, participants could select from a list of traffic safety concerns and the kinds of travel impacted, with the ability to select as many responses as applicable. A text box gave participants the option to note what they think would make the location safer. A total of 2 locations were noted in Firebaugh, noting the following traffic safety concerns:
  - o Speeding or aggressive driving (2 responses)
  - o Crashes or near misses happen here (1 response)
  - o Lack of safe places to walk, bike, or wait for the bus (1 response)
- The survey asked participants where they live and work or study, with the option to select from a list of jurisdictions or outside of Fresno County. The participants who selected Firebaugh included:
  - o 6 who live and work/study in Firebaugh
  - o 4 who live in Firebaugh and work/study outside of Firebaugh
  - o 1 who works/studies in Firebaugh and lives outside of Firebaugh

## Crash Data

Kittelson worked with Fresno COG to assemble crash data for the City of Firebaugh using the Statewide Integrated Traffic Records System (SWITRS) database, supplemented with location information from the Transportation Injury Mapping System (TIMS) database maintained by SafeTREC at the University of California, Berkeley. Throughout this report, crashes are associated with a jurisdiction based on the reporting officer's assessment of location.

The crash database represents the time period from January 1, 2015 through December 31, 2019 and includes reported crashes that occurred on public streets. Within the assembled regional crash database, a total of 130 reported crashes are located in City of Firebaugh. Crash severity is coded according to the highest degree of injury exhibited, and the data used for this analysis includes the following coded severity levels (listed in descending order):

- Fatal: death from injuries sustained in the crash.
- Severe Injury: Injuries include, for example, broken bones, severe lacerations, or other injuries that go beyond the reporting officer's assessment of "other visible injuries."
- Other visible injury: An injury, other than those described above, that is evident to observers at the scene of the crash. For example, bruises or minor lacerations.



- Complaint of pain: Internal or other non-visible injuries. For example, a person limps or seems incoherent.
- Property damage only (PDO): No injuries sustained.

## Roadway Network Data

Kittelson developed a linear referencing system of all public roadways using the Fresno County roadway centerline file. This dataset was updated to develop a measurement system based on the total road length (as determined by roadway name) to locate crashes to a specific mile point along the network. The master roadway network for the County was used to spatially analyze and prioritize specific locations within each local jurisdiction.

## Traffic Volume Data

Traffic volume data was not consistently available at a sufficient level to be able to incorporate into the safety analysis. Future updates to the City's local road safety plan could incorporate traffic volume data, if available, to understand how crash frequency, severity, and type vary at different levels of traffic.

## EXISTING ROADWAY SAFETY PERFORMANCE

The findings in this section are based on the crash database, which includes reported crashes from January 1, 2015 through December 31, 2019. It is organized as follows:

- All Road Users
  - o Severity by Road User
  - o Year, Month, and Weather
  - o Collision Type
  - o Location, Collision Type, and Severity
  - o Primary Collision Factor
  - o Lighting
  - o Time of Day
- Pedestrian-involved Crashes
  - o Year and Month
  - o Pedestrian Action and Location
  - o Lighting
- Bicyclist-involved Crashes
  - o Collision Type
  - o Primary Collision Factor
  - o Lighting

## All Road Users

This section includes analysis and findings for all reported crashes. Subsequent sections focus exclusively on crashes involving pedestrians and bicyclists.

### SEVERITY BY ROAD USER

Table 20 presents reported crashes, organized by severity level and road user.

- There were seven reported pedestrian crashes, of which three were fatal.
- There was one reported bicycle crash in the City of Firebaugh.
- Most reported crashes were property damage only (PDO)—75 percent of total reported crashes.

Table 20: Crash Severity by Road User Involved

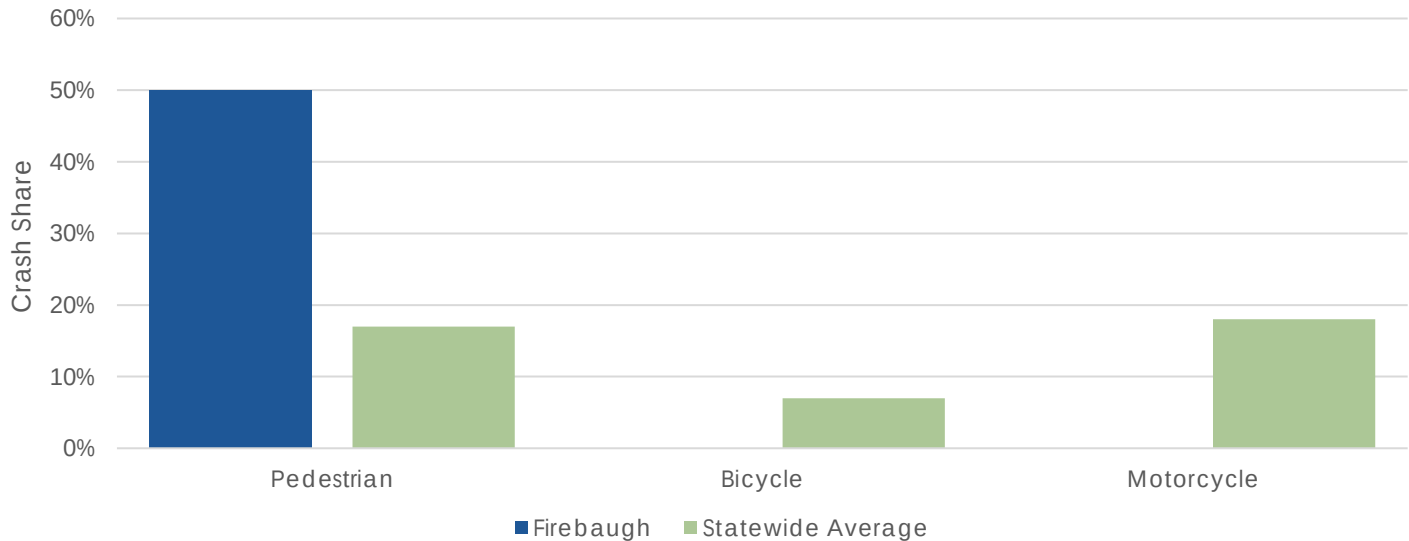
| Road Users Involved                      | Fatal<br>(% of column) | Severe Injury<br>(% of column) | Visible Injury<br>(% of column) | Complaint of<br>Pain<br>(% of column) | Property<br>Damage Only<br>(% of column) | Total<br>(% of column) |
|------------------------------------------|------------------------|--------------------------------|---------------------------------|---------------------------------------|------------------------------------------|------------------------|
| Pedestrian Involved                      | 3 (75%)                | 0 (0%)                         | 1 (11%)                         | 2 (11%)                               | 1 (1%)                                   | 7 (5%)                 |
| Bicycle Involved                         | 0 (0%)                 | 0 (0%)                         | 0 (0%)                          | 1 (6%)                                | 0 (0%)                                   | 1 (1%)                 |
| Vehicle Only or Vehicle-<br>Fixed Object | 1 (25%)                | 2 (100%)                       | 8 (89%)                         | 15 (83%)                              | 96 (99%)                                 | 122 (94%)              |
| Reported Crashes                         | 4 (100%)               | 2 (100%)                       | 9 (100%)                        | 18 (100%)                             | 97 (100%)                                | 130 (100%)             |
| Severity Share of Reported<br>Crashes    | 3%                     | 2%                             | 7%                              | 14%                                   | 75%                                      | 100%                   |

Source: SWITRS, TIMS, Kittelson, 2021.

California's Strategic Highway Safety Plan (SHSP) includes 16 challenge areas to focus statewide resources and efforts. Three such challenge areas were crashes involving pedestrians, bicyclists, and motorcyclists. The SHSP analyzed the share of fatal and severe injury crashes involving each of these road users. Figure 42 compares crash trends in the City of Firebaugh to the statewide trends reported in the SHSP.

- City of Firebaugh has one reported bicycle crash reported as a "complaint of pain" and no reported motorcycle crashes.
- Pedestrian crashes represent three of six fatal/severe injury crashes (50 percent) in Firebaugh, a higher share than the statewide average reflected in the SHSP.

Figure 42: Fatal and Severe Injury Crash Shares by Road User Compared to Statewide Trends

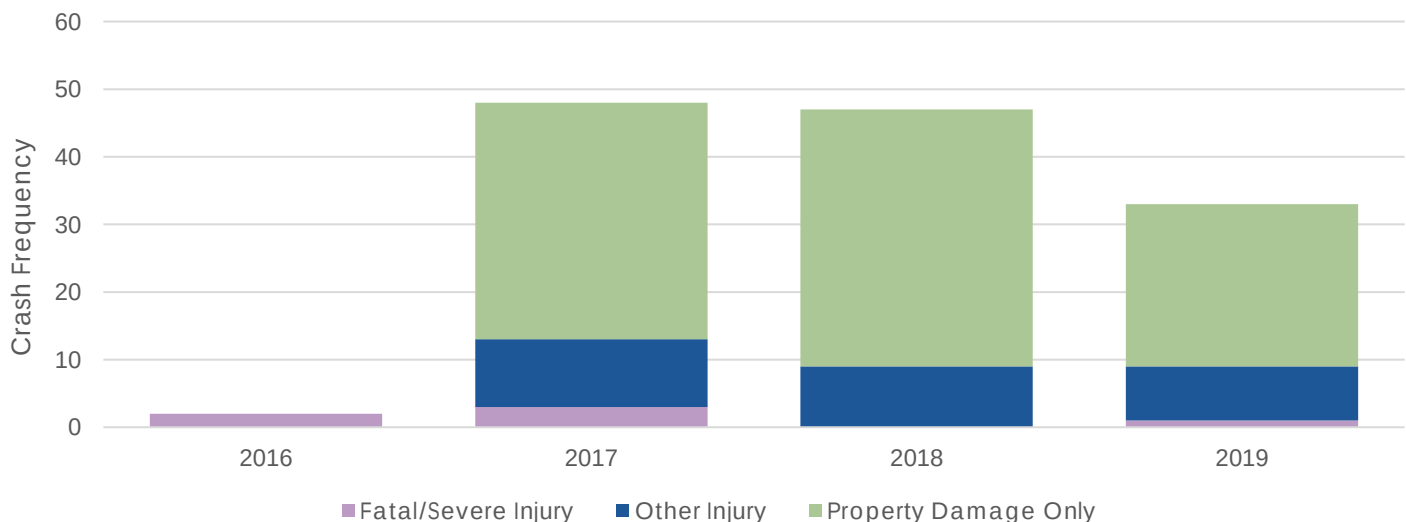


Source: SHSP, SWITRS, TIMS, Kittelson, 2021.

## YEAR, MONTH, AND WEATHER

Figure 43 shows year-over-year trends in the data by severity. There are no reported crashes in the data for the year 2015 and two fatal/severe crashes reported for the year of 2016. From the years 2017 to 2019 the average annual number is 26 crashes a year. There appears to be a downward trend in reported crashes between 2017 and 2019. A lack of reporting could contribute to the absence of crashes for analysis in 2015 and the count observed in 2016 (as well the totals in the other years shown).

Figure 43: Year-over-Year Trends in Crash Data by Severity



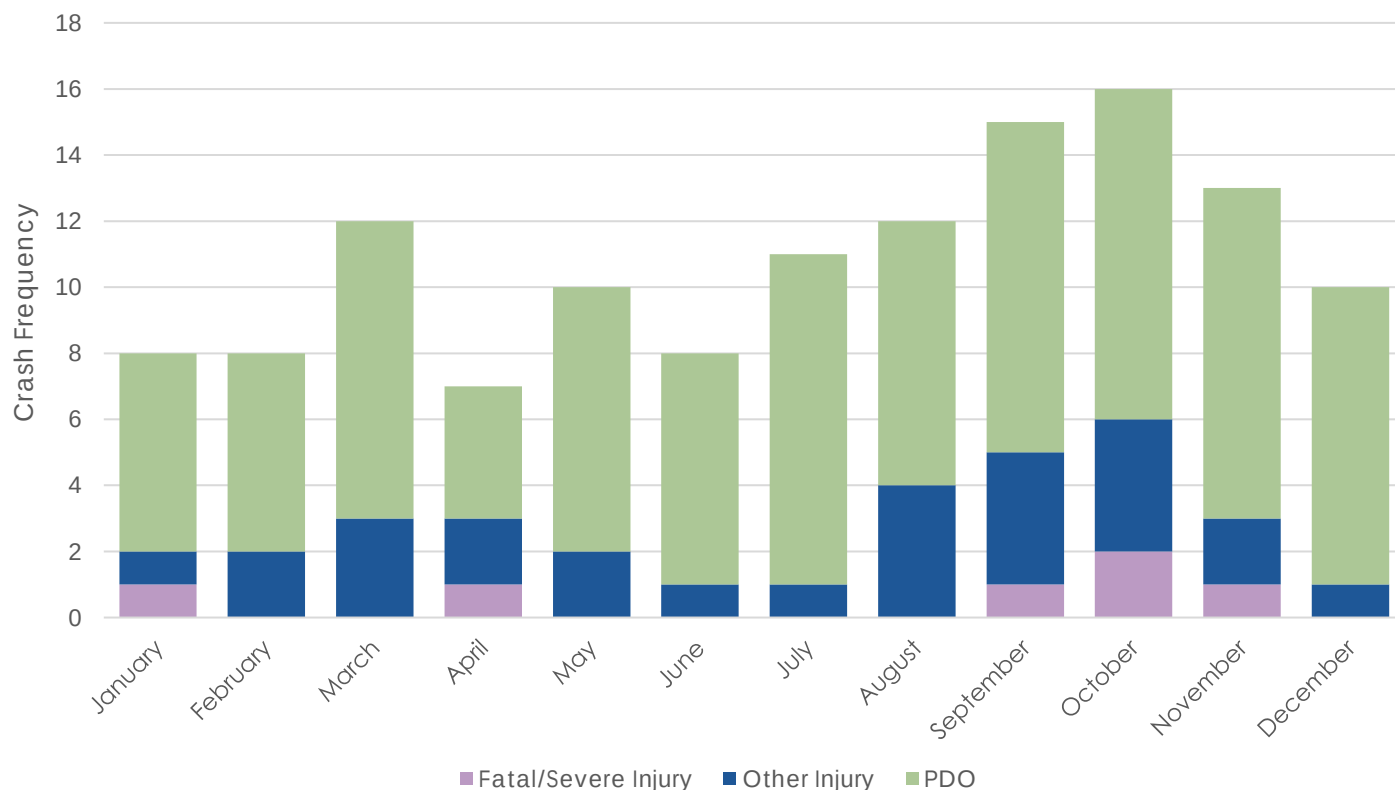
Source: SWITRS, TIMS, Kittelson, 2021.

Note: "Other injury" includes "Other visible injury" and "Complaint of pain" crashes.



Figure 44 presents the total crashes by month and severity for the crash database. On average, 12 crashes occurred per month. Fluctuations from a single month to the next tend to represent the degree of randomness in crash occurrence and are not necessarily indicative of an overall trend. The number of crashes in September, October, and November each exceed the monthly average.

Figure 44: Crashes by Month and Severity



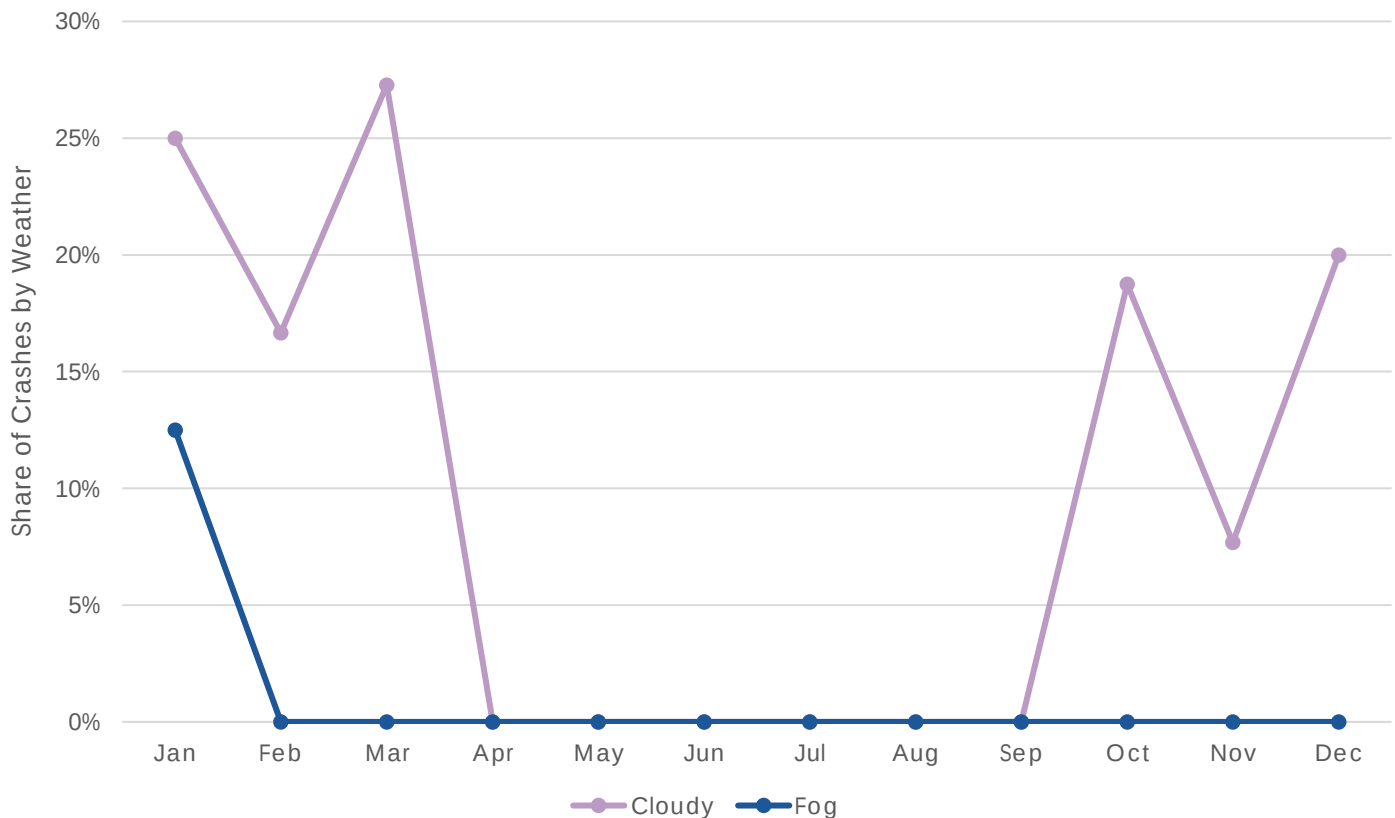
Source: SWITRS, TIMS, Kittelson, 2021

Note: "Other injury" includes "Other visible injury" and "Complaint of pain" crashes. "PDO" = property damage only.

Figure 45 illustrates crashes by month and weather conditions. The most common weather condition, clear weather, is not shown in the chart below to highlight weather's factor on crash trends.

- One crash was recorded to have occurred in foggy conditions, in January.
- Crashes occurring in cloudy conditions peak between October and March (peaking at three crashes, or 27 percent of crashes in March) and are lowest during the months of April to September.
- No reported crashes occurred during rainy conditions.

Figure 45: Crashes by Month and Weather Condition



Source: SWITRS, TIMS, Kittelson, 2021

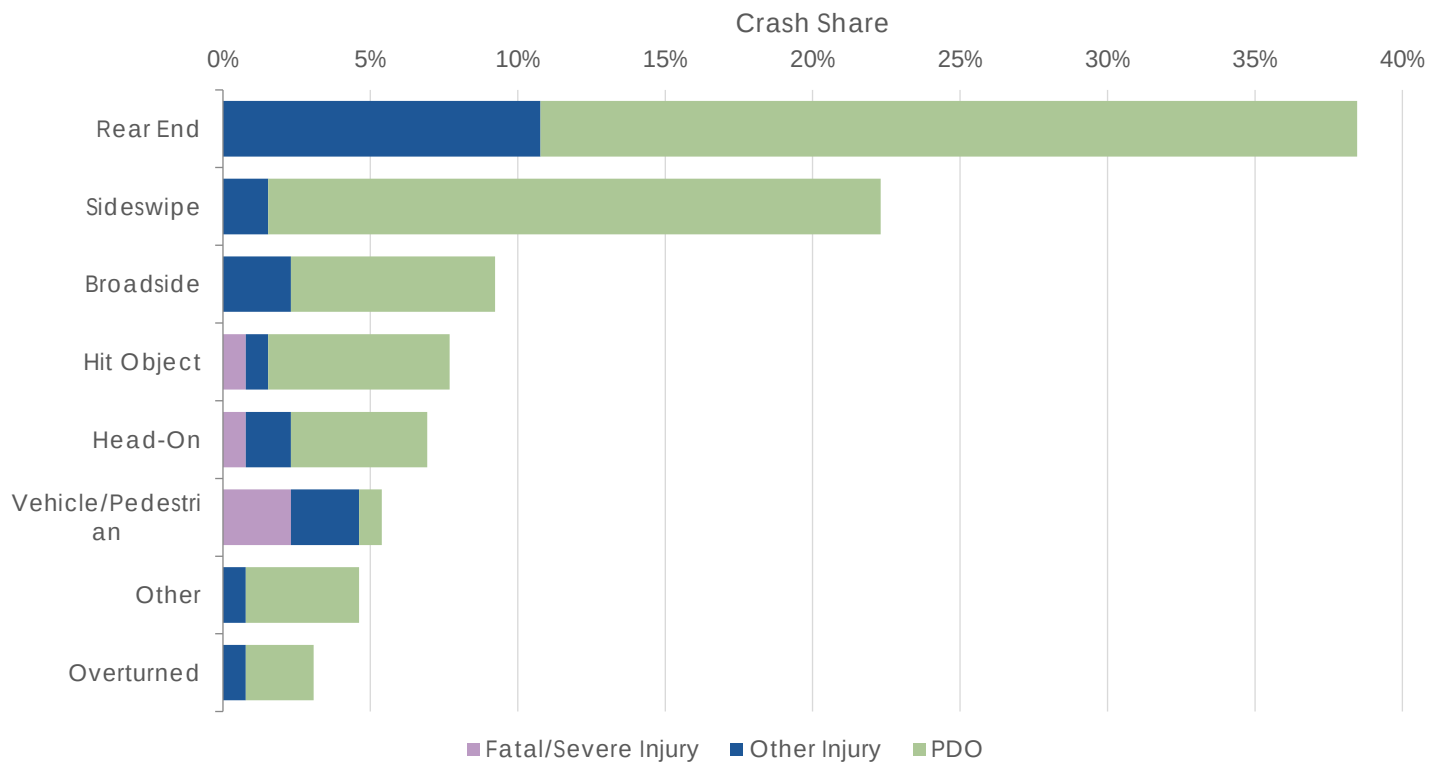
Note: Only select conditions shown to improve legibility for less frequent weather conditions.

## COLLISION TYPE

Reported collision type gives an indication of the movements most frequently involved in crashes and in severe outcomes. Figure 46 presents crashes by type and severity.

- Among total reported crashes, the top three most frequent collision types are rear end (38 percent), sideswipe (22 percent), and broadside (9 percent). These three collision types account for 69 percent of reported crashes in the City.
- Among fatal and severe injury crashes, three are vehicle/pedestrian crashes (three of six for 50 percent).<sup>22</sup> Among the remaining three, one each was head on, hit object, and not stated.

Figure 46: Crashes by Collision Type and Severity



Source: SWITRS, TIMS, Kittelson, 2021.

Note: "Other injury" includes "Other visible injury" and "Complaint of pain" crashes. "PDO" = property damage only.

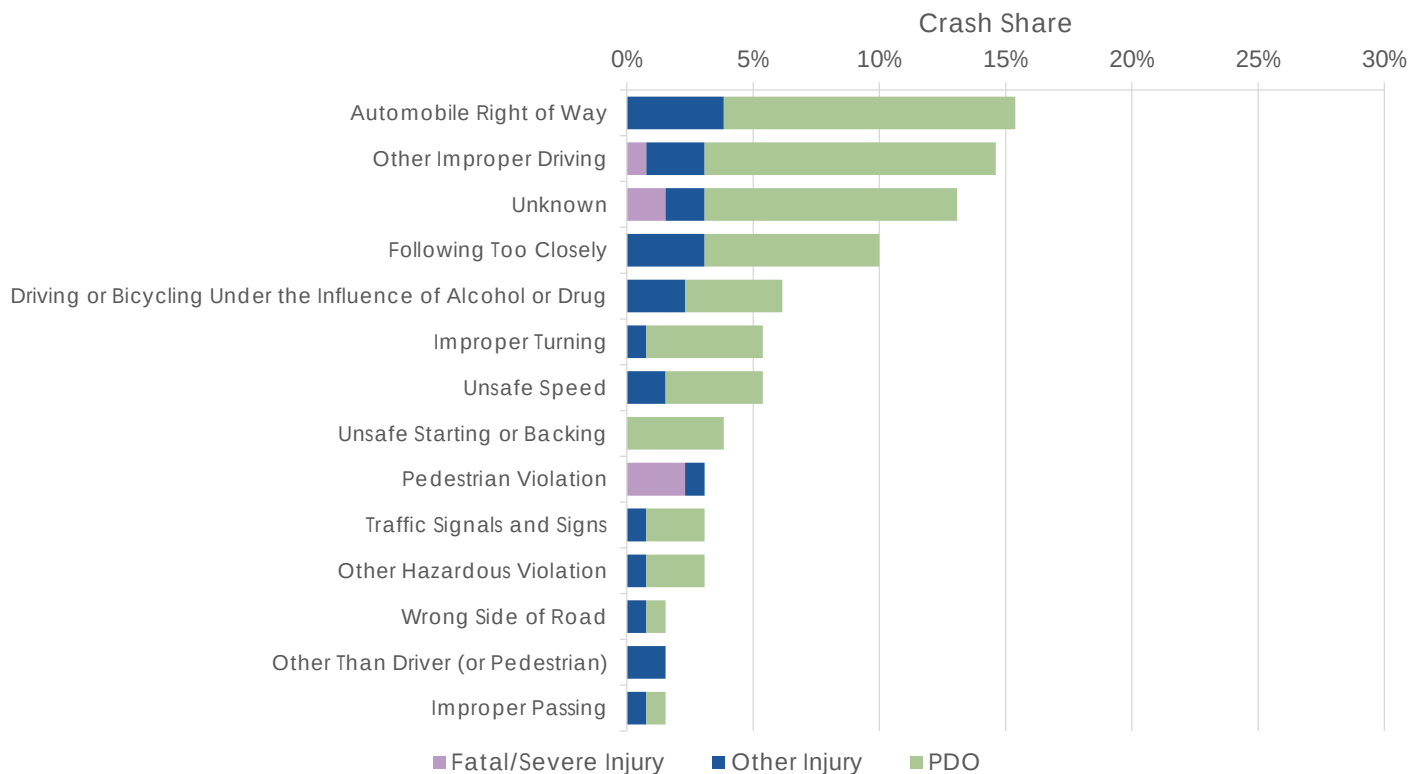
<sup>22</sup> Two crashes involving pedestrians were originally coded in the data as *head on* crashes. Kittelson recoded the collision type for these two to *vehicle/pedestrian*, given that the other information available in the data indicated each collision involved one motor vehicle and one pedestrian.

## PRIMARY COLLISION FACTOR

Reporting officers identify a primary collision factor (PCF) for each collision. It is up to the officer's judgement and information available at the scene for them to select the factor that is most relevant. Officers select one from among a list of PCFs based on California Vehicle Code (CVC) and road user behavior. Figure 47 presents the most frequently cited PCFs.

- Among total reported crashes, the three most frequently reported PCFs are automobile right of way<sup>23</sup> (15 percent), other improper driving<sup>1824</sup> (15 percent), and unknown/not reported (13 percent). These three account for 43 percent of reported crashes.
- Among the six reported fatal/severe injury crashes, three of the crashes had reported PCFs of pedestrian violation<sup>25</sup> (three of six for 50 percent). Two crashes had unknown or unreported PCFs, and the remaining one had a PCF of other improper driving<sup>24</sup>.

Figure 47: Collision by Reported PCF and Severity



Source: SWITRS, TIMS, Kittelson, 2021.

Note: "Other injury" includes "Other visible injury" and "Complaint of pain" crashes. "PDO" = property damage only.

<sup>23</sup> Reported PCF based on CVC violation indicating a driver turning failed to yield right-of-way to oncoming traffic.

<sup>24</sup> Reported PCF based on CVC violation indicating driving from a direct course without reasonable safety or not signaling appropriately.

<sup>25</sup> Reported PCF based on CVC violation indicating a pedestrian failure to yield the right of way to other vehicles.

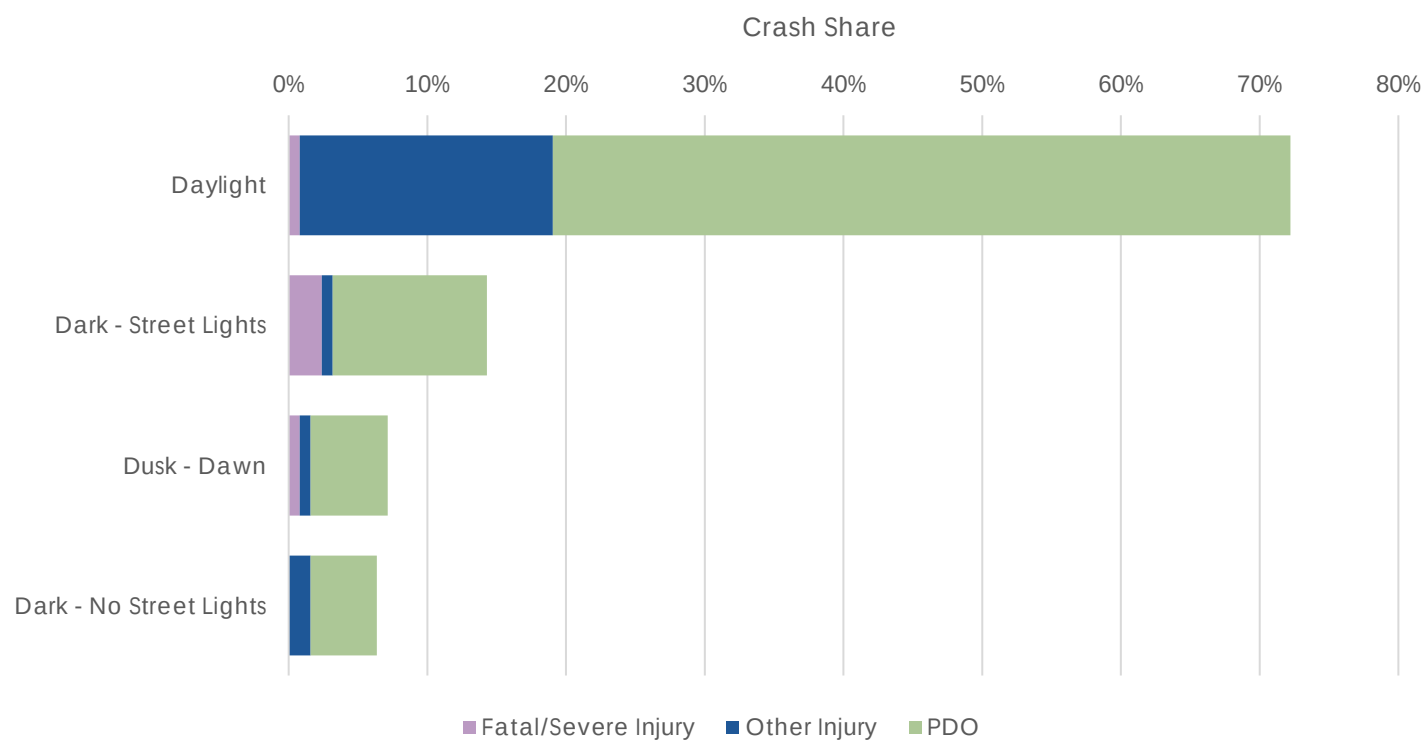


## LIGHTING

Figure 48 shows citywide crashes by reported lighting condition and severity.

- Crashes that occurred in daylight conditions make up 72 percent of total reported crashes and account for one of the five fatal/severe injury crashes.
- The remaining four fatal/severe injury crashes occurred in the dark with streetlights (three crashes) and in dusk/dawn conditions (one crash).

Figure 48: Crashes by Lighting and Severity



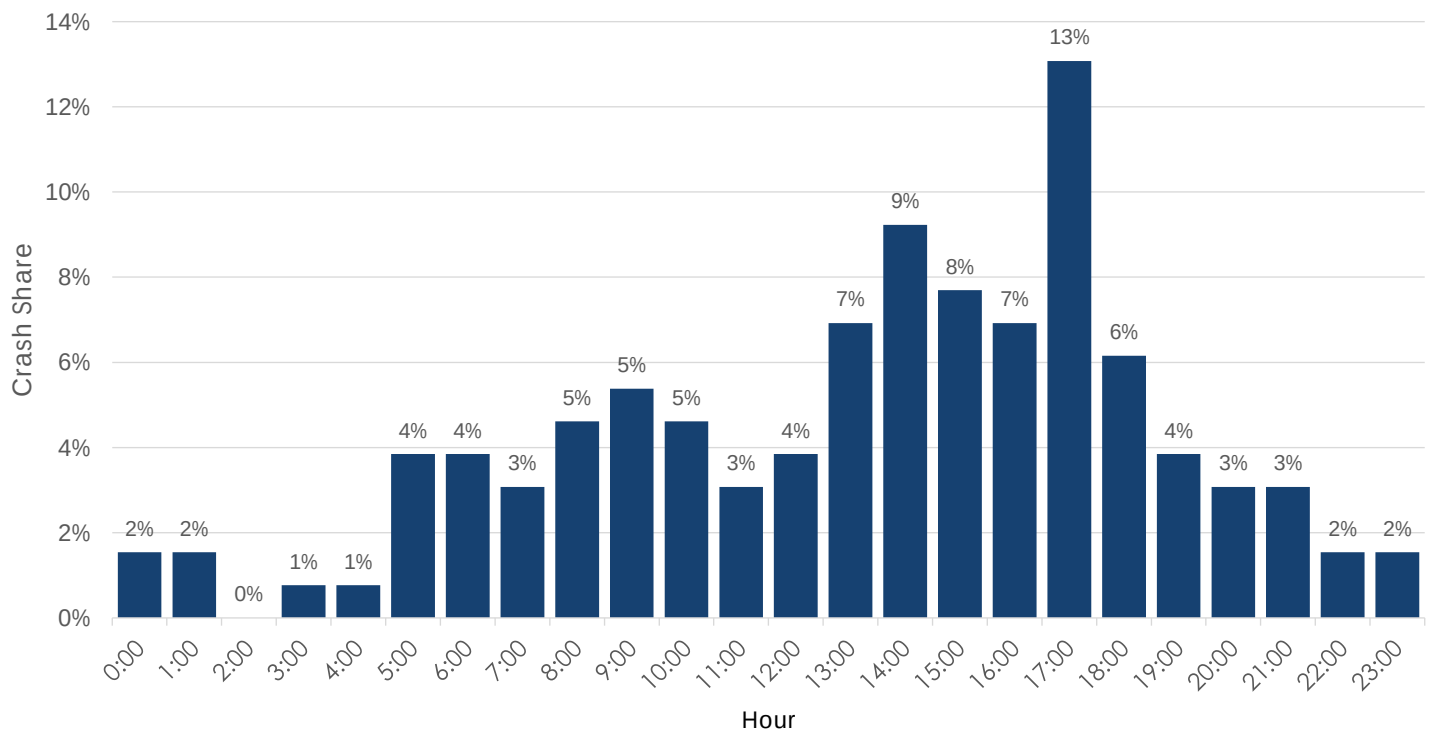
Source: SWITRS, TIMS, Kittelson, 2021

Note: "Other injury" includes "Other visible injury" and "Complaint of pain" crashes. "PDO" = property damage only.

## TIME OF DAY

Figure 49 shows crashes by time of day. A higher share of crashes occurred during the afternoon with the highest portion occurring in the 5 PM to 6 PM hour.

Figure 49: Crash Share by Time of Day



Source: SWITRS, TIMS, Kittelson, 2021.

## Pedestrians

This section focuses exclusively on crashes involving pedestrians. Table 21 shows the distribution of pedestrian crashes by severity. Of the seven reported pedestrian crashes, 43 percent were fatal or resulted in a severe injury. Reported pedestrian crashes make up 50 percent of all reported fatal/severe crashes, compared to 5 percent of total reported crashes.

Table 21: Pedestrian Involved Crashes by Severity

|                     | Fatal<br>(% of Total) | Severe Injury<br>(% of Total) | Visible Injury<br>(% of Total) | Complaint of<br>Pain<br>(% of Total) | Property<br>Damage Only<br>(% of Total) | Total    |
|---------------------|-----------------------|-------------------------------|--------------------------------|--------------------------------------|-----------------------------------------|----------|
| Pedestrian Involved | 3 (43%)               | 0 (0%)                        | 1 (14%)                        | 2 (29%)                              | 1 (14%)                                 | 7 (100%) |

Source: SWITRS, TIMS, Kittelson, 2021.

### SEVERITY AND MONTH

The reported pedestrian crashes were generally dispersed throughout the 12 months. October recorded the most reported pedestrian crashes, with three crashes.

- January had one fatal pedestrian crash.
- March had one injury pedestrian crash.
- May had one property damage only pedestrian crash.
- September had one injury pedestrian crash.
- October had a total of three pedestrian crashes: two fatal and one injury.

### PEDESTRIAN ACTION AND LOCATION

For pedestrian crashes, data are coded according to the reporting officer's judgment about the pedestrian's action and location preceding the crash.

- Two fatal crashes occurred as pedestrians were "crossing not in crosswalk."
- One fatal crash, one injury crash, and one PDO crash occurred with the pedestrian action "crossing in crosswalk at intersection" reported.
- The pedestrian action "in road, including shoulder" was reported in two injury crashes.

### LIGHTING

Two fatal crashes occurred in the dark with streetlights and one fatal crash occurred during dusk – dawn. One injury crash occurred in the dark with no streetlights. The remaining two injury crashes and PDO crash occurred during daylight.

