CALIFORNIA© SAFE ROADS

2020–2024 Strategic Highway Safety Plan

January 2023 Update

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ACRONYMS AND ABBREVIATIONS

Acronym	Definition
ABC	California Department of Alcoholic Beverage Control
ACS	American Community Survey
CA-ATSSA	California American Traffic Safety Services Association
Cal Chiefs	California Police Chiefs Association
CalSTA	California State Transportation Agency
Caltrans	California Department of Transportation
CDPH	California Department of Public Health
CEAC	County Engineers Association of California
CHP	California Highway Patrol
CVSP	Commercial Vehicle Safety Plan
DMV	California Department of Motor Vehicles
EMSA	Emergency Medical Services Authority
FARS	Fatality Analysis Reporting System
FAST ACT	Fixing America's Surface Transportation Act
FHWA	Federal Highway Administration
FMCSA	Federal Motor Carrier Safety Administration
FRA	Federal Railroad Administration
HPMS	Highway Performance Monitoring System
HR3	High Risk Rural Roads Program
HSIP	Highway Safety Improvement Program
HSP	Highway Safety Plan
League	League of California Cities
MAP-21	Moving Ahead for Progress in the 21st Century
MPO	Metropolitan Planning Organization
NAAC	Native American Advisory Committee
NHTSA	National Highway Traffic Safety Administration
OTS	Office of Traffic Safety
RTPA	Regional Transportation Planning Agency
RTPO	Regional Transportation Planning Organizations

ACRONYMS AND ABBREVIATIONS CONTINUED

Acronym	Definition
SAFETEA- LU	Safe, Accountable, Flexible, Efficient Transportation Equity Act: a Legacy for Users
SHSP	Strategic Highway Safety Plan
SMART	Specific, Measurable, Achievable, Relevant, and Time-Constrained
SWITRS	Statewide Integrated Traffic Records System
TNC	Transportation Network Company
TZD	Toward Zero Deaths
VMT	Vehicle Miles Traveled

LETTER FROM THE SECRETARY

As Secretary of the California State Transportation Agency (CalSTA), I continue to be troubled by recent trends surrounding traffic fatalities and serious injuries on our roadways.

One constant reality is that far too many people continue to die or be seriously injured on our roadways every day. I believe it is essential for all of us to tackle this issue with a sense of urgency. It is also the right moment to deploy new and novel strategies, and the 2020–2024 Strategic Highway Safety Plan (SHSP) lays the groundwork for such an approach.

The SHSP is founded on the belief that all road users, no matter how they decide to travel, should be able to safely arrive at their destination. With the growing popularity of biking, walking, e-scooters and other ways of getting around besides a vehicle, there are more vulnerable road users. This requires us to be relentless in protecting the safety of all who use our roads and streets, particularly the most vulnerable. We also must continue to take aggressive action to address other critical traffic safety issues, such as impaired driving and speed management.

The SHSP Executive Leadership and Steering Committees, made up of safety stakeholders throughout the state, have joined forces to develop strategies aimed at eliminating traffic fatalities and serious injuries on our roadways.

Making zero traffic fatalities a reality will require the collective commitment and creativity of us all. By working across the 5 Es: Education, Enforcement, Engineering, Emergency Response and Emerging Technologies, we can develop meaningful solutions to advance our traffic safety goals. As we implement this plan, we must consider both proven, evidence-based countermeasures, as well as new and innovative ways to improve safety for all California road users.

And if we truly want to enhance quality of life, we need to make sure that transportation and traffic safety programs are designed and delivered in a way that will provide equitable and safe access to opportunity. Everyone has the right to travel safely on our roads, regardless of race, socioeconomic status, gender, age, ability, or geographic location. It is important that we develop programs with an eye on improving safety for all groups, especially our most vulnerable and traditionally underserved populations.

Working together, every one of us can make a positive difference in the lives of all California road users and contribute to the health and economic vitality of our state. The California SHSP offers a clear roadmap to make progress toward that goal. Let's work together to make zero fatalities and serious injuries a reality for us all.

David S. Kim
Secretary
Signed March 4, 2021

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EXECUTIVE SUMMARY

The Strategic Highway Safety Plan (SHSP) is a statewide, coordinated traffic safety plan that provides a comprehensive framework for reducing roadway fatalities and serious injuries on California's public roads. This document represents the third update of California's initial 2005 SHSP and uses the latest crash data and insights from safety partners across the state to inform the SHSP's development. Working in conjunction with other statewide safety plans such as the Highway Safety Improvement Program, the Highway Safety Plan, and the Commercial Vehicle Safety Plan, this SHSP provides guidance that will influence the development of goals, strategies, and performance measures for stakeholders working to improve traffic safety throughout California.

Led by stakeholders representing California's 5 Es — Education, Enforcement, Engineering, Emergency Response, and Emerging Technologies — and informed by extensive outreach to a network of safety partners across the state, the 2020–2024 SHSP is founded on the belief that everyone, no matter how they travel, should be able to arrive at their destination safely.

The latest California SHSP effort focuses on strategies with the greatest potential to reduce fatalities, serious injuries, and overall crashes. To ensure that decision-making is consistent, the SHSP is anchored by a clear Vision, Mission, and Goal. The vision represents what the SHSP aims to accomplish, while the mission is the means of getting there. Fulfilling these statements affords the state, under guidance of the SHSP, the best opportunity to reach its goal: Zero Fatalities and Serious Injuries.

VISION

Safe public roads across California

MISSION

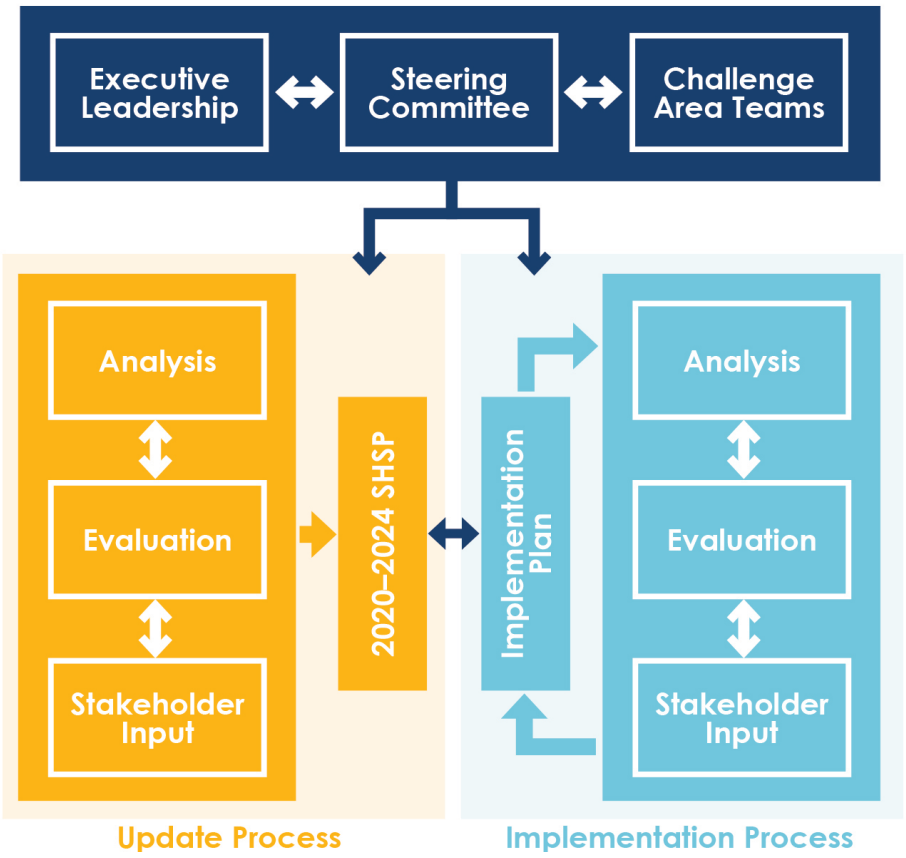
Ensure safety for all modes of travel on California's public roads

GOAL

Zero Fatalities and Serious Injuries

Working to make zero fatalities and serious injuries on California roadways a reality will require a traffic safety culture that promotes collaboration and innovation from all safety sectors and a collective commitment to the hard work of preventing and mitigating traffic crashes. Consistent with the prior SHSP, California safety leaders adopted a two-plan approach to implement the traffic safety strategies detailed by the data-driven, multi-year SHSP. This 2020–2024 SHSP was developed through a process of analysis, evaluation, and stakeholder input, led by the Steering Committee. The corresponding Implementation Plan identifies detailed actions for each of the Challenge Areas, and a process for analysis, evaluation, and stakeholder input led by the Steering Committee during the life of the plan. The Implementation Plan is a living document that will be updated over the course of this five-year period to ensure that the actions identified are being implemented as intended and are moving California toward its ultimate goal. Figure E1 below depicts the SHSP Update and Implementation Processes.

Figure E1– SHSP Update and Implementation Processes



Challenge Areas

To optimize progress toward this critical goal, the SHSP focuses on 16 Challenge Areas that have been categorized into High Priority and Focus Areas. The Challenge Areas were identified by the SHSP Executive Leadership and Steering Committees after an in-depth analysis of California crash data as well as an extensive statewide outreach process that involved hundreds of diverse traffic safety partners around the state. The High Priority Areas represent the five areas — made up of six Challenge Areas — that were identified as having the greatest opportunity to reduce fatalities and serious injuries on public roads in California. Further discussed in the Implementation Plan, actions will be developed for the High Priority Areas and Focus Areas that will improve traffic safety with the High Priority Areas coordinating more frequently with the Steering Committee on key issues and data trends. The 2020–2024 SHSP identified challenge areas are:

HIGH PRIORITY AREAS

- Active Transportation: Pedestrians & Bicyclists
- Impaired Driving
- Intersections
- Lane Departures
- Speed Management/Aggressive Driving

FOCUS AREAS

- Aging Drivers (equal to>65)
- Commercial Vehicles
- Distracted Driving
- Driver Licensing
- Emergency Response
- Emerging Technologies
- Motorcyclists
- Occupant Protection
- Work Zones
- Young Drivers (15–20)

In summer 2020, state transportation leaders recognized a bolder and more focused approach was necessary to combat the rise in fatalities and serious injuries that have occurred on California roadways. This important change, being referred to as "The Pivot," includes new Guiding Principles, a focus on High Priority Areas, and expanding SHSP committee membership. Each Challenge Area Team was tasked with institutionalizing four Guiding Principles, aligning with the 5 Es, and following the SMART guidelines throughout the lifespan of the SHSP and in development of actions for the Implementation Plan. The 2020–2024 SHSP was updated to reflect this pivot as shown in this revised Plan.

Guiding Principles

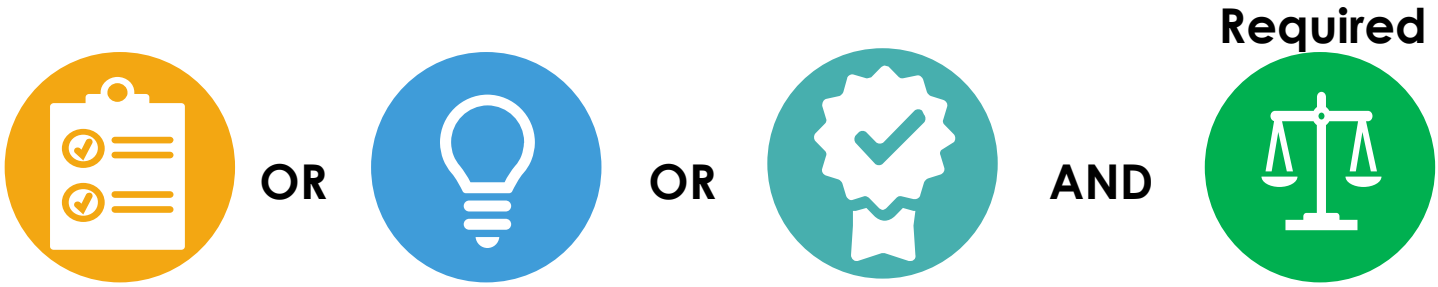
The institutionalizing of Guiding Principles supports the need to incorporate new ideas and reach a larger audience in order to achieve California's traffic safety Vision, Mission, and Goal. The four Guiding Principles are identified below and discussed in further detail in the Implementation Plan:

1. **Integrate Equity** into all aspects of the plan to address institutional and systemic biases.

2. **Implement Safe System Approach** which aims to eliminate fatal and serious injuries for all road users through a holistic view of the roadway system.

3. **Double Down on What Works** to identify strategies and actions that are going to be most effective in reducing fatalities and serious injuries, implement proven countermeasures, and encourage innovative solutions.

4. **Accelerate Advanced Technology** which encourages using advanced technology in and on our roadways by forming new partnerships with technology providers, health and safety groups, manufacturers, and government partners to prioritize safety.



Five E Safety Strategies (5 Es)

As applied to the 16 Challenge Areas, the prevention of fatalities and serious injuries will occur by implementing actions that support the following five overarching strategies as applicable under the 16 Challenge Areas:

1. Education: Educate all road users on safe behaviors
2. Enforcement: Enforce actions that reduce high-risk behaviors
3. Engineering: Apply effective and/or innovative countermeasures
4. Emergency Response: Improve emergency response times and actions
5. Emerging Technologies: Apply emerging technologies to roadway, vehicle, and user

Strategic SHSP Action Guidelines Items

Strategic actions for each Challenge Area will be included in the California 2020–2024 SHSP Implementation Plan and will be updated as needed through the life of this SHSP. All actions should be:

- **S**pecific – clear action description
- **M**easurable – identified performance measures
- **A**chievable – committed resources by responsible organization
- **R**elevant – statewide significance and data-driven issue and countermeasure
- **T**ime Constrained – achievable within SHSP time frame

EXECUTIVE LEADERSHIP

Leaders from California's state agencies and other key advocates responsible for all aspects of traffic safety collaborate to form the California Strategic Highway Safety Plan's Executive Leadership. Their support and commitment to this plan and the resources required to implement its goal are critical to reach Zero Fatalities and Serious Injuries in California. The guidance and actions of this group lead the efforts in traffic safety and reflect the importance of this plan to the entire state of California.

Voting Members

California Department of Alcoholic Beverage Control (ABC)
California Department of Motor Vehicles (DMV)
California Department of Public Health (CDPH)
California Department of Transportation (Caltrans)
California Emergency Medical Services Authority (EMSA)
California Highway Patrol (CHP)
California Office of Traffic Safety (OTS)
California Police Chiefs Association (Cal Chiefs)
County Engineers Association of California (CEAC)
Regional Transportation Planning Agencies (RTPA)
League of California Cities (League)
Metropolitan Planning Organization (MPO)
Native American Advisory Committee (NAAC)

Advisory Members

California American Traffic Safety Services Association (CA-ATSSA)
California City Transportation Initiative (CaCTI)
California State Transportation Agency (CalSTA)
Federal Highway Administration (FHWA), California Division
Federal Motor Carrier Safety Administration (FMCSA), California Division
Mothers Against Drunk Driving (MADD)
National Highway Traffic Safety Administration (NHTSA) Region 9
The Children's Initiative
Vision Zero Network

STEERING COMMITTEE

Development and implementation of the California SHSP is led by members of the Steering Committee. Representing traffic safety stakeholders across the state, members of the SHSP Steering Committee are dedicated to establishing the processes, strategies, and actions that California may implement to reduce fatal and serious injuries. The Steering Committee plays an integral part in all aspects of the SHSP and utilizes these partnerships to improve traffic safety across California.

Voting Members

California American Traffic Safety Services Association (CA-ATSSA)
California Department of Alcoholic Beverage Control (ABC)
California Department of Motor Vehicles (DMV)
California Department of Public Health (CDPH)
California Department of Transportation (Caltrans)
California Emergency Medical Services Authority (EMSA)
California Highway Patrol (CHP)
California Office of Traffic Safety (OTS)
California Police Chiefs Association (Cal Chiefs)
County Engineers Association of California (CEAC)
League of California Cities (League)
Metropolitan Planning Organization (MPO)
Native American Advisory Committee (NAAC)
Regional Transportation Planning Agencies (RTPA)

Advisory Members

American Association of Retired Persons (AARP)
California City Transportation Initiative (CaCTI)
California Walks (Cal Walks)
Federal Highway Administration (FHWA) California Division
Mothers Against Drunk Driving (MADD)
National Highway Traffic Safety Administration (NHTSA) Region 9
Rural Counties Task Force
Safe Routes Partnership
The Children's Initiative
University of California Berkeley, Institute of Transportation Studies
University of California San Diego, Training, Research and Education for Driving Safety (TREDS)
Vision Zero Network

THANK YOU TO ALL CONTRIBUTORS AND PARTNERS

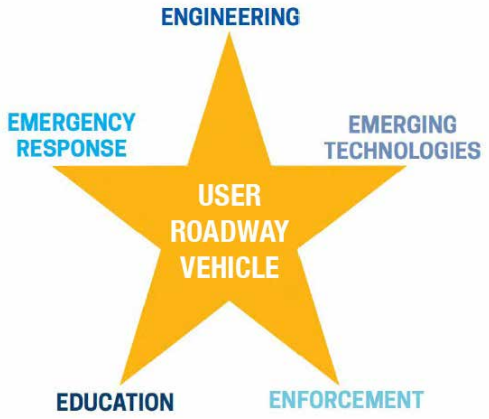
Hundreds of stakeholders and each of the agencies and organizations listed below contributed to development of the 2020–2024 California SHSP. This includes everyone who attended outreach events, provided comment cards related to the SHSP, are actively implementing the vision of the SHSP, and are promoting the SHSP. Thank you to all of these stakeholders, agencies, and organizations driving the efforts to achieve the goal of Zero Fatalities and Serious Injuries in California.

Advanced Driver Education Products and Training
Agua Caliente Band of Cahuilla Indians
Alameda County
Alameda County Transportation Commission
Alcohol Justice
Arizona Department of Transportation
Association of Monterey Bay Area Governments
Automobile Club Of Southern California
Bay Area Riders Forum
Bridgeport Indian Colony
Butte County
California Association for Safety Education
California Association of Bicycling
California Association of DUI Treatment Programs
California Bus Association
California Court Association
California Department of Education
California Department of Health Care Services
California Department of Motor Vehicles
California Department of Public Health
California Department of Transportation
California Emergency Medical Services Authority
California Friday Night Live Partnership
California Highway Patrol
California Public Utilities Commission
California State Polytechnic University, Pomona
California State Transportation Agency
California State University, Fresno
California Transportation Commission
California Walks
Center For Counseling And Education
Circlepoint
City of Berkeley
City of Capitola
City of Chico
City of Culver City
City of Elk Grove
City of Fairfield
City of Fortuna
City of Fresno
City of Gardena
City of Hayward
City of La Habra
City of Lancaster
City of Lemon Grove
City of Los Angeles
City of Monterey Park
City of Moreno Valley
City of Pomona
City of Rocklin
City of Sacramento
City of San Dimas
City of Thousand Oaks
City of Watsonville
Contra Costa County
Contra Costa Health Services
Del Norte Local Transportation Commission
Dignity Health

El Dorado County Commission on Aging
Emergent Transportation Concepts
Federal Highway Administration
Fresno Council of Governments
Fresno County
Hoopa Transportation
Humboldt County
Immunalysis
Kern Council of Governments
Kimley-Horn
Kings County Association of Governments
Know Before You Go
Lake Area Planning Council
Lake Tahoe Bicycle Coalition
Law Office of Denis White
League of American Bicyclists
Los Angeles County
Los Angeles Department of Transportation
Los Angeles District Attorney's Office
Madera County Transportation Commission
Marin County
Mendocino Council of Governments
Mercy San Juan Medical Center
Metropolitan Transportation Commission
Michael Williams Company
Middletown Rancheria
Modoc County
Mothers Against Drunk Driving
Napa Valley Transportation Authority
National Highway Traffic Safety Administration
Native Resources Economic Development Corporation
Nevada County
Novo
Office of Traffic Safety
OHS
Orange County Bicycle Coalition
Orange County Health Care Agency
Orange County Transportation Authority
Pala Band of Mission Indians
Placer County
Pro Consumer Safety
Riverside County
Robert M Shanteau, PhD, PE
Rockers Against Drunk Driving
Sacramento Area Council of Governments
Sacramento County
Safe Kids Greater Sacramento
Safety Center Incorporated
San Diego Association of Governments
San Diego County Bicycle Coalition
San Joaquin Council of Governments
San Joaquin County
San Juan Unified School Distric
Santa Barbara Association of Governments
Santa Barbara County
Santa Clara Valley Medical Center
Santa Cruz County Regional Transportation Commission
Scripps Memorial Hospital La Jolla
Shasta County
Shasta Regional Transportation Planning
Snell Research Center
Southern California Association of Governments
Stanislaus Council of Governments
Stanislaus County
State of California
Total Control Training
Town of Danville
Transportation Agency for Monterey County
Tulare County
Tulare County Association of Governments
University of California, Berkeley
University of California, San Diego
Utilitarian Cyclists
Viejas Tribal Government
Vision Zero Network
Yolo County


THANK YOU

INTRODUCTION



The Strategic Highway Safety Plan is a comprehensive statewide transportation safety plan which provides a framework for reducing fatalities and serious injuries across all travel modes on all public roads in California. The 2020–2024 SHSP was developed through a collaborative, data-driven process which identifies key safety needs and effective strategies to help guide investment decisions. This document includes an extensive data analysis that lays out the call to action for all of California. In response to a desire for bolder and more inclusive actions, this plan was updated in 2021 to include a new set of Guiding Principles and defining High Priority and Focus Areas to further improve safety on all California roadways.

The SHSP Implementation Plan, a separate and complimentary document, responds to this call for action by identifying specific strategies and detailed, trackable actions that will improve safety on all California Roads. Safety stakeholders from public and private sector agencies and organizations, representing education, enforcement, engineering, emergency response, and emerging technologies work together to create and implement the plan under the direction of the SHSP Executive Leadership and Steering Committees.

The SHSP is aligned with other statewide planning efforts and provides guidance for statewide traffic safety plans, local plans, as well as guiding the investment of funds for three federally funded programs:

- The Highway Safety Improvement Program (HSIP) managed by Caltrans
- The Highway Safety Plan (HSP) managed by the Office of Traffic Safety (OTS) and
- The Commercial Vehicle Safety Plan (CVSP) managed by the California Highway Patrol (CHP).

SHSPs were first mandated under the Safe, Accountable, Flexible, Efficient, Transportation Equity Act: A Legacy for Users (SAFETEA-LU) in 2005, which established the HSIP as a core federal-aid program. The Moving Ahead for Progress in the 21st Century Act (MAP-21) and the Fixing America's Surface Transportation Act (FAST) both extended the use of HSIP as a federal-aid program. The FAST Act provides further guidance for the development of the SHSP and requires:

- Consultation with safety stakeholders, such as:
  - » Highway safety representatives of the Governor of the State
  - » Regional Transportation Planning Organizations (RTPOs)
  - » Metropolitan Planning Organizations (MPOs)
  - » Representatives of major modes of transportation
  - » State and local traffic enforcement officials
  - » Rail-highway grade crossing safety representatives
  - » Representatives of a motor carrier safety program
  - » Motor vehicle administration agencies
  - » City and County transportation officials
  - » State representatives of non-motorized users and
  - » Other major federal, state, tribal, and local safety stakeholders
- Strategic direction and coordination:
  - » Data-driven problem identification
  - » Use of effective strategies and countermeasures
  - » A process for implementing strategies
  - » A process for evaluation
  - » Consideration of engineering, education, enforcement, and emergency services and
  - » Penalties for failure to develop an approved, updated SHSP

California adopted its first five-year SHSP in 2005 and has developed a new SHSP every five years (2010, 2015, and now 2020). Reaffirming the importance of the SHSP, funding was established to hire a consultant team to assist in the development, implementation and evaluation of the 2020–2024 SHSP.

Each step in developing this SHSP was overseen by the Steering Committee. The overall process and approach was approved by the Executive Leadership and FHWA. In summer 2020, state transportation leaders recognized a bolder and more focused approach was necessary to combat the rise in fatalities and serious injuries that have occurred on California roadways. This important change, being referred to as "The Pivot," includes new Guiding Principles, a focus on High Priority Areas, and expanding SHSP committee membership. The 2020–2024 SHSP was updated to reflect this pivot as shown in this revised Plan.

California has a large and complex roadway system with over 394,000 lane miles[1] of public roads. The roadway system encompasses diverse environments and provides mobility for nearly 27 million licensed drivers[2] and millions of pedestrians and bicyclists. California has the fifth largest economy in the world[3] and these public roads are the foundation on which California reliably moves people and goods from one place to another.

To provide a consistent and strong framework of decision-making regarding this diverse system, the efforts of the SHSP are vetted through four Guiding Principles and are anchored by a Vision, a Mission, and a Goal. These are integral components that define what the SHSP is about and what aspirations are envisioned.

We invite you to join in the quest to make zero fatalities and serious injuries a reality on California roadways; to study the data and strategies in this plan; to make a personal commitment to implement bold new projects and programs that will eliminate traffic fatalities and serious injuries in our state; and to lead by example with safe driving, bicycling and/or walking actions. The lives of California road users depend upon it.

1 FHWA 2018, Highway Statistics 2017, Table HM-60, Functional System Lane-Length, August 2018, Federal Highway Administration Washington, DC
2 FHWA 2018, Highway Statistics 2017, Table D-22, Licensed Total Drivers by Age, November 2018, Federal Highway Administration, Washington, DC
3 https://www.latimes.com/business/la-fi-california-economy-gdp-20180504-story.html

VISION, MISSION, GOAL

To ensure that decision-making is consistent, the SHSP is anchored by a Vision, Mission, and Goal. The vision represents what the SHSP intends to accomplish while the mission is the means of getting there. Fulfilling these statements affords the state, under guidance of the SHSP, the opportunity to reach its goal of Zero Fatalities and Serious Injuries.

VISION

Safe public roads across California

The vision emphasizes that safety on all public roads across the state is critical to serve the needs of the diverse population and system of California.

MISSION

Ensure safety for all modes of travel on California's public roads

The mission expands on the vision by acknowledging that safety on all public roads includes all modes of travel. California has an active and diverse population that utilizes a variety of modes that share common space on public roads.

GOAL

Zero Fatalities and Serious Injuries

Expanding on the national Toward Zero Deaths (TZD) goal, the goal encourages setting realistic and achievable steps for California to reach zero fatalities and serious injuries.

GUIDING PRINCIPLES

The SHSP is a multi-disciplinary effort involving federal, tribal, state, and local representatives from the 5 Es who dedicate countless hours to improve safety and partnerships across disciplines. In summer 2020, state transportation leaders recognized a bolder and more focused approach was necessary to combat the rise in fatalities and serious injuries that have occurred on California roadways. The following Guiding Principles were incorporated into the 2020–2024 SHSP action development process to further improve safety:

Integrate Equity:

Integrate equity into all aspects of the plan to address institutional and systemic biases. This will ensure that the processes, strategies, and outcomes of the SHSP serve all, but particularly vulnerable and traditionally under-served populations.

Double Down on What Works:

Identify strategies and actions that are going to be most effective in reducing fatalities and serious injuries, implement proven countermeasures, and encourage innovative solutions.

Accelerate Advanced Technology:

Encourage advanced technology in and on our roadways by forming new partnerships with technology providers, health and safety groups, manufacturers, and government partners to prioritize safety.

Implement Safe System Approach:

Aim to eliminate fatal and serious injuries for all road users through a holistic view of the roadway system. The SHSP embraces the Safe System Approach principles, which place additional responsibility on agencies to account for human error within the design and operations of our roadway:

- Death/serious injury is unacceptable
- Humans make mistakes
- Humans are vulnerable
- Responsibility is shared
- Safety is proactive
- Redundancy is crucial

These Guiding Principles reflect the approach and framework that the SHSP is based on and will be utilized to assist with SHSP related content.

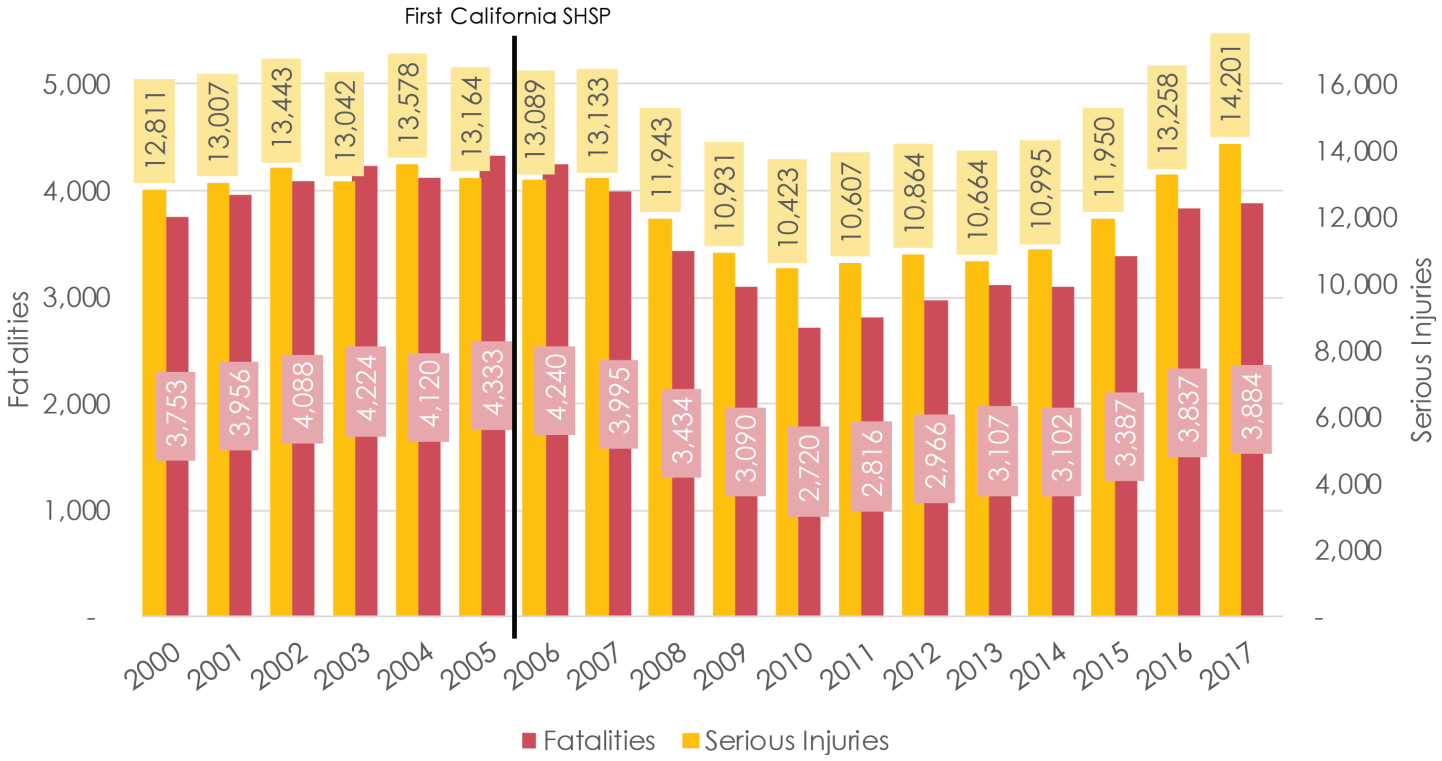
CURRENT TRENDS

Before starting an update, it is important to understand current trends and consider the state of the social and economic factors around traffic and traffic safety. This section touches on some of California's current trends and how they relate to traffic safety.

Fatalities and Serious Injuries

Figure 1 shows the historical data on fatalities and serious injuries between 2000 and 2017. There is a downward trend from 2006 to 2010, which may have been influenced by several behavioral and economic factors. This was also the period when all states, including California, were focused on safety through the development and implementation of their initial SHSPs. The black line indicates when California's first SHSP was adopted in 2006.

Figure 1 – Fatalities and Serious Injuries, 2000-2017



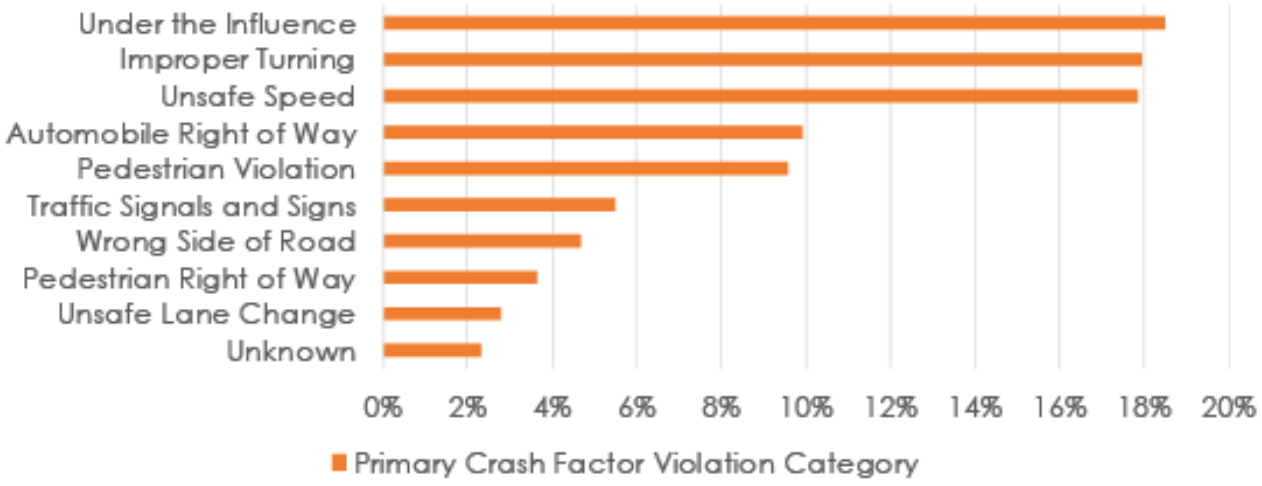
Source: Statewide Integrated Traffic Records System (SWITRS) as of July 2019 and Fatality Analysis Reporting System (FARS) as of October 2019

While California has made progress in implementing traffic safety initiatives that have reduced fatalities and serious injuries, fatalities and serious injuries have been increasing since 2010. This trend suggests extra emphasis needs to be placed on traffic safety; building on the success of the past while incorporating sound and innovative ideas for the future.

Primary Causes of Crashes

Figure 2 shows the ten most reported crash factors in fatal and serious injury crashes between 2008 and 2017. Focusing efforts on strategies that can target these factors may have a larger impact on reducing fatalities and serious injuries in California.

Figure 2 - Fatal and Serious Injury Crashes by Primary Crash Factor



Source: SWITRS, 2008 to 2017 as of July 2019

The Economic Costs of Crashes

In 2017, more than 3,600 people lost their lives in traffic crashes in California and more than 14,000 people were seriously injured. Not only is this a tragedy in human terms, there is also an economic cost. According to the most recent available data from NHTSA, traffic crashes cost California approximately $20 billion per year[4].

Photo courtesy of: Kimley-Horn

4 NHTSA, 2015. The Economic and Societal Impact of Motor Vehicle Crashes, 2010 (Revised), DOT HS 812013, National Highway Traffic Safety Administration, Washington, DC, 2015.

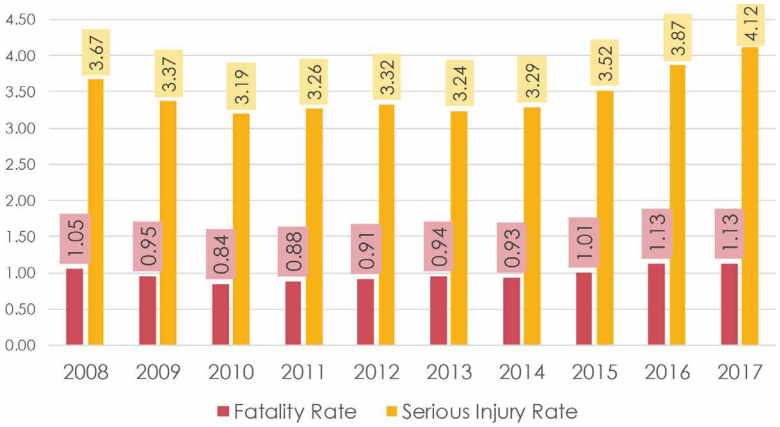
Fatality and Serious Injury Rates

Different data perspectives can contribute valuable insights into California's traffic safety picture. In particular, when evaluating the increase in fatalities and serious injuries since 2010, it is important to consider more than one statistical rate to better understand where opportunities for improvement may occur.

Injury rates per 100 million vehicle miles traveled (VMT), per 100,000 population, and per 100,000 licensed drivers for California are shown in Figures 3, 4, and 5 below.

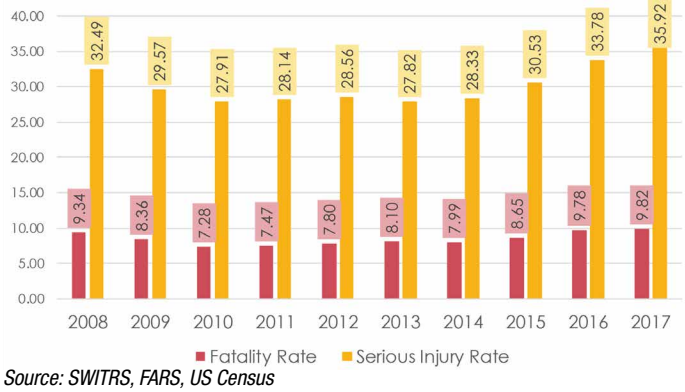
Under each evaluation, fatality rates decreased through 2010 and generally increased after 2010. Serious injury rates increased from 2010 to 2012, decreased slightly in 2013, and then continued to increase after 2013.

Figure 3 – Fatality and Serious Injury Rate (per 100 Million Vehicle Miles Traveled)



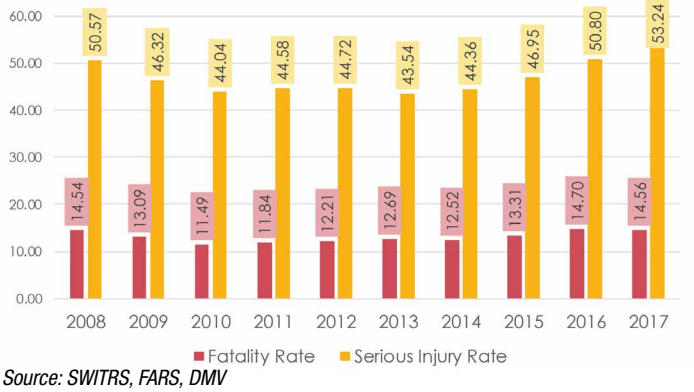
Source: SWITRS, FARS, HPMS

Figure 4 - Fatality and Serious Injury Rate (per 100,000 Population)



Source: SWITRS, FARS, US Census

Figure 5 - Fatality and Serious Injury Rate (per 100,000 Licensed Drivers)

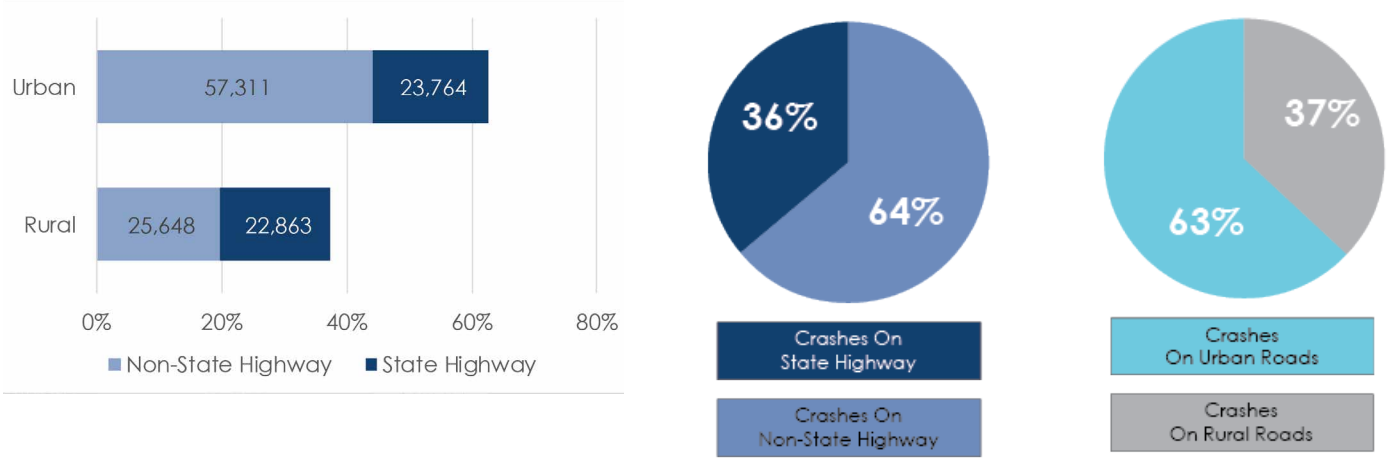


Source: SWITRS, FARS, DMV

How Crash Location Plays a Role

Figure 6 shows the number of fatal and serious injury crashes in rural and urban settings and the number of crashes on the state highway system and the non-state highway system. This information is provided to provide perspective that a significant proportion of these crashes are happening in both urban and rural areas as well as on state and local roads.