## Bicyclists

One bicycle crash, resulting in injury, was reported between 2015 and 2019. The crash was reported as a vehicle/pedestrian collision with a primary contributing factor of other than driver (or pedestrian), with the bicyclist coded as at fault.<sup>26</sup> The crash was reported to have occurred in dusk conditions around 5 PM.

## Priority Locations

Kittelson identified priority intersections and segments in Firebaugh using the annualized crash severity scores and excess predicted crashes described in the Data Summary and Analysis Approach sections (see the Introduction).

For intersection locations, the crash severity scores ranged from zero (no reported crashes during the five years) to 43.12. Figure 50 shows the results of the crash severity scoring. Figure 51 shows excess predicted crash scores by percentiles for intersection locations. For the half-mile roadway segments, the crash severity scores ranged from zero to 33.13. Crash severity score results for roadway segments are shown in Figure 52. Excess predicted crash score results are shown in Figure 53. Intersections or segments shown as not falling within one of the percentile breaks indicates there were no reported crashes at that location.

Table 22 presents the top twenty locations with the highest crash severity scores.

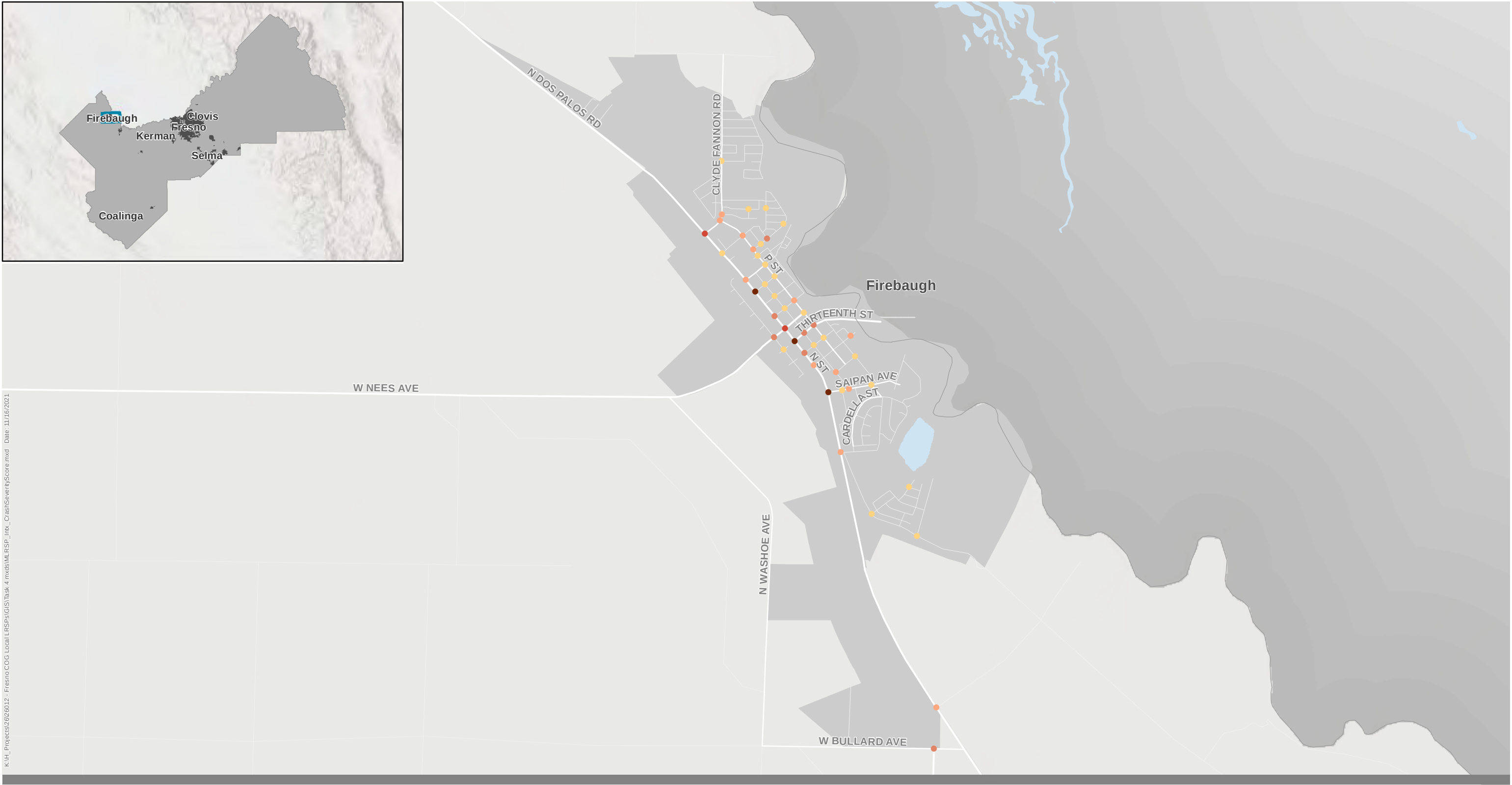
Table 22. Top 20 Locations based on Crash Severity Score

| # | Location                                     | Type         | Crash Severity Score | Total Number of Crashes | Severity |               |                      |                   |     |
|---|----------------------------------------------|--------------|----------------------|-------------------------|----------|---------------|----------------------|-------------------|-----|
|   |                                              |              |                      |                         | Fatal    | Severe Injury | Other Visible Injury | Complaint of Pain | PDO |
| 1 | N ST & SAIPAN AVE                            | Unsignalized | 43.12                | 7                       | 1        | 0             | 2                    | 0                 | 4   |
| 2 | N ST & NINTH ST                              | Unsignalized | 38.25                | 2                       | 0        | 1             | 0                    | 0                 | 1   |
| 3 | THIRTEENTH ST FROM P ST TO CITY LIMITS       | Segment      | 33.13                | 2                       | 1        | 0             | 0                    | 0                 | 1   |
| 4 | N ST FROM SEIERRA AVE TO NORTH OF SIERRA AVE | Segment      | 33.13                | 2                       | 0        | 1             | 0                    | 0                 | 1   |
| 5 | THIRTEENTH ST & N ST                         | Signal       | 28.16                | 7                       | 1        | 0             | 0                    | 3                 | 3   |
| 6 | TWELFTH ST & N ST                            | Signal       | 25.71                | 10                      | 1        | 0             | 0                    | 0                 | 9   |
| 7 | N ST & CLYDE FANNON RD                       | Unsignalized | 5.47                 | 7                       | 0        | 0             | 0                    | 4                 | 3   |
| 8 | N ST & ELEVENTH ST                           | Unsignalized | 4.36                 | 7                       | 0        | 0             | 1                    | 1                 | 5   |
| 9 | TWELFTH ST & M ST                            | Unsignalized | 2.74                 | 4                       | 0        | 0             | 1                    | 0                 | 3   |

<sup>26</sup> Other information available about this collision does not indicate that a pedestrian was involved. The reporting officer may have been imprecise in coding the collision type or an error may have been made in entering data from the collision report into the database.

| #  | Location                                                  | Type         | Crash Severity Score | Total Number of Crashes | Severity |               |                      |                   |     |
|----|-----------------------------------------------------------|--------------|----------------------|-------------------------|----------|---------------|----------------------|-------------------|-----|
|    |                                                           |              |                      |                         | Fatal    | Severe Injury | Other Visible Injury | Complaint of Pain | PDO |
| 10 | N STREET FROM CLYDE FANNON RD TO CORDEL AVE               | Segment      | 2.54                 | 3                       | 0        | 0             | 1                    | 0                 | 2   |
| 11 | CLINE ST & R ST                                           | Unsignalized | 2.43                 | 2                       | 0        | 0             | 0                    | 2                 | 0   |
| 12 | THIRTEENTH ST & P ST                                      | Unsignalized | 2.42                 | 7                       | 0        | 0             | 0                    | 1                 | 6   |
| 13 | SAN DIEGO AVE & BULLARD AVE                               | Unsignalized | 2.34                 | 2                       | 0        | 0             | 1                    | 0                 | 1   |
| 14 | N ST & FOURTEENTH ST                                      | Unsignalized | 2.34                 | 2                       | 0        | 0             | 1                    | 0                 | 1   |
| 15 | WASHOE AVE FROM NORTH OF BULLARD AVE TO SOUTH OF NEES AVE | Segment      | 2.34                 | 2                       | 0        | 0             | 1                    | 0                 | 1   |
| 16 | N ST FROM MORRIS KYLE DR TO CITY LIMITS (SOUTH)           | Segment      | 2.34                 | 2                       | 0        | 0             | 1                    | 0                 | 1   |
| 17 | THIRTEENTH ST & O ST                                      | Unsignalized | 2.22                 | 6                       | 0        | 0             | 0                    | 1                 | 5   |
| 18 | O ST & SIXTEENTH ST                                       | Unsignalized | 2.14                 | 1                       | 0        | 0             | 1                    | 0                 | 0   |
| 19 | DOS PALOS RD & SIERRA AVE                                 | Unsignalized | 1.62                 | 3                       | 0        | 0             | 0                    | 1                 | 2   |
| 20 | REV KANTOR ST FROM CLYDE FANNON RD TO ZOZAYA ST           | Segment      | 1.62                 | 3                       | 0        | 0             | 0                    | 1                 | 2   |

Note: PDO = Property Damage Only

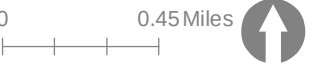


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**Crash Severity Score**

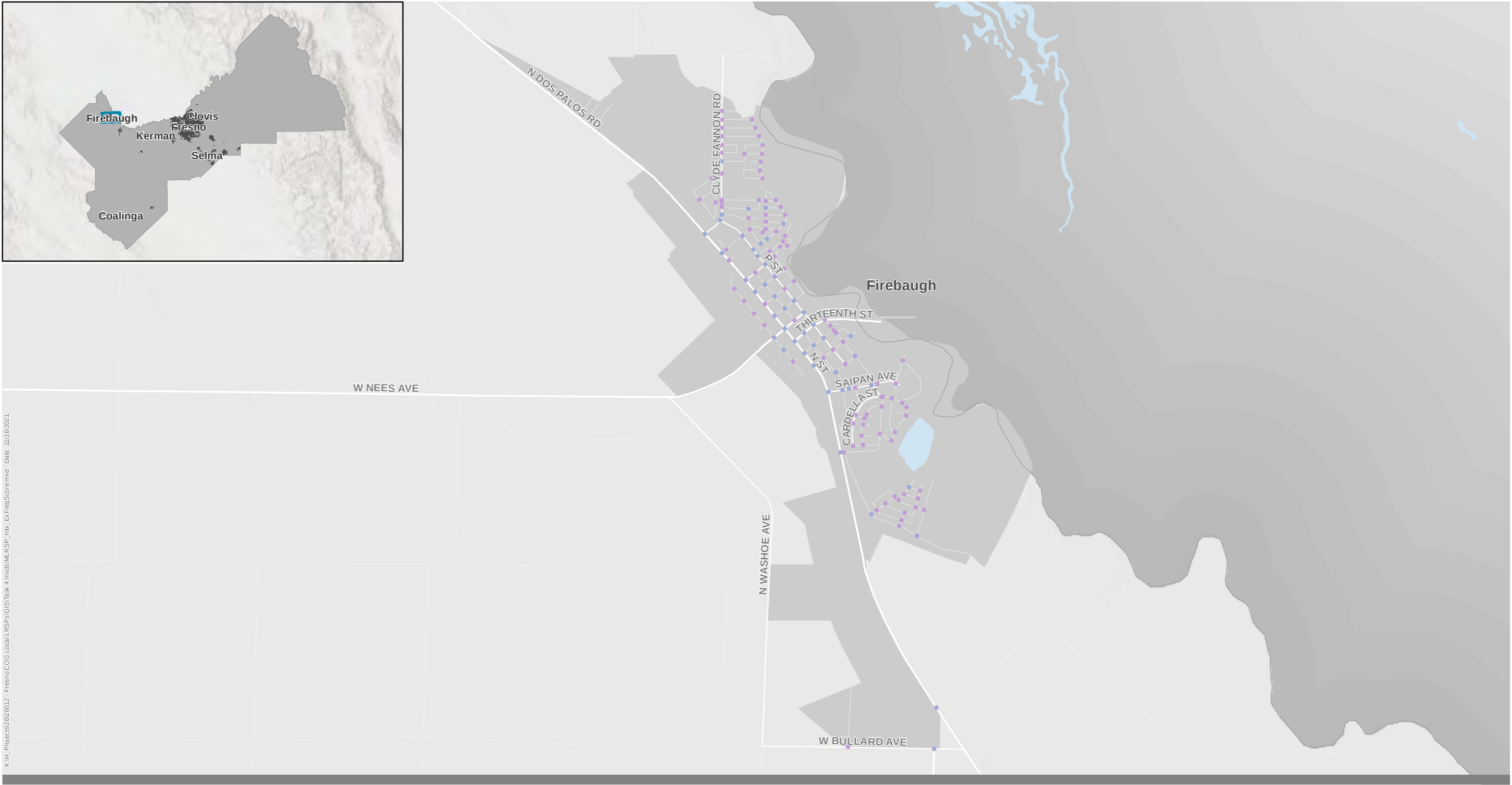
- 95-100th Percentile
- 90-95th Percentile
- 75-90th Percentile
- 50-75th Percentile
- 0-50th Percentile

- City Limits
- County Boundary



**Intersection Crash Severity Scores  
Jurisdiction Results: Firebaugh  
Fresno Council of Governments**

Figure 50



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**Excess Expected Frequency**

- 95-100th Percentile
- 90-95th Percentile

- 75-90th Percentile
- 50-75th Percentile
- 0-50th Percentile

- City Limits
- County Boundary



Figure 51



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**Crash Severity Scores**

75-90th Percentile

95-100th Percentile

90-95th Percentile

50-75th Percentile
  0-50th Percentile

City Limits
  County Boundary



Figure 52





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- Excess Expected Frequency**

  - 95-100th Percentile
  - 90-95th Percentile
- 75-90th Percentile
  - 50-75th Percentile
  - 0-50th Percentile
- City Limits
  - County Boundary



Figure 53  
**Roadway Excess Predicted Average Crash Frequency Using Method of Moments  
 Jurisdiction Results: Firebaugh  
 Fresno Council of Governments**

## EMPHASIS AREAS

Based on key trends in the crash data, emphasis areas for the City of Firebaugh include pedestrian crashes, head on crashes, and hit object crashes. The primary collision factors of automobile right of way and other improper driving are the most commonly cited overall and among fatal and severe injury crashes. Therefore, strategies aimed at encouraging safe driver behaviors is included as an emphasis area. In addition, the data review suggests that the crash data available for the City may be incomplete, which limits the ability to systematically identify locations for improvement. Each of these areas is further discussed below.

### Pedestrian Crashes

Pedestrian crashes were identified as a focus area given the overrepresentation of pedestrians in fatal crashes. Half of the six fatal crashes involve a pedestrian, two of which were reported to occur when a pedestrian was "crossing not in a crosswalk" and one of which occurred when a pedestrian was reported as "crossing in crosswalk at intersection." This suggests opportunities for improvements to pedestrian infrastructure.

Pedestrians are identified as one of the six high priority challenge areas in the California SHSP. The high priority areas represent "the greatest opportunity to reduce fatalities and serious injuries across the state" (Caltrans SHSP).

### Head on Crashes

Head on crashes were selected as an emphasis area as one of the two severe injury crashes and two of the 27 other injury crashes were classified as a head on crashes. As discussed below under Engineering Strategies, countermeasures are available targeted at head on crashes.

The California SHSP includes lane departures as one of the six high priorities in California. As indicated in the Caltrans SHSP, "the Lane Departures Challenge Area includes head-on, hit object, and overturned crashes. This includes instances where a vehicle runs off the road or crosses into the opposing lane prior to the crash." These crashes are a high priority due to their severity level.

## Hit Object Crashes

Hit object crashes were selected as an emphasis area due to the severity of the crashes. One of the ten hit object crashes resulted in a fatality and one in other injury. A variety of roadway countermeasures are available targeted at and reducing hit object crashes. As discussed below under Engineering Strategies, countermeasures are available targeted at hit object crashes.

As indicated under head on crashes discussion, the California SHSP includes lane departures – which includes hit object crashes – as one of the six high priorities in California.

## Driver Behaviors

The primary collision factors of automobile right of way and other improper driving were cited in one of the two severe crashes and seven of the 27 other injury crashes. These primary collision factors reference a CVC violation where a driver turning failed to yield right-of-way to oncoming traffic or drove from a straight course without reasonable safety or signaling property. The majority of crashes with these PCFs were classified as rear end or sideswipe. A combination of engineering, education and enforcement strategies aimed at encouraging safe driver behaviors can be utilized. Each of these areas is further discussed below.

## Improved Data Collection

Improved crash data collection is identified as an emphasis area as a lack of reporting could contribute to the absence of crashes for analysis in 2015 and potentially missing data for 2016 through 2019. High quality data is an essential component of achieving Firebaugh's goals, namely being able to systematically implement safety countermeasures.

## STRATEGIES

The following subsections present engineering, education, emergency services, and enforcement strategies to help improve roadway safety within the City of Firebaugh.



### Engineering Strategies

The three fatal and severe injury collision types reported in Firebaugh were vehicle-pedestrian, head on, and hit object crashes. The fatal and severe injury primary collision factors reported were pedestrian violation and other improper driving, and automobile right of way was the most frequently reported primary collision factor. High priority countermeasures to address these collision types and primary collision factors are shown in Table 23.

Table 23. High Priority Countermeasures

|                                    | Countermeasure Name                                                                           | ID      | Crashes Addressed                        |
|------------------------------------|-----------------------------------------------------------------------------------------------|---------|------------------------------------------|
| Roadway Countermeasures            | Street Lighting                                                                               | R1      | Crashes at night                         |
|                                    | Remove or Relocate Fixed Objects Outside of Clear Recovery Zone                               | R2      | Hit object                               |
|                                    | Install Guardrails                                                                            | R4      | Hit object                               |
|                                    | Road Diet                                                                                     | R14     | Hit object                               |
|                                    | Widen Shoulder                                                                                | R15     | Hit object                               |
|                                    | Install/Upgrade Signs with New Fluorescent Sheeting                                           | R22     | Hit object                               |
|                                    | Install Dynamic/Variable Speed Warning Signs                                                  | R26     | Hit object                               |
|                                    | Install Edgelines and Centerlines                                                             | R28     | Hit object                               |
|                                    | Install Centerline Rumble Strips/Stripes                                                      | R30     | Head on                                  |
|                                    | Install Edgeline Rumble Strips/Stripes                                                        | R31     | Hit object                               |
|                                    | Install Dynamic Regulatory Speed Warning Signs                                                | n/a     | Hit object                               |
| Intersection Countermeasures       | Add Intersection Lighting at Intersections                                                    | S1/NS1  | Crashes at night                         |
|                                    | No Right-Turn on Red                                                                          | n/a     | Vehicle-pedestrian, pedestrian violation |
|                                    | Convert Intersection to Roundabout                                                            | NS4/NS5 | All                                      |
| Pedestrian/Bicycle Countermeasures | Install Sidewalk/Pathway                                                                      | R34PB   | Pedestrian violation                     |
|                                    | Install/Upgrade Pedestrian Crossing with Enhanced Features                                    | R35PB   | Vehicle-pedestrian, pedestrian violation |
|                                    | Install Raised Medians (or Refuge Islands)                                                    | NS19PB  | Vehicle-pedestrian, pedestrian violation |
|                                    | Install/Upgrade Pedestrian Crossing at Uncontrolled Locations (with Enhanced Safety Features) | NS21PB  | Vehicle-pedestrian                       |

Note: The ID number references the Caltrans Manual Local Road Safety

Appendix B contains the regional Countermeasures Toolbox which includes more detailed information regarding the countermeasures listed above.



The following figures and tables provide data on collision types and factors for the intersections and roadways with the highest crash scores. The locations with the highest crash scores may be top priorities for implementing countermeasures and pursuing grants. Firebaugh can use the information about collision type and factors to identify potential countermeasures to apply, using the information in Table 23.

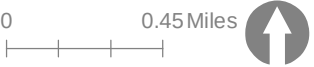
Figure 54 and Figure 55 present the top priority intersections and breakdown of the top collision types and primary collision factors, respectively. Figure 56 and Figure 57 present the top priority roadways and breakdown of the top collision types and primary collision factors, respectively.



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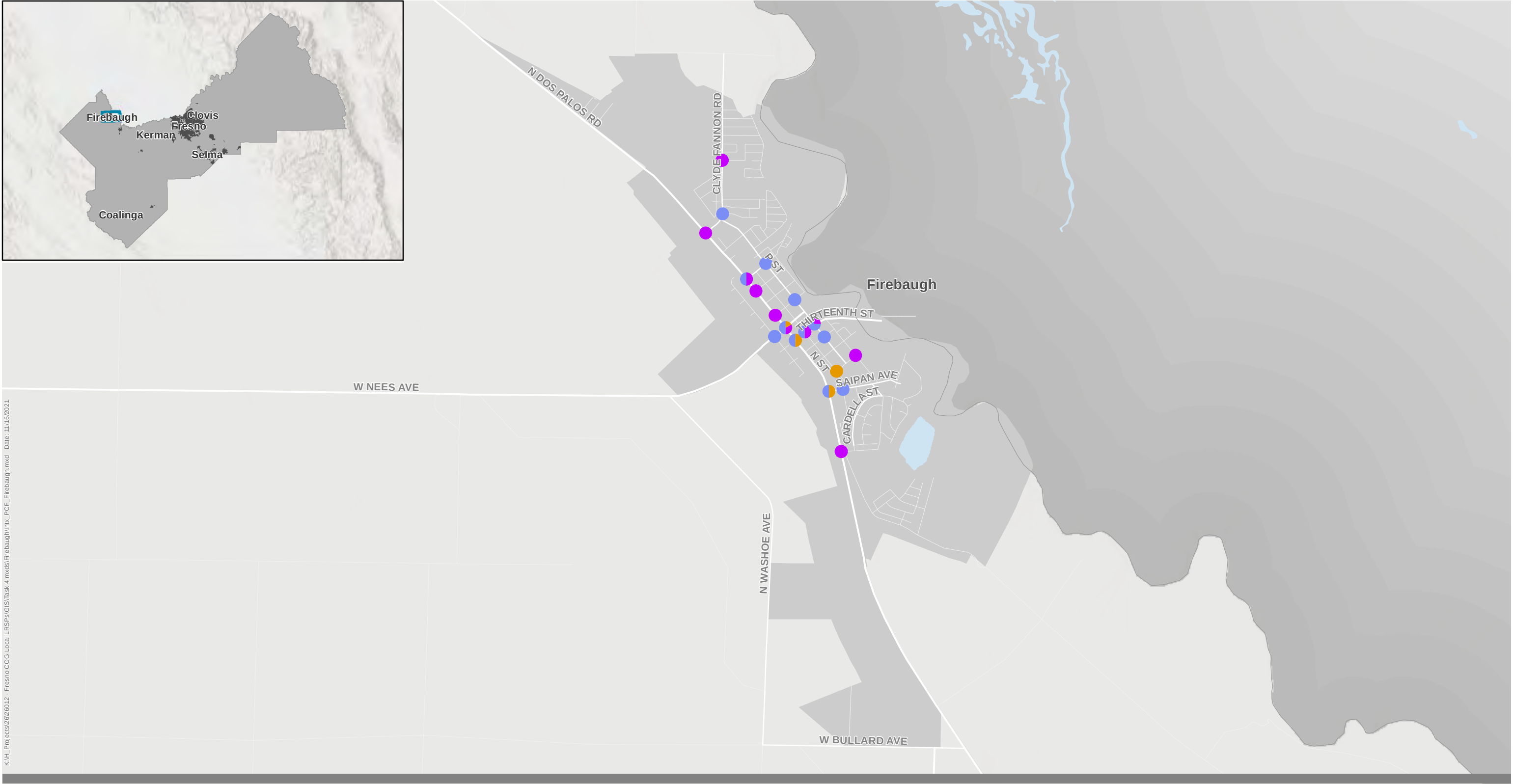
**Collision Type**

- Vehicle-Pedestrian
- Head On
- Hit Object
- City Limits
- County Boundary



**Top Fatal/Severe Injury Intersection Collision Types  
Jurisdiction Results: Firebaugh  
Fresno Council of Governments**

Figure 54



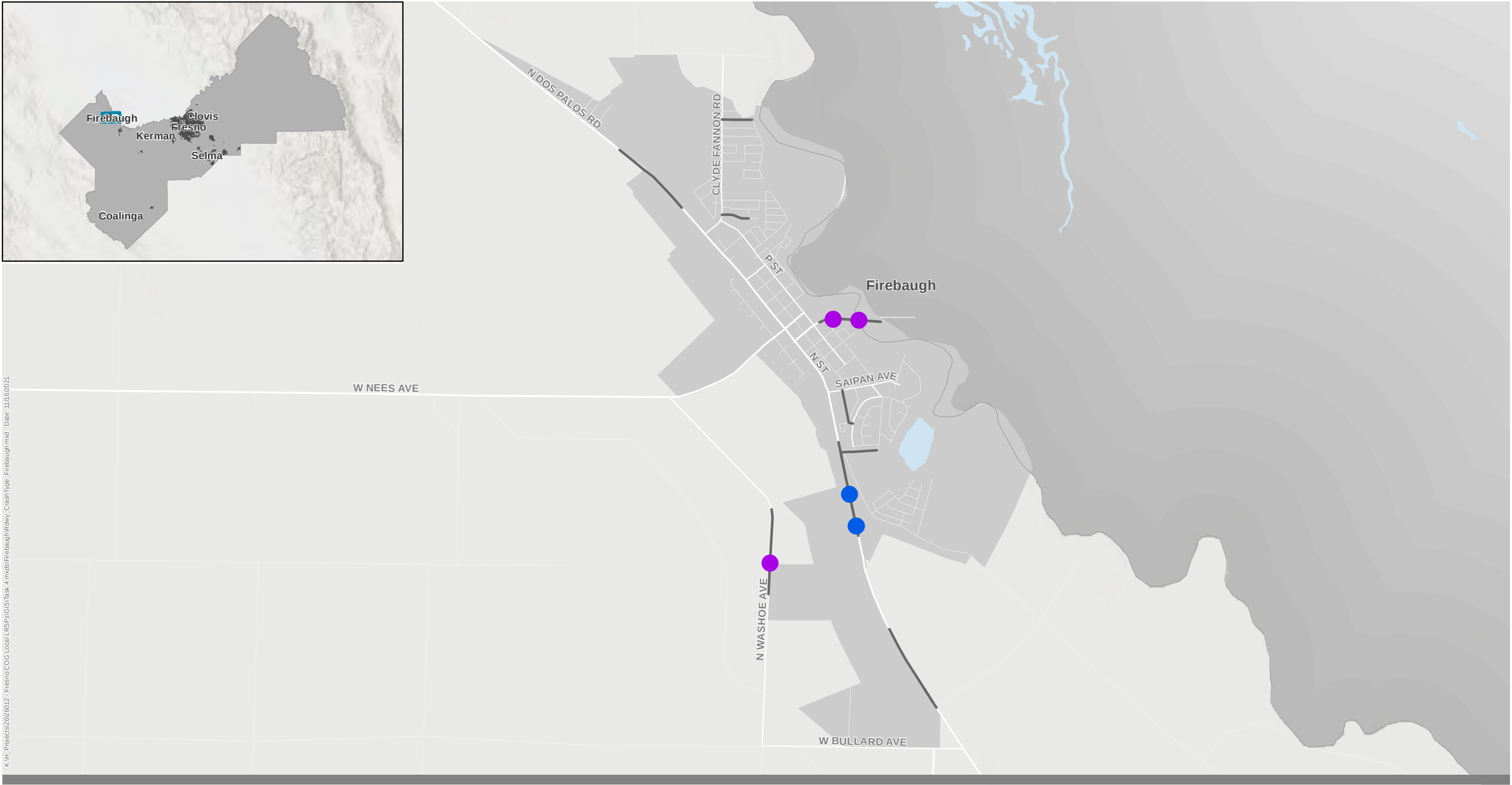
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**Primary Collision Factors**

- Pedestrian Violation
- Automobile Right of Way
- Other Improper Driving

- City Limits
- County Boundary

0 0.45 Miles



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**Collision Type**

- Head On
- Hit Object

— Priority Roadways



City Limits

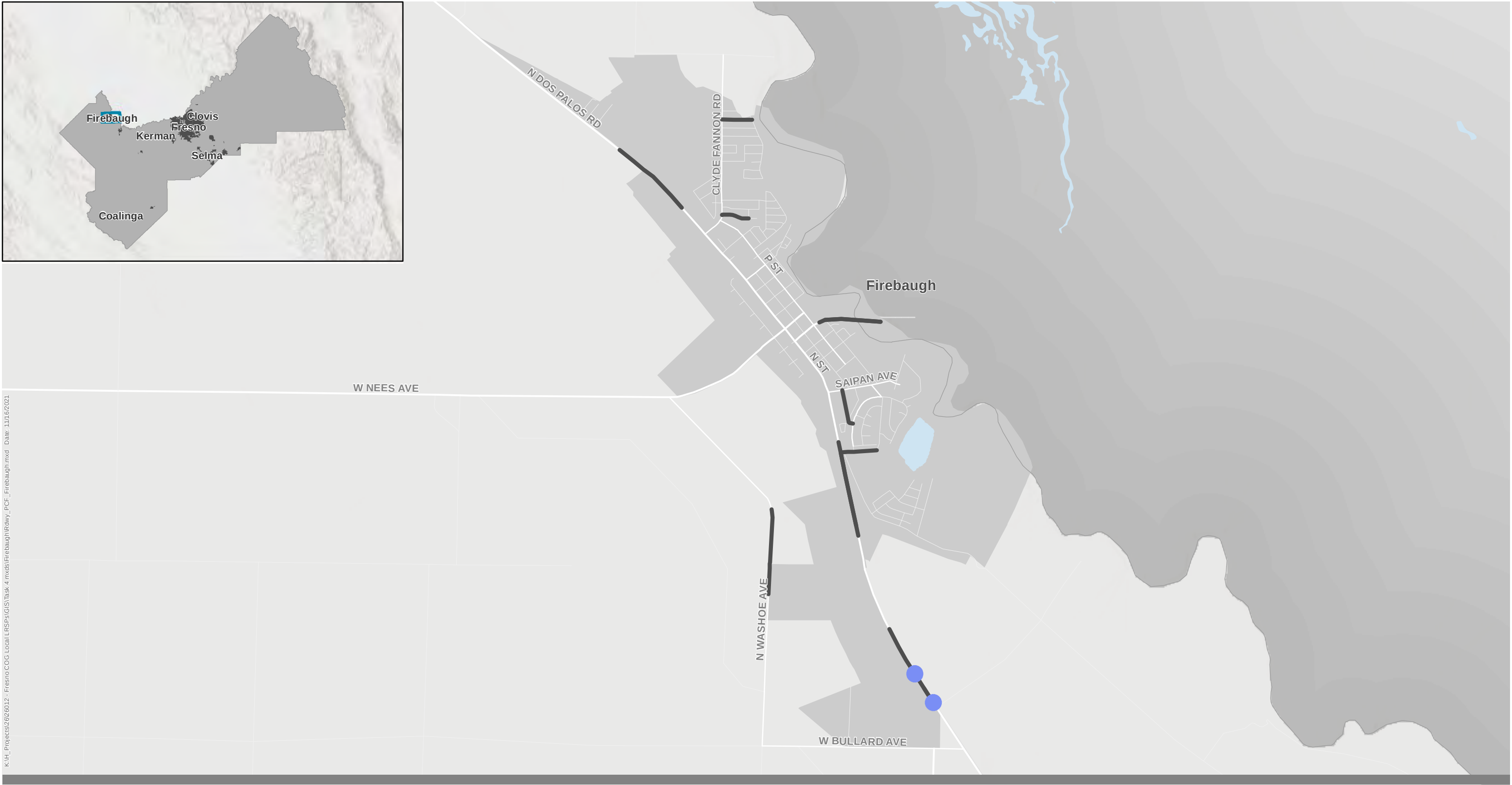


County Boundary

0 0.45 Miles







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**Primary Collision Factors**

- Other Improper Driving
- Priority Roadways
- City Limits
- County Boundary

0 0.45 Miles

Table 24 and Table 25 provide information for the top 46 intersection locations (based on crash severity score), including control type (signalized or unsignalized), crash severity score, and total number of crashes by collision type or primary collision factor.

Table 24. Priority Intersections with Collision Type based on Top 3 Fatal/Severe Injury Collision Types

| #  | Location                     | Control Type | Crash Severity Score | Total Number of Crashes | Collision Type  |         |            |       |
|----|------------------------------|--------------|----------------------|-------------------------|-----------------|---------|------------|-------|
|    |                              |              |                      |                         | Vehicle/<br>Ped | Head On | Hit Object | Other |
| 1  | N ST & SAIPAN AVE            | Unsignalized | 43.12                | 7                       | 0               | 2       | 0          | 5     |
| 2  | N ST & NINTH ST              | Unsignalized | 38.25                | 2                       | 0               | 1       | 0          | 1     |
| 3  | THIRTEENTH ST & N ST         | Signal       | 28.16                | 7                       | 1               | 0       | 0          | 6     |
| 4  | TWELFTH ST & N ST            | Signal       | 25.71                | 10                      | 0               | 1       | 0          | 9     |
| 5  | N ST & CLYDE FANNON RD       | Unsignalized | 5.47                 | 7                       | 1               | 0       | 0          | 6     |
| 6  | N ST & ELEVENTH ST           | Unsignalized | 4.36                 | 7                       | 0               | 0       | 0          | 7     |
| 7  | TWELFTH ST & M ST            | Unsignalized | 2.74                 | 4                       | 0               | 0       | 0          | 4     |
| 8  | CLINE ST & R ST              | Unsignalized | 2.43                 | 2                       | 1               | 0       | 0          | 1     |
| 9  | THIRTEENTH ST & P ST         | Unsignalized | 2.42                 | 7                       | 1               | 0       | 1          | 5     |
| 10 | SAN DIEGO AVE & BULLARD AVE  | Unsignalized | 2.34                 | 2                       | 0               | 0       | 2          | 0     |
| 11 | N ST & FOURTEENTH ST         | Unsignalized | 2.34                 | 2                       | 0               | 0       | 0          | 2     |
| 12 | THIRTEENTH ST & O ST         | Unsignalized | 2.22                 | 6                       | 0               | 1       | 0          | 5     |
| 13 | O ST & SIXTEENTH ST          | Unsignalized | 2.14                 | 1                       | 1               | 0       | 0          | 0     |
| 14 | DOS PALOS RD & SIERRA AVE    | Unsignalized | 1.62                 | 3                       | 0               | 0       | 0          | 3     |
| 15 | FIFTEENTH ST & R ST          | Unsignalized | 1.22                 | 1                       | 0               | 0       | 0          | 1     |
| 16 | P ST & CLINE ST              | Unsignalized | 1.22                 | 1                       | 0               | 0       | 0          | 1     |
| 17 | CLYDE FANNON RD & MENDOZA DR | Unsignalized | 1.22                 | 1                       | 0               | 1       | 0          | 0     |
| 18 | ELEVENTH ST & P ST           | Unsignalized | 0.60                 | 3                       | 0               | 0       | 1          | 2     |
| 19 | N ST & EIGHTH ST             | Unsignalized | 0.60                 | 3                       | 0               | 0       | 1          | 2     |
| 20 | SAIPAN AVE & O ST            | Unsignalized | 0.40                 | 2                       | 0               | 0       | 0          | 2     |
| 21 | N ST & FIFTEENTH ST          | Unsignalized | 0.40                 | 2                       | 0               | 0       | 0          | 2     |
| 22 | YIP ST & P ST                | Unsignalized | 0.40                 | 2                       | 0               | 1       | 0          | 1     |
| 23 | CLYDE FANNON RD & P ST       | Unsignalized | 0.40                 | 2                       | 0               | 0       | 0          | 2     |
| 24 | N ST & MORRIS KYLE DR        | Unsignalized | 0.40                 | 2                       | 0               | 1       | 0          | 1     |
| 25 | ALDER WAY & OAK ST           | Unsignalized | 0.20                 | 1                       | 0               | 0       | 0          | 1     |
| 26 | HELM CANAL RD & BIRCH DR     | Unsignalized | 0.20                 | 1                       | 0               | 0       | 0          | 1     |
| 27 | HELM CANAL RD & POPLAR WAY   | Unsignalized | 0.20                 | 1                       | 0               | 0       | 1          | 0     |
| 28 | SAIPAN AVE & CORREGIDOR AVE  | Unsignalized | 0.20                 | 1                       | 0               | 0       | 0          | 1     |
| 29 | SAIPAN AVE & GREENACRE ST    | Unsignalized | 0.20                 | 1                       | 0               | 0       | 0          | 1     |
| 30 | SIXTEENTH ST & Q ST          | Unsignalized | 0.20                 | 1                       | 0               | 0       | 0          | 1     |
| 31 | THIRTEENTH ST & M ST         | Unsignalized | 0.20                 | 1                       | 0               | 0       | 0          | 1     |



| #  | Location                    | Control Type | Crash Severity Score | Total Number of Crashes | Collision Type  |         |            |       |
|----|-----------------------------|--------------|----------------------|-------------------------|-----------------|---------|------------|-------|
|    |                             |              |                      |                         | Vehicle/<br>Ped | Head On | Hit Object | Other |
| 32 | FOURTEENTH ST & O ST        | Unsignalized | 0.20                 | 1                       | 0               | 1       | 0          | 0     |
| 33 | FOURTEENTH ST & P ST        | Unsignalized | 0.20                 | 1                       | 0               | 0       | 0          | 1     |
| 34 | TWELFTH ST & P ST           | Unsignalized | 0.20                 | 1                       | 0               | 0       | 0          | 1     |
| 35 | ELEVENTH ST & O ST          | Unsignalized | 0.20                 | 1                       | 0               | 0       | 0          | 1     |
| 36 | TENTH ST & O ST             | Unsignalized | 0.20                 | 1                       | 0               | 0       | 0          | 1     |
| 37 | NINTH ST & O ST             | Unsignalized | 0.20                 | 1                       | 0               | 0       | 1          | 0     |
| 38 | NINTH ST & P ST             | Unsignalized | 0.20                 | 1                       | 0               | 0       | 0          | 1     |
| 39 | EIGHTH ST & P ST            | Unsignalized | 0.20                 | 1                       | 0               | 0       | 1          | 0     |
| 40 | SEVENTH ST & P ST           | Unsignalized | 0.20                 | 1                       | 0               | 0       | 0          | 1     |
| 41 | N ST & YIP ST               | Unsignalized | 0.20                 | 1                       | 0               | 0       | 0          | 1     |
| 42 | CLINE ST & Q ST             | Unsignalized | 0.20                 | 1                       | 0               | 1       | 0          | 0     |
| 43 | CLINE ST & T ST             | Unsignalized | 0.20                 | 1                       | 0               | 0       | 0          | 1     |
| 44 | ZOZAYA ST & ALLARDT DR      | Unsignalized | 0.20                 | 1                       | 0               | 0       | 0          | 1     |
| 45 | ALLARDT DR & MENDOZA DR     | Unsignalized | 0.20                 | 1                       | 0               | 0       | 0          | 1     |
| 46 | CLYDE FANNON RD & BORBOA LN | Unsignalized | 0.20                 | 1                       | 0               | 0       | 0          | 1     |

Note: Other crashes include all crashes that are not coded as one of the top three collision types

Table 25. Priority Intersections with Primary Collision Factor based on Top 3 Fatal/Severe Injury Primary Collision Factors

| #  | Location                    | Type         | Crash Severity Score | Total Number of Crashes | Primary Collision Factor |          |                        |       |
|----|-----------------------------|--------------|----------------------|-------------------------|--------------------------|----------|------------------------|-------|
|    |                             |              |                      |                         | Pedestrian Violation     | Auto ROW | Other Improper Driving | Other |
| 1  | N ST & SAIPAN AVE           | Unsignalized | 43.12                | 7                       | 1                        | 0        | 1                      | 5     |
| 2  | N ST & NINTH ST             | Unsignalized | 38.25                | 2                       | 0                        | 1        | 0                      | 2     |
| 3  | THIRTEENTH ST & N ST        | Signal       | 28.16                | 7                       | 1                        | 0        | 1                      | 5     |
| 4  | TWELFTH ST & N ST           | Signal       | 25.71                | 10                      | 1                        | 2        | 3                      | 6     |
| 5  | N ST & CLYDE FANNON RD      | Unsignalized | 5.47                 | 7                       | 0                        | 4        | 0                      | 7     |
| 6  | N ST & ELEVENTH ST          | Unsignalized | 4.36                 | 7                       | 0                        | 4        | 0                      | 7     |
| 7  | TWELFTH ST & M ST           | Unsignalized | 2.74                 | 4                       | 0                        | 0        | 1                      | 3     |
| 8  | CLINE ST & R ST             | Unsignalized | 2.43                 | 2                       | 0                        | 0        | 0                      | 2     |
| 9  | THIRTEENTH ST & P ST        | Unsignalized | 2.42                 | 7                       | 0                        | 1        | 3                      | 4     |
| 10 | SAN DIEGO AVE & BULLARD AVE | Unsignalized | 2.34                 | 2                       | 0                        | 0        | 0                      | 2     |
| 11 | N ST & FOURTEENTH ST        | Unsignalized | 2.34                 | 2                       | 0                        | 0        | 0                      | 2     |
| 12 | THIRTEENTH ST & O ST        | Unsignalized | 2.22                 | 6                       | 0                        | 2        | 2                      | 4     |
| 13 | O ST & SIXTEENTH ST         | Unsignalized | 2.14                 | 1                       | 1                        | 0        | 0                      | 0     |
| 14 | DOS PALOS RD & SIERRA AVE   | Unsignalized | 1.62                 | 3                       | 0                        | 0        | 0                      | 3     |
| 15 | FIFTEENTH ST & R ST         | Unsignalized | 1.22                 | 1                       | 0                        | 0        | 0                      | 1     |
| 16 | P ST & CLINE ST             | Unsignalized | 1.22                 | 1                       | 0                        | 0        | 0                      | 1     |



| #  | Location                     | Type         | Crash Severity Score | Total Number of Crashes | Primary Collision Factor |          |                        |       |
|----|------------------------------|--------------|----------------------|-------------------------|--------------------------|----------|------------------------|-------|
|    |                              |              |                      |                         | Pedestrian Violation     | Auto ROW | Other Improper Driving | Other |
| 17 | CLYDE FANNON RD & MENDOZA DR | Unsignalized | 1.22                 | 1                       | 0                        | 0        | 1                      | 0     |
| 18 | ELEVENTH ST & P ST           | Unsignalized | 0.60                 | 3                       | 0                        | 0        | 1                      | 2     |
| 19 | N ST & EIGHTH ST             | Unsignalized | 0.60                 | 3                       | 0                        | 1        | 1                      | 2     |
| 20 | SAIPAN AVE & O ST            | Unsignalized | 0.40                 | 2                       | 0                        | 0        | 0                      | 2     |
| 21 | N ST & FIFTEENTH ST          | Unsignalized | 0.40                 | 2                       | 0                        | 0        | 0                      | 2     |
| 22 | YIP ST & P ST                | Unsignalized | 0.40                 | 2                       | 0                        | 0        | 0                      | 2     |
| 23 | CLYDE FANNON RD & P ST       | Unsignalized | 0.40                 | 2                       | 0                        | 0        | 0                      | 2     |
| 24 | N ST & MORRIS KYLE DR        | Unsignalized | 0.40                 | 2                       | 0                        | 1        | 0                      | 2     |
| 25 | ALDER WAY & OAK ST           | Unsignalized | 0.20                 | 1                       | 0                        | 0        | 0                      | 1     |
| 26 | HELM CANAL RD & BIRCH DR     | Unsignalized | 0.20                 | 1                       | 0                        | 0        | 0                      | 1     |
| 27 | HELM CANAL RD & POPLAR WAY   | Unsignalized | 0.20                 | 1                       | 0                        | 0        | 0                      | 1     |
| 28 | SAIPAN AVE & CORREGIDOR AVE  | Unsignalized | 0.20                 | 1                       | 0                        | 0        | 1                      | 0     |
| 29 | SAIPAN AVE & GREENACRE ST    | Unsignalized | 0.20                 | 1                       | 0                        | 0        | 0                      | 1     |
| 30 | SIXTEENTH ST & Q ST          | Unsignalized | 0.20                 | 1                       | 0                        | 1        | 0                      | 1     |
| 31 | THIRTEENTH ST & M ST         | Unsignalized | 0.20                 | 1                       | 0                        | 0        | 0                      | 1     |
| 32 | FOURTEENTH ST & O ST         | Unsignalized | 0.20                 | 1                       | 0                        | 0        | 0                      | 1     |
| 33 | FOURTEENTH ST & P ST         | Unsignalized | 0.20                 | 1                       | 0                        | 0        | 1                      | 0     |
| 34 | TWELFTH ST & P ST            | Unsignalized | 0.20                 | 1                       | 0                        | 0        | 0                      | 1     |
| 35 | ELEVENTH ST & O ST           | Unsignalized | 0.20                 | 1                       | 0                        | 0        | 0                      | 1     |
| 36 | TENTH ST & O ST              | Unsignalized | 0.20                 | 1                       | 0                        | 0        | 0                      | 1     |
| 37 | NINTH ST & O ST              | Unsignalized | 0.20                 | 1                       | 0                        | 0        | 0                      | 1     |
| 38 | NINTH ST & P ST              | Unsignalized | 0.20                 | 1                       | 0                        | 0        | 0                      | 1     |
| 39 | EIGHTH ST & P ST             | Unsignalized | 0.20                 | 1                       | 0                        | 0        | 1                      | 0     |
| 40 | SEVENTH ST & P ST            | Unsignalized | 0.20                 | 1                       | 0                        | 0        | 0                      | 1     |
| 41 | N ST & YIP ST                | Unsignalized | 0.20                 | 1                       | 0                        | 0        | 0                      | 1     |
| 42 | CLINE ST & Q ST              | Unsignalized | 0.20                 | 1                       | 0                        | 0        | 0                      | 1     |
| 43 | CLINE ST & T ST              | Unsignalized | 0.20                 | 1                       | 0                        | 0        | 0                      | 1     |
| 44 | ZOZAYA ST & ALLARDT DR       | Unsignalized | 0.20                 | 1                       | 0                        | 0        | 0                      | 1     |
| 45 | ALLARDT DR & MENDOZA DR      | Unsignalized | 0.20                 | 1                       | 0                        | 0        | 0                      | 1     |
| 46 | CLYDE FANNON RD & BORBOA LN  | Unsignalized | 0.20                 | 1                       | 0                        | 1        | 0                      | 1     |

Note: Other crashes include all crashes that are not coded as one of the top three primary collision factors

Table 26 and Table 27 provide information for the top ten roadway segments (based on crash severity score), including roadway classification, crash severity score, and total number of crashes by collision type or primary collision factor.

Table 26. Priority Roadways Segments with Collision Type based on Top 3 Fatal/Severe Injury Collision Types

| #  | Location                                                     | Classification     | Crash Severity Score | Total Number of Crashes | Collision Type |         |            |       |
|----|--------------------------------------------------------------|--------------------|----------------------|-------------------------|----------------|---------|------------|-------|
|    |                                                              |                    |                      |                         | Vehicle/ Ped   | Head On | Hit Object | Other |
| 1  | Thirteenth St (west of Q St to city limits)                  | Arterial/Collector | 33.13                | 2                       | 0              | 0       | 2          | 0     |
| 2  | SR 33 (south of N St to Sierra Ave)*                         | Arterial/Collector | 33.13                | 2                       | 0              | 0       | 0          | 2     |
| 3  | SR 33 (south of N St to Sierra Ave)*                         | Arterial/Collector | 32.93                | 1                       | 0              | 0       | 0          | 1     |
| 4  | SR 33 (south of Cordel Ave to north of Clyde Fannon Rd)*     | Arterial/Collector | 2.54                 | 3                       | 0              | 0       | 0          | 3     |
| 5  | SR 33 (Morris Kyle Dr to north of city limits)*              | Arterial/Collector | 2.34                 | 2                       | 0              | 1       | 0          | 1     |
| 6  | N Washoe Ave (south of W Nees Ave to north of W Bullard Ave) | Arterial/Collector | 2.34                 | 2                       | 0              | 0       | 1          | 1     |
| 7  | Rev Kantor St (Clyde Fannon Rd to Zozaya St)                 | Local              | 1.62                 | 3                       | 0              | 0       | 0          | 3     |
| 8  | Corregidor Ave (Saipan Ave to Cardella St)                   | Local              | 0.40                 | 2                       | 0              | 0       | 0          | 2     |
| 9  | Mendoza Dr (Clyde Fannon Rd to Menodza Dr)                   | Local              | 0.20                 | 1                       | 0              | 0       | 0          | 1     |
| 10 | Morris Kyle Dr (N St to Landucci Dr)                         | Local              | 0.20                 | 1                       | 0              | 0       | 0          | 1     |

\* Roadway segment is an at-grade Caltrans facility.

Note: Other crashes include all crashes that are not coded as one of the top three collision types

Table 27. Priority Roadways Segments with Primary Collision Factors based on Top 3 Fatal/Severe Injury Primary Collision Factors

| #  | Location                                                     | Classification      | Crash Severity Score | Total Number of Crashes | Primary Collision Factor |          |                        |       |
|----|--------------------------------------------------------------|---------------------|----------------------|-------------------------|--------------------------|----------|------------------------|-------|
|    |                                                              |                     |                      |                         | Ped Violation            | Auto ROW | Other Improper Driving | Other |
| 1  | Thirteenth St (west of Q St to city limits)                  | Arterial/ Collector | 33.13                | 2                       | 0                        | 0        | 0                      | 2     |
| 2  | SR 33 (south of N St to Sierra Ave)*                         | Arterial/ Collector | 33.13                | 2                       | 0                        | 0        | 1                      | 1     |
| 3  | SR 33 (south of N St to Sierra Ave)*                         | Arterial/ Collector | 32.93                | 1                       | 0                        | 0        | 1                      | 0     |
| 4  | SR 33 (south of Cordel Ave to north of Clyde Fannon Rd)*     | Arterial/ Collector | 2.54                 | 3                       | 0                        | 0        | 0                      | 3     |
| 5  | SR 33 (Morris Kyle Dr to north of city limits)*              | Arterial/ Collector | 2.34                 | 2                       | 0                        | 0        | 0                      | 2     |
| 6  | N Washoe Ave (south of W Nees Ave to north of W Bullard Ave) | Arterial/ Collector | 2.34                 | 2                       | 0                        | 0        | 0                      | 2     |
| 7  | Rev Kantor St (Clyde Fannon Rd to Zozaya St)                 | Local               | 1.62                 | 3                       | 0                        | 0        | 0                      | 3     |
| 8  | Corregidor Ave (Saipan Ave to Cardella St)                   | Local               | 0.40                 | 2                       | 0                        | 0        | 0                      | 2     |
| 9  | Mendoza Dr (Clyde Fannon Rd to Menodza Dr)                   | Local               | 0.20                 | 1                       | 0                        | 0        | 0                      | 1     |
| 10 | Morris Kyle Dr (N St to Landucci Dr)                         | Local               | 0.20                 | 1                       | 0                        | 0        | 0                      | 1     |

\* Roadway segment is an at-grade Caltrans facility.

Note: Other crashes include all crashes that are not coded as one of the top three primary collision factors





## Education Strategies

Emphasis areas for Firebaugh include pedestrian crashes and driver behaviors, which can serve as focus areas for education strategies. Half the six reported fatal crashes involved pedestrians and the primary collision factors of automobile right of way and other improper driving were cited in one of the two severe crashes and seven of the 27 other injury crashes. These primary collision factors reference a CVC violation where a driver turning failed to yield right-of-way to oncoming traffic or drove from a straight course without reasonable safety or signaling property.

The Safe Roads Save Lives campaign is a marketing effort led by the Fresno COG, with the goals of:

- Educate all road users on safe transportation behaviors
- Increase safety for people walking and biking
- Highlight behaviors that cause the most crashes in Fresno County—speeding and distracted driving



The campaign includes branding, social media strategies, print materials, radio and video resources, school resources, and a campaign website. Firebaugh may find these materials helpful, especially those related to pedestrian safety including speeding and watching out for pedestrians.

The following activities are recommended for Firebaugh as they move forward on implementing the Safe Roads Save Lives campaign:

- Identify staff appropriate to attend a presentation by Fresno COG staff about the Safe Roads Save Lives campaign. Appropriate staff members include staff associated with transportation engineering and planning, communications, traffic enforcement, school transportation, and other jurisdictional staff who work with the roadway system.
- Work with schools to distribute print materials and offer school-related transportation resources. Ensure that school communications are in both English and Spanish.
- Work with public information or communications staff to spread Safe Roads Save Lives materials throughout Firebaugh through the following channels:
  - o Repost and link to Fresno COG posts that refer to the Safe Roads Save Lives campaign.
  - o Have print materials (flyers, bumper stickers, pins, and postcards) available at events and community festivals.
  - o Work with the Fresno COG to identify a radio station to air a Safe Roads Save Lives radio public service announcement (PSA).
  - o Have a direct link to Safe Roads Save Lives campaign website on the City's website.



## Emergency Services

Emergency service organizations depend on safe roadways and efficient communication processes to reach and effectively respond to emergencies. Each type of emergency services organization that serves Firebaugh – law enforcement, fire, emergency medical services (EMS), California Highway Patrol – work independently and collaboratively to develop procedures that allow them to respond to incidents in their own jurisdictions as well as support others as needed. The following recommendations may help improve emergency services response as the various organizations update procedures and policies and continue to partner on roadway safety efforts:

- All roadway safety projects should be vetted by emergency service organizations to ensure that their design does not hamper access.
- As new emergency service and response procedures are developed, roadway safety improvement opportunities should be identified and implications of changes to response times should be considered.
- Firebaugh staff should participate in periodic coordination calls between emergency response agencies to gather and share recent observations about crashes and hot spots, to understand emergent safety issues that may not have led to policy reports or yet be available through statewide crash reporting systems.



## Enforcement

Enforcement strategies can include programs or campaigns specifically focused on changing road user behavior through more visible and active enforcement of existing traffic laws, as well as focusing enforcement in areas that have historically been shown to have higher-than-average crash rates. Typically, the effectiveness of enforcement strategies is temporal, meaning they are effective at changing behavior for a discrete period of time – during and shortly after the increased enforcement activities.

The following enforcement strategies should be considered for Firebaugh:

- Add additional crossing guards at high-concern locations. Train community members if needed.
- Focus speed enforcement efforts at locations with high speed-related crash rates.
- Work with schools to conduct “alternative enforcement,” such as having students write “tickets” that they hand to community members to highlight positive and negative behaviors on the roadways.

The effectiveness of each strategy should be measured and evaluated, considering the number of staff hours and amount of resources needed. The results should be reviewed and used to refine future enforcement activities.

Enforcement strategies should be undertaken with due caution to avoid inequitable enforcement activities and evaluated to determine the strategy's impact. More details about equitable enforcement can be found on page 8 (Introduction).

## EVALUATION AND IMPLEMENTATION

A key part of achieving the City's vision is consistently evaluating roadway safety performance and tracking progress towards the City's goals. The City will develop a process to regularly collect data and information around the performance measures that can be used to assess changes city-wide and at the top priority locations.

As feasible, it is recommended that the City of Firebaugh update this LRSP every three to five years using updated crash data and the performance measures. Comparing the performance measures related to investments made with the crash data should provide a clear indication of the impact of the City's and safety partner's efforts. Future LRSPs may provide new emphasis areas and top priority locations that reflect progress made and new priorities based on trends in the data.

Activities for implementing the plan include:

- Identifying countermeasures and strategies for priority locations based on the crash data.
- Utilizing the Fresno COG Regional Safety Plan to implement regional strategies and share best practices.
- Exploring funding opportunities to implement priority strategies.
- Identifying key activities to support the regional Safe Roads Save Lives campaign.
- Identifying enforcement strategies to implement and evaluate.
- Regularly coordinating with safety partner agencies to assess progress, identify opportunities to implement countermeasures and strategies, and identify opportunities for citizen involvement.
- Regularly collecting and organizing data to support evaluation of the LRSP.



## 5.0 FRESNO COUNTY

Unincorporated Fresno County has an approximate population of 171,108.<sup>27</sup> The average daily vehicle miles traveled is 6,191,770, and the County maintains approximately 3,997 total roadway centerline miles. Based on the review of crash data conducted as part of the LRSP, pedestrians and bicyclists are overrepresented in fatal and severe injury crashes. The top three fatal and severe injury collision types in unincorporated Fresno County were broadside, hit object, and overturned crashes; the top three fatal and severe injury primary collision factors were improper turning, driving under the influence, and unsafe speed. The LRSP provides potential engineering, education, emergency services, and enforcement strategies tailored to the County's crash history and local priorities, as well as performance measures to evaluate progress.

### VISION AND GOALS

The County's vision for roadway safety is:



Create a roadway network that provides a comfortable environment for all modes of transportation within the City.

The County's roadway safety goals in support of the vision are:

1. Use a data-driven approach to identify and prioritize opportunities to reduce the risk of crashes.
2. Implement proven, low-cost engineering countermeasures systemically to maximize funding opportunities across the large geographic County footprint.
3. Partner with adjacent local agencies to promote roadway safety as a priority investment.
4. Reduce the number of annual fatal and severe injury crashes across all public County roadways.
5. Engage citizens to provide feedback on roadway safety issues across the County.
6. Facilitate roadway safety stakeholder collaboration to identify effective ways to implement non-engineering strategies at key locations.
7. Achieve a reduction in the number of lane departure crashes on public County roadways.

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<sup>27</sup> 2018 population. Source: California Department of Finance

8. Achieve a reduction in the number of broadside crashes on public County roadways.
9. Establish regular communication between first responders and County staff to discuss ideas, trends, and feedback related to emergency service operations on the roadway network.

## SAFETY PARTNERS

A variety of agency staff and community partners were involved throughout the development of this LRSP and played an integral role in identifying priorities, providing local context, and reviewing the existing conditions analysis. Many of the strategies identified in this plan will require coordination with these partners and their support of the County's effort to create a culture of roadway safety. Fresno County's goals reflect the importance of partnering with local agencies, engaging with citizens, and collaborating with safety stakeholders to identify issues and implement solutions. While additional partners may be identified in the future, those involved in development of the LRSP include:

- BNSF Railroad
- California Highway Patrol
- California Rural Legal Assistance, Inc
- Central Unified School District
- Fresno Council of Governments
- Fresno County Administrative Office
- Fresno County Divisions of Public Works and Planning
- Fresno County Rural Transit
- Fresno County Sheriff's Office
- Fresno County Transportation Authority
- Kings Canyon Unified School District
- Riverdale Unified School District
- Tarpey Neighborhood

## PERFORMANCE MEASURES

Performance measures are used to track progress and a key element of making data-informed decisions. Performance measures that support the County's vision, goals, and emphasis areas include:

- Annual number of crashes (county-wide and at each of the top twenty priority locations)
- Annual number of fatal and severe injury crashes (county-wide and at each of the top twenty priority locations)
- Annual number of pedestrians and bicycle crashes (county-wide and at each of the top twenty priority locations)
- Annual number of broadside crashes (county-wide)
- Annual number of lane departure and hit object crashes (county-wide)
- Annual number of overturned vehicle crashes (county-wide)
- Annual number of crashes with a primary collision factor of unsafe speed (county-wide)
- Annual number of crashes with a primary collision factor of driving or bicycling under the influence of alcohol or drugs (county-wide)

- Investments made in roadway safety countermeasures (e.g. dollars spent, grants pursued, partnerships developed)
- Investments made in education and enforcement strategies (e.g. dollars spent, grants pursued, partnerships developed)
- Coordination with other local agencies and/or safety partners (e.g. meetings held, projects pursued)
- Opportunities provided for citizen engagement (e.g. meetings held, public campaigns launched)
- Coordination between first responders and Fresno County Office of Emergency Services staff (e.g. meetings held, programs implemented, strategies deployed)

As part of plan implementation, the County will identify a process for annually tracking these performance measures to support future updates to this roadway safety plan.

## DATA SUMMARY

The primary data sets used to inform the technical analyses for the County's local road safety plan were crash data and roadway network information. As noted below, future updates could incorporate traffic volume data if widely available for locations across the County. In addition, feedback from a publicly available survey was documented for consideration in identifying issues and improvement strategies.

### Public Survey Feedback

Toole Design Group worked with Fresno COG to develop an online survey and interactive webmap to provide the opportunity for public engagement on the LRSP. The goal was to collect both general and geographically specific feedback on safety problems, desired safety improvements in jurisdictions that are part of the MLRSP, as well as voluntary demographic information for Title IV reporting. Both activities were open from August 16, 2021 to September 20, 2021 and sought public feedback on spatial patterns of traffic safety concerns and desired improvements.

As the primary open public engagement opportunity during MLRSP development, the survey and interactive webmap served a crucial role in illuminating the community's traffic safety concerns and desired traffic safety improvements. Below is a summary of key findings from the online survey and interactive webmap specific to the unincorporated portions of Fresno County. More information on the methodology and overall findings of the survey are provided in *Appendix A*.

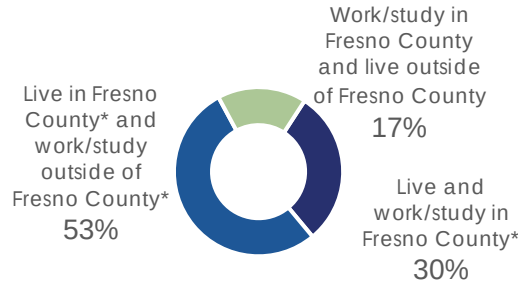


**47**  
PEOPLE  
RESPONDED



**47**  
LOCATIONS  
IDENTIFIED

#### WHERE PARTICIPANTS WORK AND LIVE



*\*Unincorporated Fresno County*



#### MOST COMMON SAFETY CONCERNS

- Crashes or near misses happen here
- Aggressive driving or speeding
- Lack of safe places to walk, bike, or wait for bus

- The survey asked respondents to provide input on the top road safety improvements needed in their communities. While the survey prompted participants to pick three improvements, some selected more than three responses. A total of 150 responses were received for Unincorporated Fresno County from 47 participants, with the most common desired improvement types including:
  - o Maintenance of existing roads and streets (33 responses)
  - o Rural road improvements to prevent run-off-road crashes (29 responses)
  - o Bike lanes/bikeways (18 responses)
  - o Street lighting (16 responses)
  - o Traffic signals (15 responses)
- Participants dropped points in the webmap in specific locations across Fresno County where they experienced road safety concerns. When leaving a point, participants could select from a list of traffic safety concerns and the kinds of travel impacted, with the ability to select as many responses as applicable. A text box gave participants the option to note what they think would make the location safer. A total of 47 locations were identified in Unincorporated Fresno County, with the following traffic safety concerns most common:
  - o Crashes or near misses happen here (30 responses)
  - o Aggressive driving or speeding (21 responses)
  - o Lack of safe places to walk, bike, or wait for bus (15 responses)
  - o Lack of safe opportunities to cross the street (12 responses)
  - o Poor lighting or poor visibility (10 responses)
- The survey asked participants where they live and work or study, with the option to select either outside of Fresno County or from a list of jurisdictions within the County. The participants who selected Unincorporated Fresno County included:
  - o 14 who live and work/study in Unincorporated Fresno County
  - o 25 who live in Unincorporated Fresno County and work/study outside of Unincorporated Fresno County
  - o 8 who work/study in Unincorporated Fresno County and live outside of Unincorporated Fresno County

## Crash Data

Kittelton worked with Fresno COG to assemble crash data for Unincorporated Fresno County using the Statewide Integrated Traffic Records System (SWITRS) database, supplemented with location information from the Transportation Injury Mapping System (TIMS) database maintained by SafeTREC at the University of California, Berkeley. Throughout this report, crashes are associated with a jurisdiction based on the reporting officer's assessment of location. Some crashes may occur at or near jurisdiction boundaries, especially along state routes bordering incorporated areas of the County.

The crash database represents the time period from January 1, 2015 through December 31, 2019 and includes reported crashes that occurred on public streets. Within the assembled regional crash database, a total of 18,314 reported crashes are located in Unincorporated Fresno County. Crash severity is coded according to the highest degree of injury exhibited, and the data used for this analysis includes the following coded severity levels (listed in descending order):

- Fatal: death from injuries sustained in the crash.
- Severe Injury: Injuries include, for example, broken bones, severe lacerations, or other injuries that go beyond the reporting officer's assessment of "other visible injuries."
- Other visible injury: An injury, other than those described above, that is evident to observers at the scene of the crash. For example, bruises or minor lacerations.
- Complaint of pain: Internal or other non-visible injuries. For example, a person limps or seems incoherent.
- Property damage only (PDO): No injuries sustained.

## Roadway Network Data

Kittelton developed a linear referencing system of all public roadways using the Fresno County roadway centerline file. This dataset was updated to develop a measurement system based on the total road length (as determined by roadway name) to locate crashes to a specific mile point along the network. The master roadway network for the County was used to spatially analyze and prioritize specific locations within each local jurisdiction.

## Traffic Volume Data

Traffic volume data was not consistently available at a sufficient level to be able to incorporate into the safety analysis. Future updates to the County's local road safety plan could incorporate traffic volume data, if available, to understand how crash frequency, severity, and type vary at different levels of traffic.

## EXISTING ROADWAY SAFETY PERFORMANCE

The findings in this section are based on the crash database, which includes reported crashes from January 1, 2015 through December 31, 2019. It is organized as follows:

- Severity by Road User
  - o Year, Month, and Weather
  - o Collision Type
  - o Location, Collision Type, and Severity
  - o Primary Collision Factor
  - o Lighting
  - o Time of Day
- Pedestrian-involved Crashes
  - o Year and Month
  - o Pedestrian Action and Location
  - o Lighting
- Bicyclist-involved Crashes
  - o Collision Type
  - o Primary Collision Factor
  - o Lighting

## All Road Users

This section includes analysis and findings for all reported crashes. Subsequent sections focus exclusively on crashes involving pedestrians and bicyclists.

### SEVERITY BY ROAD USER

Table 28 presents reported crashes, organized by severity level and road user. Notable trends include:

- Pedestrians are overrepresented in fatal and severe injury crashes. Pedestrians are involved in approximately 1 percent of reported crashes but are involved in 6 percent of fatal/severe injury crashes.
- Bicyclists are also overrepresented in fatal and severe injury crashes. Bicyclists are involved in approximately 1 percent of reported crashes but 3 percent of fatal/severe injury crashes.

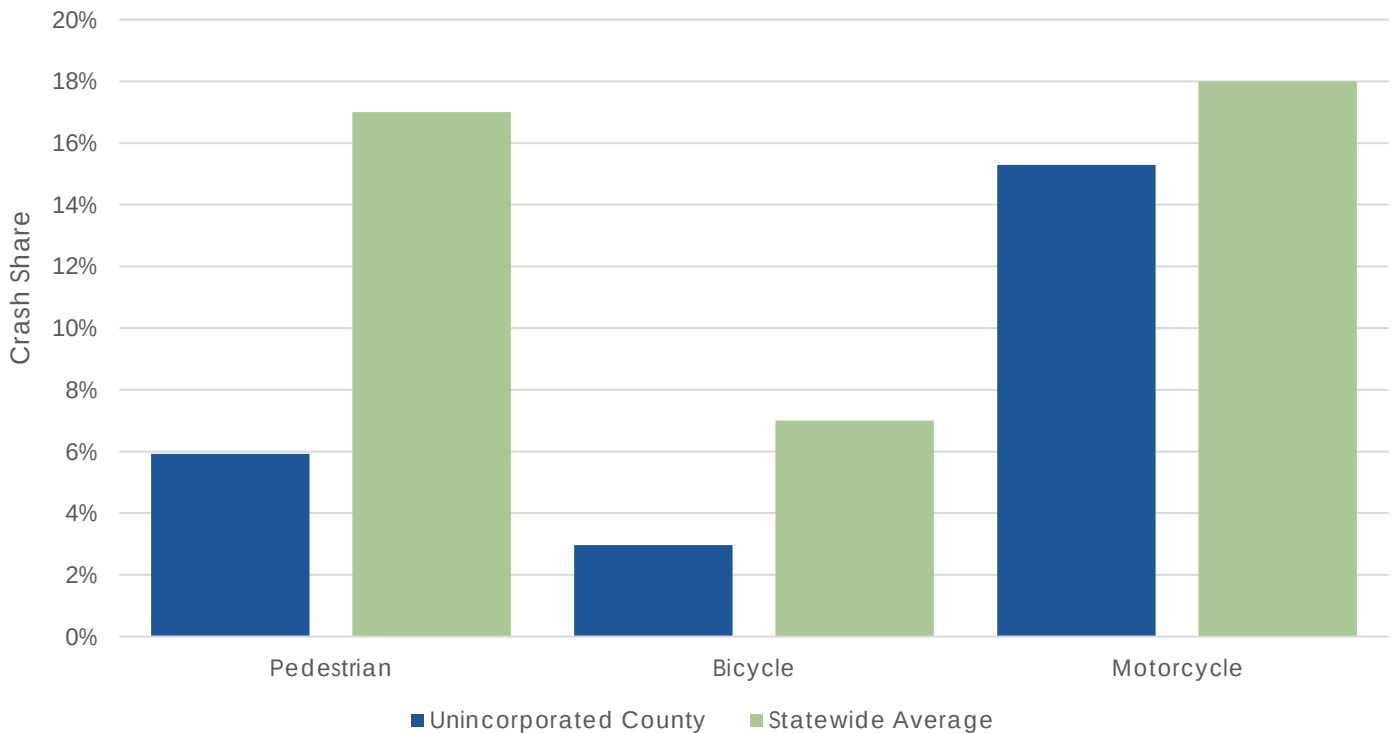
Table 28: Crash Severity by Road User Involved

| Road Users Involved                      | Fatal<br>(% of column) | Severe Injury<br>(% of column) | Visible Injury<br>(% of column) | Complaint of<br>Pain<br>(% of column) | Property<br>Damage Only<br>(% of column) | Total<br>(% of column) |
|------------------------------------------|------------------------|--------------------------------|---------------------------------|---------------------------------------|------------------------------------------|------------------------|
| Pedestrian Involved                      | 35 (10%)               | 39 (4%)                        | 42 (2%)                         | 24 (1%)                               | 4 (0%)                                   | 144 (1%)               |
| Bicycle Involved                         | 14 (4%)                | 23 (3%)                        | 51 (2%)                         | 29 (1%)                               | 11 (0%)                                  | 128 (1%)               |
| Vehicle Only or Vehicle-<br>Fixed Object | 308 (86%)              | 830 (93%)                      | 2,348 (96%)                     | 3,566 (98%)                           | 10,990 (100%)                            | 18,042 (98%)           |
| Reported Crashes                         | 357 (100%)             | 892 (100%)                     | 2,441 (100%)                    | 3,619 (100%)                          | 11,005 (100%)                            | 18,314 (100%)          |
| Severity Share of<br>Reported Crashes    | 2%                     | 5%                             | 13%                             | 20%                                   | 60%                                      | 100%                   |

Source: SWITRS, TIMS, Kittelson, 2021.

The California Strategic Highway Safety Plan (SHSP) includes 16 challenge areas to focus statewide resources and efforts. Three of those challenge areas are crashes involving pedestrians, bicyclists, and motorcyclists. The SHSP analyzed the share of fatal and severe injury crashes involving each of these road users. Figure 58 compares crash trends in Unincorporated Fresno County to the statewide trends reported in the SHSP. Unincorporated Fresno County fatal/severe crashes share for pedestrian, bicycle, and motorcycle were equal to or less than the statewide average fatal/severe crash share.

Figure 58: Unincorporated Fresno Fatal and Severe Crash Shares by Road Users Compared to Statewide Trends



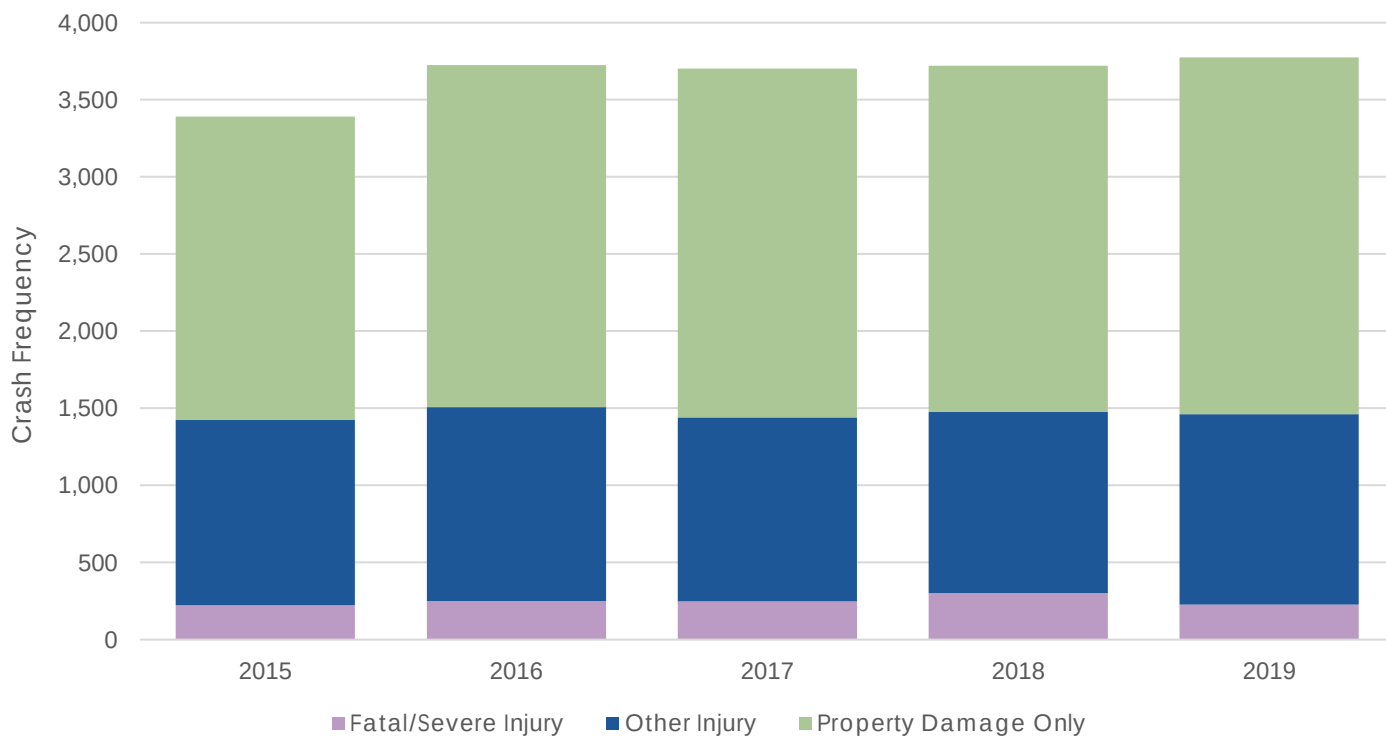
Source: City of Fresno, SWITRS, TIMS, Kittelson, 2021.



## YEAR, MONTH, AND WEATHER

Figure 59 shows year-over-year trends in the data by severity. The total number of crashes each year has been relatively steady, with an average of 3,663 annual crashes and 250 fatal/severe injury crashes annually. Fluctuations from a single year to the next tend to represent the degree of randomness in crash occurrence and are not necessarily indicative of an overall trend.