Figure 6 – Fatal and Serious Injury Crashes By Roadway Ownership and Location



Source: SWITRS, 2008 to 2017 as of July 2019

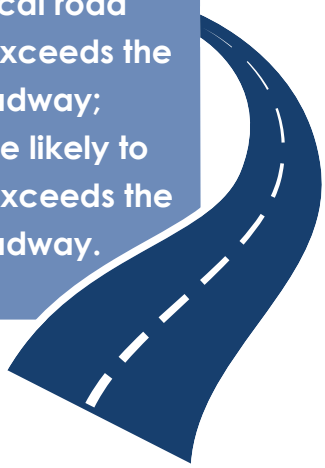
The majority of fatalities and serious injury crashes occur on the non-state highway system, which includes roads not owned and operated by the state of California. This is particularly true in urban areas.

A key factor to reducing crashes is ensuring sufficient safety focus is placed on non-state roadways where two-thirds of fatalities and serious injuries occur.

A larger number of fatalities and serious injuries occur in urban areas as shown in the urban versus rural comparison. However, there is still a significant portion of fatalities and serious injuries occurring in rural areas and the crash rate is generally higher in rural areas. This SHSP defines rural as unincorporated or incorporated areas with a population of fewer than 2,500. Urban is defined as incorporated areas with a population of 2,500 or more.

California initiated a High Risk Rural Roads Program (HR3) as part of the HSIP in 2012. This structure allows HR3 eligible projects to benefit from the HSIP funding. To meet the FHWA requirement of defining high risk rural roads for California in the SHSP, a definition is provided below. The Fixing America's Surface Transportation Act (FAST Act) requires a state to obligate a certain amount of funds on HR3 if the fatality rate on its rural roads increases, which is currently not triggered for California as of 2019.

The term 'high risk rural road' means any roadway functionally classified as a rural major or minor collector or rural local road on which the crash rate for fatalities and serious injuries exceeds the statewide average for those functional classes of roadway; or that will likely have increases in traffic volume that are likely to create a crash rate for fatalities and serious injuries that exceeds the statewide average for those functional classes of roadway.



More and Better Data

More and Better Data (Updates)

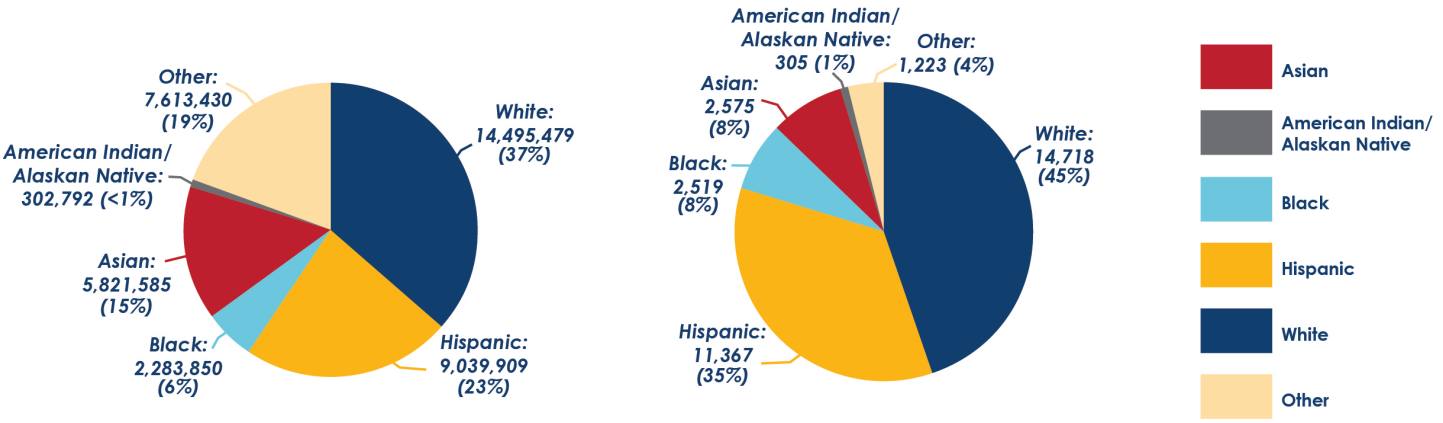
A key element of SHSP implementation is to use data to drive decisions and actions. To be most effective, it is important to continually improve the availability of data for analysis in order to achieve the safety and equity outcomes identified in the plan. Enhancements in data quality and timeliness offer opportunities to expand access and scope to this critical information and encourages the exploration of additional data variables. The Guiding Principle of Integrate Equity supports a better understanding of the effects of socioeconomic and demographic influences on fatal and serious injury crashes. This includes incorporation of improved data resources related to race, income, population density, and other demographic, socioeconomic, and location-based information to better inform the development and implementation of the SHSP.

As a result of "The Pivot" described previously, which included the addition of the Guiding Principle to Integrate Equity, there have been ongoing efforts to include equity-related data within the SHSP. During the initial review of equity-related data for traffic fatalities and serious injuries, it was readily apparent that there were limitations with the current collection of crash related data. The race/ethnicity data within SWITRS is determined at the party level rather than victim level, meaning that multiple victims in the same party are coded as a single race, whether or not that is accurate. It was also noted that the party race is not a personal identification by the party and there is not a standardized process for determining party race at the scene of a crash. Lastly, SWITRS data over the last four years only has accurate location information for approximately fifty percent of all fatal and serious injury crashes. However, the National Highway Traffic Safety Administration (NHTSA) Fatality Analysis Reporting System (FARS) has additional data cleansing, including the geolocation of all fatalities and the use of the victim's death certificate to obtain race/ethnicity data at the victim level. For these reasons, FARS data from NHTSA was used for the initial SHSP equity-related data analyses. Opportunities to improve and enhance equity-related data analyses will continue to be explored throughout the implementation of the SHSP to support the institutionalization of the Integrate Equity Guiding Principle.

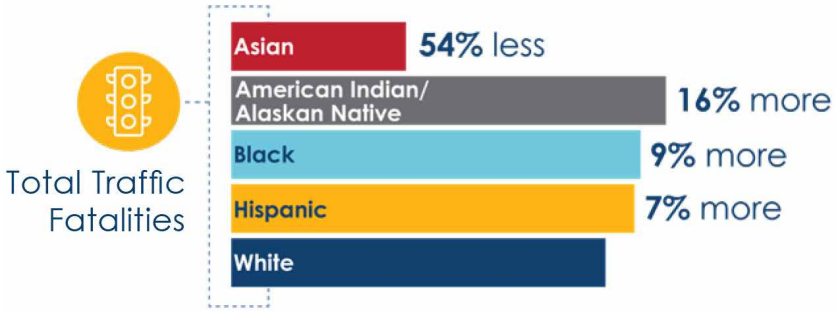
Figure 7 on the following page shows equity-related data for race/ethnicity and income. There is a graphic depicting the fatality rate by population of race/ethnicity compared to White. FARS data from 2009-2018 was used along with data from the US Census Bureau American Community Survey (ACS). The race/ethnicity shown on the next page represent groups that could be consistently compared across the different data sets. **Appendix A** includes the data definitions for all of the data analysis including the equity-related data analysis.

Figure 7 – Equity-Related Data Analysis for Race/Ethnicity and Income

Distribution of California Traffic Fatalities by Race/Ethnicity



Comparison of Fatalitiy Rate by Race/Ethnicity to White



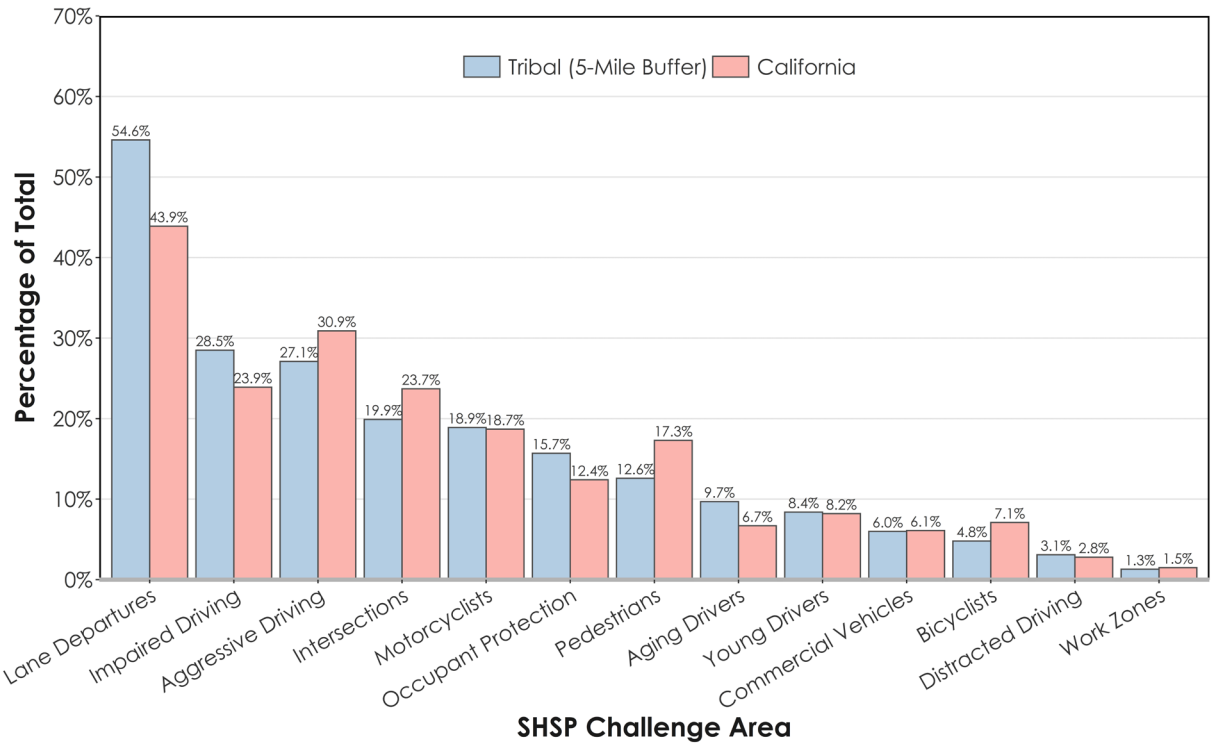
Income Equity in Traffic Fatalities

Rate of Fatalities for Census Block Groups with Average Household Income Less than $50,000 Compared to Income Greater than $50,000

The analysis of income equity looked at the increased rate of fatalities for Census Block Groups with average household income less than $50,000 compared to income greater than $50,000. The data source was also the ACS and FARS 2010-2019. Income data is available for the Census Block Groups where a traffic fatality occurred and not the individual. The graphic to the right above shows that Census Block Groups with average household income less than $50,000 had a 50% higher fatality rate per population than Census Block Groups with average income greater than $50,000. See Appendix A for a summary of the approach to the equity-related data analysis

Another aspect of equity-related data where progress has been made as a result of the Pivot is related to tribal data. Tools have also been developed by University of California, Berkeley's Safe Transportation Research and Education Center to better track traffic injuries and fatalities that occur on public roads on or through tribal lands. These tools have made it easier to collect and include tribal road safety data, resulting in more complete and comprehensive safety information for Tribal governments and other decision makers. Figure 8 compares the percentage of fatalities and serious injuries by SHSP Challenge Area for tribal land plus a five-mile buffer around each tribe to that in California. This figure shows that challenge areas such as lane departures, impaired driving, occupant protection and aging driving are a higher percentage of the total for tribes and challenge areas such as pedestrians and bicyclists are a lower percentage of the total for tribes.

Figure 8 – Challenge Area Analysis Comparing Tribal Areas to California as a Whole (Fatalities and Serious Injuries), 2010-2019

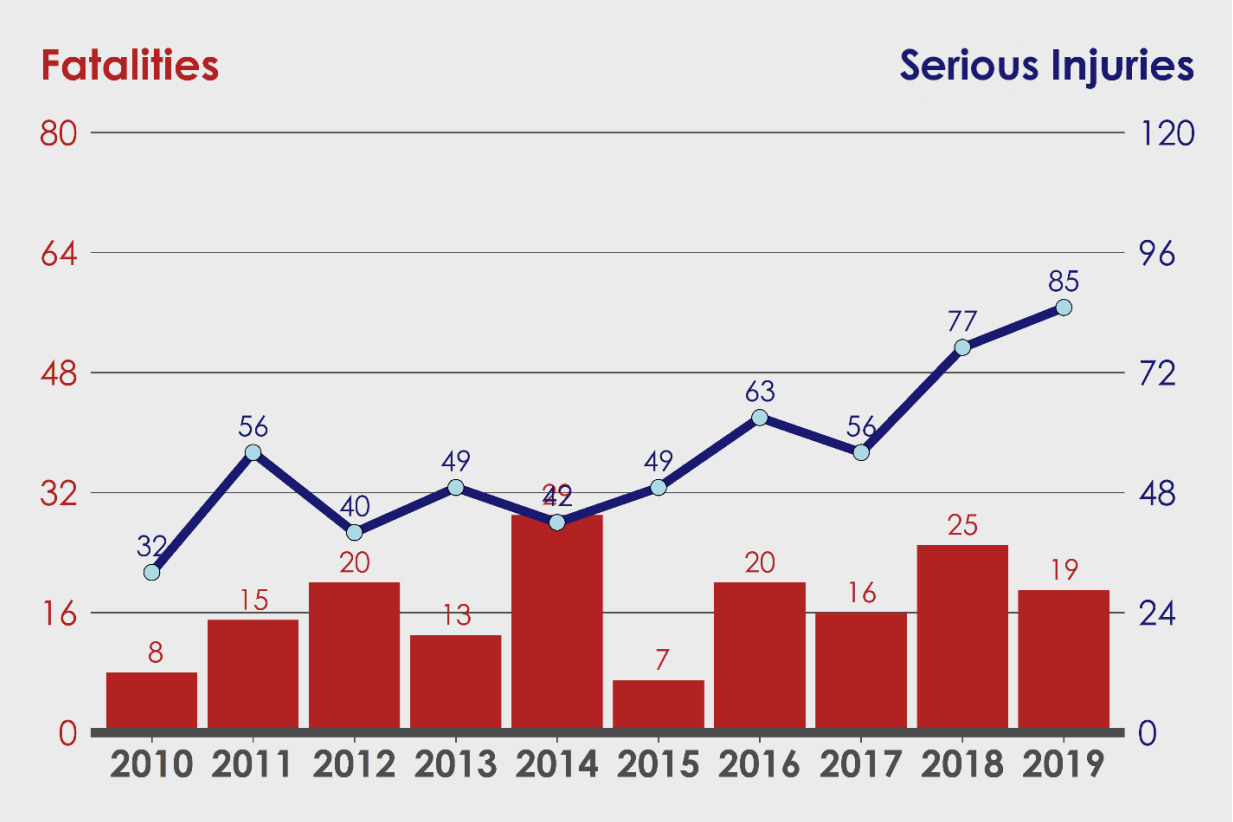


Source: University of California, Berkeley's Safe Transportation Research and Education Center (SWITRS 2010 - 2019)

NOTE:
1. Note that for the period 2010 - 2019, there were 12,072 fatal and serious injuries (FSIs) within tribal 5-mile buffer areas and 159,063 FSIs in California.

Figure 9 shows the annual trend for fatal and serious injuries for tribal areas including the five-mile buffer around the tribal boundaries.

Figure 9 – Yearly Trend for Fatal and Serious Injuries
All Tribes, 2010 – 2019



Source: University of California, Berkeley's Safe Transportation Research and Education Center (SWITRS 2010 - 2019)

Another significant improvement was related to the SHSP Crash Data Dashboard (https://shsp.dot.ca.gov/). The dashboard was expanded to include a tribal filter so that all of the data available on the ten tabs with fatal and serious injury data can be filtered specially for each tribe (including a five-mile buffer) around the boundary.

This increase in data being compiled for and reported by Tribal representatives expands opportunities to Tribal governments for grant funding and local partnerships to improve traffic safety within and adjacent to tribal lands.

The SHSP process provides an opportunity for Tribal leaders to participate in and recommend data-driven priorities that will make tribal lands safer for Tribal members, community members and visitors. These recommendations can be incorporated into the statewide challenge area investigation and countermeasure implementation process.

MEASURABLE OBJECTIVES

In developing the measurable objectives, the SHSP Steering Committee considered the following information:

- Fatalities increased 15% from 2008 to 2017
- Fatalities decreased from 2008 to 2010 before increasing again at approximately 4% per year from 2010 to 2017
- Serious injuries increased 19% from 2008 to 2017
- The 2015–2019 SHSP set measurable objectives of a 3% annual reduction of number and rate of fatalities and a 1.5% annual reduction of the number and rate of serious injuries
- Reduce the current upward trend of fatal and serious injuries

When all the information was taken into consideration, the Steering Committee decided on the following for its primary objective:

Establish a trend to reach zero fatalities and serious injuries by 2050.

The Steering Committee felt it was important to be aggressive in the objective to further highlight the importance of traffic safety. It also wanted to provide messaging and goals for the SHSP to be targeted in other state documents.


Photo courtesy of: Kimley-Horn

ACCOMPLISHMENTS FROM THE 2015–2019 SHSP

While recent trends show an increase in fatalities and serious injuries in California, the number could be higher without all the efforts of dedicated stakeholders in the state. It is important to review successes from implementation of the 2015–2019 SHSP to carry forward what is working and to inform future actions.

While there is still a lot of work to reach zero fatalities and serious injuries, the number of partnerships that have enabled the SHSP to evolve over the last 14 years continue to grow. SHSP leadership is proud of the many accomplishments achieved by the hundreds of stakeholders who devoted their time, energy, and ideas to helping California reduce traffic-related fatalities and serious injuries.

The 2015–2019 SHSP included 15 Challenge Areas, each tasked with specific actions to improve traffic safety. The table on the following pages describes some of the major accomplishments achieved by the SHSP Challenge Area Teams over the last five years. From the 2015–2019 SHSP, 110 of 124 were implemented by December 31, 2019.

Photo courtesy of: CHP


Photo courtesy of: Caltrans

Photo courtesy of: Kimley-Horn

GO SAFELY CALIFORNIA

Photo source: California Office of Traffic Safety

Accomplishments from 2015–2019 SHSP	2015–2019 SHSP Challenge Area	Engineering	Enforcement	Education	EMS
Developed informational brochures titled, "Prescription Medications and Driving: What Are the Hazards?" and "Medications and Driving: A Guide for Healthcare Practitioners"	Aging Road Users			X	
A presentation has been developed to share best engineering practices related to traffic control devices for Aging Road Users	Aging Road Users	X			
Developed information on and presented the benefits of the multi-track DUI court system to counties and other states	Alcohol and Drug Impairment		X	X	
Implemented the "Not on My Watch" campaign for young people, teens, and parents to target underage drinking/ impaired driving	Alcohol and Drug Impairment		X	X	
Created and distributed educational materials and an issue paper on drug impairment and its effects on driving	Alcohol and Drug Impairment		X	X	
Provided issue paper to Peace Officers Standards and Training (POST) establishing benefits of Standardized Field Sobriety Tests training	Alcohol and Drug Impairment		X	X	

Accomplishments from 2015–2019 SHSP	2015–2019 SHSP Challenge Area	Engineering	Enforcement	Education	EMS
Increased the number of CHP personnel who have complete Advanced Roadside Impaired Driving Enforcement (ARIDE) training to 96%	Alcohol and Drug Impairment		X	X	
Implementation of a statewide pedestrian and bicycle count database and count methodology guidance	Bicycling	X			
Addition of the classification of a bikeway incorporated in the latest update to CHP Form 555	Bicycling		X		
Bicycle crash data was analyzed and disseminated to local health departments.	Bicycling			X	
Recommendations have been provided to be incorporated into the DMV Driver Handbook, a secondary Bicycle "Driver" Handbook is being considered	Bicycling			X	
Hosted six trucker appreciation events with approximately 1500 drivers attending. Two trucker appreciation days were held in 2018 and nine were held in 2016	Commercial Vehicles			X	

Accomplishments from 2015–2019 SHSP	2015–2019 SHSP Challenge Area	Engineering	Enforcement	Education	EMS
CHP continues to conduct free educational seminars statewide to motor carriers and their respective drivers	Commercial Vehicles			X	
CHP is beta testing updates to InSPECT to collect data on commercial vehicle enforcement programs	Commercial Vehicles		X		
Launched "Alive at 25" campaign aimed at teen-specific driver diversion programs	Distracted Driving		X	X	
Developmental work with targeted counties continues, as well as the implementation of the "What Do You Consider Lethal?" parent and teen programs	Distracted Driving			X	
Presentations were made to professional trucking organizations, law enforcement officers, driver licensing agency representatives	Distracted Driving			X	

Accomplishments from 2015–2019 SHSP	2015–2019 SHSP Challenge Area	Engineering	Enforcement	Education	EMS
Assessed the potential effect of increasing Negligent Operator Points using driver citation records to determine whether distracted driving citations are capturing a risky group and what effect additional points would have on the Negligent Operator Treatment System (NOTS)	Distracted Driving			X	
Driver license competency of new drivers was collected as part of the "Friday Night Live" program to inform recommendations on removing barriers to driver education opportunities	Driver Licensing and Competency			X	
A publication on the Federal Transit Administration/Surface Transportation Program (FTA/STP) driver amnesty program was prepared by DMV	Driver Licensing and Competency		X	X	
Increased the number of EMS/Fire Personnel taking Traffic Incident Management Training	Emergency Response			X	X
Revised EMSA #145 manual with the latest information	Emergency Response			X	X

Accomplishments from 2015–2019 SHSP	2015–2019 SHSP Challenge Area	Engineering	Enforcement	Education	EMS
A workshop was developed and implemented for the new Intersection Control Evaluation (ICE) training program to increase the knowledge and skills to evaluate intersections and choose the most effective countermeasures. A schedule of two workshops per year is expected	Intersections, Interchanges, and Other Roadway Access	X			
Developed educational information and updated driving school courses related to motorcycle and driver safety, such as safety benefits of being more visible in traffic with personal protective equipment and the dangers of distracted riding and driving	Motorcycles			X	
Require a U.S. DOT-compliant motorcycle helmet for DMV motorcycle skills test	Motorcycles		X		
Refresher Training classes were held at various sites	Motorcycles			X	
Caltrans has identified locations to incorporate safer barrier technology	Motorcycles	X			

Accomplishments from 2015–2019 SHSP	2015–2019 SHSP Challenge Area	Engineering	Enforcement	Education	EMS
Disseminated to targeted 15–24 year olds a combination of documents on seatbelt use in California and nationwide, social media campaigns on seat belt use, and best practice countermeasures to reduce people killed and injured due to lack of seatbelt use	Occupant Protection			X	
Developed supplementary programs for both expectant parents and a CPS court diversion to improve efficacy of child passenger safety classes	Occupant Protection			X	
Systemic Safety Analysis Report Program was developed with over 100 safety plans funded	Pedestrians	X			

Accomplishments from 2015–2019 SHSP	2015–2019 SHSP Challenge Area	Engineering	Enforcement	Education	EMS
In 2018, CHP conducted enhanced enforcement operations focused on pedestrian safety, including pedestrian safety enforcement operations, school zone enforcement operations, and vehicles illegally passing school zones operations, resulting in 2,946 citations to motorists, bicyclists, and pedestrians	Pedestrians		X		
Held over 1,000 outreach and education traffic safety events reaching over 300,000 people	Pedestrians			X	
Implemented a HSIP program that incorporated High Friction Surface Treatment (HFST) incentives and prioritized systemic low-cost safety methodologies. Three HFST projects and 107 low cost systemic safety measures were funded in Cycle 9 HSIP call for projects	Roadway Departure and Head-On Crashes	X			

Accomplishments from 2015–2019 SHSP	2015–2019 SHSP Challenge Area	Engineering	Enforcement	Education	EMS
California held over 20 train-the-trainer sessions to expand the Traffic Incident Management (TIM) training program	Roadway Departure and Head-On Crashes			X	X
Received grant funding to increase high visibility enforcement and for new patrol vehicle mounted radar devices	Speeding and Aggressive Driving		X		
Conducted a public opinion survey measuring public attitudes and awareness of aggressive driving to develop a media campaign	Speeding and Aggressive Driving			X	
Created new specification and design guidance for the use of vehicle speed feedback signs and automated information signs in work zones	Work Zones		X		
Updated the Caltrans Standard Plans to reflect the findings of the Work Zone Review Process and incorporate effective countermeasures	Work Zones	X	X		

Accomplishments from 2015–2019 SHSP	2015–2019 SHSP Challenge Area	Engineering	Enforcement	Education	EMS
Educational material on Graduated Driver Licensing has been created as well as quarterly newsletter for administrators, educators, parents/guardians to provide information on trends, resources, and legal/ educational issues in driver education/training climate in California	Young Drivers			X	
Piloted education programs to judicial officers on the use of teen-specific driver diversion programs and on GDL restrictions	Young Drivers		X	X	

THE UPDATE PROCESS

Every update of the SHSP presents an opportunity to reflect on what is working and what needs to be improved. This reflection includes reviewing data trends, organizational structures, collaborations, partner engagement, implementation successes, notable challenges to implementation, and current policies and initiatives.

California began the development of the 2020–2024 SHSP in 2018 by initiating the following efforts:

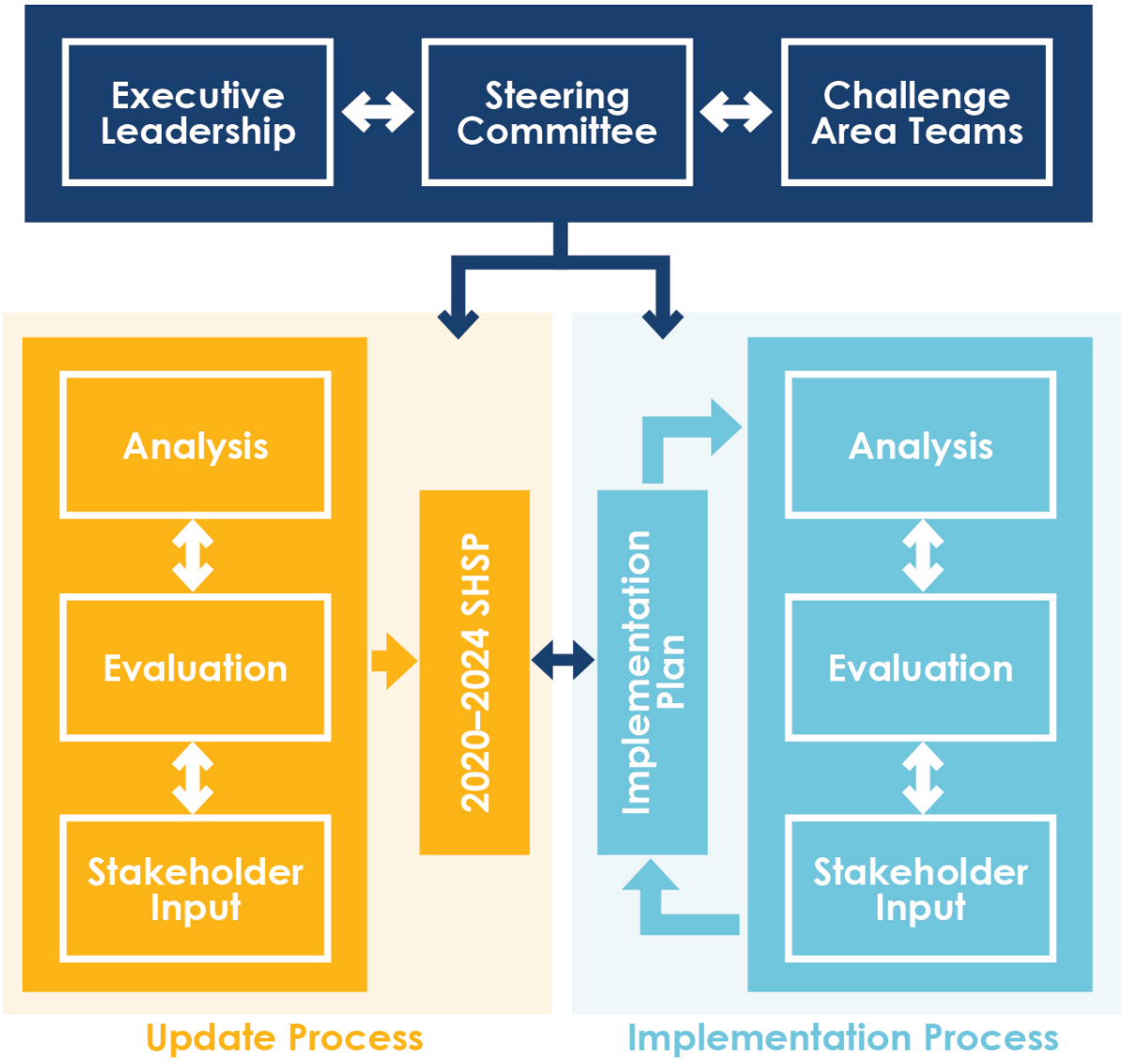
- Evaluation of 2015–2019 SHSP and current processes
- A review of various other state and regional plans in California to assess current alignment with the SHSP
- A review of various other SHSPs prepared in the United States and
- Crash data analysis

The findings helped inform the development of Guiding Principles for developing the 2020–2024 SHSP. A series of six outreach meetings were held in different locations throughout California in April 2019, and a webinar was conducted in May 2019. At each meeting, the SHSP process and preliminary findings were presented and then open house sessions were held to support discussions on specific traffic safety issues and potential strategies and to gain feedback from stakeholders on the components of the SHSP. This 2020–2024 SHSP document was finalized using the initial findings and consolidated feedback from the outreach efforts.

Efforts related to the SHSP do not stop with this document, and will continue throughout the following five years through:

- An implementation plan that defines specific actions and that may be updated as needed throughout the five years. Figure 7 on the following page depicts the SHSP Update and Implementation Processes
- Annual statewide summits in the spring targeted to traffic safety executives focused on key implementation needs from agency partners statewide and promote agency collaboration
- Regional workshops annually in the fall in six regions throughout California to engage local stakeholders to share and discuss best practices on effective implementation of strategies

Figure 7 - SHSP Update and Implementation Processes



2015–2019 SHSP Process Evaluation

The 2015–2019 SHSP Evaluation was a review of the SHSP structure and processes. This effort included gathering feedback from previous and current participants in the SHSP through an online survey, and input from the Steering Committee. The information obtained was used as a consolidated source of input for the development of the California 2020–2024 SHSP.

The following list provides key findings of the 2015–2019 SHSP Process Evaluation that will be incorporated into the 2020–2024 SHSP processes:

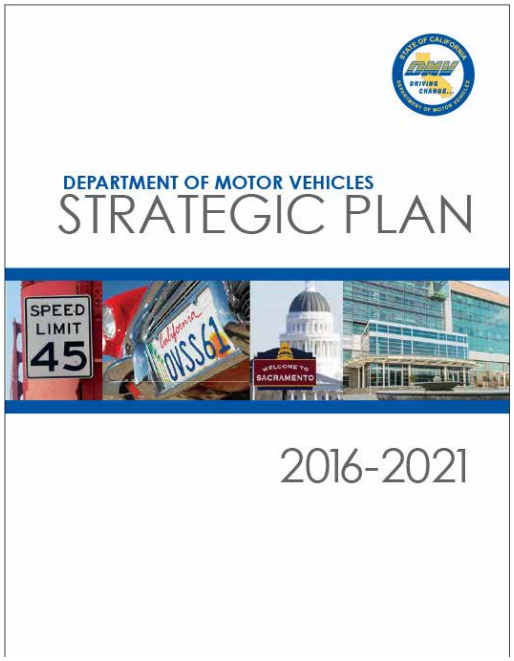
- There is strong leadership involvement that provides the political opportunities to support the SHSP in a tangible manner
- The SHSP provides collaboration between state agencies to develop overlapping goals and policies in statewide plans, policies, and visions
- There is a need and benefit to having Challenge Area Teams meet on a quarterly basis and utilize an online Action Tracking Tool as a shared progress-tracking resource for stakeholders
- Resources at state and local agencies may be limited and it is important to align SHSP implementation responsibilities with available subject matter expert staff and clearly communicate roles and responsibilities for those involved
- SHSP actions need to be Specific, Measurable, Achievable, Relevant, and Time-Constrained (SMART)
- Annual review and updates of crash data and trends would be helpful to increase data-driven aspects of the SHSP
- Finding additional data sources besides SWITRS or FARS to utilize could provide additional trends to consider when developing and implementing SHSP actions
- The SHSP should continue to increase meaningful engagement of regional and local representatives
- The SHSP should continue to engage potential stakeholders, notably judicial, medical services, the automobile industry, advocates, consultants, Tribal governments, and local governments
- The existing public SHSP website should include additional information such as best practices regarding traffic safety, annual data updates, and links to safety campaigns and education material

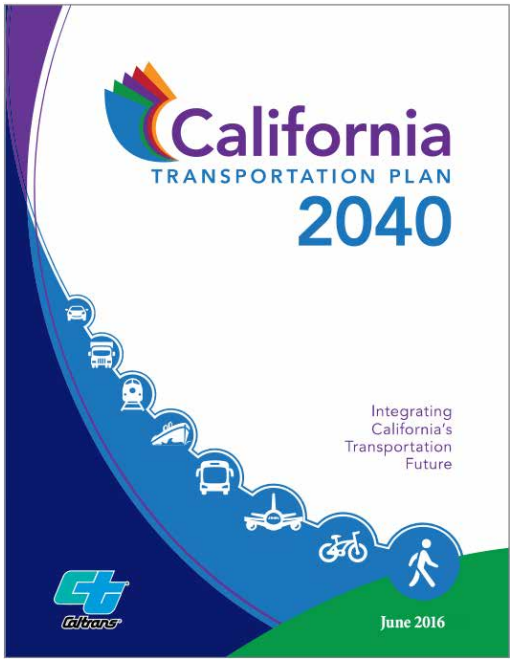
Alignment of SHSP with other Statewide Plans

Achieving the Vision, Mission, and Goal of the SHSP relies on the diverse decision-making of multiple agencies. Improving coordination and linkages among regional and statewide planning processes in California will facilitate a common approach to transportation safety planning and collectively work towards the same goal. Since the SHSP is rooted in interagency coordination, it is critical that partners of the SHSP are notified and review changes to published regional and statewide plans. Doing so will encourage transparency between agencies, facilitate strong partnerships, and better align plans to implement safety programs that address key priorities throughout California.

The following published documents were reviewed to evaluate the extent to which other plans were aligned with the SHSP:

- California Bike and Pedestrian Plan Summary
- California Freight Plan
- California Highway Patrol Strategic Plan
- California Highway Safety Plan
- Caltrans Section 190 Grade Separation Program
- California State Rail Plan
- California Transportation Plan
- California Commercial Vehicle Safety Plan
- California Traffic Records Coordinating Committee/ Strategic Traffic Safety Data Plan
- Department of Motor Vehicles Strategic Plan
- Plan to Promote Health and Mental Health Equity

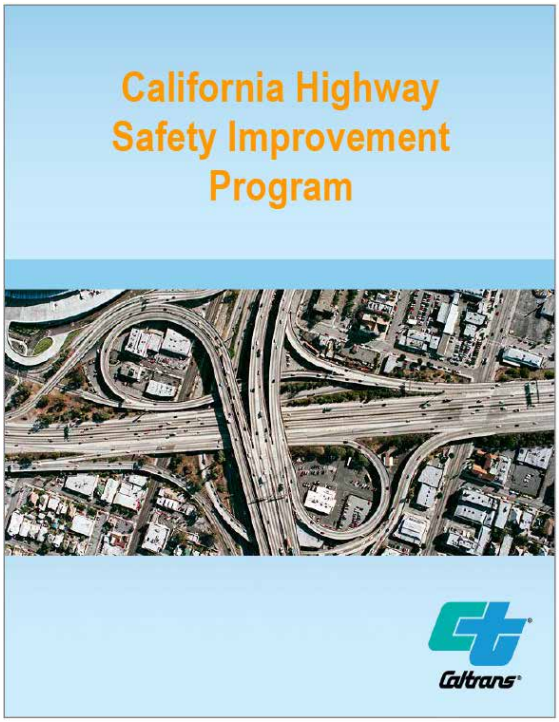




Each of the plans were reviewed for content on traffic safety, including the extent of safety analysis, safety inclusion in goals and objectives, existence of safety-oriented performance measures and targets, and inclusion of safety as a project prioritization method. Alignment of plans is helpful in sending consistent messaging and maximizing resources. Alignment of plans is also needed for some funding requirements.

Projects that are funded through the HSP (Office of Traffic Safety) and HSIP (Caltrans) must reflect the SHSP at a strategic level.

Members of the SHSP Steering Committee will continue to collaborate in the development of their agencies' strategic plan to support the goal of Zero Fatalities and Serious Injuries in California.



Stakeholder Engagement

Support Partnerships and Innovation

Focus SHSP efforts in areas of most critical need that will benefit from a partnered approach with state, regional, tribal, and local stakeholders.

Regional Outreach Events

As part of the SHSP development process, six regional outreach events were conducted across the state: in Sacramento, San Francisco Bay Area, Redding, Greater Los Angeles Area, San Diego, and Fresno. The attendees represented were affiliated with 101 organizations covering all 5 Es. The following is a summary of the agencies and organizations represented at the outreach events:

- 2 federal agencies
- 7 state agencies
- 11 metropolitan planning organizations and regional transportation planning agencies
- 15 counties
- 14 cities
- 19 law enforcement agencies
- 3 universities
- 7 Tribal governments
- 21 associations and non-profits, and
- 2 private industry representatives


Photo courtesy of: Kimley-Horn


Photo courtesy of: Kimley-Horn

Outreach events began with presentations by key SHSP partner agencies and an overview of statewide and regional traffic safety data. Data covered in the presentation and in handouts included fatal and serious injury trends for location, age, and gender information; a breakdown by month, time of day, and day of week; and a listing of the primary crash factors and crash types. At each outreach event, there was an open house format session for participants to discuss and provide comments on the various components of traffic safety. The open house session included SHSP team members attending stations where data and strategies were presented on poster boards to support discussions for the following groups: Drivers and Passengers, Infrastructure, Vulnerable Users, Vehicles, and Emergency Response. A tribal outreach session was included as well.

Webinar

To give safety stakeholders who could not travel to the regional events an additional opportunity to provide input into the SHSP, a webinar was held during the last week of May 2019. The webinar shared the role of the state and federal agencies on the implementation of the SHSP, the most recent statewide crash data information, and included a safety strategy session discussing Drivers and Passengers, Infrastructure, Vulnerable Users, Vehicles, and Emergency Response. A tribal outreach session was included as well.