Figure 59: Year-over-Year Trends in Crash Data by Severity

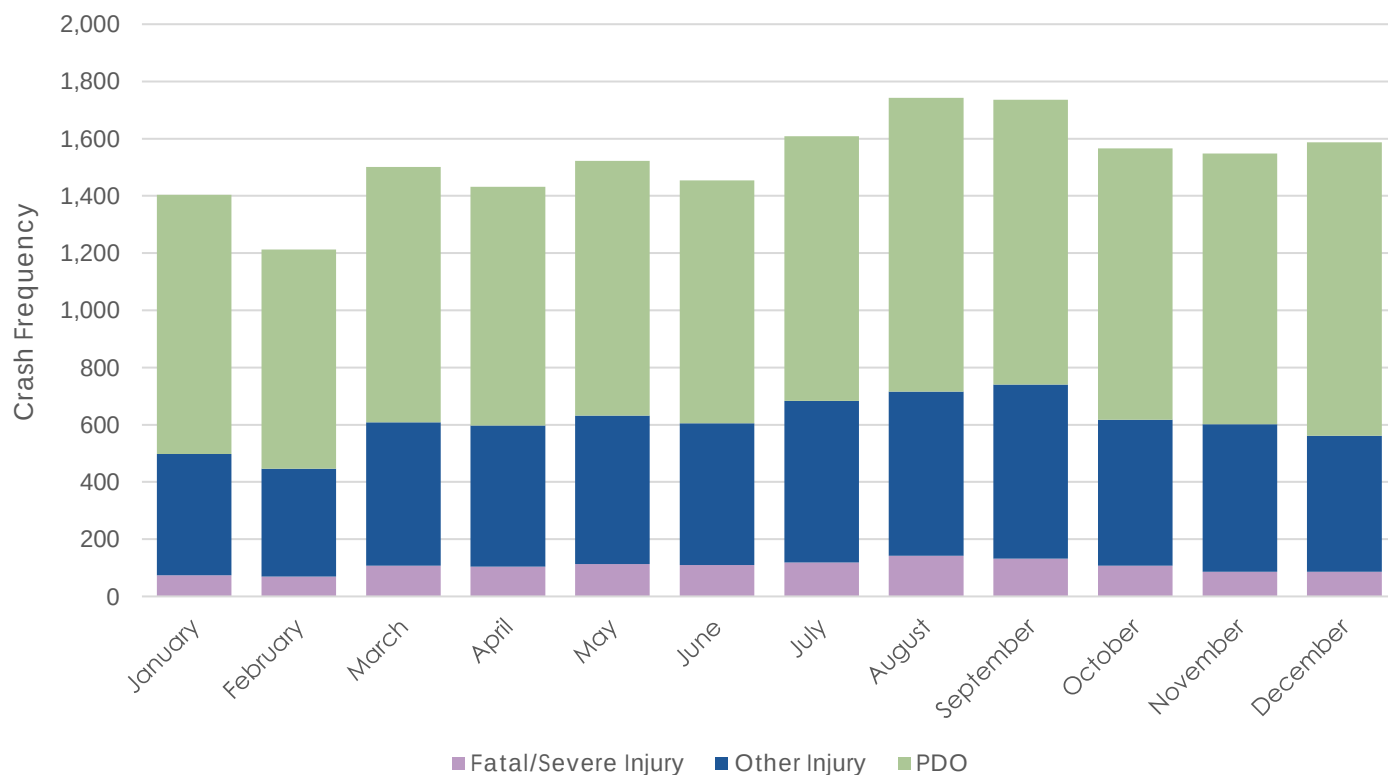


Source: SWITRS, TIMS, Kittelson, 2021.

Note: "Other injury" includes "Other visible injury" and "Complaint of pain" crashes..

Figure 60 presents the total crashes by month for the crash database. On average, 1,526 crashes occurred per month. The lowest number of crashes were reported in February and January and the highest number of crashes were reported in August and September.

Figure 60: Crashes by Month and Severity



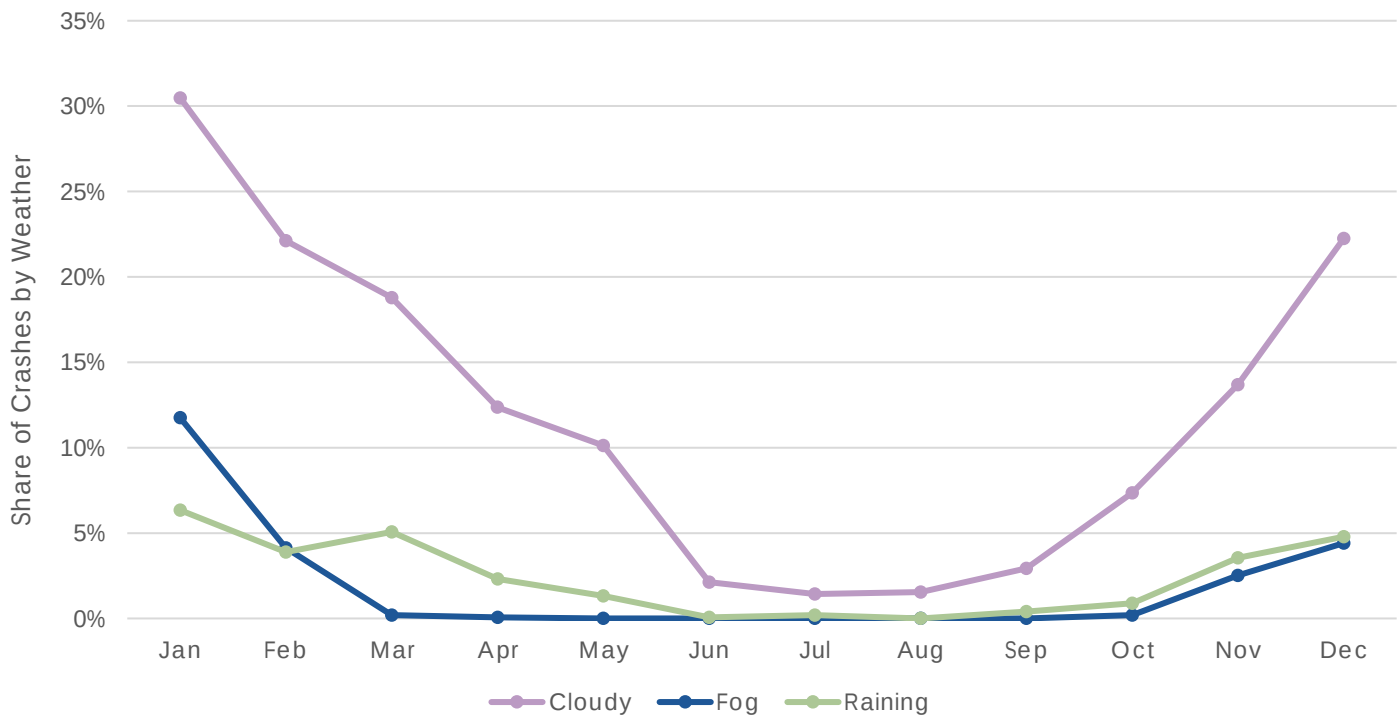
Source: SWITRS, TIMS, Kittelson, 2021

Note: "Other injury" includes "Other visible injury" and "Complaint of pain" crashes. "PDO" = property damage only.

Figure 61 illustrates crashes by month and weather conditions. The most common weather condition, clear weather, is not shown in the chart below to highlight weather's factor on crash trends.

- Crashes recorded to have occurred during fog, cloudy conditions, and/or raining conditions are at the lowest share of crashes in the months of June to August and increase through October to March.
- Crashes recorded to have occurred in foggy conditions peak in the winter months (November through February). This is the case in January and February as well even though other collision types and total reported crashes in January and February tend to decrease relative to other months in the year.

Figure 61: Crashes by Month and Weather Condition



Source: SWITRS, TIMS, Kittelson, 2021.

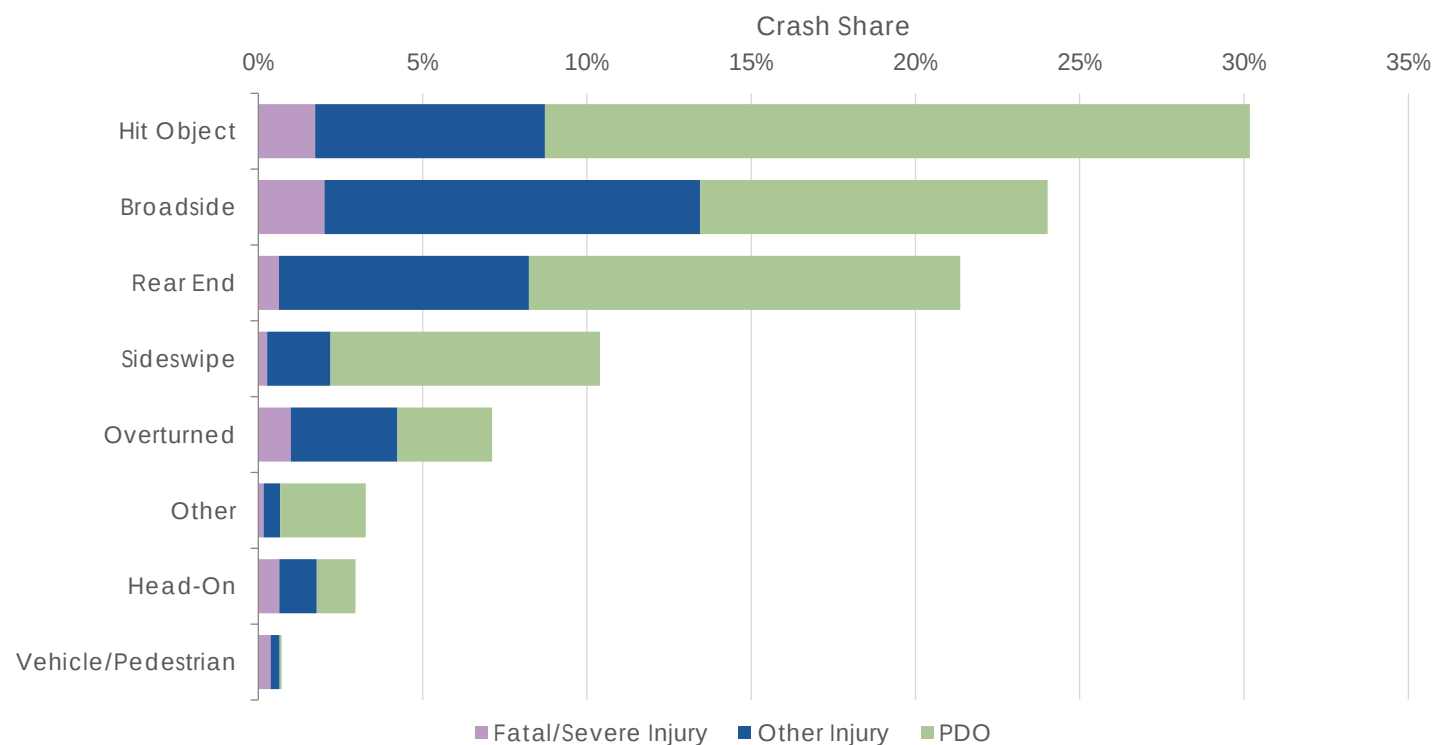
Note: Only select conditions shown to improve legibility for less frequent weather conditions.

## COLLISION TYPE

Reported collision type gives an indication of the movements most frequently involved in crashes and in severe outcomes. Figure 62 reports the most frequent reported collision types by severity.

- Among total reported crashes, the top three most frequent collision types are hit object (30 percent), broadside (24 percent), and rear end (21 percent). These three collision types account for 75 percent of reported crashes in the unincorporated county.
- Among fatal/severe injury crashes, the top three collision types are broadside (30 percent), hit object (25 percent), and overturned (14 percent). These three collision types account for 69 percent of all fatal/severe injury crashes in the unincorporated county.

Figure 62: Crashes by Collision Type by Severity



Source: SWITRS, TIMS, Kittelson, 2021.

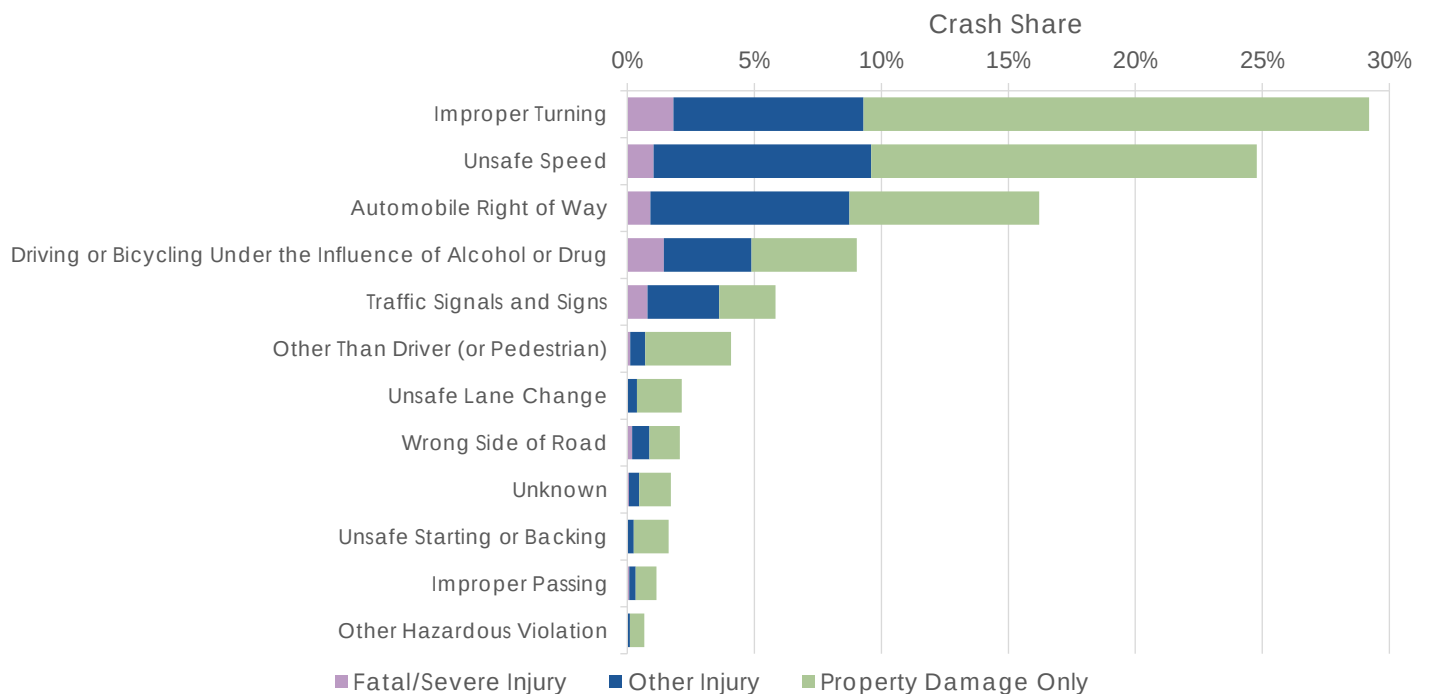
Note: "Other injury" includes "Other visible injury" and "Complaint of pain" crashes. "PDO" = property damage only.

## PRIMARY COLLISION FACTOR

Reporting officers identify a primary collision factor (PCF) for each crash. It is up to the officer's judgement and information available at the scene for them to select the factor that is most relevant. Officers select one from among a list of PCFs based on California Vehicle Code (CVC) and road user behavior. Figure 63 presents the most frequently cited PCFs.

- Among total reported crashes, the three most frequently reported PCFs are improper turning<sup>28</sup> (29 percent), unsafe speed<sup>29</sup> (25 percent), and automobile right of way<sup>30</sup> (16 percent). These three account for 70 percent of reported crashes.
- Among fatal/severe injury crashes, the three most frequently reported PCFs are improper turning<sup>28</sup> (27 percent), driving or bicycling under the influence of alcohol and drugs<sup>31</sup> (21 percent), and unsafe speed<sup>29</sup> (15 percent). These three account for 63 percent of reported fatal/severe crashes.

Figure 63: Crashes by Reported PCF



Source: SWITRS, TIMS, Kittelson, 2021.

Notes: PCFs constituting <1% excluded from chart to enhance legibility. Those PCFs include other equipment, hazardous parking, impeding traffic, lights, and brakes.

"Other injury" includes "Other visible injury" and "Complaint of pain" crashes. "PDO" = property damage only.

<sup>28</sup> Reported PCF based on CVC violation indicating a failure while turning from a direct course without reasonable safety or not signaling appropriately.

<sup>29</sup> Reported PCF based on CVC violation indicating unsafe speeding on a highway.

<sup>30</sup> Reported PCF based on CVC violation indicating a driver turning failed to yield right-of-way to oncoming traffic.

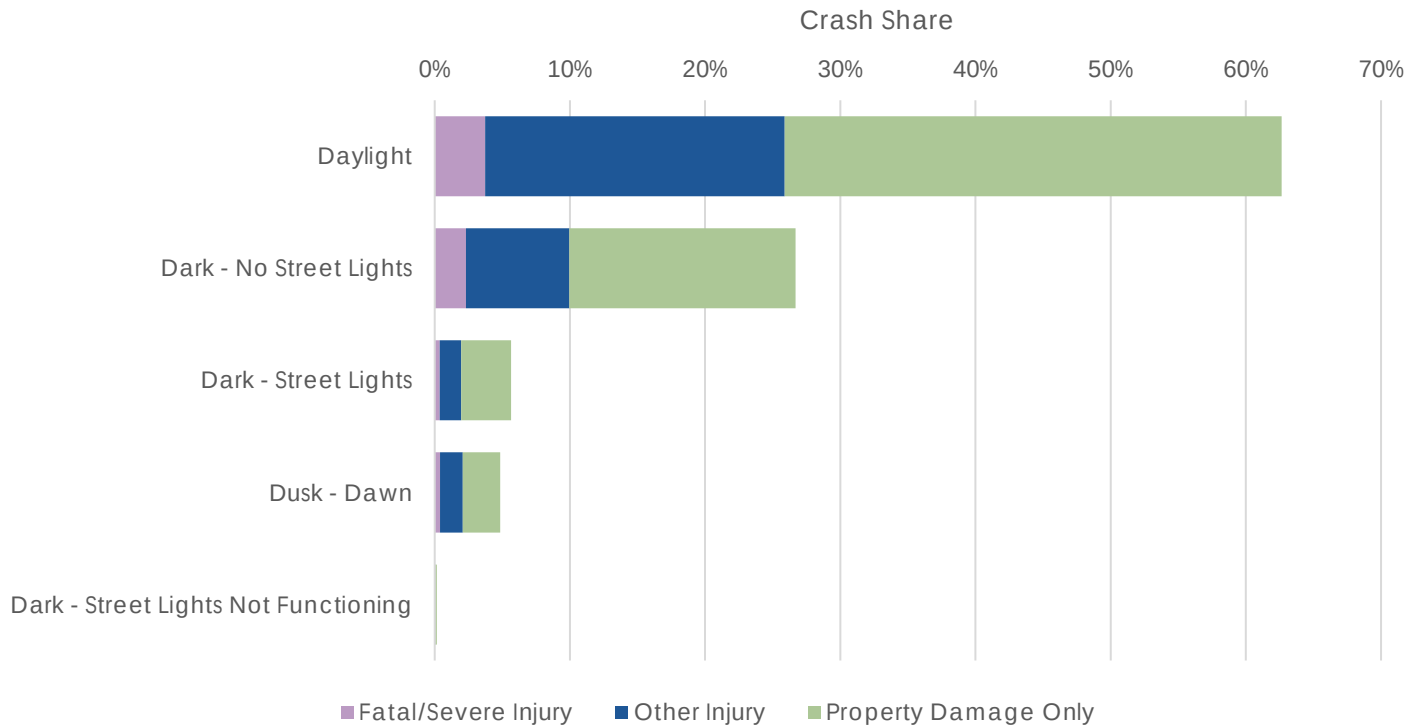
<sup>31</sup> Reported PCF based on CVC violation indicating driver was under the influence of alcohol.

## LIGHTING

Figure 64 shows crashes by reported lighting condition and severity.

- Crashes that occurred in daylight conditions make up 63 percent of total reported crashes, and account for 55 percent of fatal and severe injury crashes.
- 164 fatal crashes occurred in the dark (46 percent of fatal crashes), of which 145 occurred where there were no streetlights.

Figure 64: Crashes by Lighting and Severity



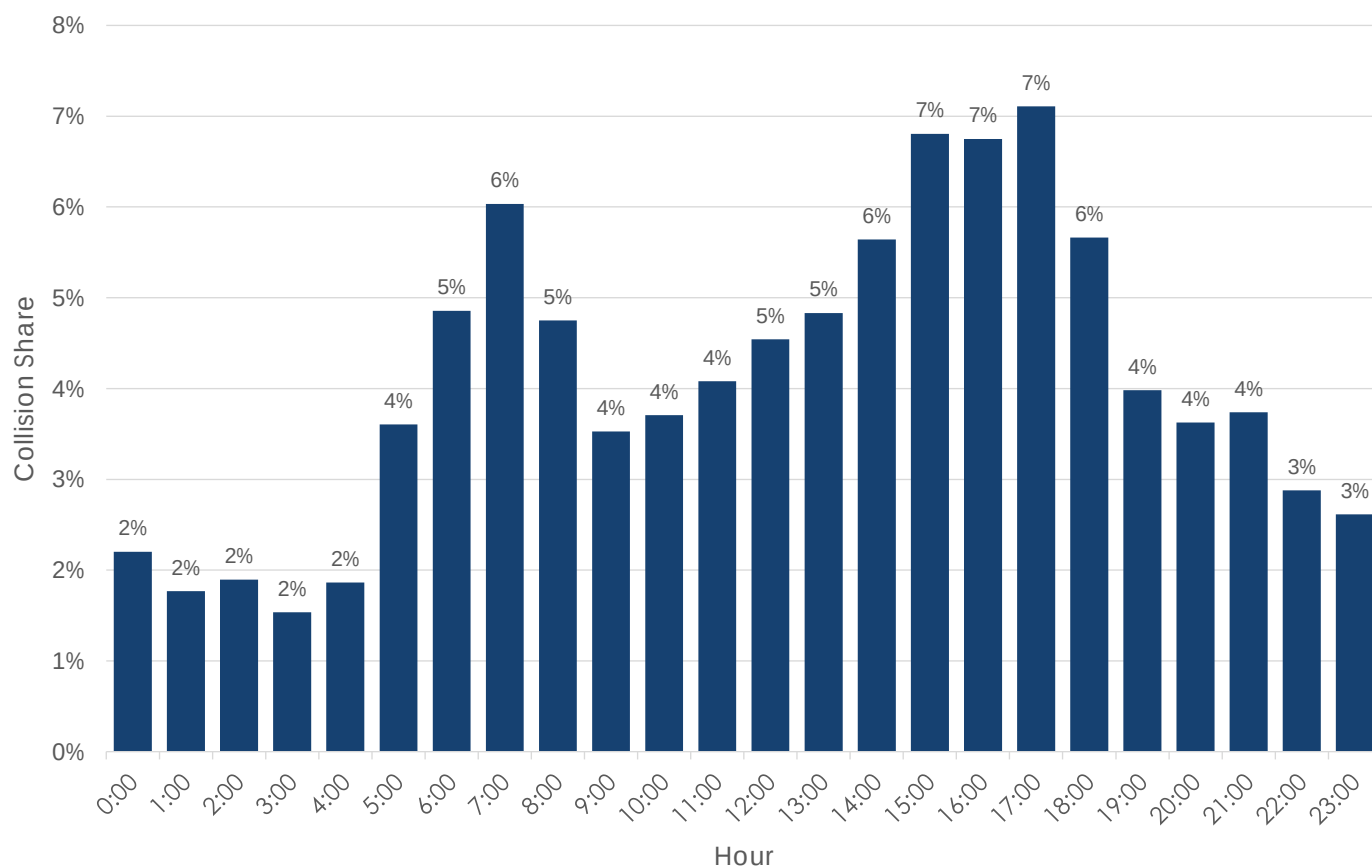
Source: SWITRS, TIMS, Kittelson, 2021.

Note: "Other injury" includes "Other visible injury" and "Complaint of pain" crashes.

## TIME OF DAY

Figure 65 shows crashes by time of day. Crashes appear to have a higher share in two general times of day. The morning appears to show a peak from 5 AM to 9 AM with the highest number of morning crashes in the 7 AM hour. In the afternoon, crashes tend to be more frequent from 12 PM to 7 PM with the peak from 3 PM to 6 PM.

Figure 65: Crash Share by Time of Day



Source: SWITRS, TIMS, Kittelson, 2021.

Note: 2% of crashes are unknown time.

## Pedestrians

This section focuses exclusively on reported crashes involving pedestrians. Table 29 shows the distribution of pedestrian crashes by severity. Of the 144 reported pedestrian crashes, 51 percent resulted in death or severe injury. Pedestrian fatal/severe injury crashes are 6 percent of total reported fatal/severe crashes, compared to 1 percent of total reported crashes.

Table 29: Severity by Pedestrians Involved

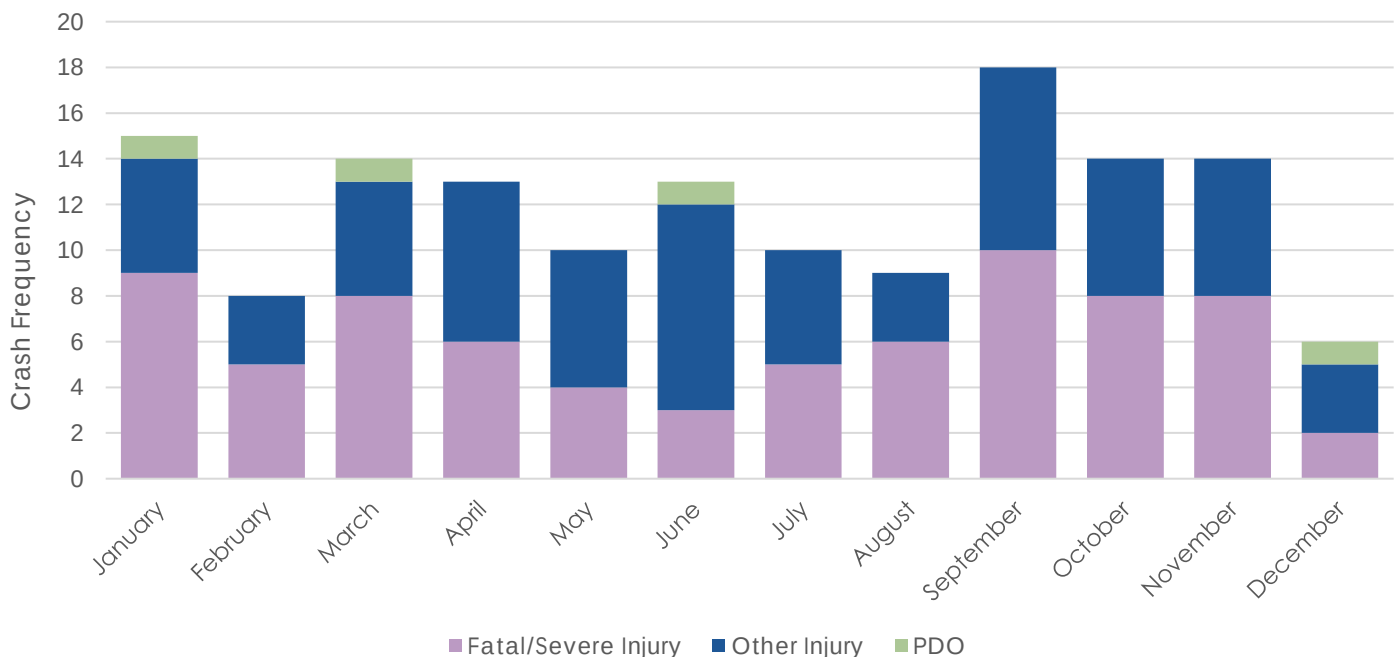
|                     | Fatal<br>(% of Total) | Severe Injury<br>(% of Total) | Visible Injury<br>(% of Total) | Complaint of<br>Pain<br>(% of Total) | Property<br>Damage Only<br>(% of Total) | Total      |
|---------------------|-----------------------|-------------------------------|--------------------------------|--------------------------------------|-----------------------------------------|------------|
| Pedestrian Involved | 35 (24%)              | 39 (27%)                      | 42 (29%)                       | 24 (17%)                             | 4 (3%)                                  | 144 (100%) |

Source: SWITRS, TIMS, Kittelson, 2021.

### SEVERITY AND MONTH

Figure 66 presents pedestrian crashes organized by month and severity with a monthly average of 12 crashes per month. December and February appear to be noticeably lower than the average while the highest number of crashes per month occurred in September. However, these trends should be interpreted with caution: fluctuations from a single month to the next tend may represent a degree of randomness in crash occurrence.

Figure 66: Pedestrian Crashes by Month and Severity



Source: SWITRS, TIMS, Kittelson, 2021.

Note: "Other injury" includes "Other visible injury" and "Complaint of pain" crashes. "PDO" = property damage only.



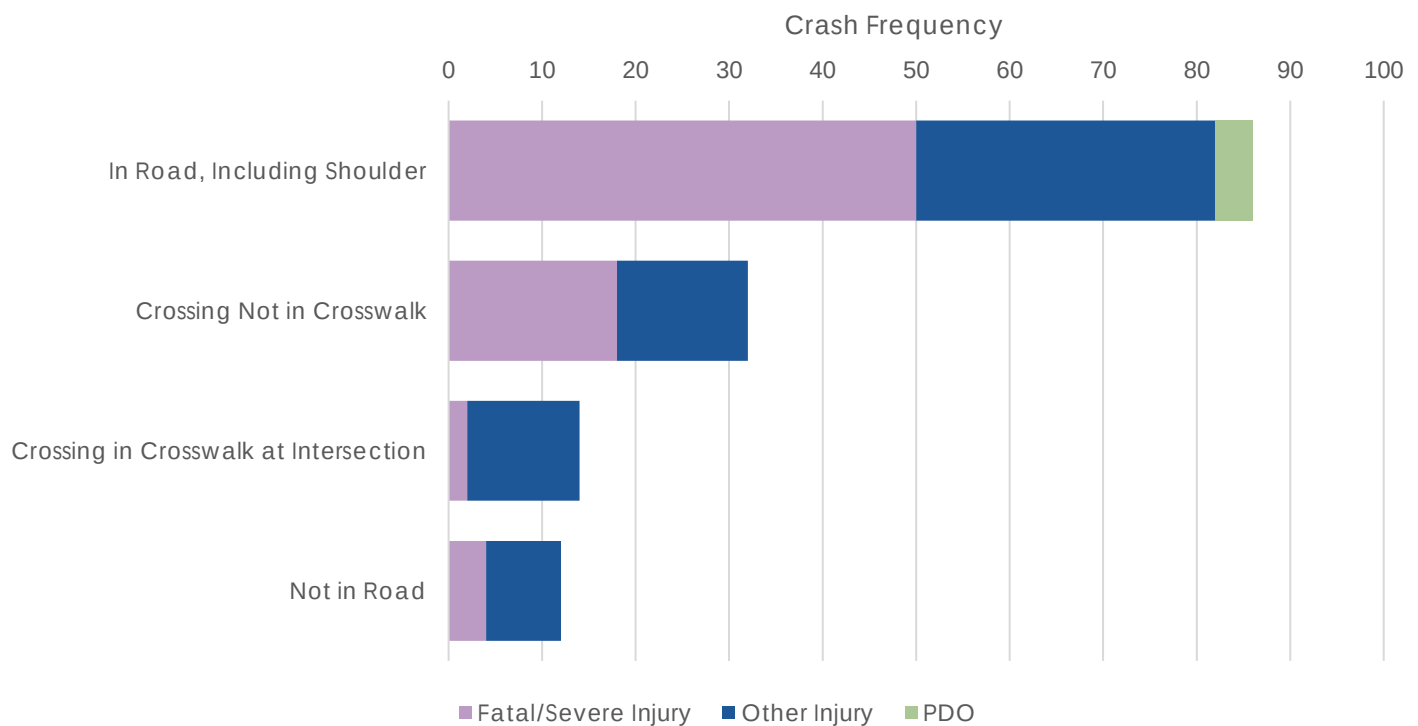


## PEDESTRIAN ACTION AND LOCATION

For pedestrian crashes, data are recorded according to the reporting officer's best judgment about the pedestrian's action and location preceding the crash. Figure 67 reports these trends in unincorporated Fresno County.

- Among fatal/severe injury pedestrian crashes, 68 percent occurred while a pedestrian was in the road (including the shoulder). Pedestrian crashes with this action account for 60 percent of total pedestrian crashes.
- The second and third most common pedestrian actions preceding a crash included crossing not in a crosswalk (22 percent) and crossing in crosswalk at intersection (10 percent).

Figure 67: Pedestrian Crashes by Reported Action/Location and Severity



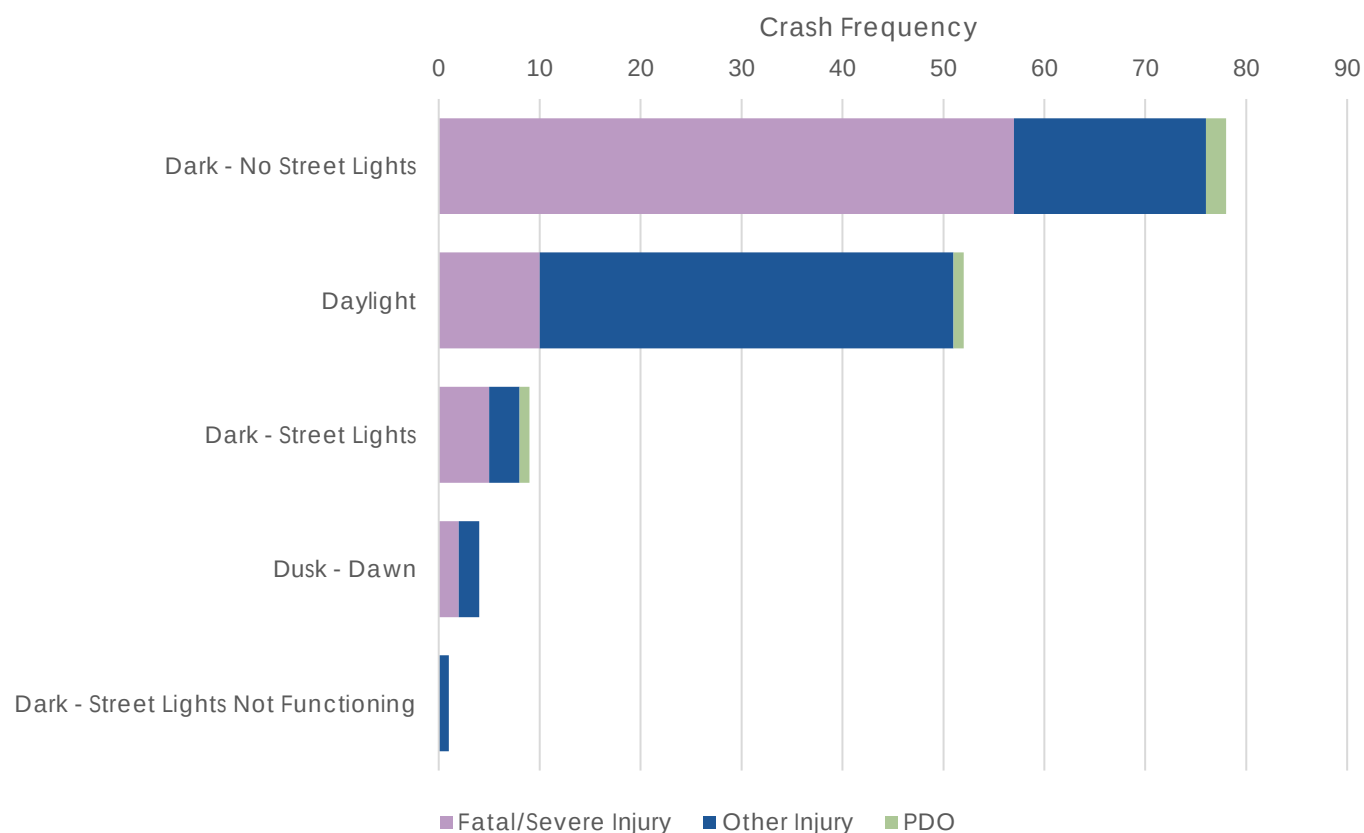
Source: SWITRS, TIMS, Kittelson, 2021.

Note: "Other injury" includes "Other visible injury" and "Complaint of pain" crashes. "PDO" = property damage only.

## LIGHTING

Figure 68 shows pedestrian crashes by reported lighting condition and severity within unincorporated Fresno County. Crashes that occurred in the dark with no streetlights make up 54 percent of total pedestrian crashes and make up 77 percent of fatal/severe injury pedestrian crashes.

Figure 68: Pedestrian Crashes by Lighting and Severity



Source: SWITRS, TIMS, Kittelson, 2021.

Note: "Other injury" includes "Other visible injury" and "Complaint of pain" crashes. "PDO" = property damage only.

## Bicyclists

This section focuses exclusively on reported crashes involving bicyclists. Table 30 presents bicyclist-involved crashes in unincorporated Fresno County organized by severity level. Of the 128 bicyclist crashes in the County, 29 percent resulted in fatal/severe injury. Bicyclist fatal/severe injury crashes are 3 percent of total reported fatal/severe crashes, compared to 1 percent of total reported crashes.

Table 30: Bicycle User Involved Crashes by Severity

|                  | Fatal<br>(% of total) | Severe Injury<br>(% of total) | Visible Injury<br>(% of total) | Complaint of<br>Pain<br>(% of total) | Property<br>Damage Only<br>(% of total) | Total<br>(% of total) |
|------------------|-----------------------|-------------------------------|--------------------------------|--------------------------------------|-----------------------------------------|-----------------------|
| Bicycle Involved | 14 (11%)              | 23 (18%)                      | 51 (40%)                       | 29 (23%)                             | 11 (9%)                                 | 128 (100%)            |

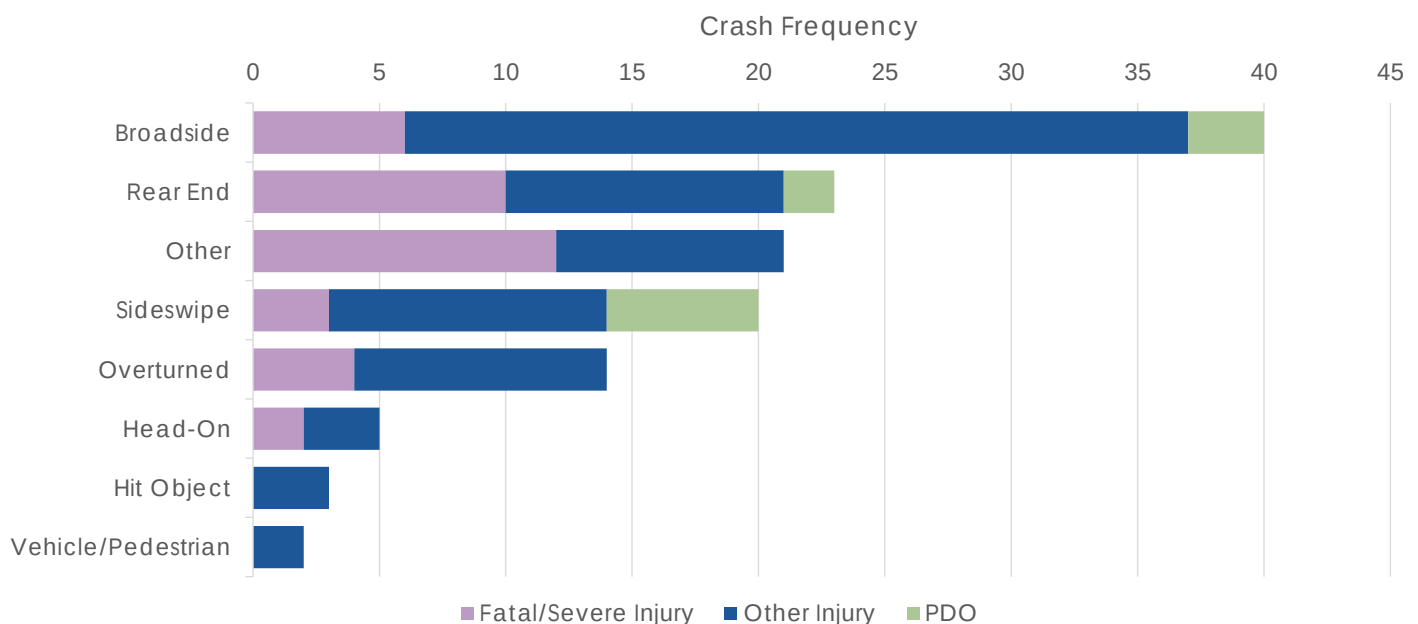
Source: SWITRS, TIMS, Kittelson, 2021.

## COLLISION TYPE

Figure 69 presents reported bicycle crashes organized by collision type.

- The top two collision types among bicyclist crashes include broadside (31 percent) and rear end (18 percent). Crashes reported as other or not stated account for 16 percent of bicycle crashes.
- The top three fatal/severe collision types among bicyclist crashes are other (32 percent), rear end (27 percent), and broadside (16 percent).

Figure 69: Bicycle Crashes by Collision Type and Severity



Source: SWITRS, TIMS, Kittelson, 2021.

Note: "Other injury" includes "Other visible injury" and "Complaint of pain" crashes. "PDO" = property damage only.

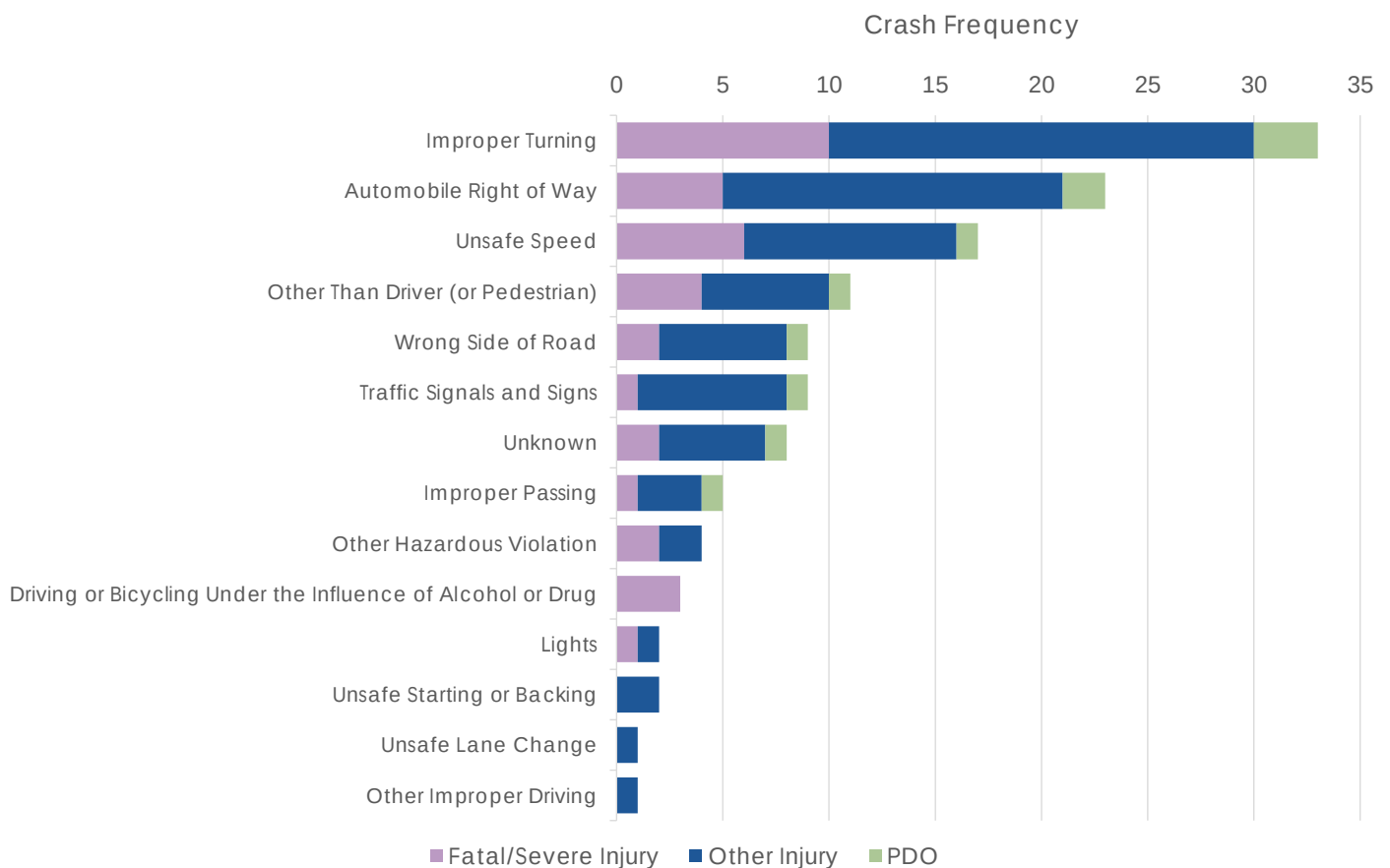


## PRIMARY COLLISION FACTOR

Figure 70 presents the reported PCF among bicycle crashes.

- The most frequently cited PCF was improper turning<sup>32</sup>, which accounted for 26 percent of total bicycle crashes and 27 percent of total fatal/severe bicycle crashes.
- The other two most frequent PCFs among bicycle crashes include automobile right of way<sup>33</sup> (18 percent) and unsafe speed<sup>34</sup> (13 percent).

Figure 70: Bicycle Crashes by Reported PCF and Severity



Source: SWITRS, TIMS, Kittelson, 2021.

Note: "Other injury" includes "Other visible injury" and "Complaint of pain" crashes. "PDO" = property damage only.

<sup>32</sup> Reported PCF based on CVC violation indicating a failure while turning from a direct course without reasonable safety or not signaling appropriately.

<sup>33</sup> Reported PCF based on CVC violation indicating a driver turning failed to yield right-of-way to oncoming traffic.

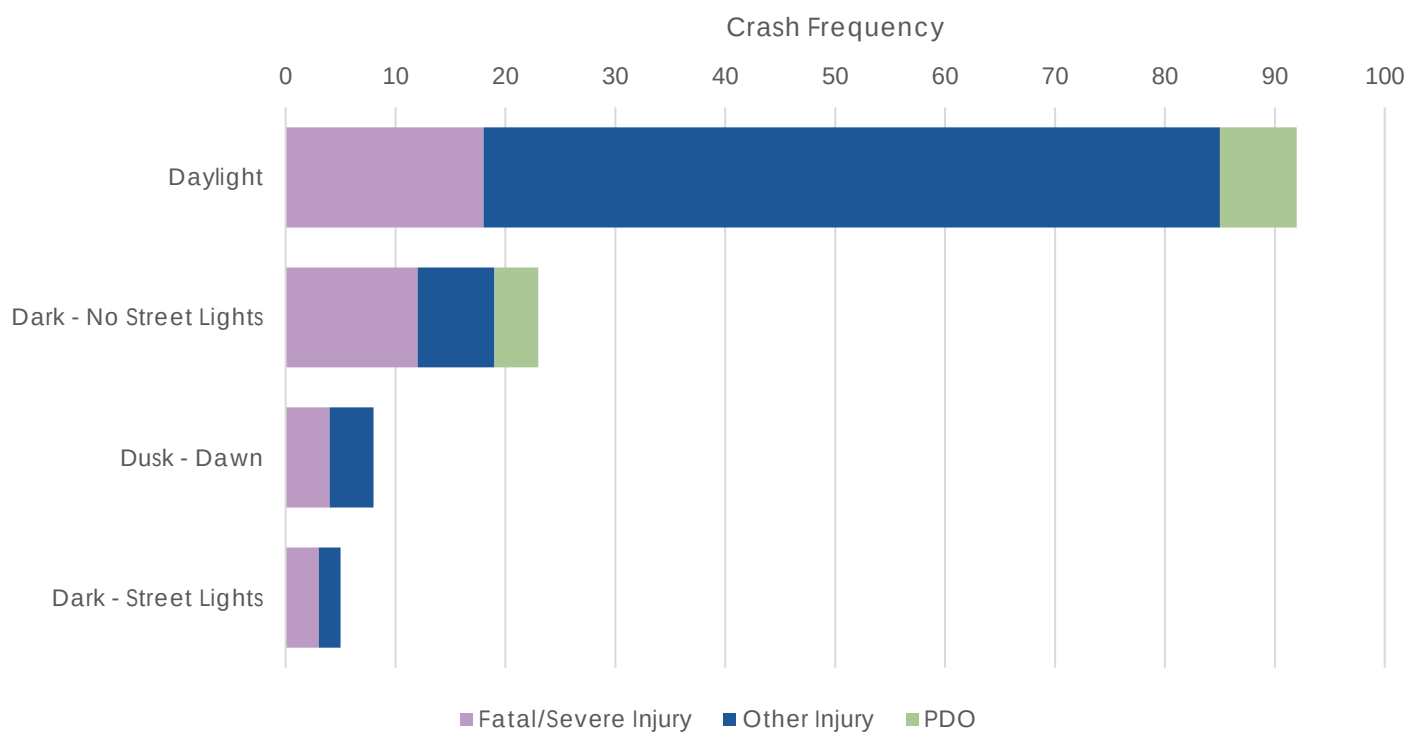
<sup>34</sup> Reported PCF based on CVC violation indicating unsafe speeding on a highway.

## LIGHTING

Figure 71 presents bicycle crashes organized by lighting and severity.

- Most bicycle crashes (72 percent of those reported) occur in daylight.
- Bicycle crashes occurring in the dark account for 22 percent of reported bicyclist crashes but 41 percent of fatal/severe injury crashes.

Figure 71: Bicycle Crashes by Lighting and Severity



Source: SWITRS, TIMS, Kittelson, 2021.

Note: "Other injury" includes "Other visible injury" and "Complaint of pain" crashes. "PDO" = property damage only.

## Priority Locations

Kittelson identified priority intersections and segments in unincorporated Fresno County using the annualized crash severity scores and excess predicted crashes described in the Data Summary and Analysis Approach sections (see the Introduction).

For intersection locations, the crash severity scores ranged from zero (no reported crashes during the five years) to 201.09. Figure 72.1 through Figure 72.4 show the results of the crash severity scoring. Figure 73.1 through Figure 73.4 show excess predicted crash scores by percentiles for intersection locations. For the half-mile roadway segments, the crash severity scores ranged from zero to 145.02. Crash severity score results for roadway segments are shown in Figure 74.1 through Figure 74.4. Excess predicted crash score results are shown in Figure 75.1 through Figure 75.4. Intersections or segments shown as not falling within one of the percentile breaks indicates there were no reported crashes at that location.

Table 31 presents the top twenty locations with the highest crash severity scores.

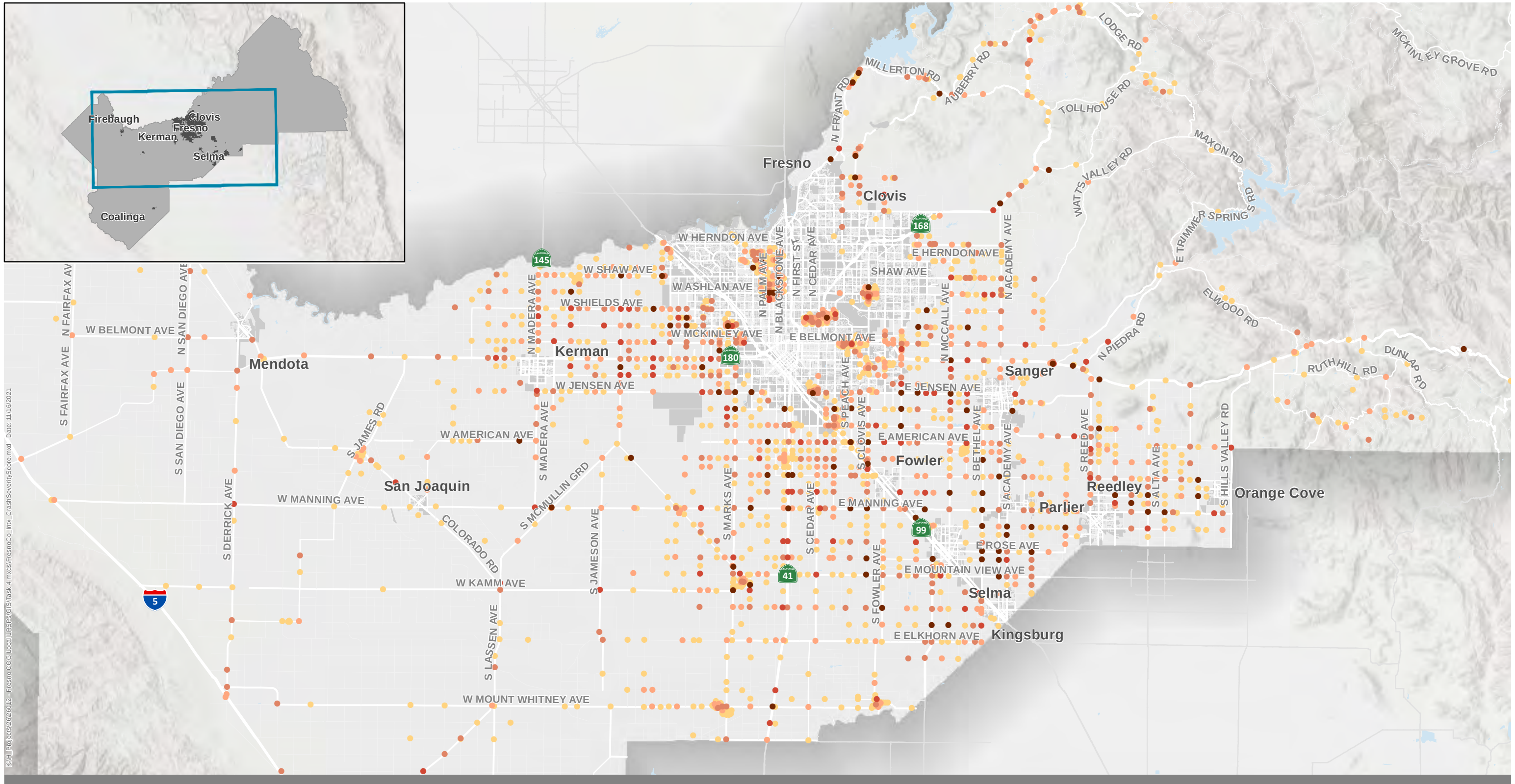
Table 31. Top 20 Locations based on Crash Severity Score

| #  | Location                                                          | Type         | Crash Severity Score | Total Number of Crashes | Severity |               |                      |                   |     |
|----|-------------------------------------------------------------------|--------------|----------------------|-------------------------|----------|---------------|----------------------|-------------------|-----|
|    |                                                                   |              |                      |                         | Fatal    | Severe Injury | Other Visible Injury | Complaint of Pain | PDO |
| 1  | LAC JAC AVE & DINUBA AVE                                          | Unsignalized | 201.09               | 15                      | 0        | 5             | 3                    | 3                 | 4   |
| 2  | FRANKWOOD AVE & CENTRAL AVE                                       | Unsignalized | 164.99               | 14                      | 0        | 4             | 4                    | 3                 | 3   |
| 3  | ACADEMY AVE & ADAMS AVE                                           | Unsignalized | 162.93               | 18                      | 1        | 3             | 2                    | 4                 | 8   |
| 4  | BETHEL AVE & DINUBA AVE                                           | Unsignalized | 157.25               | 49                      | 1        | 2             | 7                    | 20                | 19  |
| 5  | AUBERRY RD & FRAZIER RD                                           | Unsignalized | 154.92               | 8                       | 2        | 2             | 1                    | 0                 | 3   |
| 6  | MILLERTON RD FROM MILLERTON LAKE ACCESS (WEST) TO SKY HARBOUR RD  | Segment      | 145.02               | 21                      | 2        | 2             | 3                    | 4                 | 10  |
| 7  | AUBERRY RD FROM EAST OF OLD AUBERRY RD TO SOUTH OF OLD AUBERRY RD | Segment      | 144.23               | 18                      | 1        | 3             | 5                    | 0                 | 9   |
| 8  | KINGS CANYON RD WEST OF HILLS VALLEY RD                           | Segment      | 141.08               | 13                      | 1        | 3             | 3                    | 4                 | 2   |
| 9  | KEARNEY BLVD & CORNELIA AVE & MADISON AVE                         | Unsignalized | 139.01               | 29                      | 0        | 3             | 7                    | 6                 | 13  |
| 10 | CLOVIS AVE & MOUNTAIN VIEW AVE                                    | Unsignalized | 137.94               | 19                      | 1        | 2             | 8                    | 5                 | 3   |
| 11 | BETHEL AVE & ROSE AVE                                             | Unsignalized | 135.54               | 25                      | 1        | 2             | 3                    | 11                | 8   |
| 12 | CLOVIS AVE & NEBRASKA AVE                                         | Unsignalized | 133.24               | 20                      | 0        | 3             | 6                    | 4                 | 7   |
| 13 | MARKS AVE & JENSEN AVE                                            | Unsignalized | 132.02               | 19                      | 2        | 1             | 6                    | 3                 | 7   |
| 14 | AMERICAN AVE & GOLDEN STATE BLVD                                  | Unsignalized | 128.81               | 26                      | 2        | 1             | 1                    | 8                 | 14  |
| 15 | FRIANT RD & BELCHER                                               | Unsignalized | 128.36               | 15                      | 0        | 3             | 4                    | 4                 | 4   |
| 16 | BETHEL AVE & NEBRASKA AVE                                         | Unsignalized | 127.34               | 15                      | 2        | 1             | 4                    | 3                 | 5   |
| 17 | MCMULLIN GRD & MANNING AVE                                        | Unsignalized | 127.13               | 19                      | 1        | 2             | 4                    | 2                 | 10  |
| 18 | FRONTIER TRAIL LN & SAMPLE RD                                     | Unsignalized | 122.99               | 8                       | 0        | 3             | 3                    | 2                 | 0   |
| 19 | TEMPERANCE AVE & CENTRAL AVE                                      | Unsignalized | 121.12               | 13                      | 1        | 2             | 1                    | 3                 | 6   |
| 20 | TEMPERANCE AVE & JENSEN AVE                                       | Signalized   | 120.58               | 34                      | 0        | 4             | 4                    | 11                | 15  |

Notes: All unsignalized intersections are classified as rural intersections. PDO = Property Damage Only.





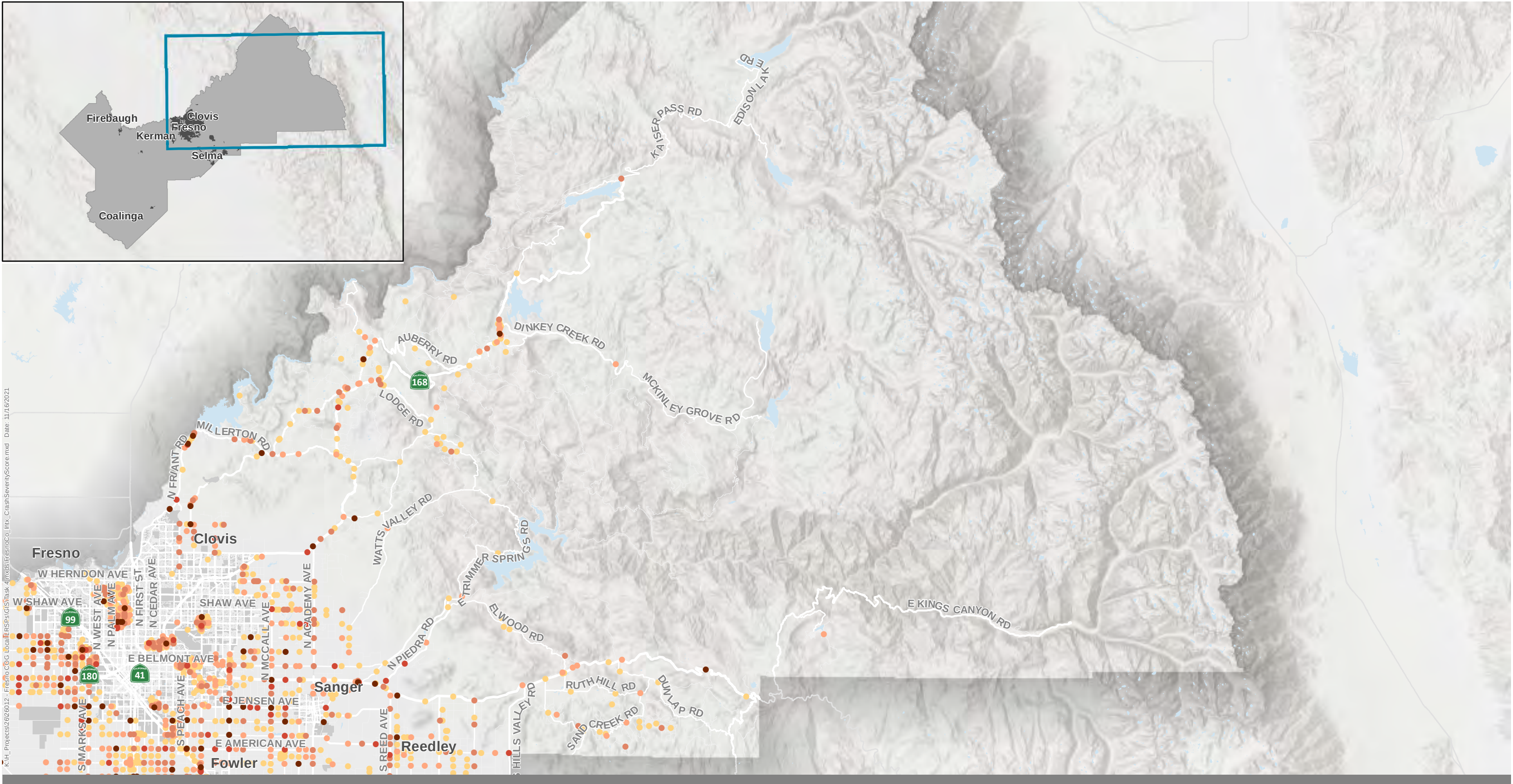


- Crash Severity Score**
  - 95-100th Percentile
  - 90-95th Percentile
- 75-90th Percentile
  - 50-75th Percentile
  - 0-50th Percentile
- City Limits
  - County Boundary



Figure 72.1





- Crash Severity Score

● 95-100th Percentile

● 90-95th Percentile

● 75-90th Percentile

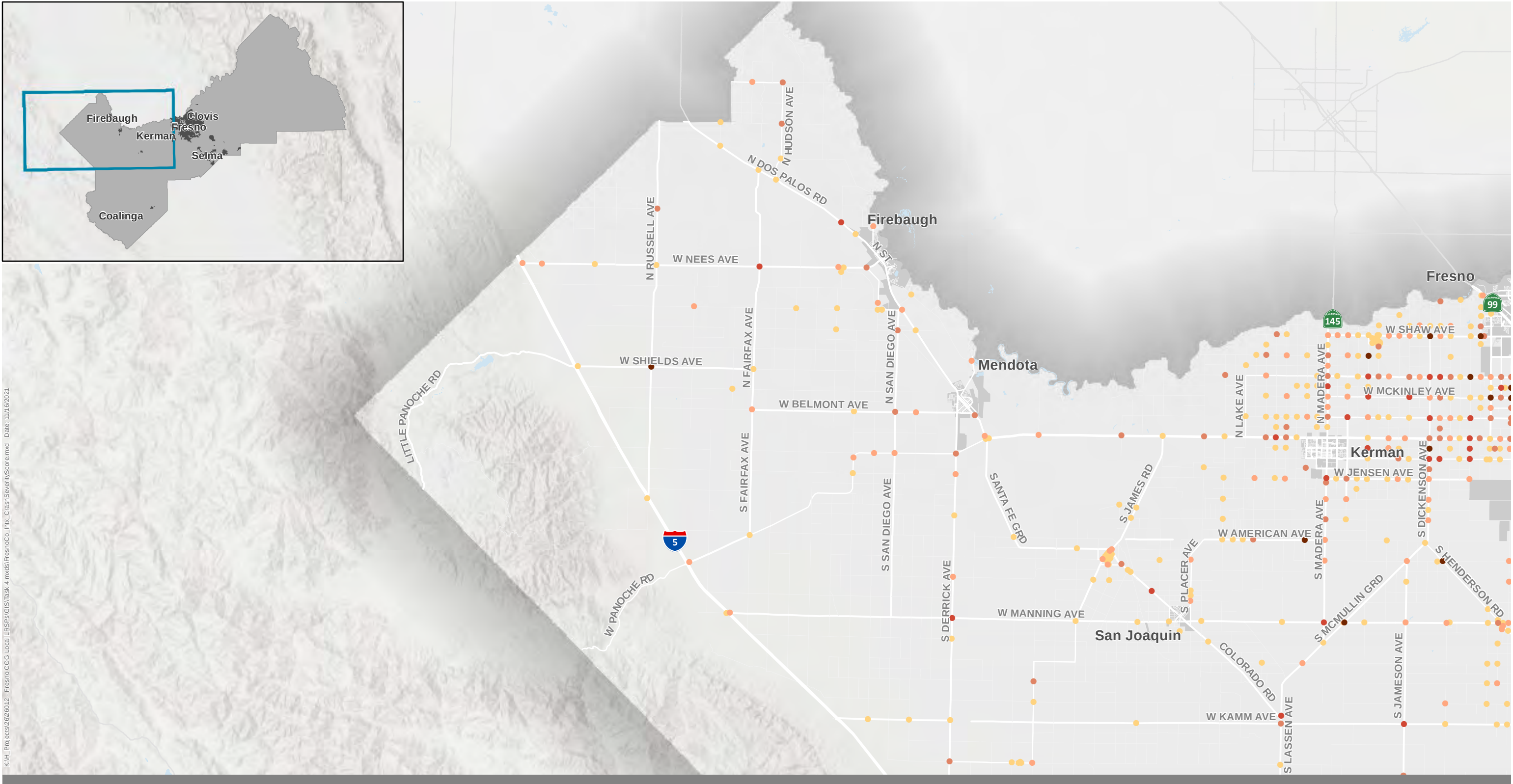
● 50-75th Percentile

● 0-50th Percentile

■ City Limits

□ County Boundary
- 
- Figure 72.2
-  **KITTELSON**  
& ASSOCIATES
- Intersection Crash Severity Scores  
Jurisdiction Results: Fresno County  
Fresno Council of Governments**



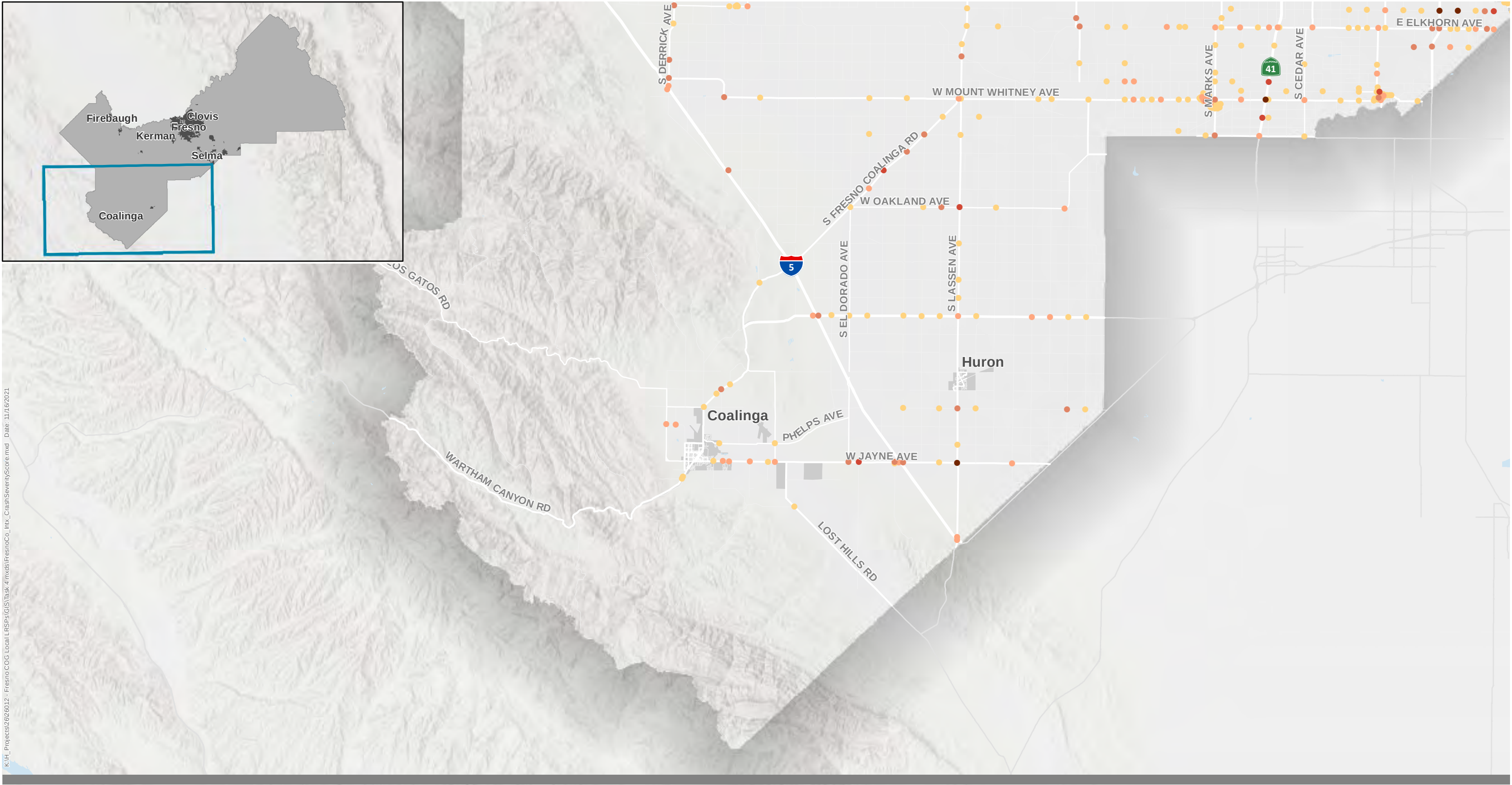


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- Crash Severity Score**
  - 95-100th Percentile
  - 75-90th Percentile
  - 50-75th Percentile
  - 0-50th Percentile
- City Limits
  - County Boundary



Figure 72.3



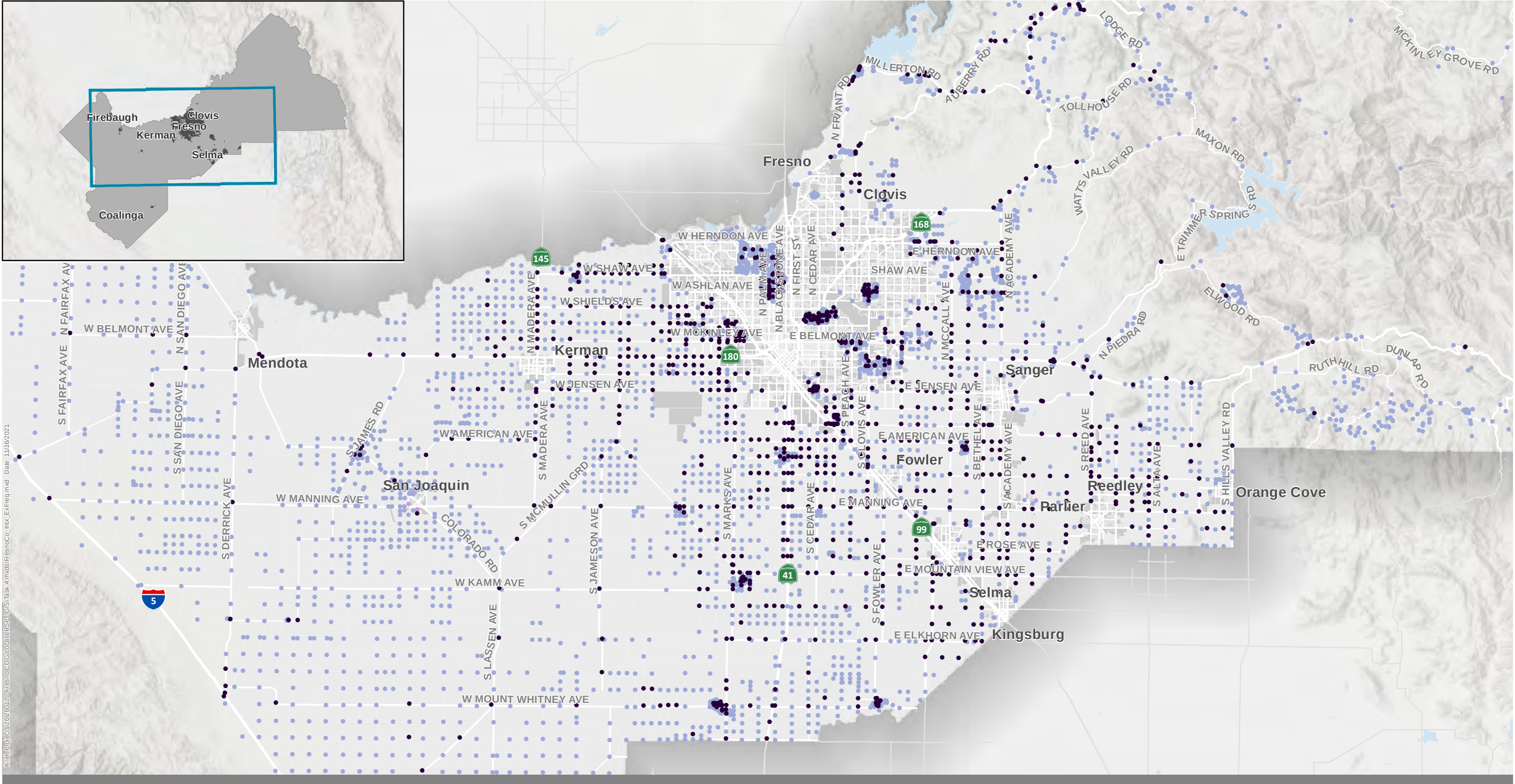
**Crash Severity Score**

- 95-100th Percentile
- 75-90th Percentile
- 50-75th Percentile
- 0-50th Percentile
- 90-95th Percentile

- City Limits
- County Boundary







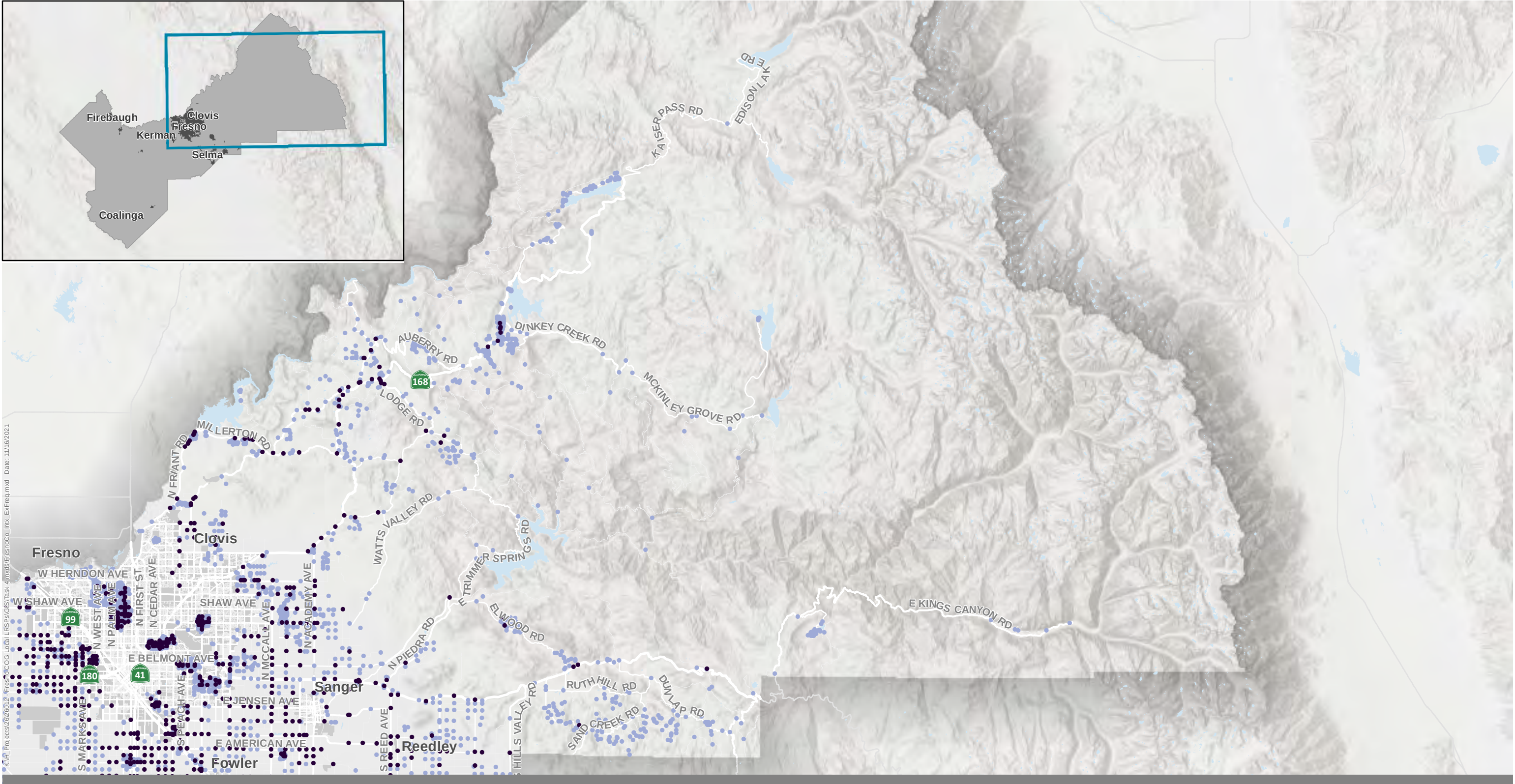
- Excess Expected Frequency**

  - 95-100th Percentile
  - 90-95th Percentile
- 75-90th Percentile
  - 50-75th Percentile
  - 0-50th Percentile
- City Limits
  - County Boundary