A total of 72 people representing 47 organizations participated in the webinar. The following is a summary of the agencies and organizations represented on the webinar:

- 2 federal agencies
- 6 state agencies
- 6 metropolitan planning organizations and regional transportation planning agencies
- 4 counties
- 7 law enforcement agencies
- 5 cities
- 3 universities
- 2 Tribal governments
- 10 associations and non-profits, and
- 2 private industry representatives

Tribal Involvement

The SHSP Steering Committee made significant efforts to engage Tribal governments, including a dedicated session during the outreach events and the webinar. The core issues identified consistently by all groups is the need for increased coordination among the many disparate groups involved in traffic safety as related to the 110 federally recognized Tribal governments in California.

Feedback from tribal outreach sessions highlighted additional challenges to actually implement roadway improvements on roads within and adjacent to tribal lands.

Outreach Input Summary and Next Steps

All information collected through the outreach events, webinar, and other input received through the SHSP website was compiled into a matrix showing what comments were received and the SHSP Challenge Area(s) in which it applies. General themes and consistent ideas were gathered from the comments. Stakeholder concerns were discussed at Steering Committee meetings and/or specific response to comments provided. Additionally, the information will be reviewed by each of the Challenge Area Teams who recommended the final list of actions for the Implementation Plan.

Photo courtesy of: Southern California Association of Governments

CHALLENGE AREAS

Overview

Stakeholders identified safety "Challenge Areas" on which to focus resources and efforts. The 16 Challenge Areas in this SHSP include all 15 of the Challenge Areas from the 2015–2019 SHSP and the addition of Emerging Technologies as a new Challenge Area.

The 16 Challenge Areas were categorized into High Priority and Focus Areas to assist in establishing guidance for implementation. High Priority Areas will have more detailed and frequent updates and analyses to support action development. The High Priority Areas represent five areas — made up of six Challenge Areas — most often involved in fatal and serious injury crashes and have the greatest potential to significantly decrease statewide fatalities and serious injuries. The remaining 10 Challenge Areas are Focus Areas, which are equally important to traffic safety in California but have fewer fatalities and serious injuries associated with them.

HIGH PRIORITY AREAS

- Active Transportation: Pedestrians & Bicyclists
- Impaired Driving
- Intersections
- Lane Departures
- Speed Management/Aggressive Driving

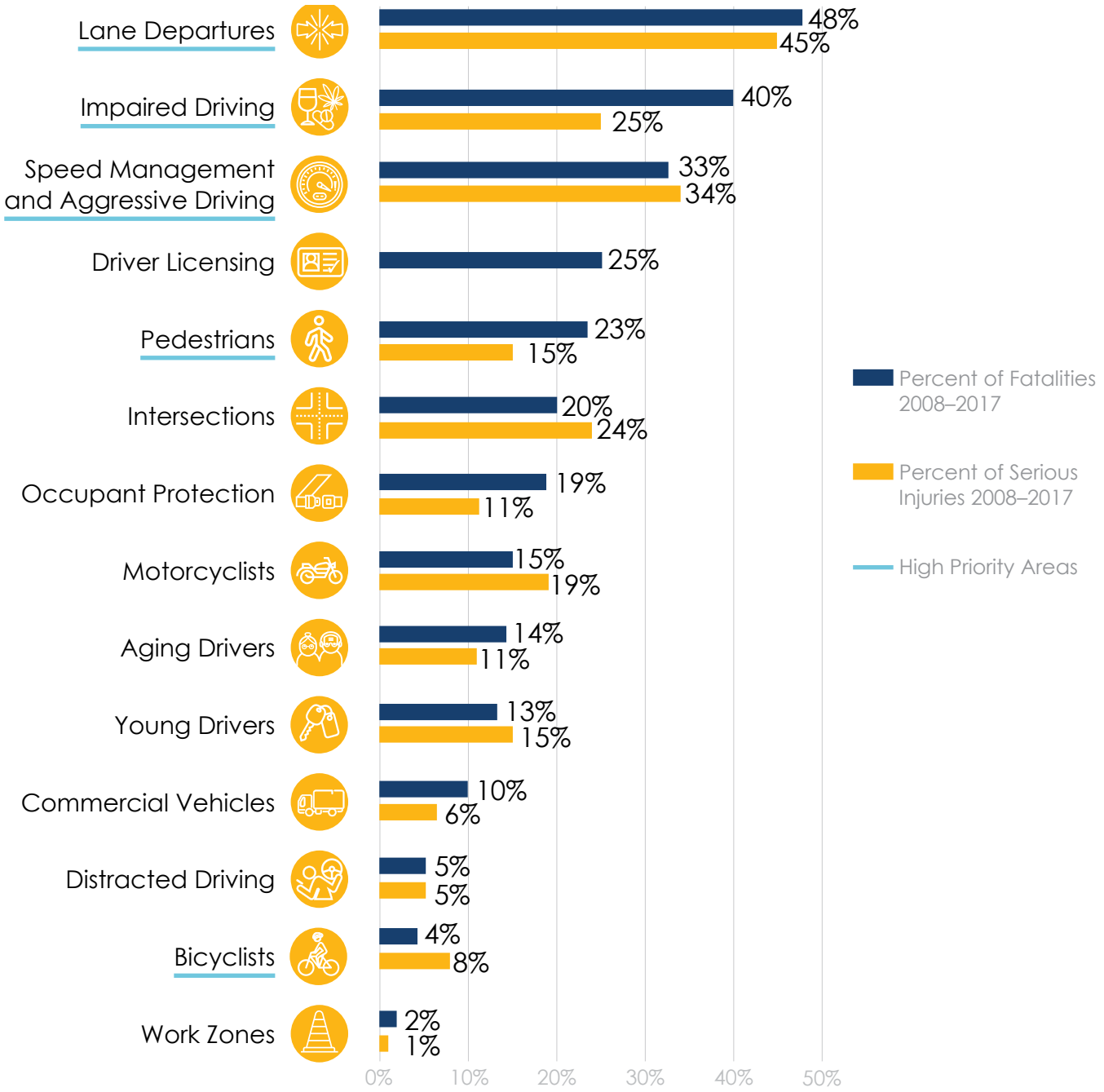
FOCUS AREAS

- Aging Drivers (equal to>65)
- Commercial Vehicles
- Distracted Driving
- Driver Licensing
- Emergency Response
- Emerging Technologies
- Motorcyclists
- Occupant Protection
- Work Zones
- Young Drivers (15–20)

The Challenge Area fact sheets are presented in alphabetical order with the High Priority Areas followed by Focus Areas. Fact sheets include a definition of each Challenge Area along with corresponding data and discussion related to that area.

Challenge Area Involvement in Fatalities and Serious Injuries

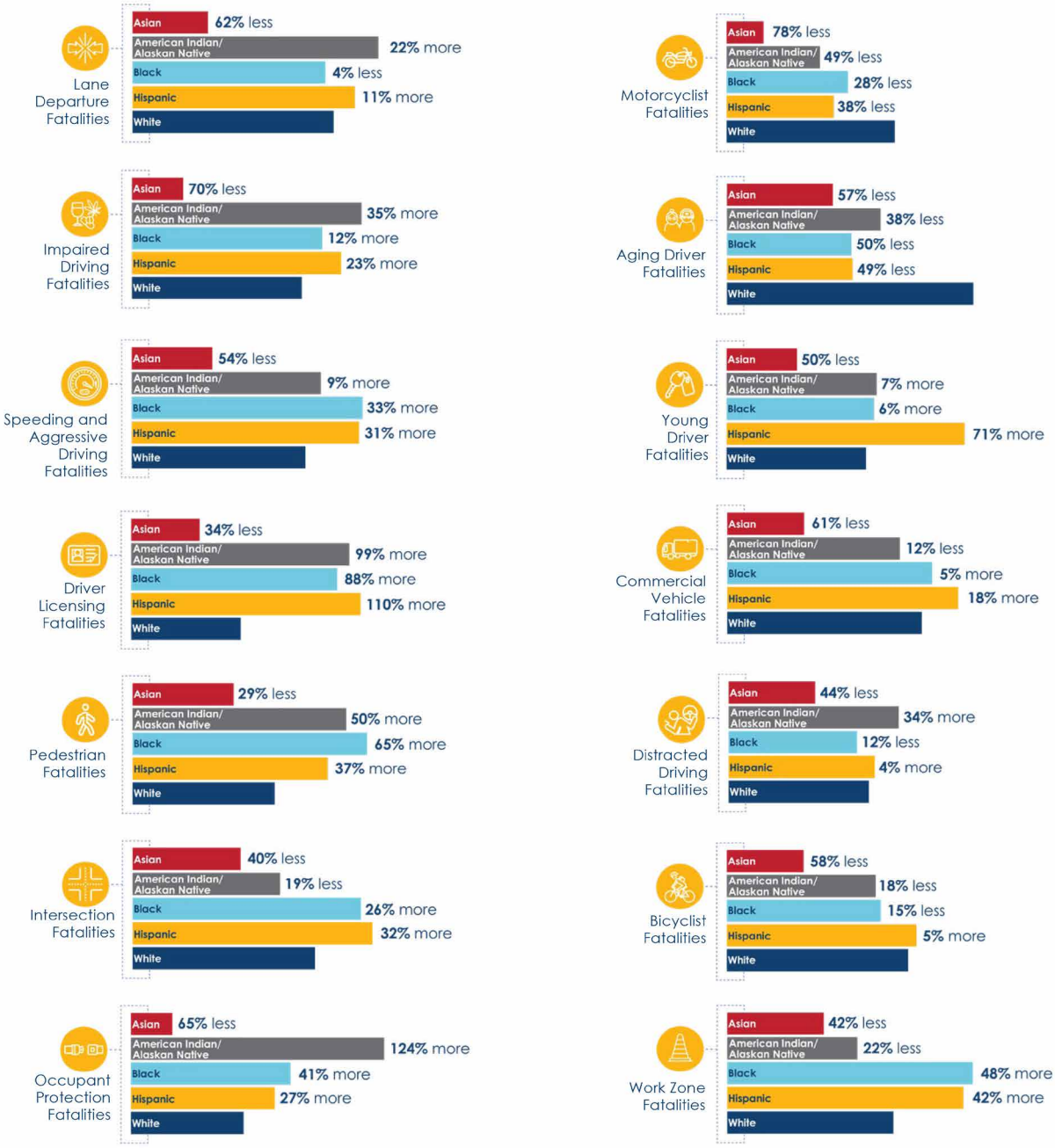
A ranking of the Challenge Area involvement, shown as a percentage of the total number of fatalities and serious injuries, is provided below. The High Priority Areas are underlined in blue.



Some crashes may involve more than one factor and would be counted in multiple groups; the sum of all groups is greater than 100%. Emergency Response and Emerging Technologies Challenge Areas do not have reported collision data and are not represented in this chart.

Racial Equity in Challenge Area Traffic Fatalities

Fatality Rate by Race/Ethnicity Compared to White (Comparison of Fatality Rate by Population)



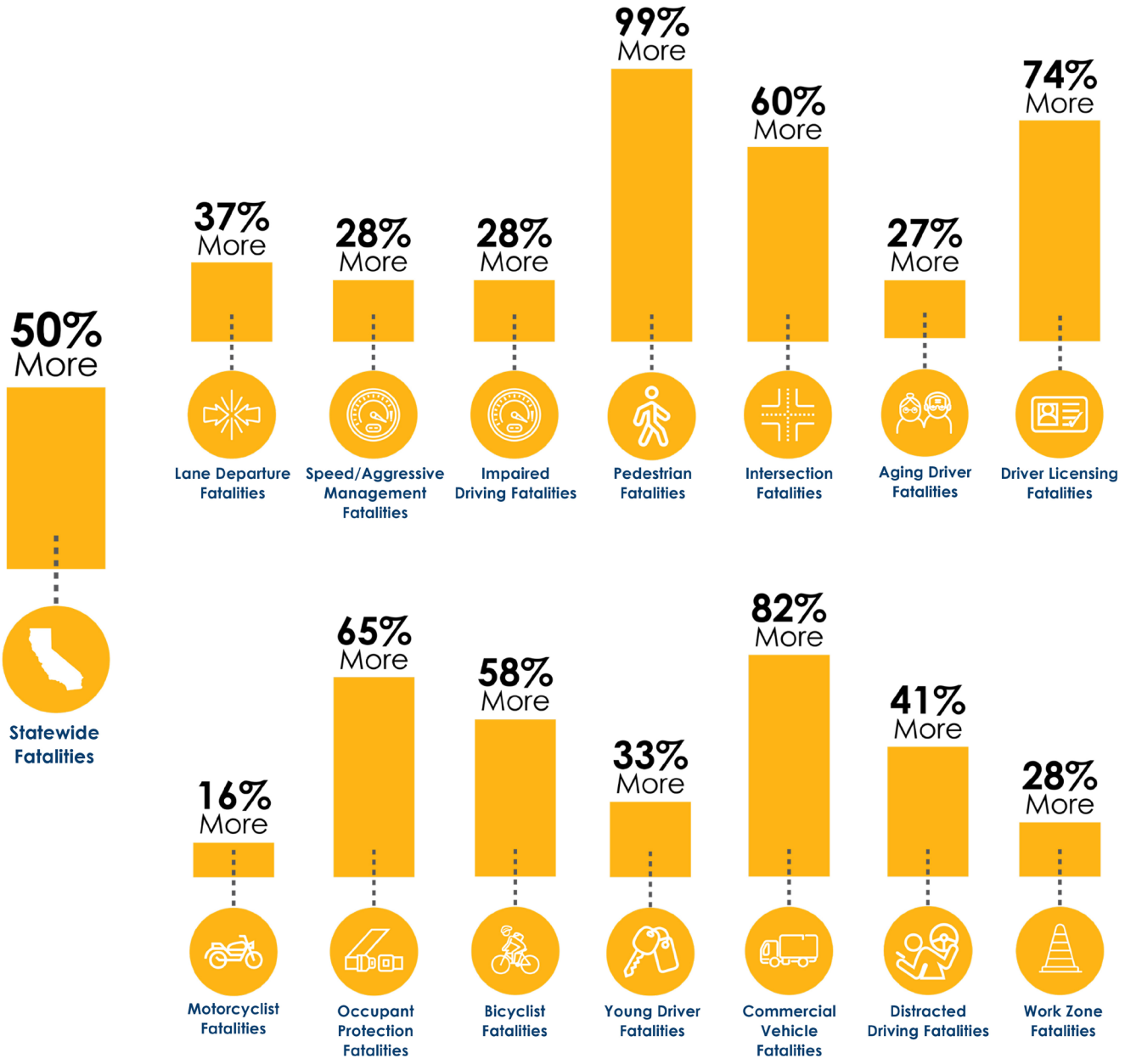
Data Source: *US Census Bureau ACS and FARS (2009-2018)*

1. *The race/ethnic groups presented above summarizes groups that could be consistently compared across the different data sets.*

2. *Fatality data from FARS is used on this sheet because racial data in FARS is victim specificity (rather than SWITRS, which is at the party level).*

Income Equity in Challenge Area Traffic Fatalities

Increased Rate of Fatalities for Census Block Groups with Average Household Income Less than $50,000 Compared to Average Household Income Greater than $50,000

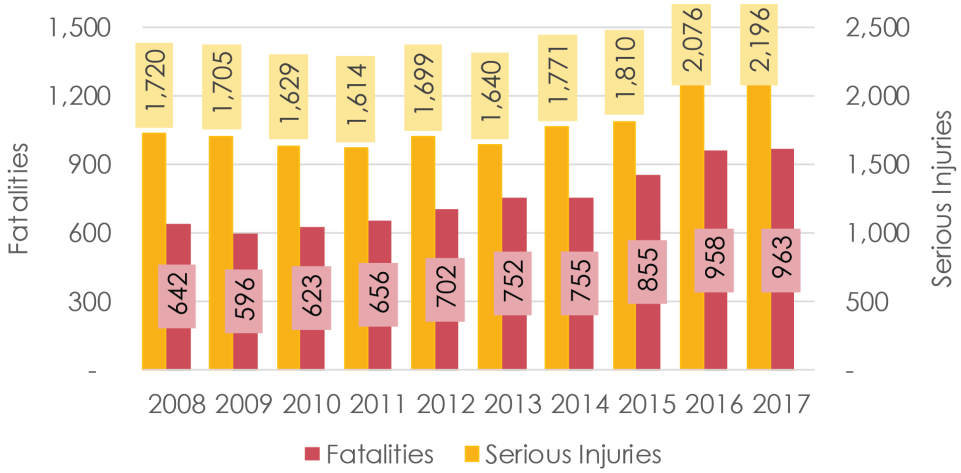


Data Source: *American Community Survey (ACS) collected by U.S. Census Bureau, FARS*

1. *Income data is available for the Census Block Groups where a traffic fatality occurs and not the individual (i.e. this data represents the income information of the Census Block Groups where the crash occurs and not the income of the crash victim.)*
2. *The ACS 1-Year Estimates for 2018 were used to determine per-capita fatality rates.*
3. *FARS data was used because it has a greater percentage of located crashes than SWITRS.*

ACTIVE TRANSPORTATION: PEDESTRIANS

Fatalities and Serious Injuries by Year - Pedestrians



Note: The graph above has two different vertical scales

The Pedestrians Challenge Area includes instances where a motor vehicle is involved in a crash with a pedestrian.

Between 2008 and 2017, 24,773 crashes involved a fatally or seriously injured pedestrian in California. These crashes resulted in 7,502 pedestrian fatalities and 17,860 pedestrian serious injuries. Crashes related to pedestrians represent 19% of fatal or serious injury crashes, 23% of all traffic fatalities, and 15% of all serious injuries over the same period.

In pedestrian-involved crashes, 37% of pedestrians are crossing a street but not in a crosswalk, 28% are crossing in a crosswalk at an intersection, 26% are in the roadway (including the shoulder), 6% are not in the roadway, and 2% are crossing in a crosswalk not at an intersection.

Number and Percent of Fatalities

7,502 Fatalities Involved Pedestrians

24,967 Fatalities Involved Other Factors

Number and Percent of Serious Injuries

17,860 Serious Injuries Involved Pedestrians

97,976 Serious Injuries Involved Other Factors

ACTIVE TRANSPORTATION: PEDESTRIANS

Crashes involving pedestrians primarily occur on urban non-state highways where pedestrian activity is generally higher.

10% of pedestrian-related crash victims are ages 0 to 14.

The two most frequent primary crash factors in this Challenge Area are pedestrian violation (50%) and pedestrian right of way (19%).