Figure 73.1



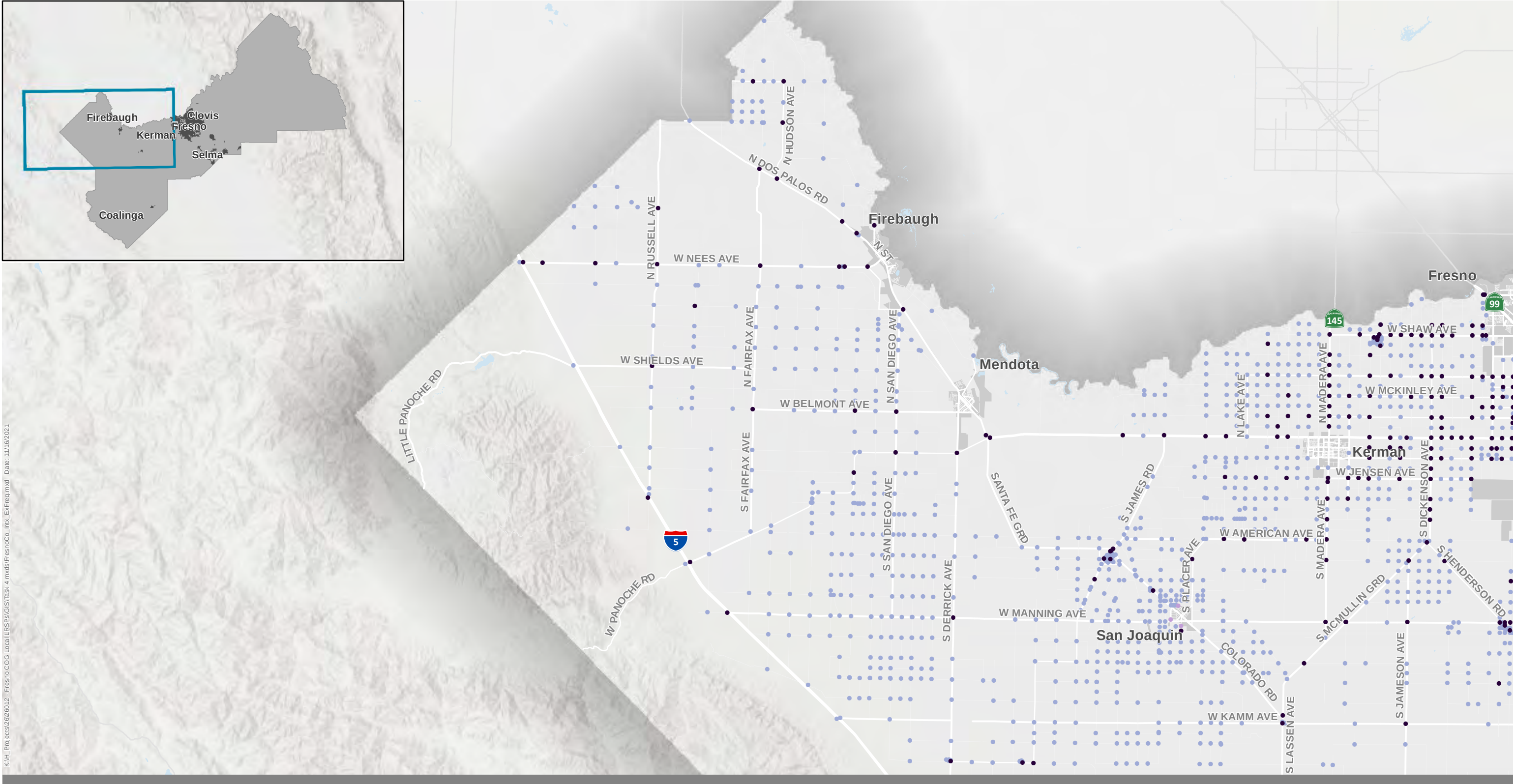


- Excess Expected Frequency**
- 95-100th Percentile
  - 90-95th Percentile
  - 75-90th Percentile
  - 50-75th Percentile
  - 0-50th Percentile
  - City Limits
  - County Boundary



Figure 73.2





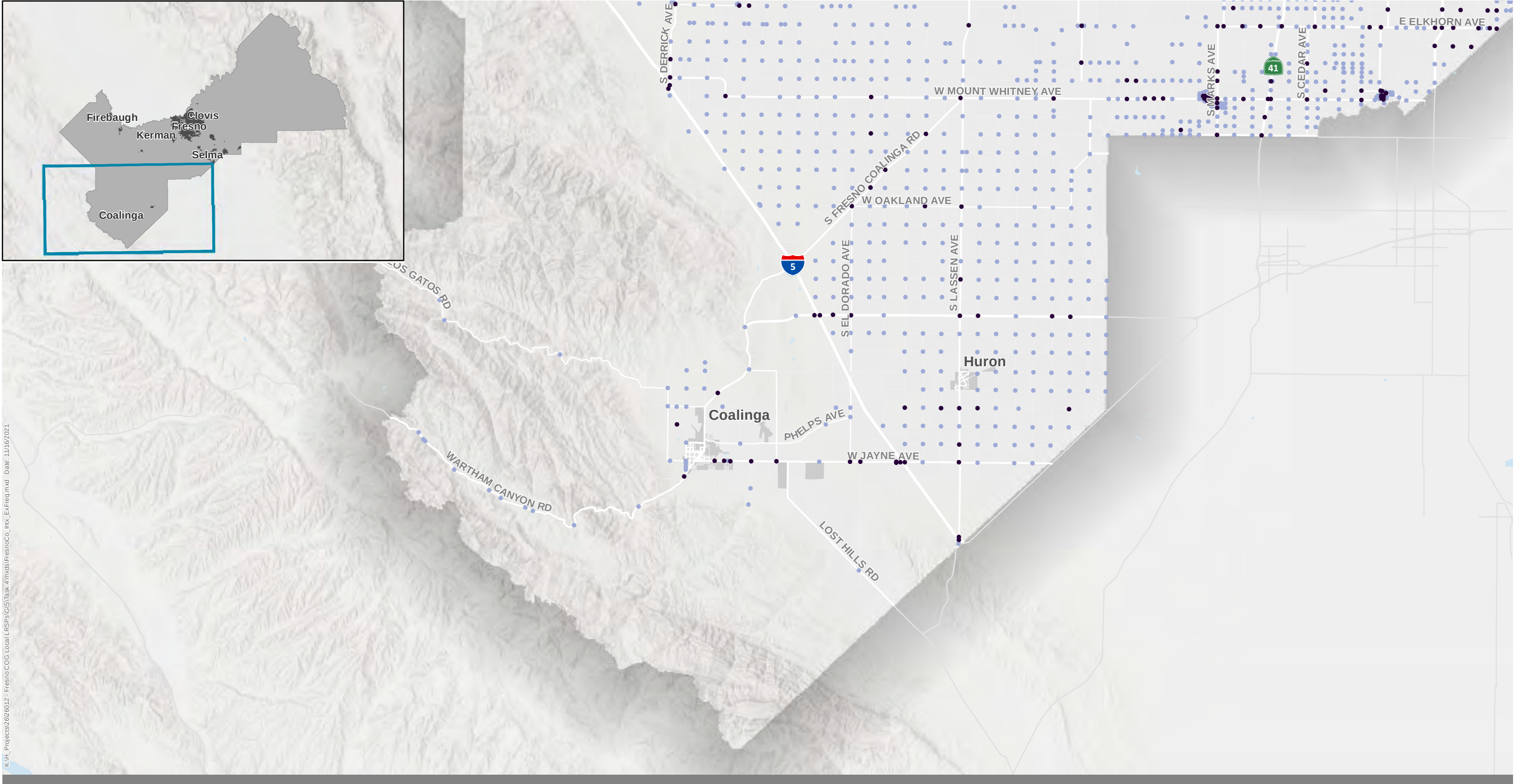
- Excess Expected Frequency**

  - 95-100th Percentile
  - 90-95th Percentile
- 75-90th Percentile
  - 50-75th Percentile
  - 0-50th Percentile
- City Limits
  - County Boundary



Figure 73.3

**Excess Predicted Average Crash Frequency Using Method of Moments  
Jurisdiction Results: Fresno County  
Fresno Council of Governments**



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**Excess Expected Frequency**

- 95-100th Percentile
- 90-95th Percentile

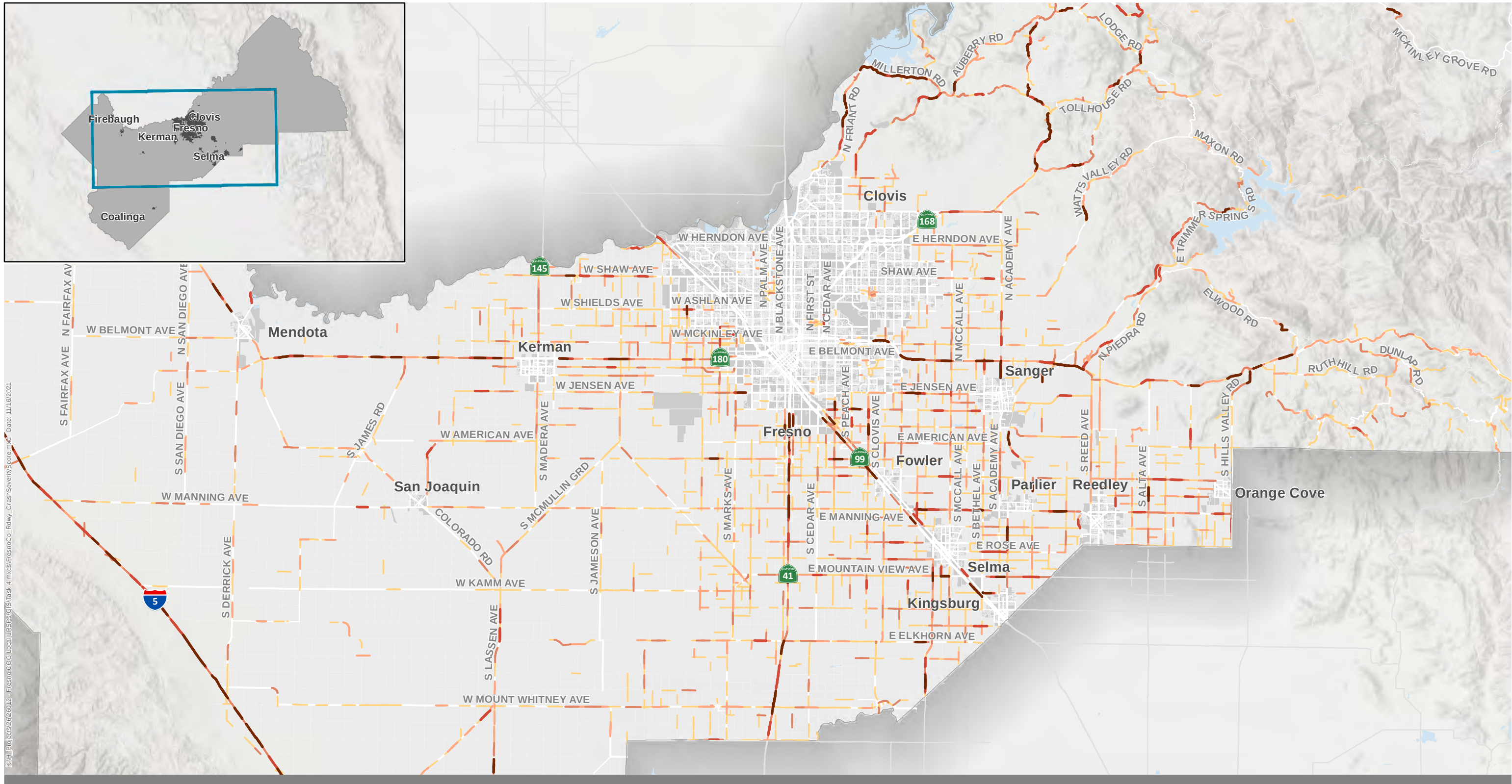
- 75-90th Percentile
- 50-75th Percentile
- 0-50th Percentile

- City Limits
- County Boundary



Figure 73.4





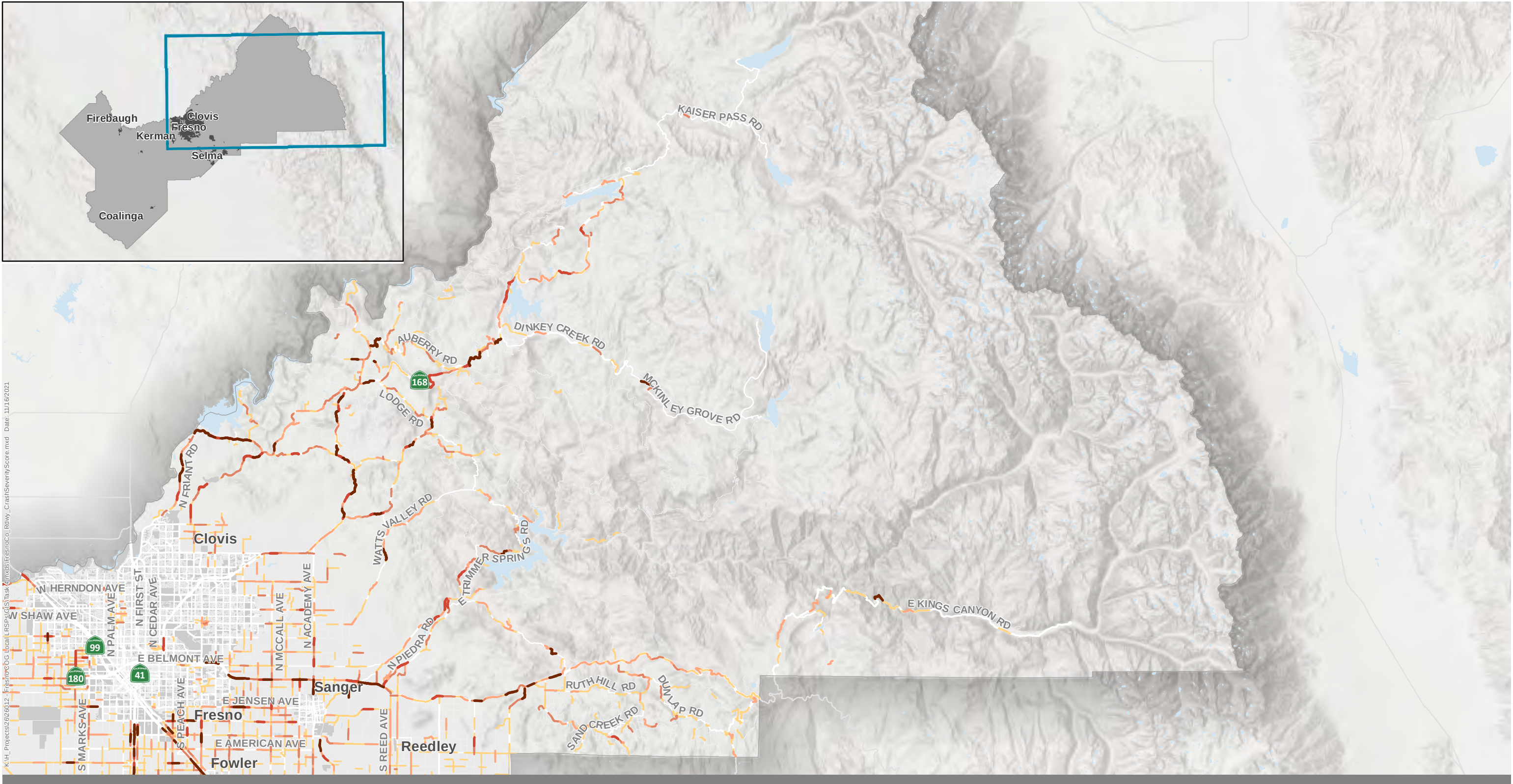
**Crash Severity Scores**

|                     |                 |
|---------------------|-----------------|
| 75-90th Percentile  | City Limits     |
| 95-100th Percentile | County Boundary |
| 50-75th Percentile  |                 |
| 0-50th Percentile   |                 |



Figure 74.1





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Figure 74.2





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**Crash Severity Scores**

- 95-100th Percentile
- 90-95th Percentile
- 75-90th Percentile
- 50-75th Percentile
- 0-50th Percentile
- City Limits
- County Boundary



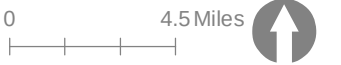
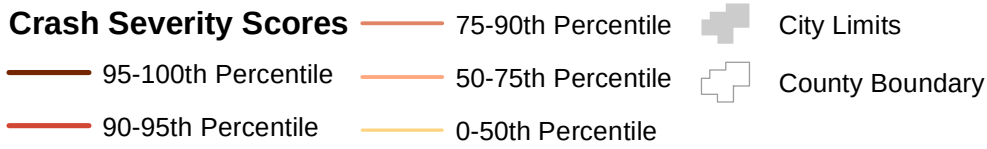
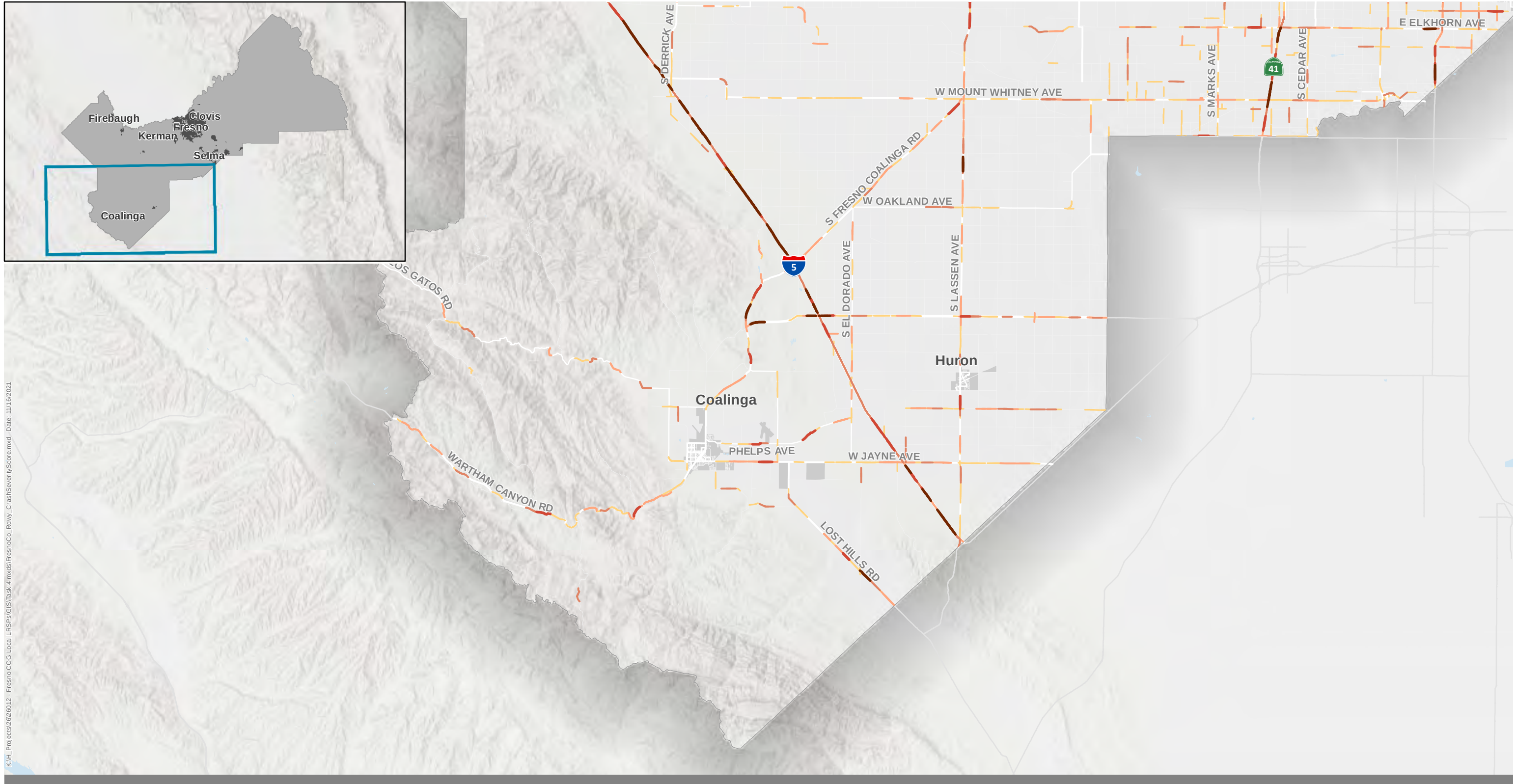
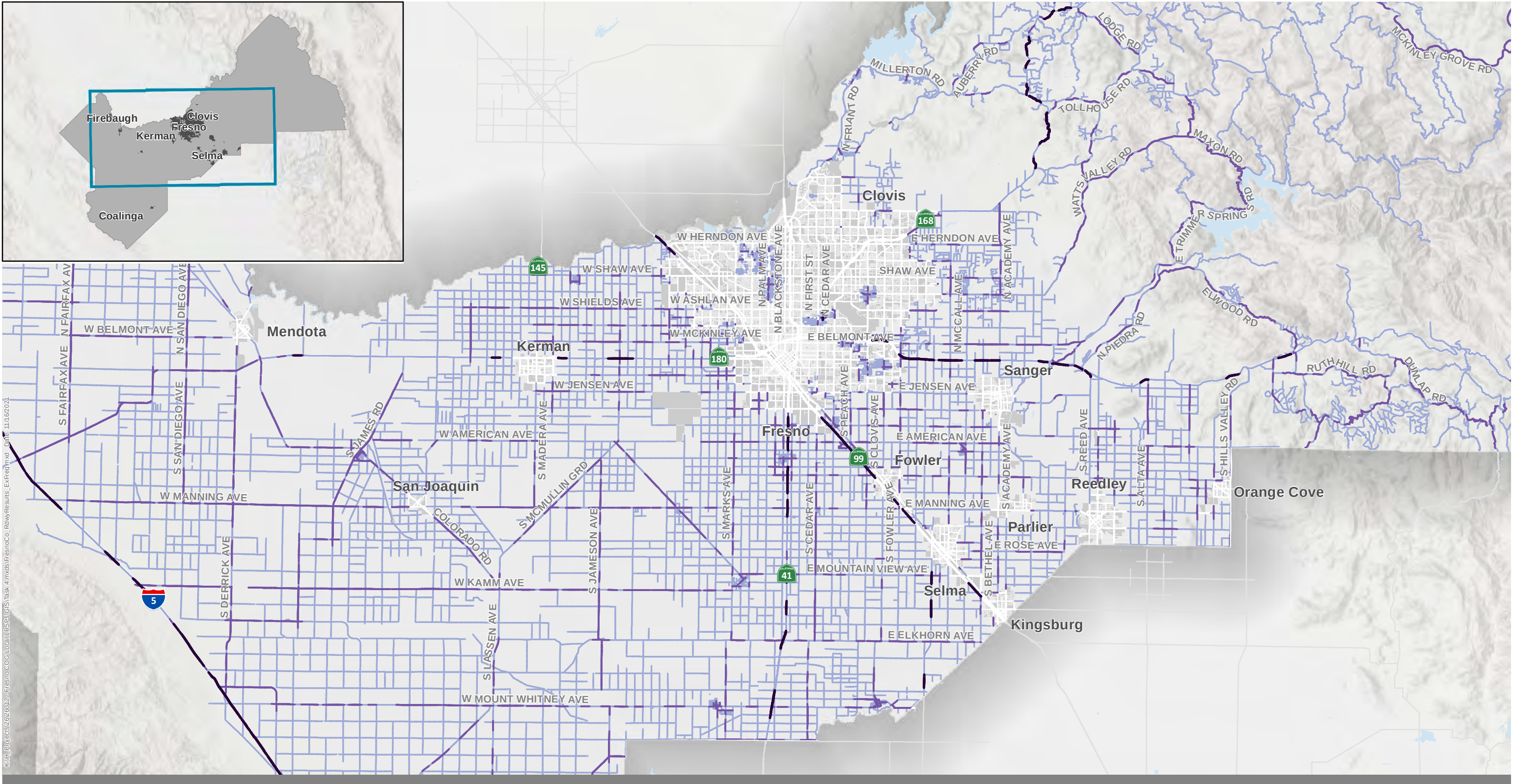


Figure 74.4





**Excess Expected Frequency**

|                     |                    |                 |
|---------------------|--------------------|-----------------|
| 95-100th Percentile | 75-90th Percentile | City Limits     |
| 90-95th Percentile  | 50-75th Percentile | County Boundary |
|                     | 0-50th Percentile  |                 |





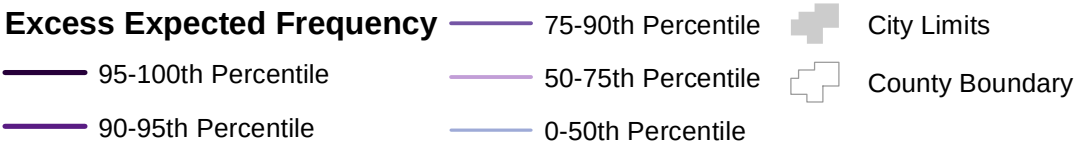
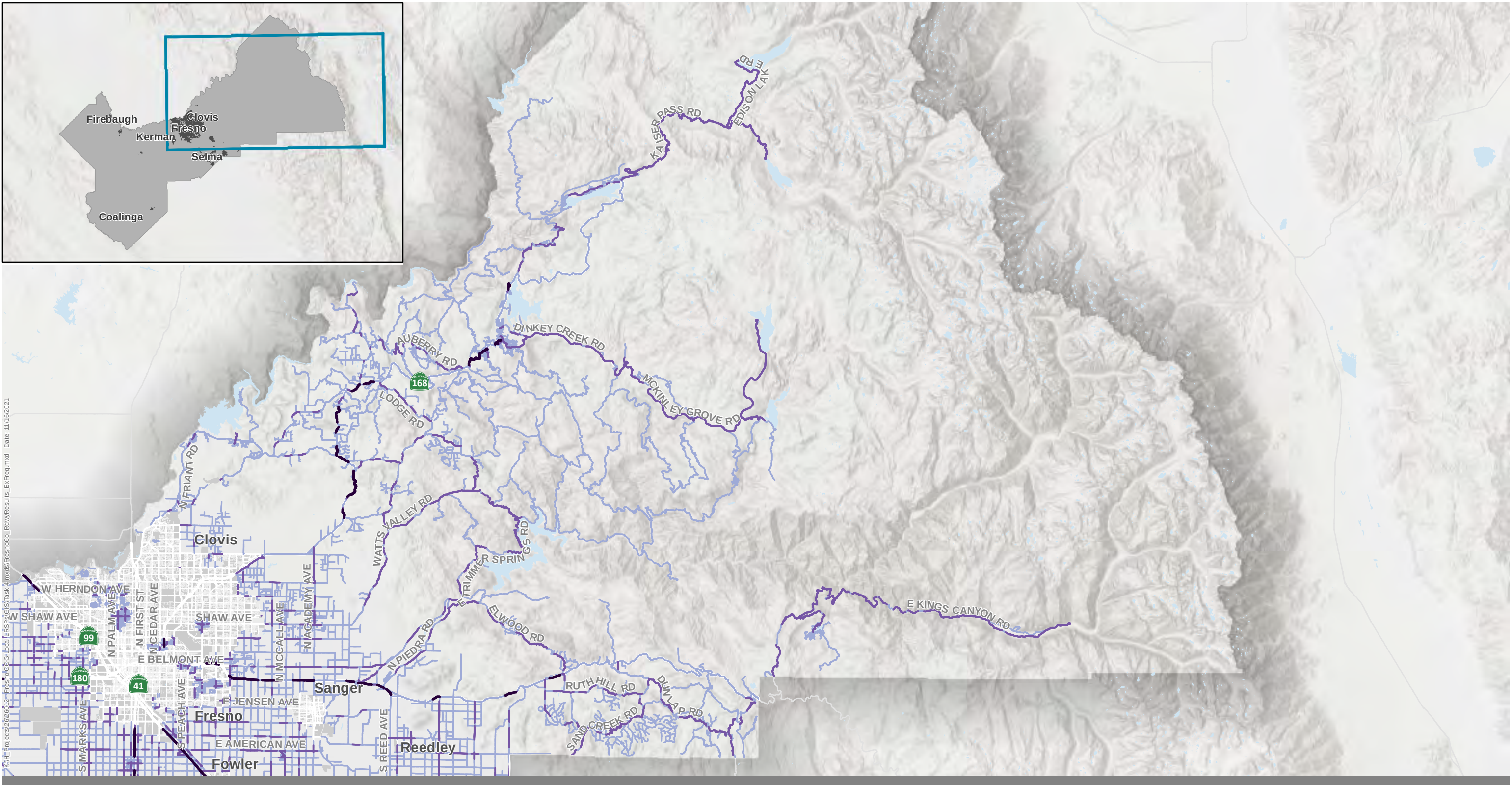


Figure 75.2

**Roadway Excess Predicted Average Crash Frequency Using Method of Moments  
Jurisdiction Results: Fresno County  
Fresno Council of Governments**



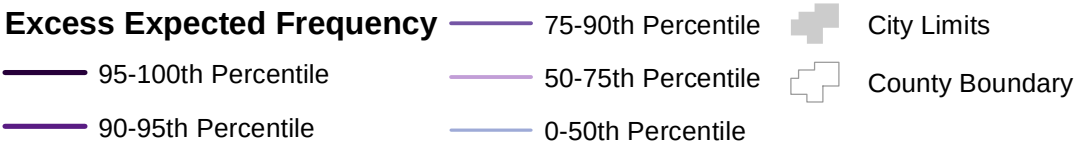
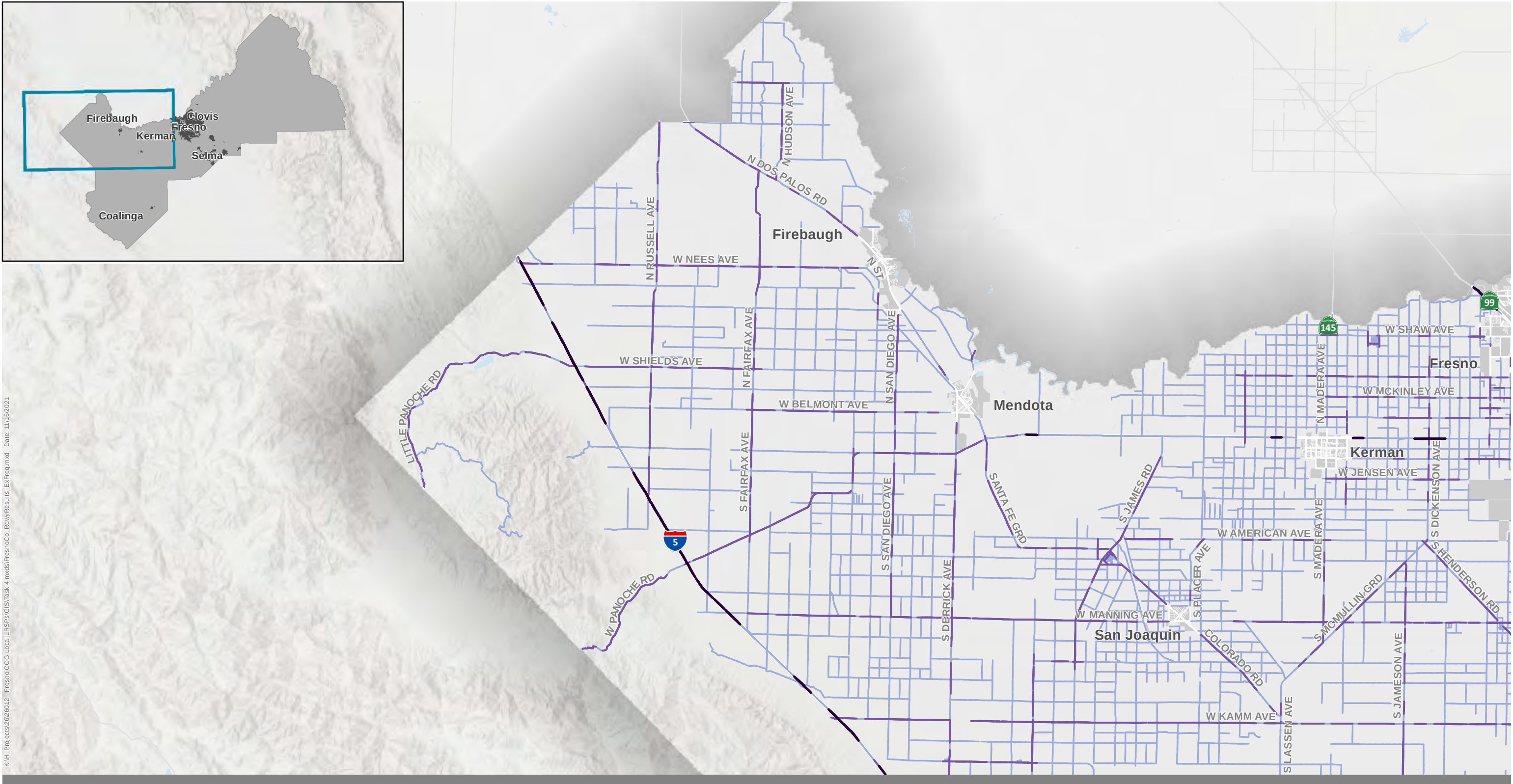
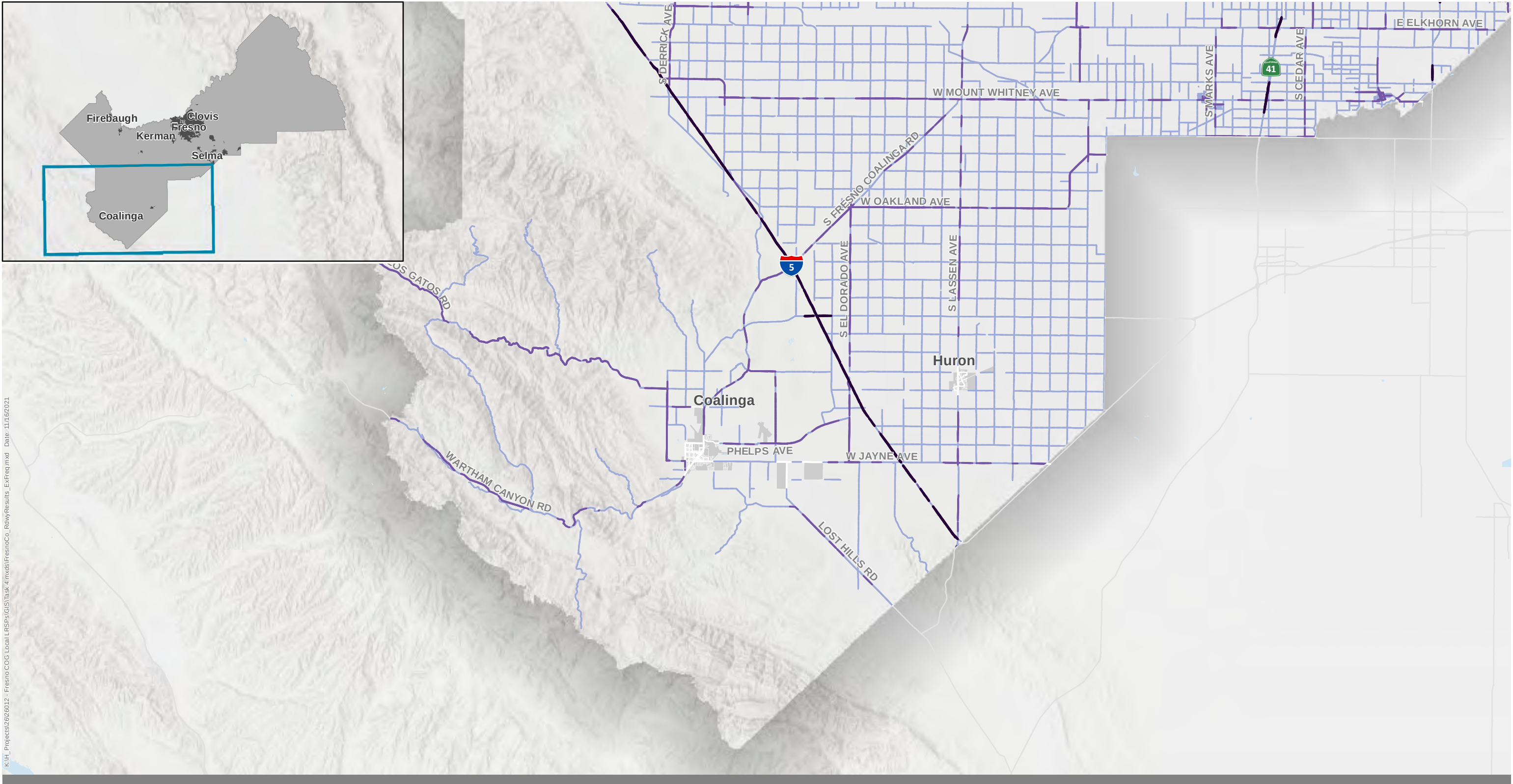


Figure 75.3

**Roadway Excess Predicted Average Crash Frequency Using Method of Moments  
Jurisdiction Results: Fresno County  
Fresno Council of Governments**



- Excess Expected Frequency**

  - 95-100th Percentile
  - 75-90th Percentile
  - 50-75th Percentile
  - 90-95th Percentile
  - 0-50th Percentile
- City Limits
  - County Boundary

Figure 75.4



## EMPHASIS AREAS

Based on key trends in the crash data, emphasis areas for unincorporated Fresno County include pedestrian and bicycle crashes, broadside crashes, hit object crashes and overturned crashes. Due to the prevalence of collision factors citing driving under the influence and unsafe speed, strategies aimed at encouraging safe driver behaviors is included as an emphasis area. Each of these areas is further discussed below.

### Pedestrian and Bicycle Crashes

Pedestrian and bicycle crashes were identified as a focus area given the overrepresentation of pedestrians and bicyclists in fatal and severe crashes. Of the 357 fatal crashes, 35 involved a pedestrian and 14 a bicyclist. Of the 892 severe injury crashes, 39 involved a pedestrian and 23 a bicyclist.

Pedestrians and bicyclists are identified as two of the six high priority challenge areas in the California SHSP. These challenge areas “were identified through historical data evaluations and feedback from traffic safety stakeholders across the state” (Caltrans SHSP). The high priorities represent “the greatest opportunity to reduce fatalities and serious injuries across the state” (Caltrans SHSP).

### Broadside Crashes

A broadside crash occurs when the front of one vehicle hits the side of another vehicle. Broadside crashes were selected as an emphasis area due to the frequency and severity of these collision types. Broadside crashes were the second most frequent collision type and represent 30 percent of fatal and severe injury crashes. Of the 357 fatal crashes, 105 were broadside crashes. As discussed below under Engineering Strategies, countermeasures are available targeted at broadside crashes.

### Hit Object Crashes

Hit object crashes were selected as an emphasis area due to their frequency and severity. They are the most common collision type and represent 25 percent of fatal and severe injury crashes. A variety of roadway countermeasures are available targeted at reducing hit object crashes.

The California SHSP includes lane departures as one of the six high priorities in California. As indicated in the Caltrans SHSP, “the Lane Departures Challenge Area includes head-on, hit object, and overturned crashes. This includes instances where a vehicle runs off the road or crosses into the opposing lane prior to the collision.” These crashes are a high priority due to their severity level.



## Overtaken Crash

Overtaken crashes were selected as an emphasis area due to their severity. Overtaken crashes account for 14 percent of fatal/severe crashes, including 46 of the 357 fatal crashes. Unsafe speed, poor weather, and darkness are often common factors for overtaken vehicle crashes and countermeasures are available to address those as discussed below under Engineering Strategies.

As indicated under hit object crashes discussion, the California SHSP includes lane departures – which includes overtaken crashes – as one of the six high priorities in California.

## Driver Behavior

Driving or bicycling under the influence of alcohol and drugs is the second most common primary collision factor in fatal/severe crashes. Unsafe speed is the most frequently reported PCF among all reported crashes and the third most frequent in fatal/severe injury crashes. This suggests there are opportunities to address driver behavior through countermeasures that encourage lower speeds and education and enforcement.

The California SHSP also identified impaired driving and speed management/aggressive driving as two of the six high priorities in California, reflecting the potential to reduce fatalities and serious injuries by addressing these challenge areas.

## STRATEGIES

The following subsections present engineering, education, emergency services, and enforcement strategies to help improve roadway safety across the County.



### Engineering Strategies

The top three fatal and severe injury collision types in Fresno County were broadside, hit object, and overtaken crashes; the top three fatal and severe injury primary collision factors were improper turning, driving under the influence, and unsafe speed. High priority countermeasures to address these collision types and primary collision factors are shown in Table 32.

Table 32. High Priority Countermeasures

|                                    | Countermeasure Name                                                                            | ID           | Crashes Addressed                  |
|------------------------------------|------------------------------------------------------------------------------------------------|--------------|------------------------------------|
| Roadway Countermeasures            | Street Lighting                                                                                | R1           | Crashes at night                   |
|                                    | Remove or Relocate Fixed Objects Outside of Clear Recovery Zone                                | R2           | Hit object, unsafe speed           |
|                                    | Install Guardrails                                                                             | R4           | Hit object, unsafe speed           |
|                                    | Install Raised Median                                                                          | R8           | Improper turning                   |
|                                    | Road Diet                                                                                      | R14          | Hit object, unsafe speed           |
|                                    | Widen Shoulder                                                                                 | R15          | Hit object, unsafe speed           |
|                                    | Improve Pavement Friction (High Friction Surface Treatment)                                    | R21          | Hit object, unsafe speed           |
|                                    | Install/Upgrade Signs with New Fluorescent Sheeting                                            | R22          | Hit object, unsafe speed           |
|                                    | Install Dynamic/Variable Speed Warning Signs                                                   | R26          | Hit object, unsafe speed           |
|                                    | Install Edgelines and Centerlines                                                              | R28          | Hit object, unsafe speed           |
|                                    | Install Edgeline Rumble Strips/Stripes                                                         | R31          | Hit object, unsafe speed           |
|                                    | Install Variable Message Signs                                                                 |              | Crashes in poor weather conditions |
| Intersection Countermeasures       | Add Intersection Lighting at Intersections                                                     | S1/NS1       | Crashes at night                   |
|                                    | Improve Signal Hardware: Lenses, Backplates with Retroreflective Border, Mounting Size, Number | S2           | Broadside                          |
|                                    | Provide Advanced Dilemma-Zone Detection                                                        | S4           | All                                |
|                                    | Install Flashing Beacons as Advance Warning                                                    | S10/NS9      | Broadside, unsafe speed            |
|                                    | Convert Intersection to Roundabout                                                             | NS4/NS5      | Unsafe speed                       |
|                                    | Install/Upgrade Stop Signs or Intersection Warning/Regulatory Signs                            | NS6          | Broadside                          |
|                                    | Upgrade Intersection Pavement Markings                                                         | NS7          | Broadside                          |
|                                    | Install Splitter Islands for Minor Street Approaches                                           | NS13         | Broadside                          |
| Pedestrian/Bicycle Countermeasures | Install Bike Lanes                                                                             | R32PB        | Overrepresented bicycle crashes    |
|                                    | Install Sidewalk/Pathway                                                                       | R34PB        | Pedestrian crashes                 |
|                                    | Install/Upgrade Pedestrian Crossing with Enhanced Features                                     | R35PB        | Pedestrian crashes                 |
|                                    | Install Pedestrian Countdown Signal Heads                                                      | S17PB        | Pedestrian crashes                 |
|                                    | Install Pedestrian Crossing                                                                    | S18PB/NS20PB | Pedestrian crashes                 |
|                                    | Modify Signal Phasing to Implement a Leading Pedestrian Interval                               | S21PB        | Pedestrian crashes                 |
|                                    | Install Raised Medians (or Refuge Islands)                                                     | NS19PB       | Pedestrian crashes                 |
|                                    | Install/Upgrade Pedestrian Crossing at Uncontrolled Locations (with Enhanced Safety Features)  | NS21PB       | Pedestrian crashes                 |
|                                    | Bike Lane Extension Through Intersections                                                      | n/a          | Overrepresented bicycle crashes    |
|                                    | Bike Boxes                                                                                     | n/a          | Overrepresented bicycle crashes    |

Notes: The ID number references the Caltrans Manual Local Road Safety

There were no high priority intersection countermeasures listed for Fresno County. Intersection countermeasures listed were given a medium priority.

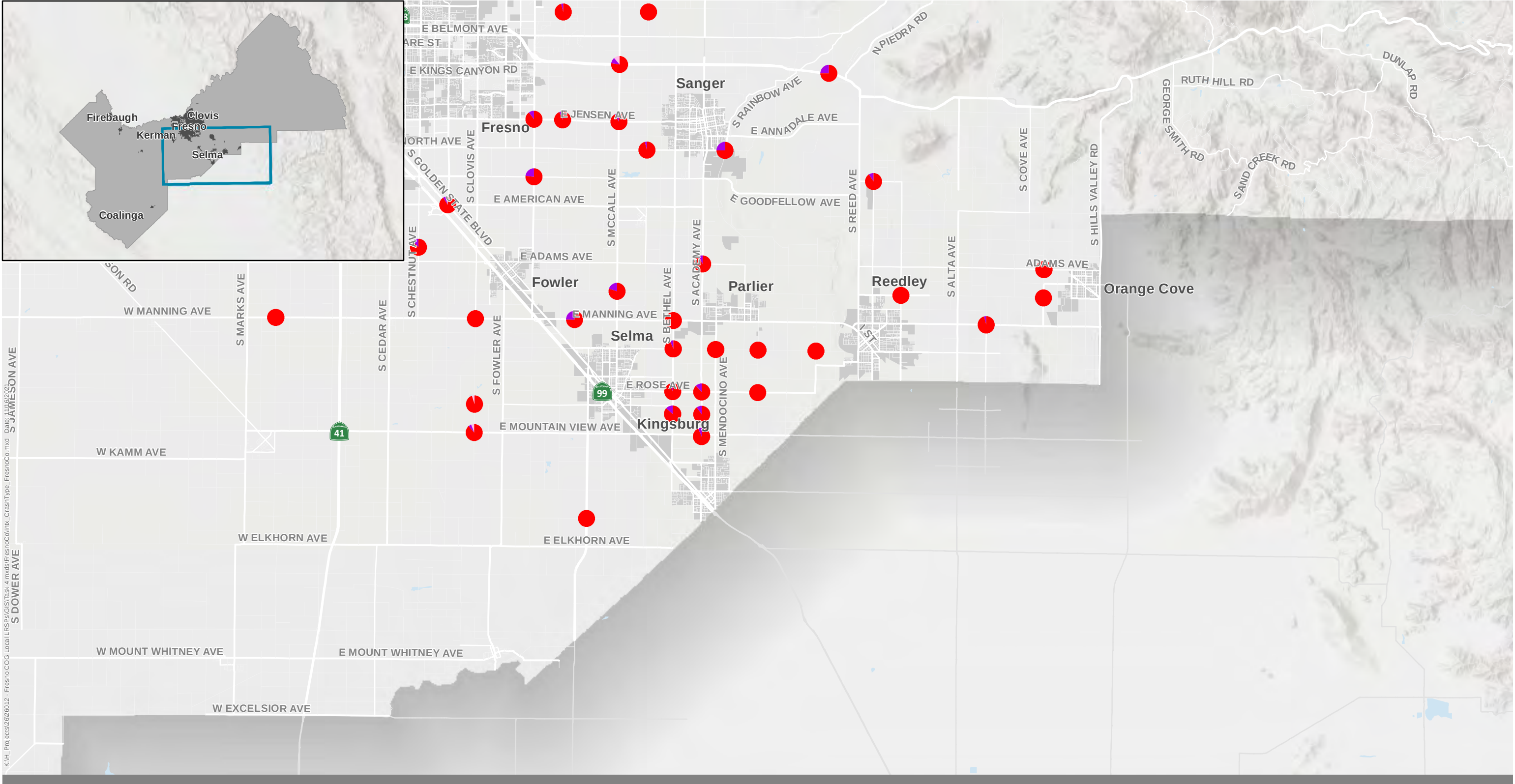
*Appendix B* contains the regional Countermeasures Toolbox which includes more detailed information regarding the countermeasures listed above.

The following figures and tables provide data on collision types and factors for the intersections and roadways with the highest crash scores. The locations with the highest crash scores may be top priorities for implementing countermeasures and pursuing grants. Fresno County can use the information about collision type and factors to identify potential countermeasures to apply, using the information in Table 32.

Figure 76.1 to Figure 76.3 and Figure 77.1 to Figure 77.3 present the top priority intersections and breakdown of the top collision types and primary collision factors, respectively. Figure 78 and Figure 79 present the top priority roadways and breakdown of the top collision types and primary collision factors, respectively.







**Collision Type**

- Broadside
- Hit Object
- Overturned
- City Limits
- County Boundary

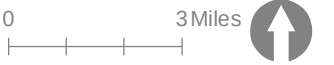
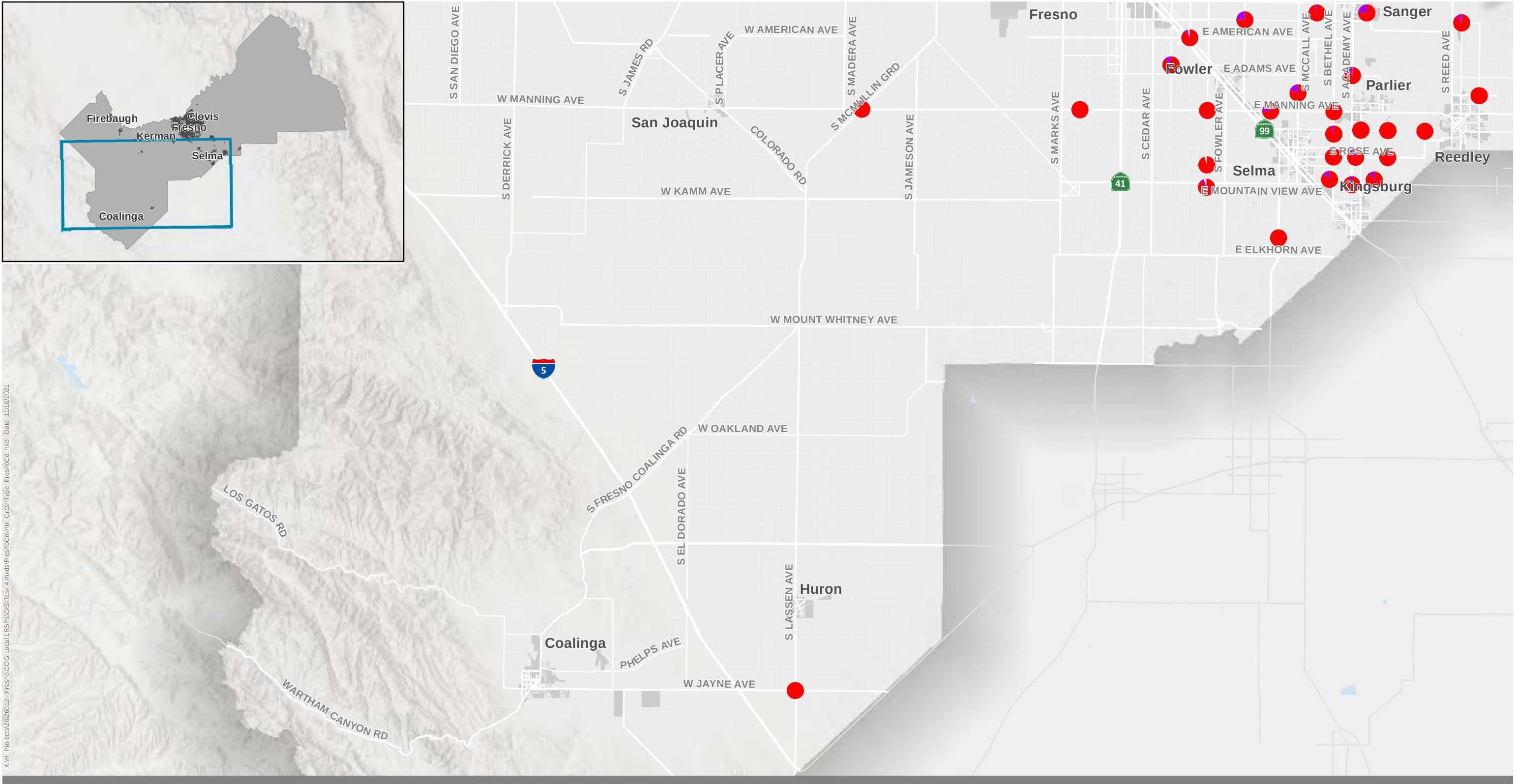


Figure 76.2  
**Top Fatal/Severe Injury Intersection Collision Types  
Jurisdiction Results: Unincorporated Fresno County  
Fresno Council of Governments**



### Collision Type

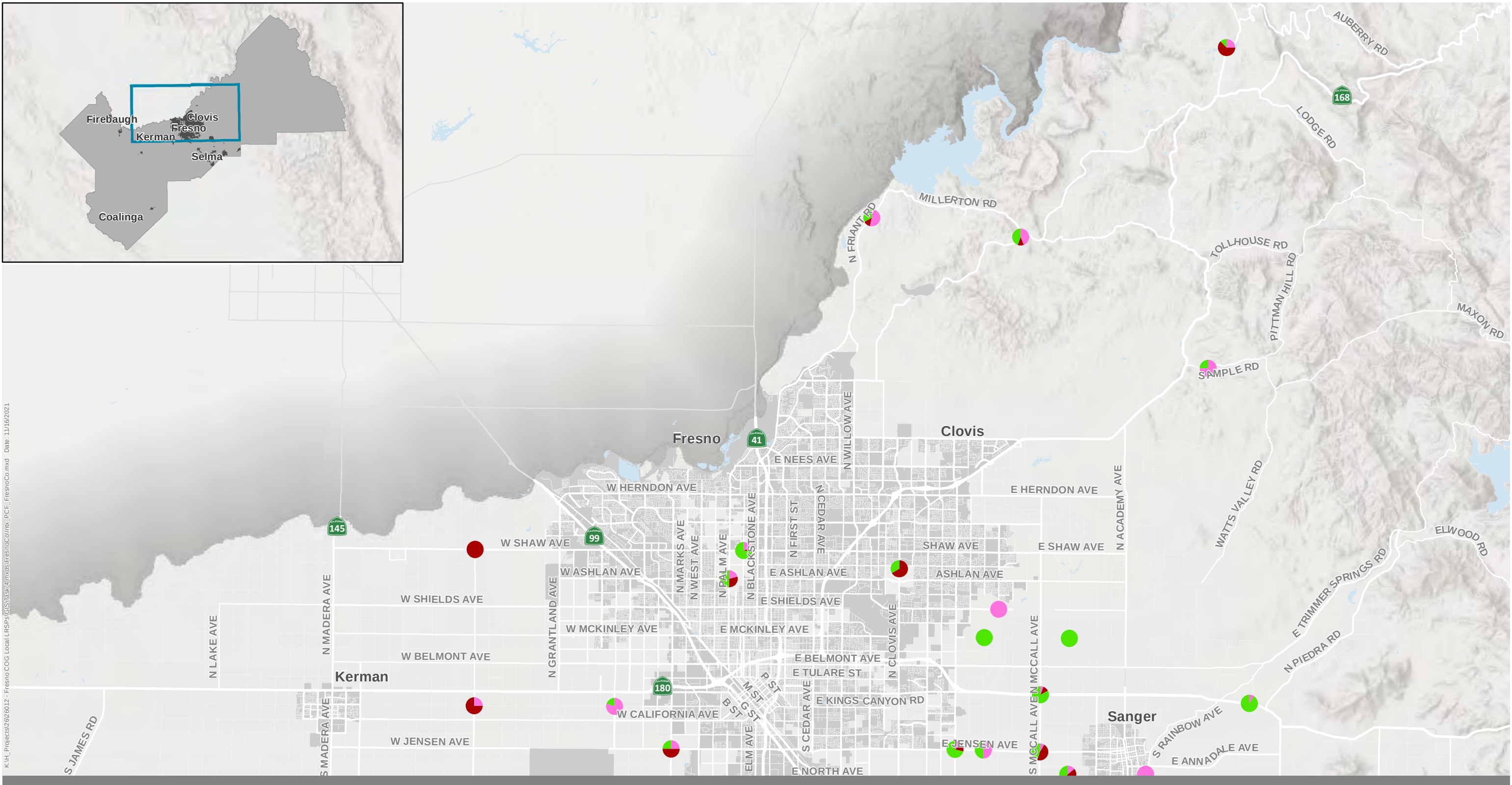
- Broadside
- Hit Object
- Overturned
- City Limits
- County Boundary



Figure 76.3

**Top Fatal/Severe Injury Intersection Collision Types  
Jurisdiction Results: Unincorporated Fresno County  
Fresno Council of Governments**



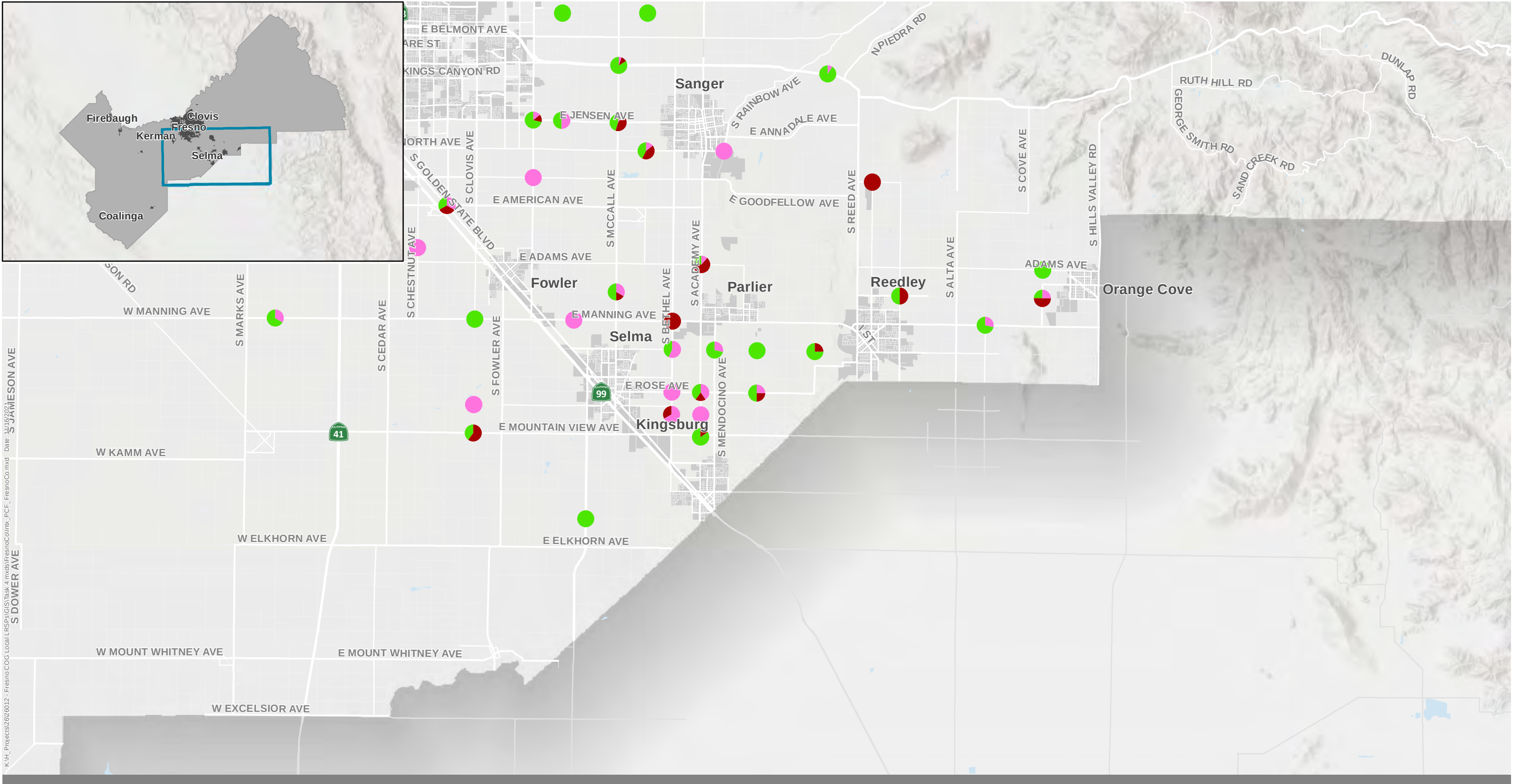


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- Primary Collision Factors**
- Improper Turning
  - Driving Under the Influence
  - Unsafe Speed
- City Limits**
- County Boundary**



Figure 77.1



Primary Collision Factors

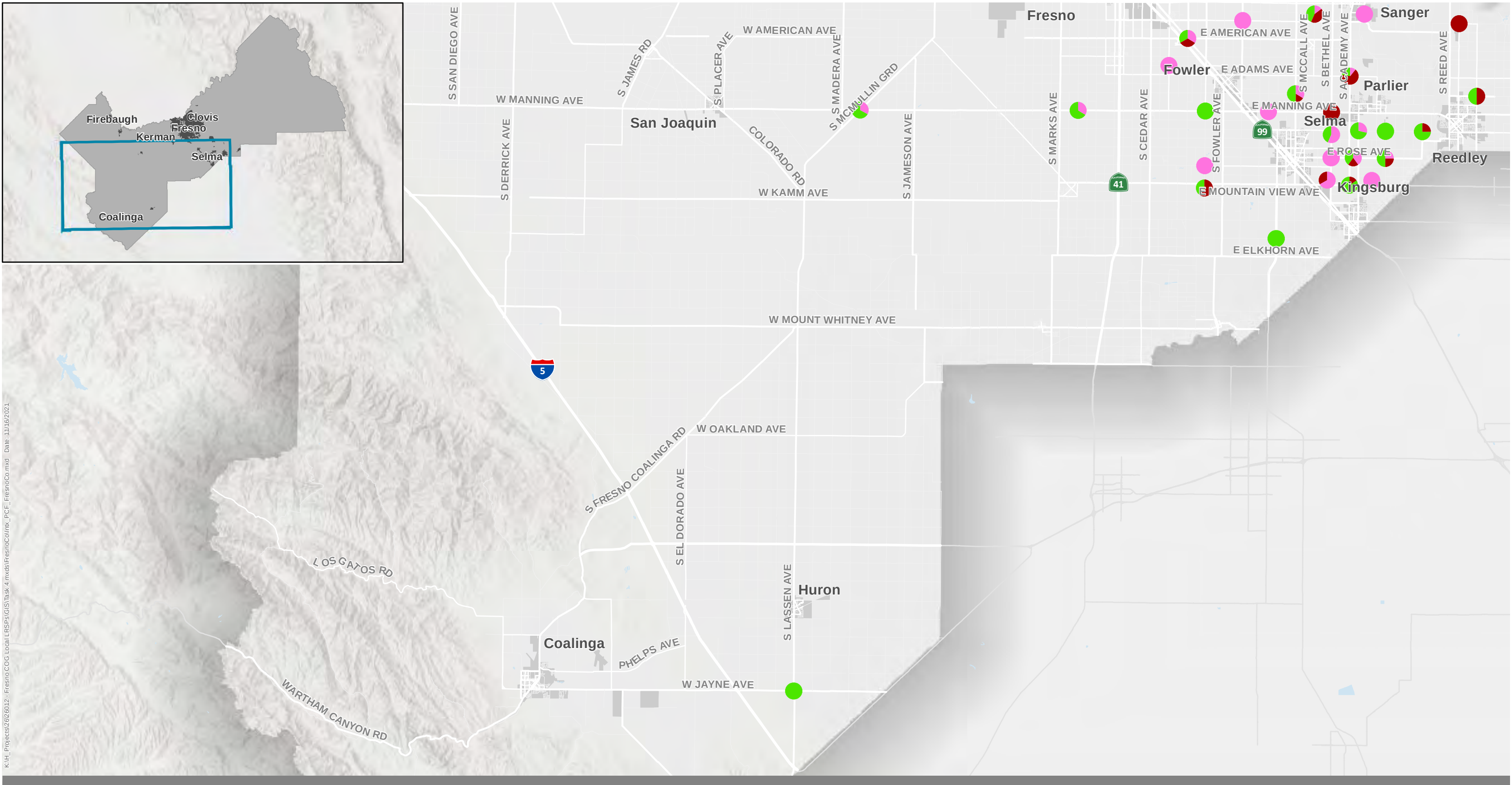
- Improper Turning
- Driving Under the Influence
- Unsafe Speed

- City Limits
- County Boundary



Figure 77.2  
Top Fatal/Severe Injury Intersection Primary Collision Factors  
Jurisdiction Results: Unincorporated Fresno County  
Fresno Council of Governments



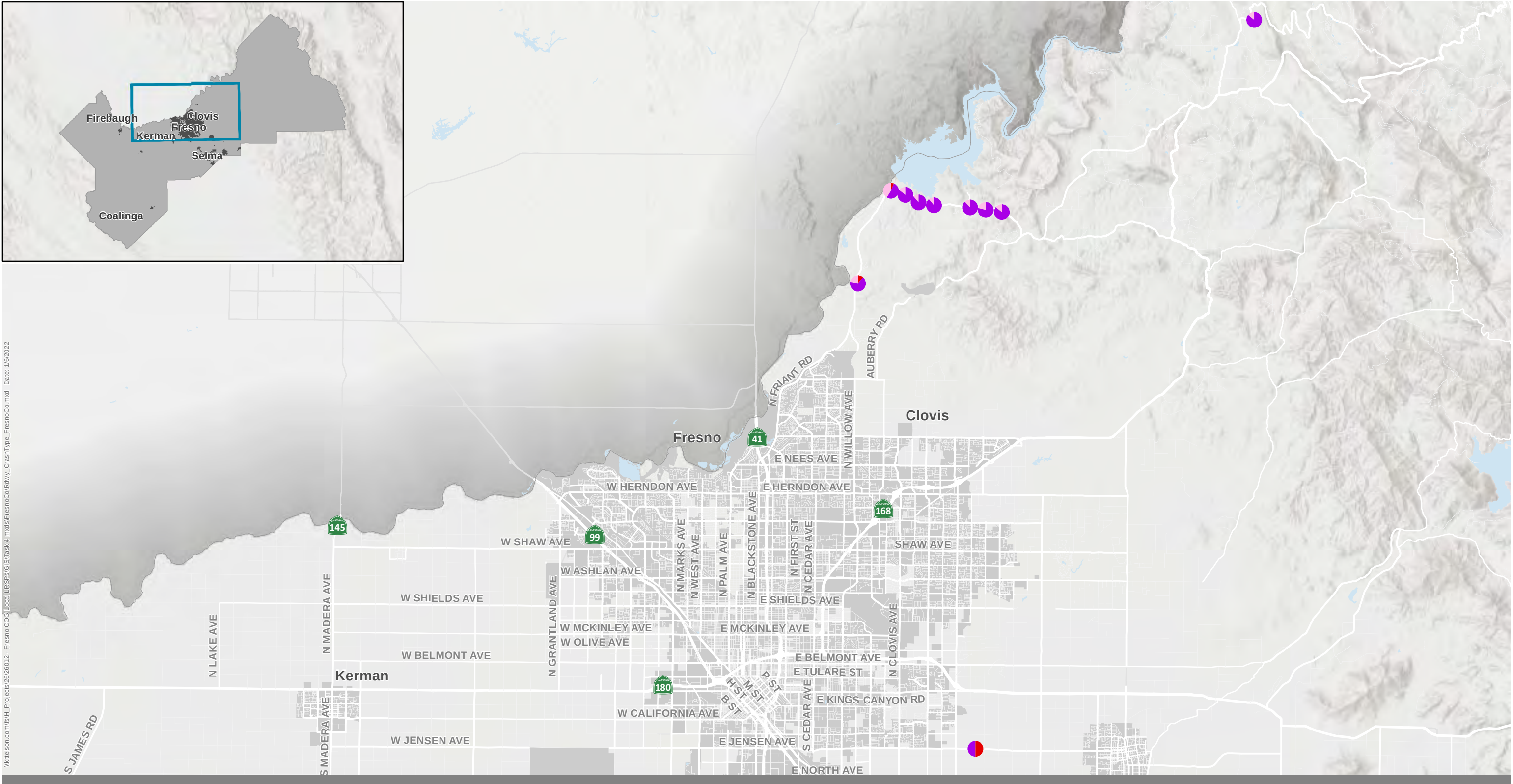


- Primary Collision Factors**
- Improper Turning
  - Driving Under the Influence
  - Unsafe Speed
- City Limits**
- County Boundary**



Figure 77.3

**Top Fatal/Severe Injury Intersection Primary Collision Factors  
Jurisdiction Results: Unincorporated Fresno County  
Fresno Council of Governments**



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**Collision Type**

- Broadside
- Hit Object
- Overturned

 City Limits

 County Boundary

 Priority Roadways

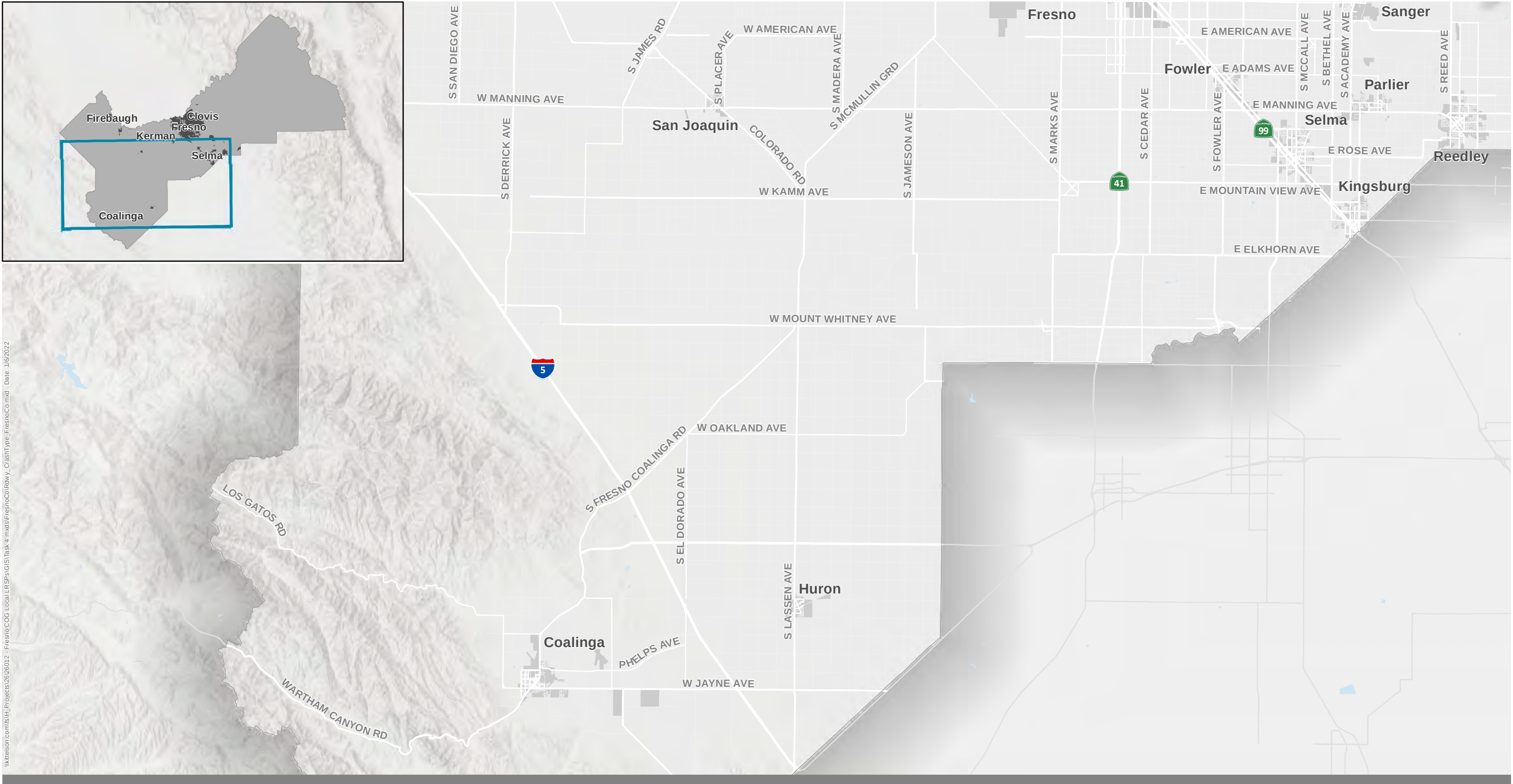


**Intersection Top 3 Collision Types**  
**Jurisdiction Results: Unincorporated Fresno County**  
**Fresno Council of Governments**