Given that pedestrians were involved in approximately 19% of fatal and serious injury crashes, three non-pedestrian primary crash factors were over-represented:

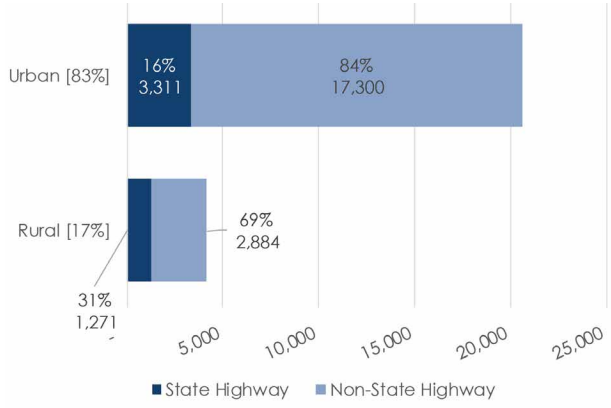
47% of crashes where the primary crash factor was Unsafe Starting or Backing

43% of crashes where the primary crash factor was Hazardous Parking

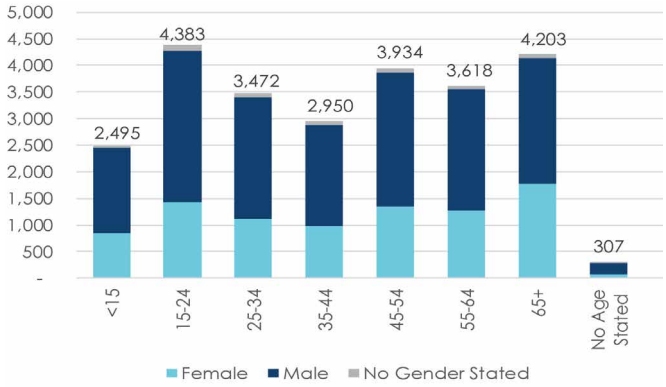
37% of crashes where the primary crash factor was Impeding Traffic

Photo courtesy of: Caltrans

Fatal and Serious Injury Crashes by Roadway Ownership and Location - Pedestrians (2008 to 2017)



Victim Age and Gender - Fatally and Seriously Injured Pedestrians (2008 to 2017)

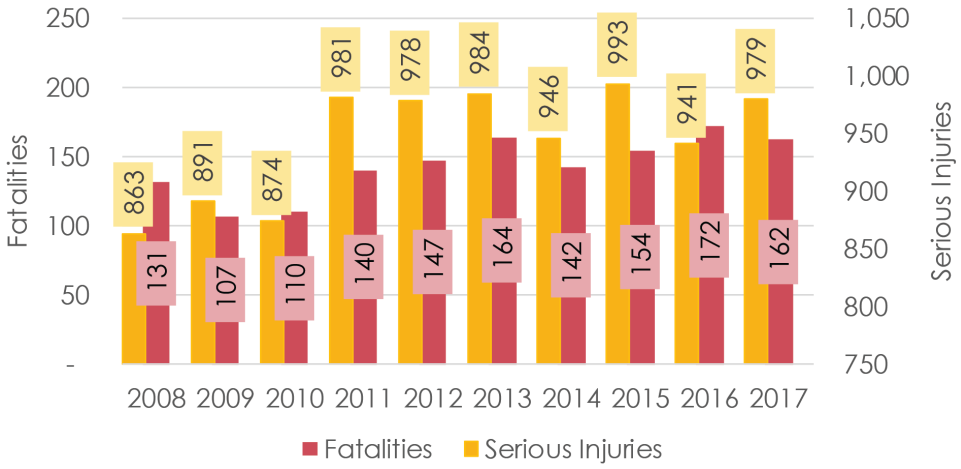


The information provided on these fact sheets are intended to highlight factors that may influence selection of appropriate countermeasures and actions to address crashes related to this Challenge Area.

Data Source: SWITRS, 2008 to 2017 as of July 2019

ACTIVE TRANSPORTATION: BICYCLISTS

Fatalities and Serious Injuries by Year - Bicyclists



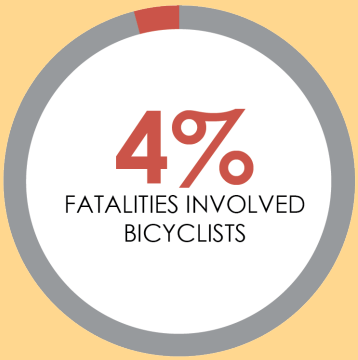
Note: The graph above has two different vertical scales

The Bicyclists Challenge Area includes instances where a motor vehicle is involved in a crash with a bicyclist.

Between 2008 and 2017, 10,838 crashes involved a fatally or seriously injured bicyclist in California. These crashes resulted in 1,429 bicyclist fatalities and 9,430 bicyclist serious injuries. Bicyclist-involved crashes represent 8% of fatal or serious injury crashes, 4% of all traffic fatalities, and 8% of all serious injuries over the same period.

Bicycling is a popular mode of transportation in California with its temperate climate and spreading network of bike lanes and paths. Bicyclists over the age of 18 are not required by law to wear a helmet in California.

Number and Percent of Fatalities



1,429 Fatalities Involved Bicyclists

31,040 Fatalities Involved Other Factors

Number and Percent of Serious Injuries

9,430 Serious Injuries Involved Bicyclists

106,406 Serious Injuries Involved Other Factors

ACTIVE TRANSPORTATION: BICYCLISTS

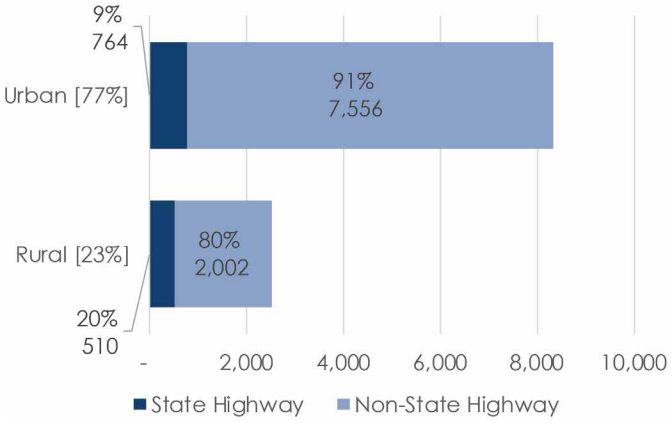
Crashes involving bicyclists primarily occur on non-state highways in urban areas.

When comparing the movement drivers make preceding the crash with a bicyclist, 28% of drivers are parked, 24% of drivers are making a right turn and 14% of drivers are merging into another lane. Sixty-eight percent of bicyclists are proceeding straight before the crash occurs.

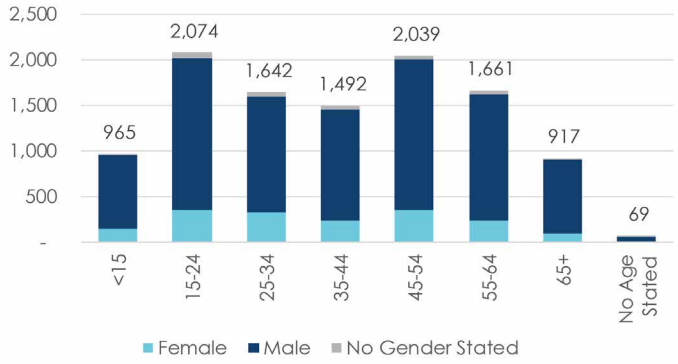
The two most frequent primary crash factors in this challenge area are automobile right of way (18%) and improper turning (15%).

Photo courtesy of: Kimley-Horn

Fatal and Serious Injury Crashes by Roadway Ownership and Location - Bicyclists (2008 to 2017)



Victim Age and Gender - Fatally and Seriously Injured Bicyclists (2008 to 2017)

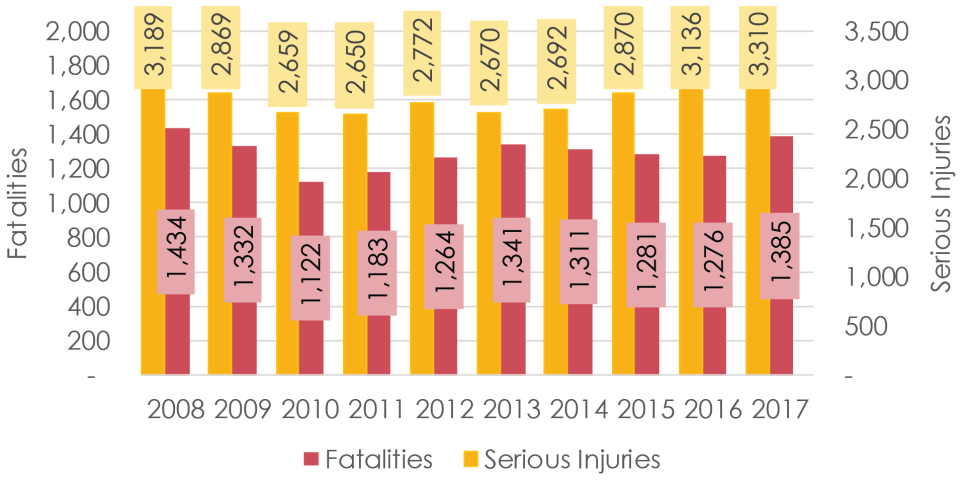


The information provided on these fact sheets are intended to highlight factors that may influence selection of appropriate countermeasures and actions to address crashes related to this Challenge Area.

Data Source: SWITRS, 2008 to 2017 as of July 2019

IMPAIRED DRIVING

Fatalities and Serious Injuries by Year - Impaired Driving



Note: The graph above has two different vertical scales

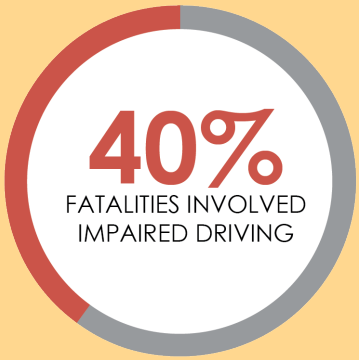
The Impaired Driving Challenge Area includes crashes where any evidence of drug or alcohol use by the driver is present, even if the driver was not over the legal limit. The previous SHSP included the Alcohol and Drug Impairment Challenge Area that addressed crashes where a motorist, pedestrian or bicyclist had been using alcohol and/or drugs; this SHSP's definition has been updated to only include crashes with drivers that had been using alcohol and/or drugs.

Between 2008 and 2017, 33,478 fatal or serious injury crashes involved a driver that had been drinking or using drugs in California. These crashes resulted in 12,929 fatalities and 28,817 serious injuries. Crashes related to impaired driving represent 26% of fatal and serious injury crashes, 40% of all traffic fatalities, and 25% of all serious injuries over the same period.

Impaired driving includes instances where the driver of a motor vehicle was using alcohol and/or drugs, including illicit, prescribed, or over-the-counter drugs. It should be noted that Proposition 64, effective in 2016, legalized recreational marijuana consumption in California and the effects of this change will be monitored in data in future years.

Data Source: SWITRS, 2008 to 2017 as of July 2019

Number and Percent of Fatalities



12,929 Fatalities Involved Impaired Driving

19,540 Fatalities Involved Other Factors

Number and Percent of Serious Injuries

28,817 Serious Injuries Involved Impaired Driving

87,019 Serious Injuries Involved Other Factors

IMPAIRED DRIVING

Males in their 20s and 30s are most likely to have been drinking and/or using drugs when involved in an impaired driving-related crash. Impairment crashes occur on the state highway system at approximately the same rate as fatal and serious crashes in general. Saturdays and Sundays had higher rates of impairment-related crashes, as did the hours between 7 p.m. and 4 a.m. with the peak time around 2 a.m.

In addition to other factors, crashes involving impaired driving elevate the risk of lane departure crashes. Given that impaired driving was a factor in approximately 26% of fatal and serious injury crashes, impaired driving was over-represented in three types of crashes.

44% of fixed object crashes involve impaired driving

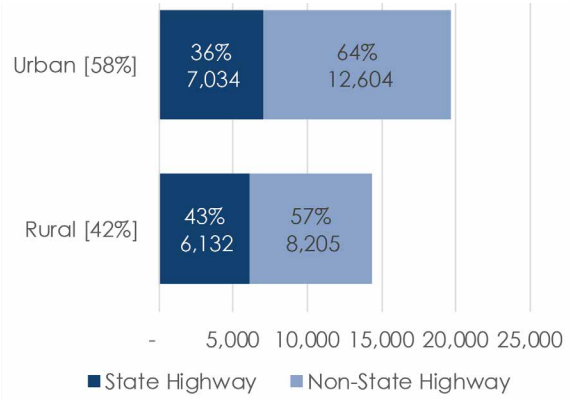
34% of head-on crashes involve impaired driving

29% of overturn crashes involve impaired driving

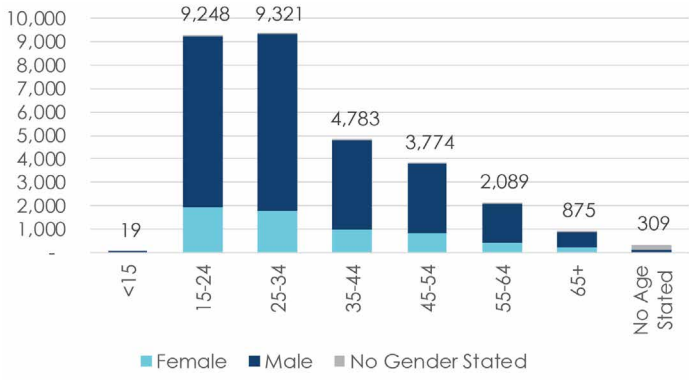
These crash types often occur at higher speeds and therefore, often lead to more serious injuries and fatalities.

Photo courtesy of: CHP

Fatal and Serious Injury Crashes by Roadway Ownership and Location - Impaired Driving (2008 to 2017)



At Fault Party Age and Gender - Impaired Driving Fatal and Serious Injury Crashes (2008 to 2017)

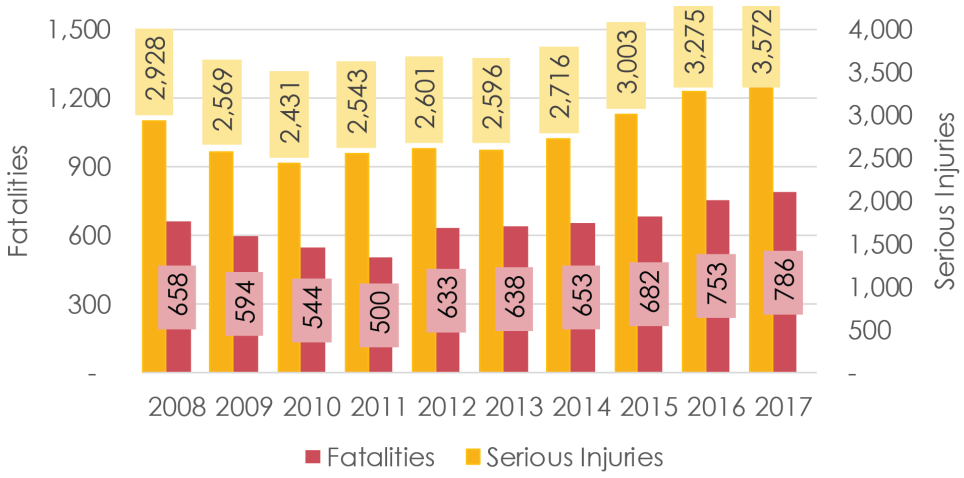


The information provided on these fact sheets are intended to highlight factors that may influence selection of appropriate countermeasures and actions to address crashes related to this Challenge Area.

Data Source: SWITRS, 2008 to 2017 as of July 2019

INTERSECTIONS

Fatalities and Serious Injuries by Year - Intersections



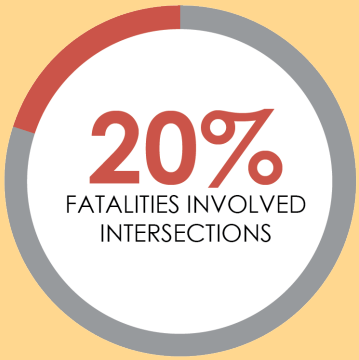
Note: The graph above has two different vertical scales

The Intersections Challenge Area includes crashes identified by the responding officer as occuring at an intersection or involving a train or rail vehicle. The previous SHSP included a challenge area that included crashes at intersections, interchanges, and other roadway access; this challenge area only includes intersections.

Between 2008 and 2017, 30,639 fatal or serious injury crashes occurred at intersections. These crashes resulted in 6,441 fatalities and 28,234 serious injuries. Crashes related to intersections represent 24% of fatal or serious injury crashes, 20% of all traffic fatalities, and 24% of all serious injuries over the same period.

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. Crashes can occur when drivers do not comply with traffic control rules. Since 2010, the number of fatal and serious injury crashes at intersections has been increasing each year. 2017 had more fatal and serious injury crashes than any other year in the ten-year study period.

Number and Percent of Fatalities



6,441 Fatalities Involved Intersections

26,028 Fatalities Involved Other Factors

Number and Percent of Serious Injuries

28,234 Serious Injuries Involved Intersections

87,602 Serious Injuries Involved Other Factors

INTERSECTIONS

Crashes involving intersections primarily occur on urban roads, where intersections are more frequent.

24% of all fatal and serious injury crashes where an at fault party was determined occur at an intersection. However, that percentage increases to 45% for female drivers over the age of 75 and 35% for male drivers over the age of 75.

Using the Federal Railroad Administration database for rail crashes between 2013 and 2017, a total of 533 fatalities and injuries were reported and the following trends were identified:

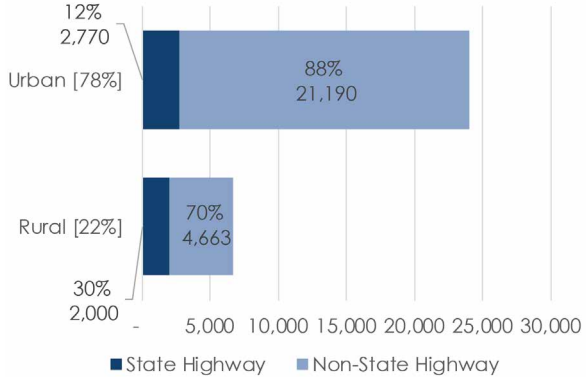
79% of crashes involved a rail equipment striking a road user

70% of crashes included the road user moving over the crossing

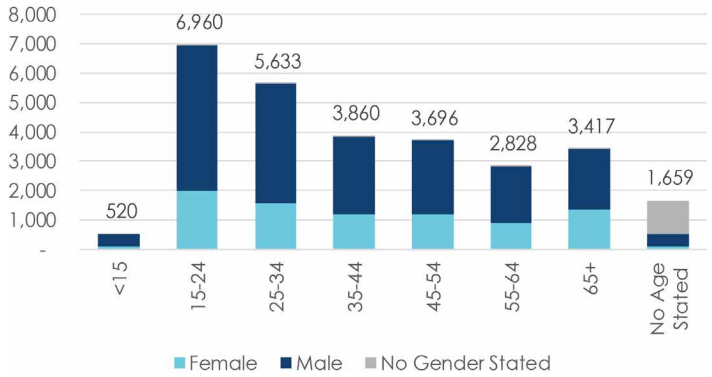
21% of crashes involved a pedestrian

Photo courtesy of: Kimley-Horn

Fatal and Serious Injury Crashes By Roadway Ownership and Location - Intersections (2008 to 2017)



At Fault Party Age and Gender - Intersections Fatal and Serious Injury Crashes (2008 to 2017)

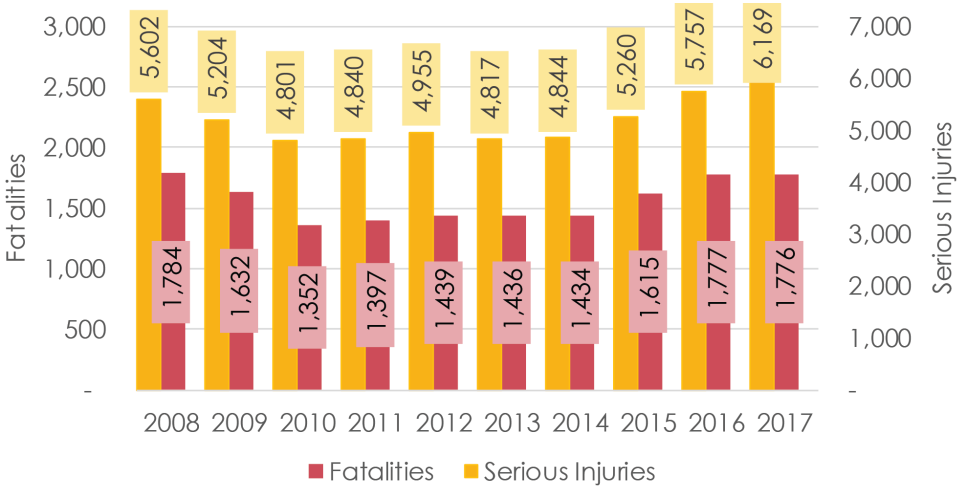


The information provided on these fact sheets are intended to highlight factors that may influence selection of appropriate countermeasures and actions to address crashes related to this Challenge Area. Additional information on rail crashes is provided in Appendix B.

Data Source: SWITRS, 2008 to 2017 as of July 2019

LANE DEPARTURES

Fatalities and Serious Injuries by Year - Lane Departures

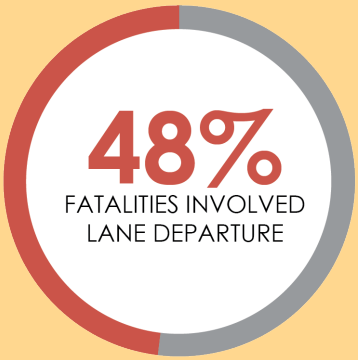


Note: The graph above has two different vertical scales

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. The previous SHSP had a Roadway Departure and Head-On Crashes Challenge Area; this challenge area has been expanded to also include hit object and overturned crashes.

Between 2008 and 2017, 56,633 fatal or serious injury crashes involved a motor vehicle that departed from its lane in California. These crashes resulted in 15,642 fatalities and 52,249 serious injuries. Crashes related to lane departures crashes represent 44% of fatal or serious injury crashes, 48% of all traffic fatalities, and 45% of all serious injuries over the same period.

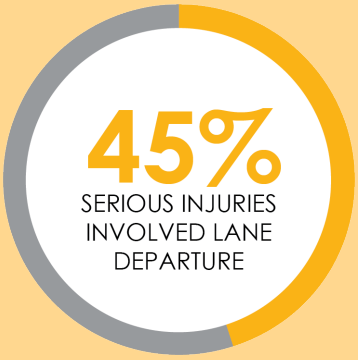
Number and Percent of Fatalities



15,642 Fatalities Involved Lane Departure

16,827 Fatalities Involved Other Factors

Number and Percent of Serious Injuries



52,249 Serious Injuries Involved Lane Departure

63,587 Serious Injuries Involved Other Factors

LANE DEPARTURES

The two most frequent primary crash factors in this Challenge Area are improper turning (31%) and under the influence of alcohol or drug (29%).

Given that lane departures were a factor in approximately 44% of all fatal and serious injury crashes, lane departures are over-represented in crashes with the following three primary crash factors:

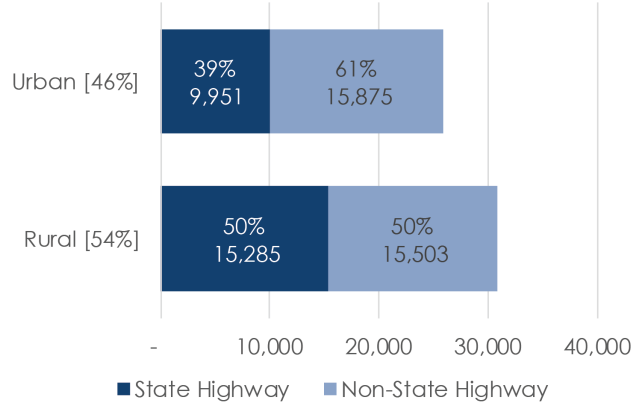
75% of crashes where the primary crash factor was improper turning

71% of crashes where the primary crash factor was wrong side of road

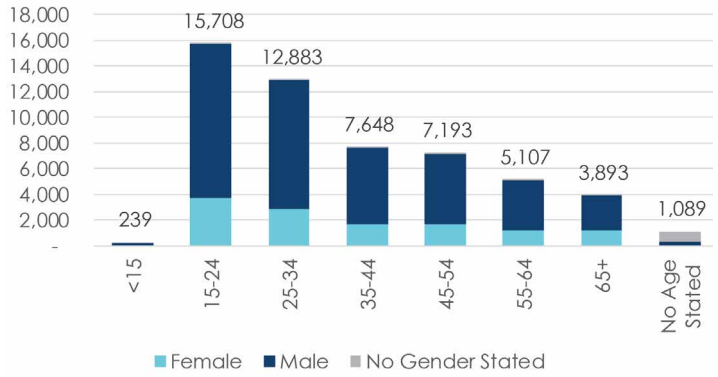
68% of crashes where the primary crash factor was under the influence of alcohol or drug

Photo courtesy of: Caltrans

Fatal and Serious Injury Crashes by Roadway Ownership and Location - Lane Departures (2008 to 2017)



At Fault Party Age and Gender - Lane Departures Fatal and Serious Injury Crashes (2008 to 2017)

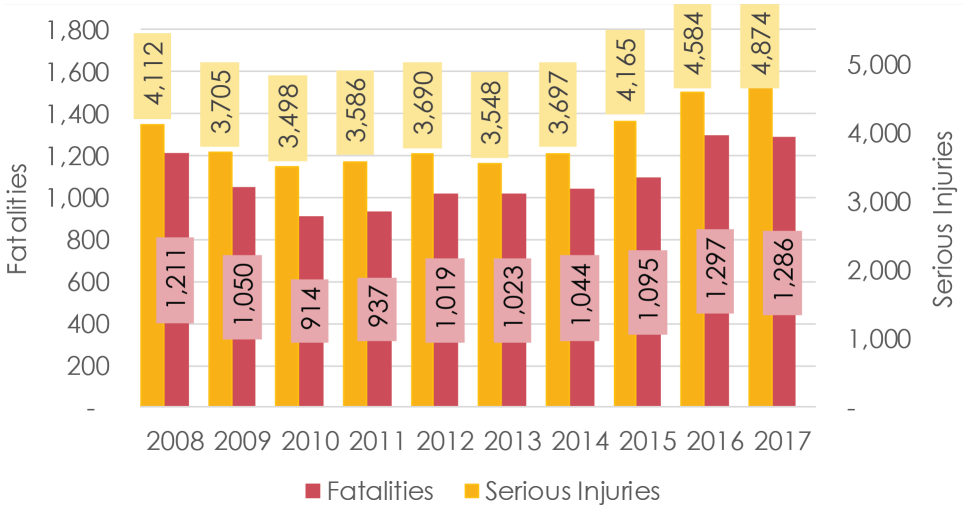


The information provided on these fact sheets are intended to highlight factors that may influence selection of appropriate countermeasures and actions to address crashes related to this Challenge Area.

Data Source: SWITRS, 2008 to 2017 as of July 2019

SPEED MANAGEMENT/ AGGRESSIVE DRIVING

Fatalities and Serious Injuries by Year - Aggressive Driving



Note: The graph above has two different vertical scales

The Aggressive Driving Challenge Area includes several behaviors including driving too fast, tailgating, and other reckless driving maneuvers as determined by the officer on scene. The data definition for this challenge area has been expanded from the previous SHSP to include crashes where drivers run traffic signals and signs, and where any of the before mentioned attributes are present even if they are not the primary crash factor.

Between 2008 and 2017, 43,079 fatal or serious injury crashes involved aggressive driving in California. These crashes resulted in 10,876 fatalities and 39,459 serious injuries. Crashes related to aggressive driving represent 33% of fatal or serious injury crashes, 33% of all traffic fatalities, and 34% of all serious injuries over the same period.

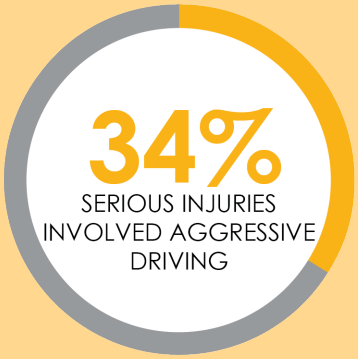
Fatalities and serious injuries caused by aggressive driving have been increasing since 2010, with the number of serious injury crashes increasing at an even greater pace than the number of fatal crashes.

Number and Percent of Fatalities

10,876 Fatalities Involved Aggressive Driving

21,593 Fatalities Involved Other Factors

Number and Percent of Serious Injuries



39,459 Serious Injuries Involved Aggressive Driving

76,377 Serious Injuries Involved Other Factors

SPEED MANAGEMENT/AGGRESSIVE DRIVING

2/3 of crashes involving aggressive driving occur on urban roads.

Males were more likely to be at fault in aggressive driving-related crashes regardless of age.

Unsafe speed was indicated as the primary aggressive driving behavior in over 54% of the fatal and serious injury crashes. Nearly 75% of fatal and serious injury rear-end crashes were associated with aggressive driving. Overturns and fixed object crashes were often associated with aggressive driving. Aggressive driving also increases the likelihood of a fatality for broadside, sideswipe, and hit object crashes.

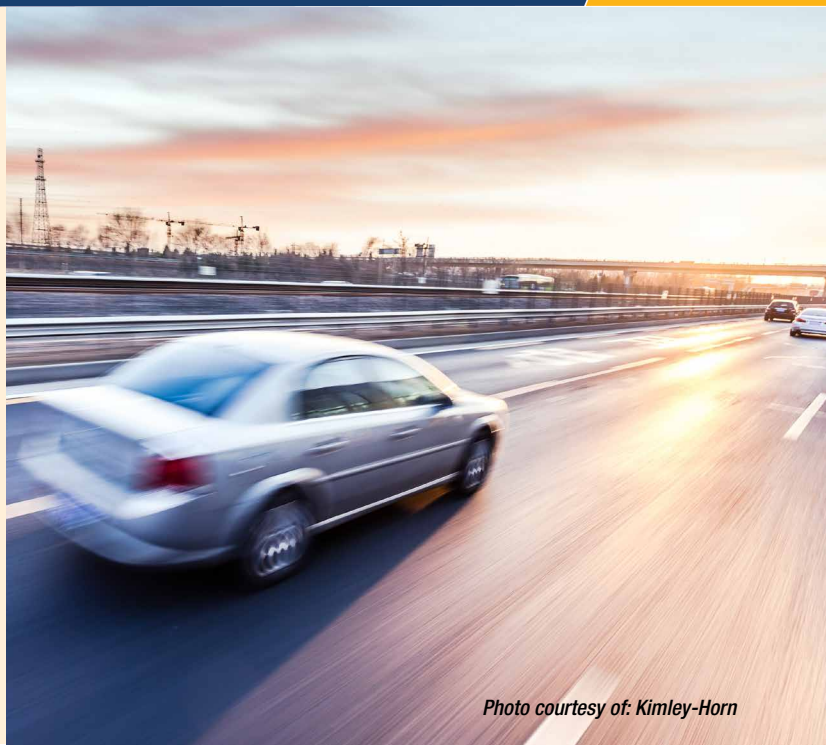
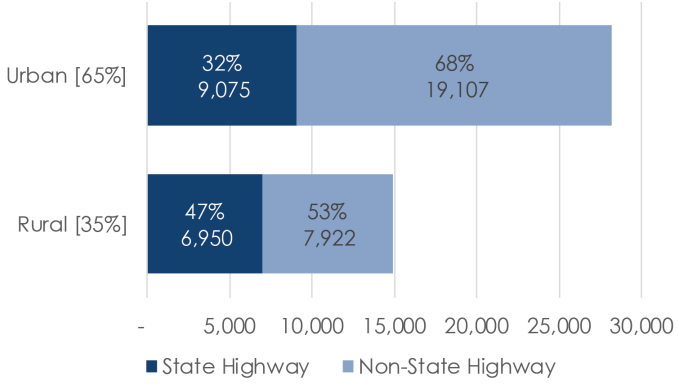
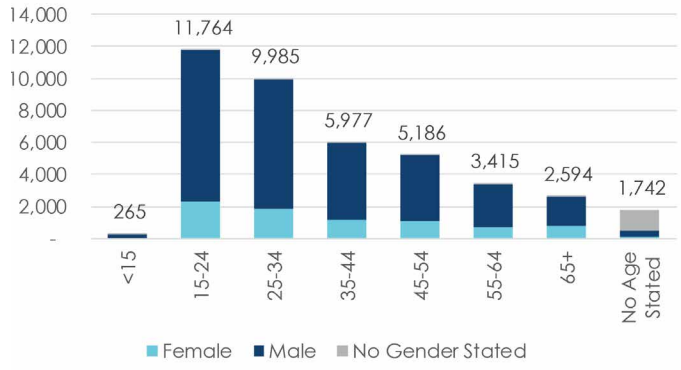


Photo courtesy of: Kimley-Horn

Fatal and Serious Injury Crashes by Roadway Ownership and Location - Aggressive Driving (2008 to 2017)



At Fault Party Age and Gender - Aggressive Driving Fatal and Serious Injury Crashes (2008 to 2017)

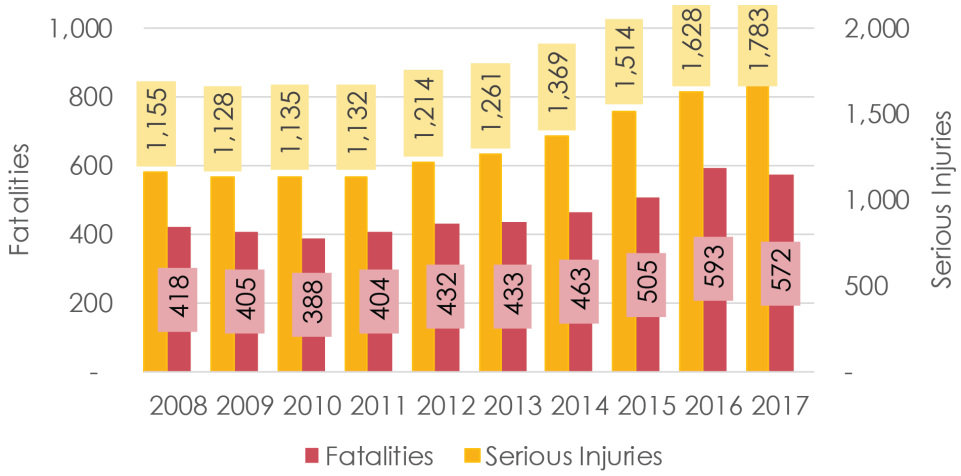


The information provided on these fact sheets are intended to highlight factors that may influence selection of appropriate countermeasures and actions to address crashes related to this Challenge Area.

Data Source: SWITRS, 2008 to 2017 as of July 2019

AGING DRIVERS

Fatalities and Serious Injuries by Year - Aging Drivers



Note: The graph above has two different vertical scales

The Aging Drivers Challenge Area includes instances where the driver of a motor vehicle is 65 years or older. The previous SHSP included a challenge area with all aging road users; however, this Challenge Area has been narrowed down to specifically look at crashes involving aging drivers.

Between 2008 and 2017, 15,468 fatal or serious injury crashes involved an aging driver in California. These crashes resulted in 4,613 fatalities and 13,319 serious injuries. Crashes related to aging drivers represent 12% of fatal or serious injury crashes, 14% of all traffic fatalities, and 11% of all serious injuries over the same period.

The number of licensed drivers 65 years or older in California has increased from 12.5% of the total licensed drivers in 2008 to 16% in 2017. As drivers age and gain experience, they are also less often found at fault in crashes. However, after the age of 65, this trend reverses and older drivers are more often found at fault. By the age of 75, the proportion of at fault crashes returns to a level similar to when drivers are 25.

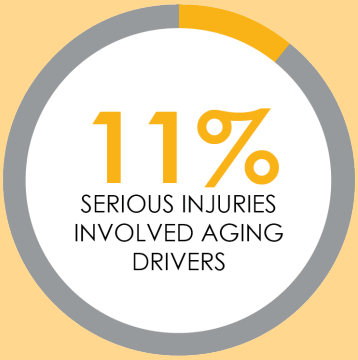
Aging drivers also have increased vulnerability resulting in a higher likelihood of injury in a crash.[1]

Number and Percent of Fatalities

4,613 Fatalities Involved Aging Drivers

27,856 Fatalities Involved Other Factors

Number and Percent of Serious Injuries



13,319 Serious Injuries Involved Aging Drivers

102,517 Serious Injuries Involved Other Factors

1. Frailty in Older People. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4098658/ (accessed September 2019)

AGING DRIVERS

Crashes involving aging drivers more frequently occur on urban roads.

The two most frequent primary crash factors for this challenge area are violating automobile right of way (18%) and improper turning (17%).

Given that aging drivers were involved in approximately 12% of all fatal and serious injury crashes, three crash types were over-represented:

18% of broadside crashes involve aging drivers

17% of head-on crashes involve aging drivers

15% of rear end crashes involve aging drivers

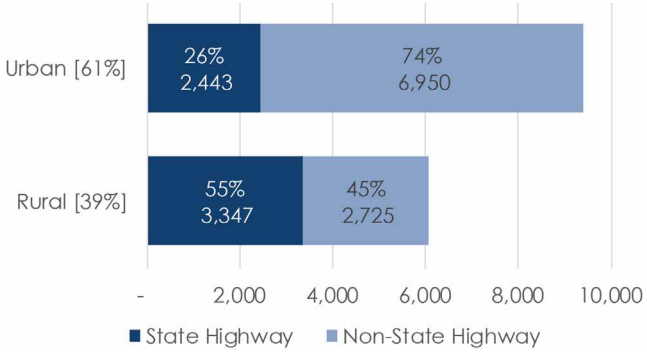
Photo courtesy of: Kimley-Horn

Comparison of Average Older Drivers and Pedestrians Fatality Rate (per 100M population)

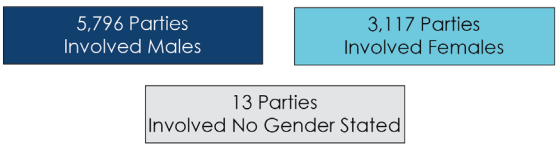
2010-2014 Average	2012-2016 Average	Difference
12.7	12.8	0.1

The fatality rates of older drivers and pedestrians are a special consideration required by federal regulations. California experienced an increase in 0.1 of fatality rates of older drivers and pedestrians from 2010 through 2016. The California 2020–2024 SHSP incorporates Aging Drivers and Pedestrians as designated Challenge Areas with specific actions that address the increase in Older Driver and Pedestrian fatalities and serious injuries.

Fatal and Serious Injury Crashes by Roadway Ownership and Location - Aging Drivers (2008 to 2017)



At Fault Party Gender - Aging Drivers Fatal and Serious Injury Crashes (2008 to 2017)

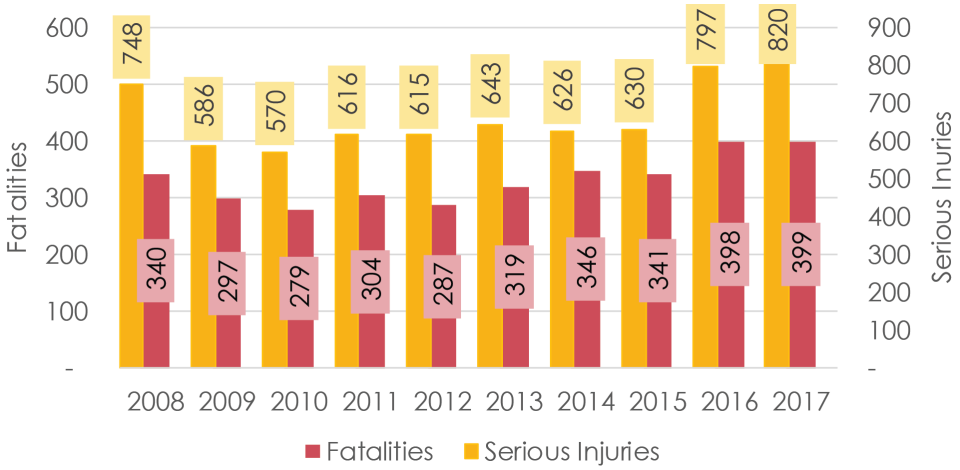


The information provided on these fact sheets are intended to highlight factors that may influence selection of appropriate countermeasures and actions to address crashes related to this Challenge Area.

Data Source: SWITRS, 2008 to 2017 as of July 2019

COMMERCIAL VEHICLES

Fatalities and Serious Injuries by Year - Commercial Vehicles



Note: The graph above has two different vertical scales

The Commercial Vehicles Challenge Area includes instances where the crash involves a truck, truck tractor, school bus or other bus.

Between 2008 and 2017, 8,266 fatal or serious injury crashes involved a commercial vehicle in California. These crashes resulted in 3,310 fatalities and 6,651 serious injuries. Crashes related to commercial vehicles represent 6% of fatal or serious injury crashes, 10% of all traffic fatalities, and 6% of all serious injuries over the same period.