Figure 78.1







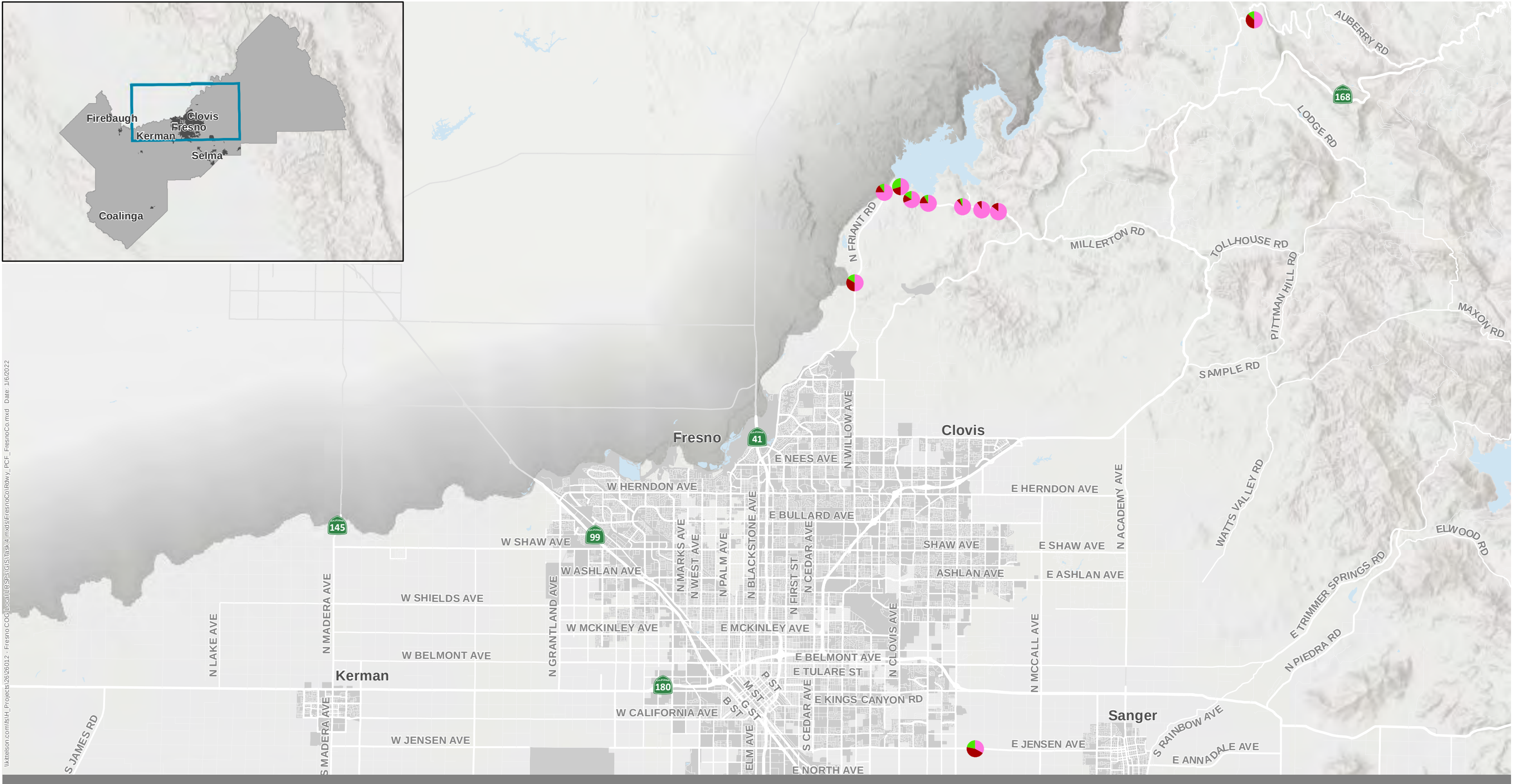
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- Collision Type**
- Broadside
  - Hit Object
  - Overturned
  - Priority Roadways
  - City Limits
  - County Boundary



Figure 78.3





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**Primary Collision Factors**

- Improper Turning
- Driving Under the Influence
- Unsafe Speed

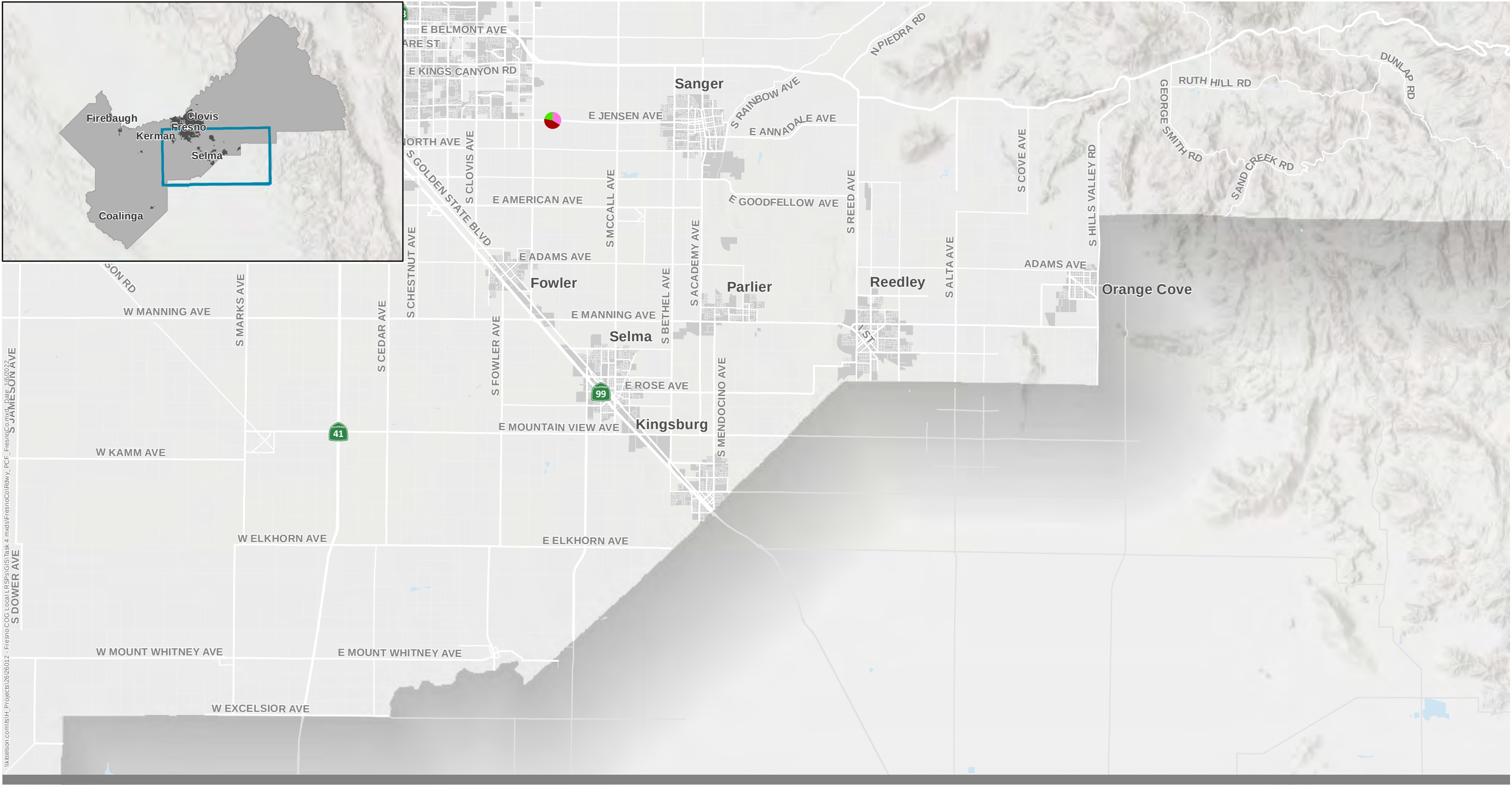
Priority Roadways

- City Limits
- County Boundary

0 3 Miles



Figure 79.1  
Top Fatal/Severe Injury Roadway Primary Collision Factor  
Jurisdiction Results: Unincorporated Fresno County  
Fresno Council of Governments



- Primary Collision Factors

Improper Turning

Driving Under the Influence

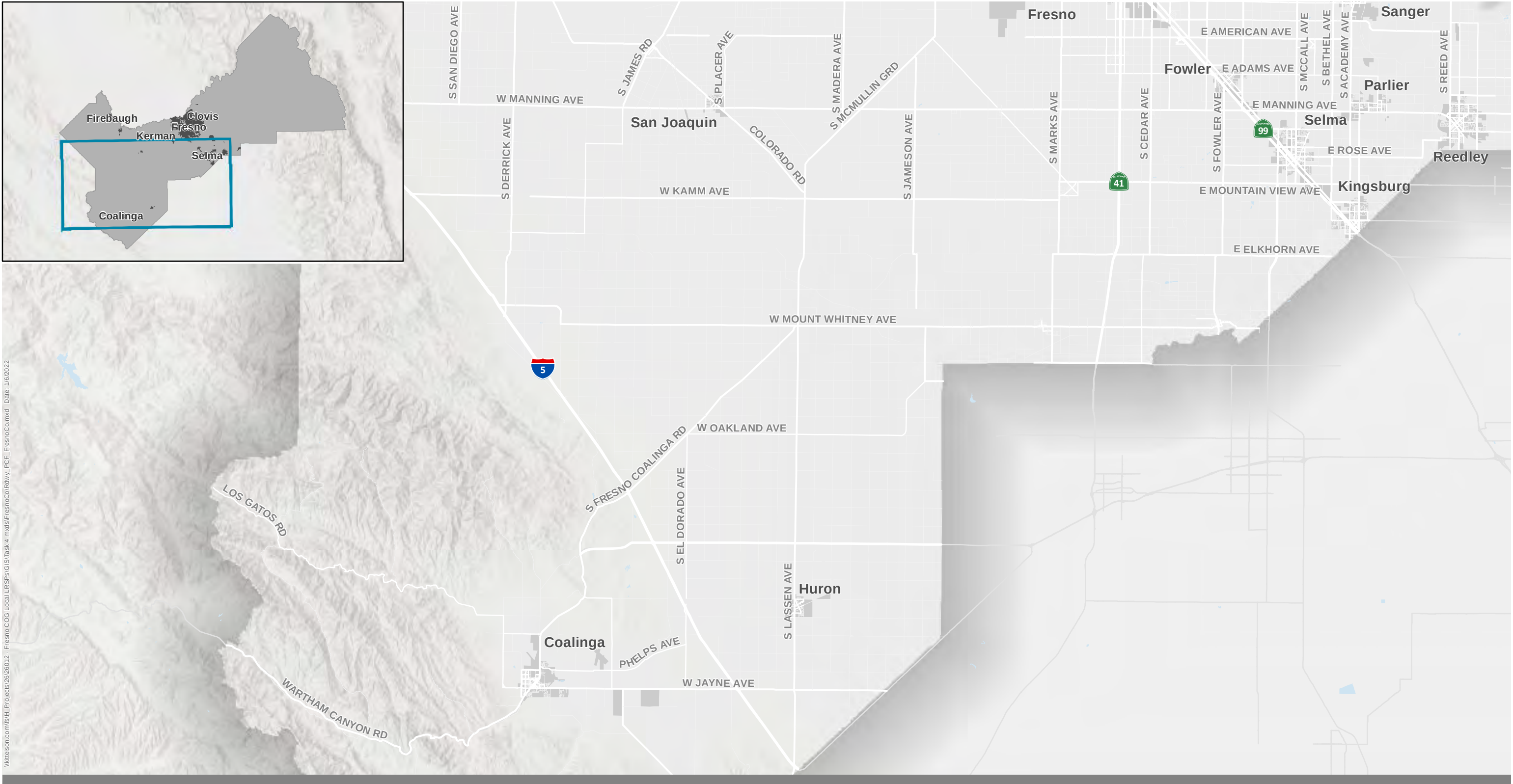
Unsafe Speed
- City Limits

County Boundary
- Priority Roadways



Figure 79.2  
Top Fatal/Severe Injury Roadway Primary Collision Factor  
Jurisdiction Results: Unincorporated Fresno County  
Fresno Council of Governments





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- Primary Collision Factors**
  - Improper Turning
  - Driving Under the Influence
  - Unsafe Speed
  - Priority Roadways
- City Limits
  - County Boundary



Figure 79.3  
**Top Fatal/Severe Injury Roadway Primary Collision Factor  
 Jurisdiction Results: Unincorporated Fresno County  
 Fresno Council of Governments**

Table 33 and Table 34 provide information for the top fifty intersection locations (based on crash severity score), including control type (signalized or unsignalized), crash severity score, and total number of crashes by collision type or primary collision factor.

Table 33. Priority Intersections with Collision Type based on Top 3 Fatal/Severe Injury Collision Types

| #  | Location                                  | Type         | Crash Severity Score | Total Number of Crashes | Collision Type |            |             |       |
|----|-------------------------------------------|--------------|----------------------|-------------------------|----------------|------------|-------------|-------|
|    |                                           |              |                      |                         | Broadside      | Hit Object | Over-turned | Other |
| 1  | LAC JAC AVE & DINUBA AVE                  | Unsignalized | 201.09               | 15                      | 12             | 0          | 0           | 3     |
| 2  | FRANKWOOD AVE & CENTRAL AVE               | Unsignalized | 164.99               | 14                      | 10             | 1          | 0           | 3     |
| 3  | ACADEMY AVE & ADAMS AVE                   | Unsignalized | 162.93               | 18                      | 11             | 1          | 0           | 6     |
| 4  | BETHEL AVE & DINUBA AVE                   | Unsignalized | 157.25               | 49                      | 44             | 3          | 0           | 2     |
| 5  | AUBERRY RD & FRAZIER RD                   | Unsignalized | 154.92               | 8                       | 0              | 6          | 2           | 0     |
| 6  | KEARNEY BLVD & CORNELIA AVE & MADISON AVE | Unsignalized | 139.01               | 29                      | 22             | 5          | 0           | 2     |
| 7  | CLOVIS AVE & MOUNTAIN VIEW AVE            | Unsignalized | 137.94               | 19                      | 16             | 1          | 1           | 1     |
| 8  | BETHEL AVE & ROSE AVE                     | Unsignalized | 135.54               | 25                      | 20             | 1          | 0           | 4     |
| 9  | CLOVIS AVE & NEBRASKA AVE                 | Unsignalized | 133.24               | 20                      | 19             | 0          | 1           | 0     |
| 10 | MARKS AVE & JENSEN AVE                    | Unsignalized | 132.02               | 19                      | 17             | 1          | 0           | 1     |
| 11 | AMERICAN AVE & GOLDEN STATE BLVD          | Unsignalized | 128.81               | 26                      | 20             | 1          | 1           | 4     |
| 12 | FRIANT RD & BELCHER                       | Unsignalized | 128.36               | 15                      | 0              | 6          | 7           | 2     |
| 13 | BETHEL AVE & NEBRASKA AVE                 | Unsignalized | 127.34               | 15                      | 13             | 2          | 0           | 0     |
| 14 | MCMULLIN GRD & MANNING AVE                | Unsignalized | 127.13               | 19                      | 19             | 0          | 0           | 0     |
| 15 | FRONTIER TRAIL LN & SAMPLE RD             | Unsignalized | 122.99               | 8                       | 0              | 1          | 4           | 3     |
| 16 | TEMPERANCE AVE & CENTRAL AVE              | Unsignalized | 121.12               | 13                      | 10             | 3          | 0           | 0     |
| 17 | TEMPERANCE AVE & JENSEN AVE               | Signal       | 120.58               | 34                      | 26             | 3          | 0           | 5     |
| 18 | HILL AVE & SOUTH AVE                      | Unsignalized | 118.78               | 11                      | 8              | 0          | 0           | 3     |
| 19 | PALM AVE & ASHLAN AVE                     | Signal       | 116.62               | 63                      | 31             | 3          | 0           | 29    |
| 20 | MCCALL AVE & KINGS CANYON RD              | Signal       | 113.07               | 26                      | 7              | 1          | 1           | 17    |
| 21 | ACADEMY AVE & NEBRASKA AVE                | Unsignalized | 107.37               | 30                      | 26             | 3          | 0           | 1     |
| 22 | BETHEL AVE                                | Signal       | 105.38               | 13                      | 13             | 0          | 0           | 0     |
| 23 | DICKENSON AVE & KEARNEY BLVD              | Unsignalized | 103.69               | 31                      | 28             | 1          | 0           | 2     |
| 24 | CRAWFORD AVE & MANNING AVE                | Unsignalized | 102.08               | 28                      | 21             | 1          | 0           | 6     |
| 25 | DE WOLF AVE & MCKINLEY AVE                | Unsignalized | 98.92                | 27                      | 21             | 1          | 0           | 5     |
| 26 | ZEDIKER AVE & ROSE AVE                    | Unsignalized | 96.98                | 27                      | 26             | 0          | 0           | 1     |
| 27 | ACADEMY AVE & MOUNTAIN VIEW AVE           | Signal       | 96.36                | 31                      | 14             | 1          | 0           | 16    |
| 28 | AUBERRY RD & MILLERTON RD                 | Unsignalized | 95.87                | 27                      | 7              | 15         | 2           | 3     |
| 29 | DEL REY AVE & NORTH AVE                   | Unsignalized | 95.86                | 26                      | 21             | 1          | 0           | 4     |
| 30 | MENDOCINO AVE & DINUBA AVE                | Unsignalized | 92.32                | 18                      | 13             | 0          | 0           | 5     |

| #  | Location                        | Type         | Crash Severity Score | Total Number of Crashes | Collision Type |            |             |       |
|----|---------------------------------|--------------|----------------------|-------------------------|----------------|------------|-------------|-------|
|    |                                 |              |                      |                         | Broadside      | Hit Object | Over-turned | Other |
| 31 | KINGS CANYON RD & RIO VISTA AVE | Unsignalized | 91.21                | 18                      | 3              | 1          | 0           | 14    |
| 32 | MCCALL AVE & SOUTH AVE          | Unsignalized | 87.88                | 12                      | 8              | 2          | 0           | 2     |
| 33 | DE WOLF AVE & JENSEN AVE        | Unsignalized | 87.85                | 16                      | 14             | 1          | 0           | 1     |
| 34 | BUTTONWILLOW AVE & SOUTH AVE    | Unsignalized | 87.65                | 15                      | 12             | 0          | 0           | 3     |
| 35 | DEL REY AVE & MCKINLEY AVE      | Unsignalized | 87.58                | 10                      | 8              | 0          | 0           | 2     |
| 36 | ACADEMY AVE & ROSE AVE          | Unsignalized | 86.42                | 19                      | 15             | 2          | 0           | 2     |
| 37 | DICKENSON AVE & SHAW AVE        | Unsignalized | 86.14                | 13                      | 9              | 0          | 0           | 4     |
| 38 | CHESTNUT AVE & CLAYTON AVE      | Unsignalized | 85.14                | 8                       | 7              | 1          | 0           | 0     |
| 39 | MCCALL AVE & JENSEN AVE         | Signal       | 84.20                | 21                      | 12             | 1          | 0           | 8     |
| 40 | ZEDIKER AVE & DINUBA AVE        | Unsignalized | 84.19                | 12                      | 10             | 0          | 0           | 2     |
| 41 | LEONARD AVE & SHIELDS AVE       | Unsignalized | 83.90                | 11                      | 10             | 1          | 0           | 0     |
| 42 | CLOVIS AVE & DONNER AVE         | Unsignalized | 83.31                | 9                       | 5              | 1          | 0           | 3     |
| 43 | LASSEN AVE & JAYNE AVE          | Unsignalized | 83.28                | 13                      | 9              | 0          | 0           | 4     |
| 44 | WEST AVE & MANNING AVE          | Unsignalized | 82.48                | 9                       | 6              | 0          | 0           | 3     |
| 45 | HIGHLAND AVE & CLARKSON AVE     | Unsignalized | 82.39                | 9                       | 6              | 0          | 0           | 3     |
| 46 | CLOVIS AVE & MANNING AVE        | Unsignalized | 81.86                | 11                      | 8              | 0          | 0           | 3     |
| 47 | HILL AVE & ADAMS AVE            | Unsignalized | 81.76                | 10                      | 8              | 0          | 0           | 2     |
| 48 | LEONARD AVE & MANNING AVE       | Unsignalized | 81.66                | 10                      | 6              | 2          | 0           | 2     |
| 49 | NEWMARK AVE & NORTH AVE         | Unsignalized | 81.16                | 7                       | 3              | 1          | 0           | 3     |
| 50 | MAROA AVE & SHAW AVE            | Signal       | 80.54                | 45                      | 17             | 3          | 0           | 25    |

Notes: All unsignalized intersections are classified as rural intersections.

Other crashes include all crashes that are not coded as one of the top three collision types

Table 34. Priority Intersections with Primary Collision Factor based on Top 3 Fatal/Severe Injury Primary Collision Factors

| #  | Location                                  | Type         | Crash Severity Score | Total Number of Crashes | Primary Collision Factor |     |              |       |
|----|-------------------------------------------|--------------|----------------------|-------------------------|--------------------------|-----|--------------|-------|
|    |                                           |              |                      |                         | Improper Turning         | DUI | Unsafe Speed | Other |
| 1  | LAC JAC AVE & DINUBA AVE                  | Unsignalized | 201.09               | 15                      | 0                        | 1   | 3            | 11    |
| 2  | FRANKWOOD AVE & CENTRAL AVE               | Unsignalized | 164.99               | 14                      | 0                        | 1   | 0            | 13    |
| 3  | ACADEMY AVE & ADAMS AVE                   | Unsignalized | 162.93               | 18                      | 1                        | 6   | 2            | 9     |
| 4  | BETHEL AVE & DINUBA AVE                   | Unsignalized | 157.25               | 49                      | 4                        | 0   | 3            | 42    |
| 5  | AUBERRY RD & FRAZIER RD                   | Unsignalized | 154.92               | 8                       | 2                        | 5   | 1            | 0     |
| 6  | KEARNEY BLVD & CORNELIA AVE & MADISON AVE | Unsignalized | 139.01               | 29                      | 4                        | 0   | 1            | 24    |
| 7  | CLOVIS AVE & MOUNTAIN VIEW AVE            | Unsignalized | 137.94               | 19                      | 0                        | 3   | 2            | 14    |
| 8  | BETHEL AVE & ROSE AVE                     | Unsignalized | 135.54               | 25                      | 1                        | 0   | 0            | 24    |
| 9  | CLOVIS AVE & NEBRASKA AVE                 | Unsignalized | 133.24               | 20                      | 1                        | 0   | 0            | 19    |
| 10 | MARKS AVE & JENSEN AVE                    | Unsignalized | 132.02               | 19                      | 2                        | 4   | 2            | 11    |



| #  | Location                         | Type         | Crash Severity Score | Total Number of Crashes | Primary Collision Factor |     |              |       |
|----|----------------------------------|--------------|----------------------|-------------------------|--------------------------|-----|--------------|-------|
|    |                                  |              |                      |                         | Improper Turning         | DUI | Unsafe Speed | Other |
| 11 | AMERICAN AVE & GOLDEN STATE BLVD | Unsignalized | 128.81               | 26                      | 2                        | 2   | 2            | 20    |
| 12 | FRIANT RD & BELCHER              | Unsignalized | 128.36               | 15                      | 8                        | 2   | 5            | 0     |
| 13 | BETHEL AVE & NEBRASKA AVE        | Unsignalized | 127.34               | 15                      | 2                        | 1   | 0            | 12    |
| 14 | MCMULLIN GRD & MANNING AVE       | Unsignalized | 127.13               | 19                      | 1                        | 0   | 2            | 16    |
| 15 | FRONTIER TRAIL LN & SAMPLE RD    | Unsignalized | 122.99               | 8                       | 6                        | 0   | 2            | 0     |
| 16 | TEMPERANCE AVE & CENTRAL AVE     | Unsignalized | 121.12               | 13                      | 3                        | 0   | 0            | 10    |
| 17 | TEMPERANCE AVE & JENSEN AVE      | Signal       | 120.58               | 34                      | 1                        | 1   | 5            | 27    |
| 18 | HILL AVE & SOUTH AVE             | Unsignalized | 118.78               | 11                      | 1                        | 2   | 1            | 7     |
| 19 | PALM AVE & ASHLAN AVE            | Signal       | 116.62               | 63                      | 5                        | 7   | 12           | 39    |
| 20 | MCCALL AVE & KINGS CANYON RD     | Signal       | 113.07               | 26                      | 1                        | 2   | 15           | 8     |
| 21 | ACADEMY AVE & NEBRASKA AVE       | Unsignalized | 107.37               | 30                      | 2                        | 0   | 0            | 28    |
| 22 | BETHEL AVE                       | Signal       | 105.38               | 13                      | 0                        | 1   | 0            | 12    |
| 23 | DICKENSON AVE & KEARNEY BLVD     | Unsignalized | 103.69               | 31                      | 1                        | 3   | 0            | 27    |
| 24 | CRAWFORD AVE & MANNING AVE       | Unsignalized | 102.08               | 28                      | 2                        | 0   | 5            | 21    |
| 25 | DE WOLF AVE & MCKINLEY AVE       | Unsignalized | 98.92                | 27                      | 0                        | 0   | 3            | 24    |
| 26 | ZEDIKER AVE & ROSE AVE           | Unsignalized | 96.98                | 27                      | 1                        | 1   | 2            | 23    |
| 27 | ACADEMY AVE & MOUNTAIN VIEW AVE  | Signal       | 96.36                | 31                      | 0                        | 2   | 11           | 18    |
| 28 | AUBERRY RD & MILLERTON RD        | Unsignalized | 95.87                | 27                      | 8                        | 2   | 8            | 9     |
| 29 | DEL REY AVE & NORTH AVE          | Unsignalized | 95.86                | 26                      | 1                        | 3   | 3            | 19    |
| 30 | MENDOCINO AVE & DINUBA AVE       | Unsignalized | 92.32                | 18                      | 2                        | 0   | 5            | 11    |
| 31 | KINGS CANYON RD & RIO VISTA AVE  | Unsignalized | 91.21                | 18                      | 1                        | 0   | 11           | 6     |
| 32 | MCCALL AVE & SOUTH AVE           | Unsignalized | 87.88                | 12                      | 2                        | 1   | 3            | 6     |
| 33 | DE WOLF AVE & JENSEN AVE         | Unsignalized | 87.85                | 16                      | 1                        | 0   | 1            | 14    |
| 34 | BUTTONWILLOW AVE & SOUTH AVE     | Unsignalized | 87.65                | 15                      | 0                        | 1   | 1            | 13    |
| 35 | DEL REY AVE & MCKINLEY AVE       | Unsignalized | 87.58                | 10                      | 0                        | 0   | 1            | 9     |
| 36 | ACADEMY AVE & ROSE AVE           | Unsignalized | 86.42                | 19                      | 2                        | 1   | 2            | 14    |
| 37 | DICKENSON AVE & SHAW AVE         | Unsignalized | 86.14                | 13                      | 0                        | 1   | 0            | 12    |
| 38 | CHESTNUT AVE & CLAYTON AVE       | Unsignalized | 85.14                | 8                       | 1                        | 0   | 0            | 7     |
| 39 | MCCALL AVE & JENSEN AVE          | Signal       | 84.20                | 21                      | 1                        | 5   | 5            | 10    |
| 40 | ZEDIKER AVE & DINUBA AVE         | Unsignalized | 84.19                | 12                      | 0                        | 0   | 1            | 11    |
| 41 | LEONARD AVE & SHIELDS AVE        | Unsignalized | 83.90                | 11                      | 1                        | 0   | 0            | 10    |
| 42 | CLOVIS AVE & DONNER AVE          | Unsignalized | 83.31                | 9                       | 0                        | 2   | 1            | 6     |
| 43 | LASSEN AVE & JAYNE AVE           | Unsignalized | 83.28                | 13                      | 0                        | 0   | 3            | 10    |

| #  | Location                    | Type         | Crash Severity Score | Total Number of Crashes | Primary Collision Factor |     |              |       |
|----|-----------------------------|--------------|----------------------|-------------------------|--------------------------|-----|--------------|-------|
|    |                             |              |                      |                         | Improper Turning         | DUI | Unsafe Speed | Other |
| 44 | WEST AVE & MANNING AVE      | Unsignalized | 82.48                | 9                       | 1                        | 0   | 2            | 6     |
| 45 | HIGHLAND AVE & CLARKSON AVE | Unsignalized | 82.39                | 9                       | 0                        | 0   | 1            | 8     |
| 46 | CLOVIS AVE & MANNING AVE    | Unsignalized | 81.86                | 11                      | 0                        | 0   | 3            | 8     |
| 47 | HILL AVE & ADAMS AVE        | Unsignalized | 81.76                | 10                      | 0                        | 0   | 4            | 6     |
| 48 | LEONARD AVE & MANNING AVE   | Unsignalized | 81.66                | 10                      | 1                        | 0   | 0            | 9     |
| 49 | NEWMARK AVE & NORTH AVE     | Unsignalized | 81.16                | 7                       | 1                        | 0   | 0            | 6     |
| 50 | MAROA AVE & SHAW AVE        | Signal       | 80.54                | 45                      | 3                        | 1   | 11           | 30    |

Notes: All unsignalized intersections are classified as rural intersections.

Other crashes include all crashes that are not coded as one of the top three primary collision factors

DUI = Driving Under the Influence

Table 35 and Table 36 provide information for the top ten roadway segments (based on crash severity score), including roadway classification, crash severity score, and total number of crashes by collision type or primary collision factor.

Table 35. Priority Roadways Segments with Collision Type based on Top 3 Fatal/Severe Injury Collision Types

| #  | Location                                                         | Classification     | Crash Severity Score | Total Number of Crashes | Collision Type |            |             |       |
|----|------------------------------------------------------------------|--------------------|----------------------|-------------------------|----------------|------------|-------------|-------|
|    |                                                                  |                    |                      |                         | Broad-side     | Hit Object | Over-turned | Other |
| 1  | Millerton Rd (Winchell Cove to Brighton Crest Dr)                | Arterial/Collector | 145.02               | 21                      | 0              | 11         | 3           | 7     |
| 2  | Auberry Rd (Old Auberry Rd to Old Auberry Rd)                    | Arterial/Collector | 144.23               | 18                      | 0              | 12         | 2           | 4     |
| 3  | Millerton Rd (Brighton Crest Dr to Sky Harbour Rd)               | Arterial/Collector | 136.81               | 10                      | 0              | 6          | 1           | 3     |
| 4  | Millerton Rd (Via Bellaggio to East of Via Bellaggio)            | Arterial/Collector | 136.69               | 14                      | 0              | 8          | 1           | 5     |
| 5  | Millerton Rd (East of Via Bellaggio to West of Millerton Rd)     | Arterial/Collector | 136.49               | 13                      | 0              | 8          | 1           | 4     |
| 6  | Millerton Rd (West of Via Bellaggio to East of Millerton Rd)     | Arterial/Collector | 134.15               | 11                      | 0              | 6          | 1           | 4     |
| 7  | N Friant Rd (South of Bluff View Ave to North of N Friant Rd)    | Arterial/Collector | 111.61               | 13                      | 1              | 6          | 2           | 4     |
| 8  | Millerton Rd (East of North Fork Rd to West of Via Bellaggio)    | Arterial/Collector | 108.80               | 23                      | 1              | 9          | 7           | 6     |
| 9  | Millerton Rd (East of Winchell Cove to Brighton Crest Dr)        | Arterial/Collector | 107.93               | 14                      | 0              | 7          | 1           | 6     |
| 10 | E Jensen Ave (East of S Temperance Ave to West of S De Wolf Ave) | Arterial/Collector | 106.11               | 10                      | 3              | 3          | 0           | 4     |

Note: Other crashes include all crashes that are not coded as one of the top three collision types

Table 36. Priority Roadways Segments with Primary Collision Factors based on Top 3 Fatal/Severe Injury Primary Collision Factors

| #  | Location                                                         | Type               | Crash Severity Score | Total Number of Crashes | Primary Collision Factor |     |              |       |
|----|------------------------------------------------------------------|--------------------|----------------------|-------------------------|--------------------------|-----|--------------|-------|
|    |                                                                  |                    |                      |                         | Improper Turning         | DUI | Unsafe Speed | Other |
| 1  | Millerton Rd (Winchell Cove to Brighton Crest Dr)                | Arterial/Collector | 145.02               | 21                      | 15                       | 1   | 1            | 4     |
| 2  | Auberry Rd (Old Auberry Rd to Old Auberry Rd)                    | Arterial/Collector | 144.23               | 18                      | 8                        | 6   | 2            | 2     |
| 3  | Millerton Rd (Brighton Crest Dr to Sky Harbour Rd)               | Arterial/Collector | 136.81               | 10                      | 6                        | 0   | 0            | 4     |
| 4  | Millerton Rd (Via Bellaggio to East of Via Bellaggio)            | Arterial/Collector | 136.69               | 14                      | 9                        | 2   | 2            | 1     |
| 5  | Millerton Rd (East of Via Bellaggio to West of Millerton Rd)     | Arterial/Collector | 136.49               | 13                      | 0                        | 2   | 1            | 10    |
| 6  | Millerton Rd (West of Via Bellaggio to East of Millerton Rd)     | Arterial/Collector | 134.15               | 11                      | 5                        | 2   | 3            | 1     |
| 7  | N Friant Rd (South of Bluff View Ave to North of N Friant Rd)    | Arterial/Collector | 111.61               | 13                      | 6                        | 4   | 2            | 1     |
| 8  | Millerton Rd (East of North Fork Rd to West of Via Bellaggio)    | Arterial/Collector | 108.80               | 23                      | 15                       | 3   | 2            | 3     |
| 9  | Millerton Rd (East of Winchell Cove to Brighton Crest Dr)        | Arterial/Collector | 107.93               | 14                      | 10                       | 1   | 0            | 3     |
| 10 | E Jensen Ave (East of S Temperance Ave to West of S De Wolf Ave) | Arterial/Collector | 106.11               | 10                      | 3                        | 4   | 2            | 1     |

Notes: Other crashes include all crashes that are not coded as one of the top three primary collision factors

DUI = Driving Under the Influence



## Education Strategies

Education strategies for Unincorporated Fresno County are targeted at unsafe speed and driving or bicycling under the influence of drugs or alcohol, given the prevalence of these primary collision factors in fatal and severe injury crashes.

The Safe Roads Save Lives campaign is a marketing effort led by the Fresno COG, with the goals of:

- Educate all road users on safe transportation behaviors
- Increase safety for people walking and biking
- Highlight behaviors that cause the most crashes in Fresno County—speeding and distracted driving



The campaign includes branding, social media strategies, print materials, radio and video resources, school resources, and a campaign website. Unincorporated Fresno

County may find these materials helpful, especially those related to the dangers of speeding, using the roadway under the influence, and using the roadway in lower visibility conditions.

The following activities are recommended for Unincorporated Fresno County as they move forward on implementing the Safe Roads Save Lives campaign:

- Identify a team of staff appropriate to attend a presentation by Fresno COG staff about the Safe Roads Save Lives campaign. Appropriate staff members include staff associated with transportation engineering and planning, communications, traffic enforcement, school transportation, and other jurisdictional staff who work with the roadway system.
- Identify a specific staff member to be the County's lead for the Safe Roads Save Lives campaign deployment. This lead should focus on the following tasks:
  - o Identify local transportation and public health advocacy groups that would be interested in helping to promote the Safe Roads Save Lives campaign. Meet with group leaders to better understand how they can participate in the campaign.
  - o Identify community groups that work with migrant workers throughout the county to understand how materials about the campaign can be best distributed.
  - o Work with school districts to distribute print materials and offer school-related transportation resources. Ensure that school communications are in both English and Spanish.
  - o Work with public information staff to spread Safe Roads Save Lives materials throughout Unincorporated Fresno County through the following channels:
    - Independently implement social media calendar and graphics through jurisdictional accounts. At minimum, repost Fresno COG posts.
    - Have print materials (flyers, bumper stickers, pins, and postcards) available at events and community festivals.
    - Print posters for posting at governmental buildings such as libraries, DMVs, and other facilities that the public regularly uses.
    - Identify key outdoor locations in the community that would be effective for larger print advertisement, such as bus shelters, community parks, or billboard locations.
    - Create one or more radio public service announcements (PSAs) and record at least one of the PSAs in Spanish and air it on Spanish-language radio.



## Emergency Services

Emergency service organizations depend on safe roadways and efficient communication processes to reach and effectively respond to emergencies. Each type of emergency services organization that serves Fresno County – law enforcement, fire, emergency medical services (EMS), California Highway Patrol – work independently and collaboratively to develop procedures that allow them to respond to incidents in their own jurisdictions as well as support others as needed. The

following recommendations may help improve emergency services response as the various organizations update procedures and policies and continue to partner on roadway safety efforts:

- All roadway safety projects should be vetted by emergency service organizations to ensure that their design does not hamper access.
- As new emergency service and response procedures are developed, roadway safety improvement opportunities should be identified and implications of changes to response times should be considered.
- Fresno County staff should participate in periodic coordination calls between emergency response agencies to gather and share recent observations about crashes and hot spots, to understand emergent safety issues that may not have led to policy reports or yet be available through statewide crash reporting systems.



## Enforcement

Enforcement strategies can include programs or campaigns specifically focused on changing road user behavior through more visible and active enforcement of existing traffic laws, as well as focusing enforcement in areas that have historically been shown to have higher-than-average crash rates. Typically, the effectiveness of enforcement strategies is temporal, meaning they are effective at changing behavior for a discrete period of time – during and shortly after the increased enforcement activities.

The following enforcement strategies should be considered for Unincorporated Fresno County:

- Schedule heightened speed (or other behavior) enforcement checks during strategic times of the year, such as when students return to school or the beginning of fog season.
- Focus speed enforcement efforts in locations with high crash rates.
- Use automatic enforcement, such as red-light cameras or speed feedback signs, especially in school zones.

The effectiveness of each strategy should be measured and evaluated, considering the number of staff hours and amount of resources needed. The results should be reviewed and used to refine future enforcement activities.

Enforcement strategies should be undertaken with due caution to avoid inequitable enforcement activities and evaluated to determine the strategy's impact. More details about equitable enforcement can be found on page 8 (Introduction).



## EVALUATION AND IMPLEMENTATION

A key part of achieving the County's vision is consistently evaluating roadway safety performance and tracking progress towards the County's goals. The County will develop a process to regularly collect data and information around the performance measures that can be used to assess changes city-wide and at the top priority locations.

As feasible, it is recommended that Fresno County update this LRSP every three to five years using updated crash data and the performance measures. Comparing the performance measures related to investments made with the crash data should provide a clear indication of the impact of the County's and safety partner's efforts. Future LRSPs may provide new emphasis areas and top priority locations that reflect progress made and new priorities based on trends in the data.

Activities for implementing the plan include:

- Identifying countermeasures and strategies for priority locations based on the crash data.
- Utilizing the Fresno COG Regional Safety Plan to implement regional strategies and share best practices.
- Exploring funding opportunities to implement priority strategies.
- Identifying key staff and activities to support the regional Safe Roads Save Lives campaign.
- Identifying enforcement strategies to implement and evaluate.
- Regularly coordinating with safety partner agencies to assess progress, identify opportunities to implement countermeasures and strategies, and identify opportunities for citizen involvement.
- Regularly collecting and organizing data to support evaluation of the LRSP.