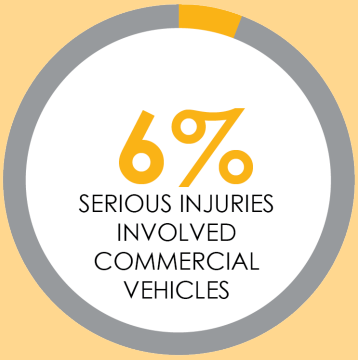
California has a significant number of commercial vehicles that transport goods from marine ports and Mexico. Many crashes involving commercial vehicles are caused by passenger vehicles not accounting for the time and ability that a commercial vehicle has to slow down or speed up. Due to the size of trucks and buses, the severity of a commercial vehicle crash is often substantial.

Number and Percent of Fatalities

3,310 Fatalities Involved Commercial Vehicles

29,159 Fatalities Involved Other Factors

Number and Percent of Serious Injuries



6,651 Fatalities Involved Commercial Vehicles

109,185 Fatalities Involved Other Factors

COMMERCIAL VEHICLES

The two most frequent primary crash factors in this Challenge Area are improper turning (18%) and unsafe speed (26%).

Given that commercial vehicles were a factor in approximately 6% of all fatal and serious injury crashes, three primary crash factors were over-represented:

23% of crashes where the primary crash factor was Other Equipment

15% of crashes where the primary crash factor was Brakes

15% of crashes where the primary crash factor was Hazardous Parking

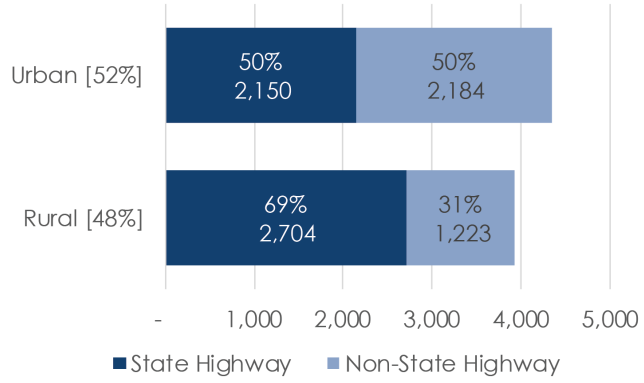
Two crash types were also over-represented:

17% of rear end crashes involved commercial vehicles

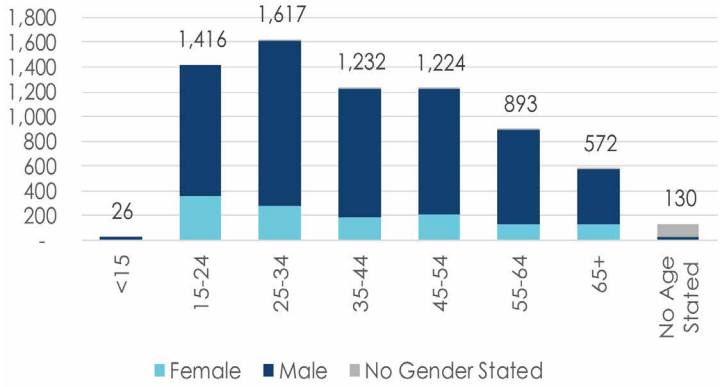
13% of sideswipe crashes involved commercial vehicles

Photo courtesy of: Kimley-Horn

Fatal and Serious Injury Crashes by Roadway Ownership and Location - Commercial Vehicles (2008 to 2017)



At Fault Party Age and Gender - Commercial Vehicles Fatal and Serious Injury Crashes (2008 to 2017)

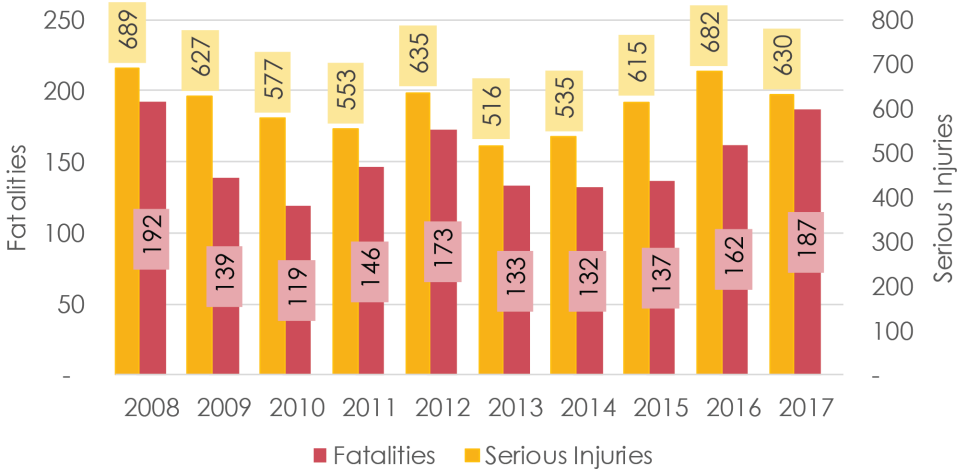


The information provided on these fact sheets are intended to highlight factors that may influence selection of appropriate countermeasures and actions to address crashes related to this Challenge Area.

Data Source: SWITRS, 2008 to 2017 as of July 2019

DISTRACTED DRIVING

Fatalities and Serious Injuries by Year - Distracted Driving



Note: The graph above has two different vertical scales

The Distracted Driving Challenge Area includes instances where the driver of a motor vehicle was not paying attention or using an electronic device.

Between 2008 and 2017, 6,681 fatal or serious injury crashes officially involved a distracted driver in California. These crashes resulted in 1,520 fatalities and 6,059 serious injuries. Crashes related to distracted driving represent 5% of fatal or serious injury crashes, 5% of all traffic fatalities and 5% of all serious injuries over the same period.

It is generally believed that distracted driving crashes are significantly underreported in the data due to the difficulty of an officer being able to determine if a driver was distracted when they arrive on scene after a crash.

Number and Percent of Fatalities

1,520 Fatalities Involved Distracted Driving

30,949 Fatalities Involved Other Factors

Number and Percent of Serious Injuries

6,059 Serious Injuries Involved Distracted Driving

109,777 Serious Injuries Involved Other Factors

DISTRACTED DRIVING

Crashes involving distracted driving are most common on urban roads.

In addition to other factors, crashes involving distracted driving often include unsafe speed, improper turning or not reacting or stopping in time. Given that distracted driving was a factor in approximately 5% of all crashes, distracted driving was over-represented in the following two crash types:

8% of rear-end crashes involved distracted driving. This over-representation is also a factor in crashes with the primary crash factor of following too closely

8% of vehicle/pedestrian crashes involved distracted driving. This over representation can also be seen in crashes with the primary crash factor of violating pedestrian right-of-way

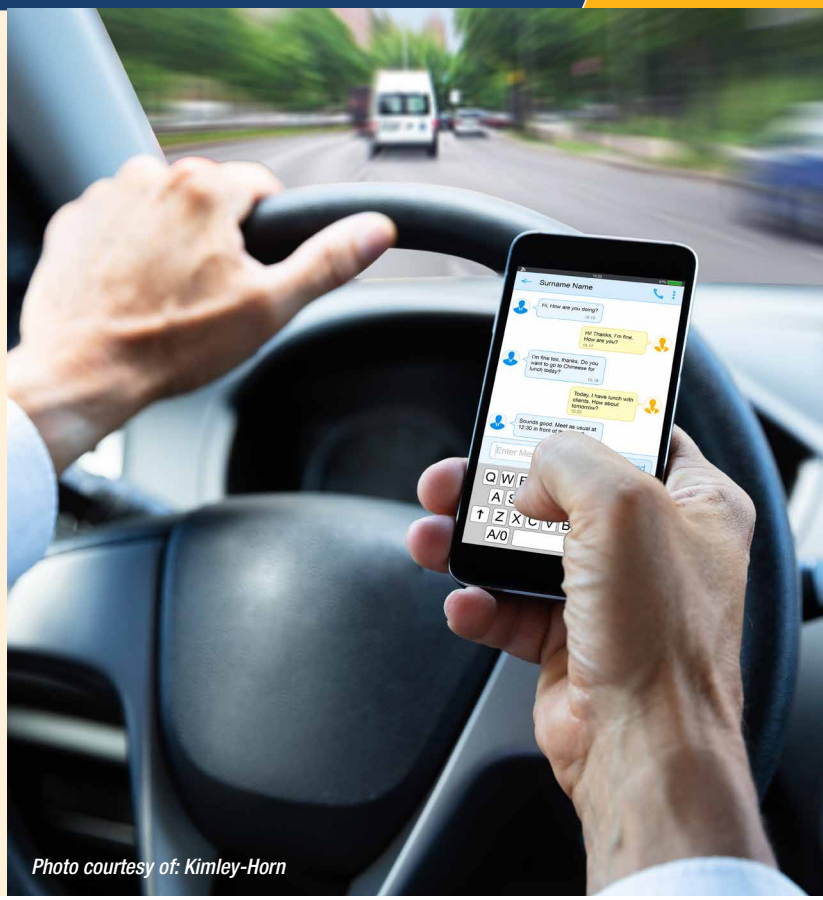
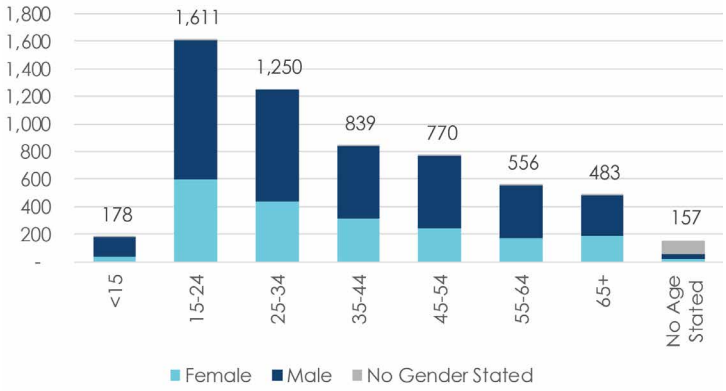


Photo courtesy of: Kimley-Horn

Fatal and Serious Injury Crashes by Roadway Ownership and Location - Distracted Driving (2008 to 2017)

At Fault Party Age and Gender - Distracted Driving Fatal and Serious Injury Crashes (2008 to 2017)

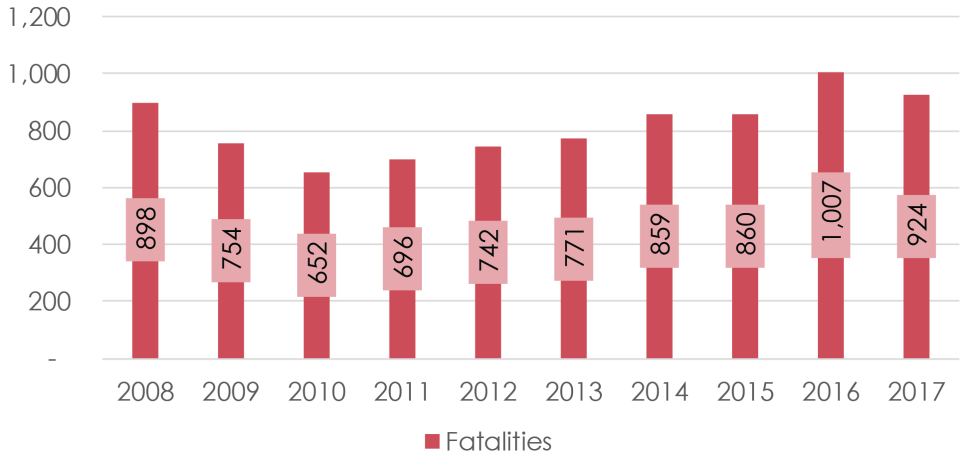


The information provided on these fact sheets are intended to highlight factors that may influence selection of appropriate countermeasures and actions to address crashes related to this Challenge Area.

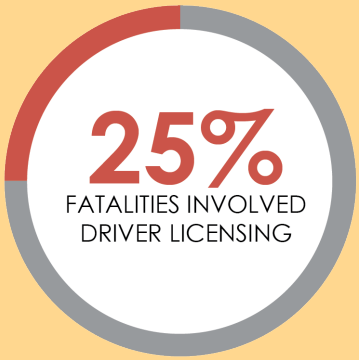
Data Source: SWITRS, 2008 to 2017 as of July 2019

DRIVER LICENSING

Fatalities by Year - Driver Licensing



Number and Percent of Fatalities



8,163 Fatalities Involved Driver Licensing

24,306 Fatalities Involved Other Factors

The Driver Licensing Challenge Area includes instances where an involved driver is unlicensed or does not carry a valid license for the vehicle that they are operating. This information on driver licensing is only currently available through the FARS data; therefore, the data being reported for this challenge area only pertains to fatalities.

Between 2008 and 2017, 7,254 fatal crashes involved an unlicensed or improperly licensed driver in California, resulting in 8,163 fatalities. Unlicensed driver-related crashes represent 25% of fatal crashes and 25% of all traffic fatalities over the same period.

Revoking a license does not restrict drivers from getting behind the wheel. The data shows that people are continuing to drive after their privileges have been suspended or revoked, and driver licensing remains an issue associated with fatalities on California roadways.

Number and Percent of Fatal Crashes

7,254 Fatal Crashes Involved Driver Licensing

22,256 Fatal Crashes Involved Other Factors

DRIVER LICENSING

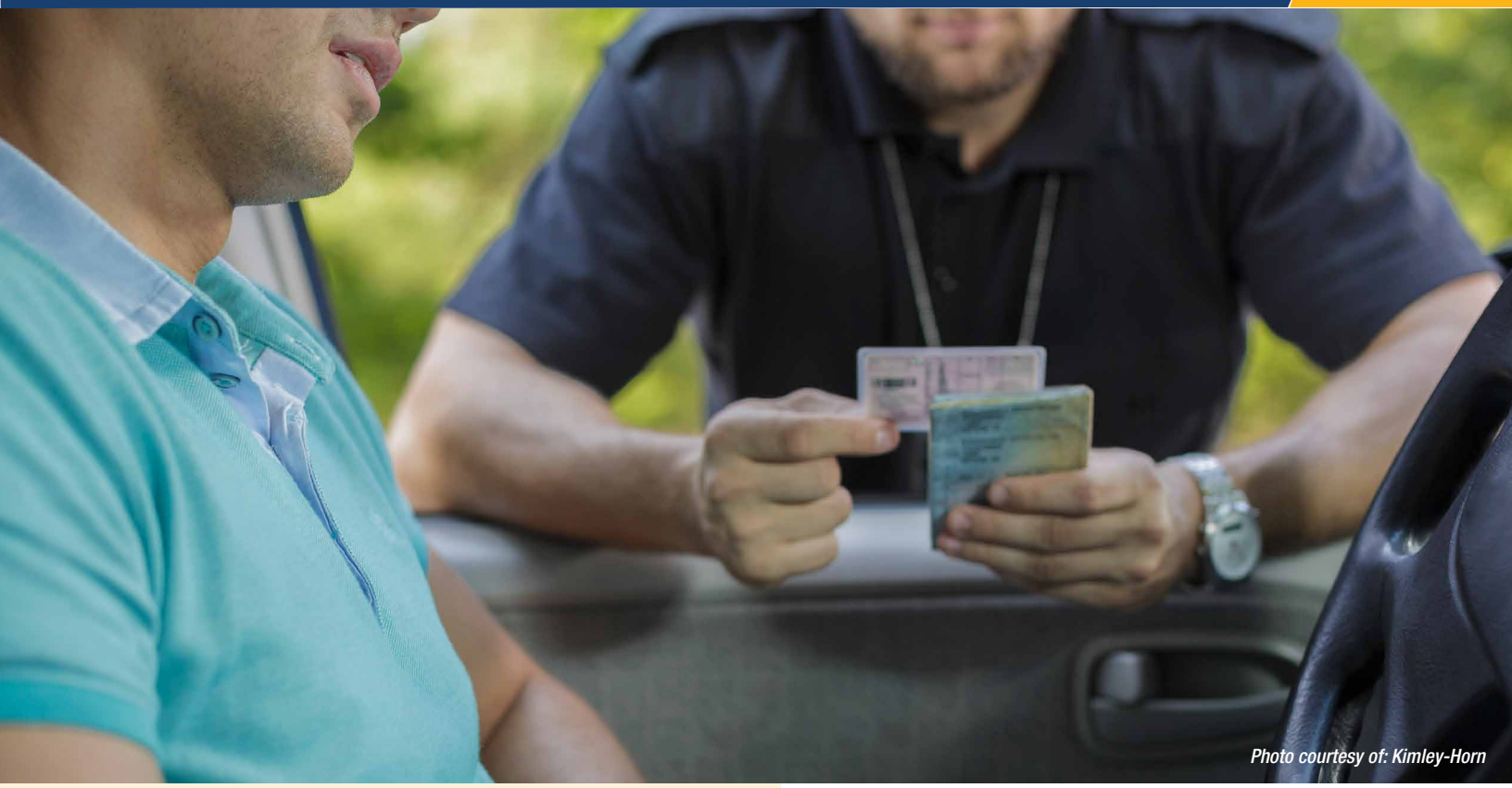
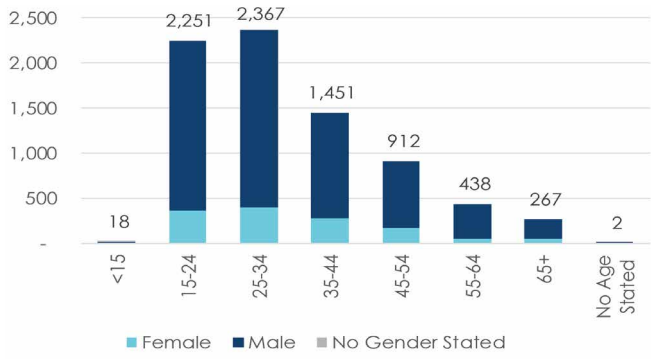


Photo courtesy of: Kimley-Horn

1/2 of the unlicensed drivers involved in fatal crashes are males between 15 and 34 years old.

Unlicensed Drivers Involved in Fatal Crashes by Age and Gender (2008 to 2017)



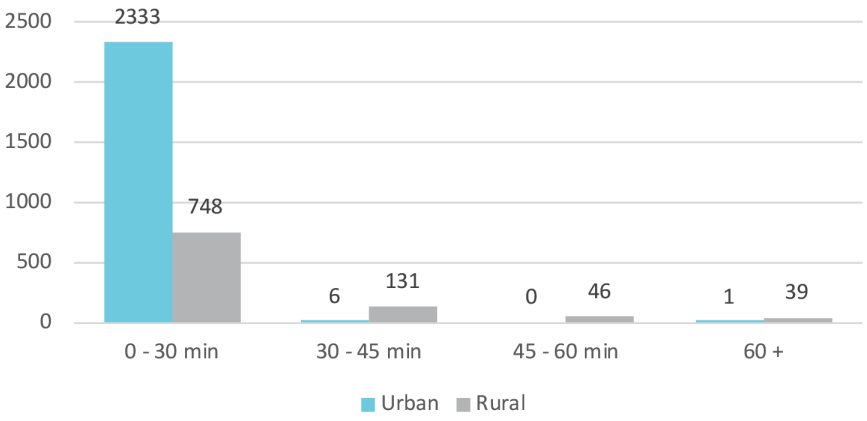
The information provided on these fact sheets are intended to highlight factors that may influence selection of appropriate countermeasures and actions to address crashes related to this Challenge Area.

Data Source: FARS, 2008 to 2017 as of July 2019

EMERGENCY RESPONSE

The Emergency Response Challenge Area focuses on post-crash efforts to reduce fatalities and serious injuries. Emergency Response is critical to reduce the severity of injuries sustained from crashes through high quality medical care at the scene and during transport to a trauma center. Several components make up Emergency Response including detection of a crash site, collection of crash details pertaining to severity and injuries, dispatching the right responders, pre-arrival instructions, determining the fastest path for responders to access the crash, and the safe and rapid transportation of patients to appropriate trauma centers.

Fatal Crash Drive Time to Nearest Hospital (2017)

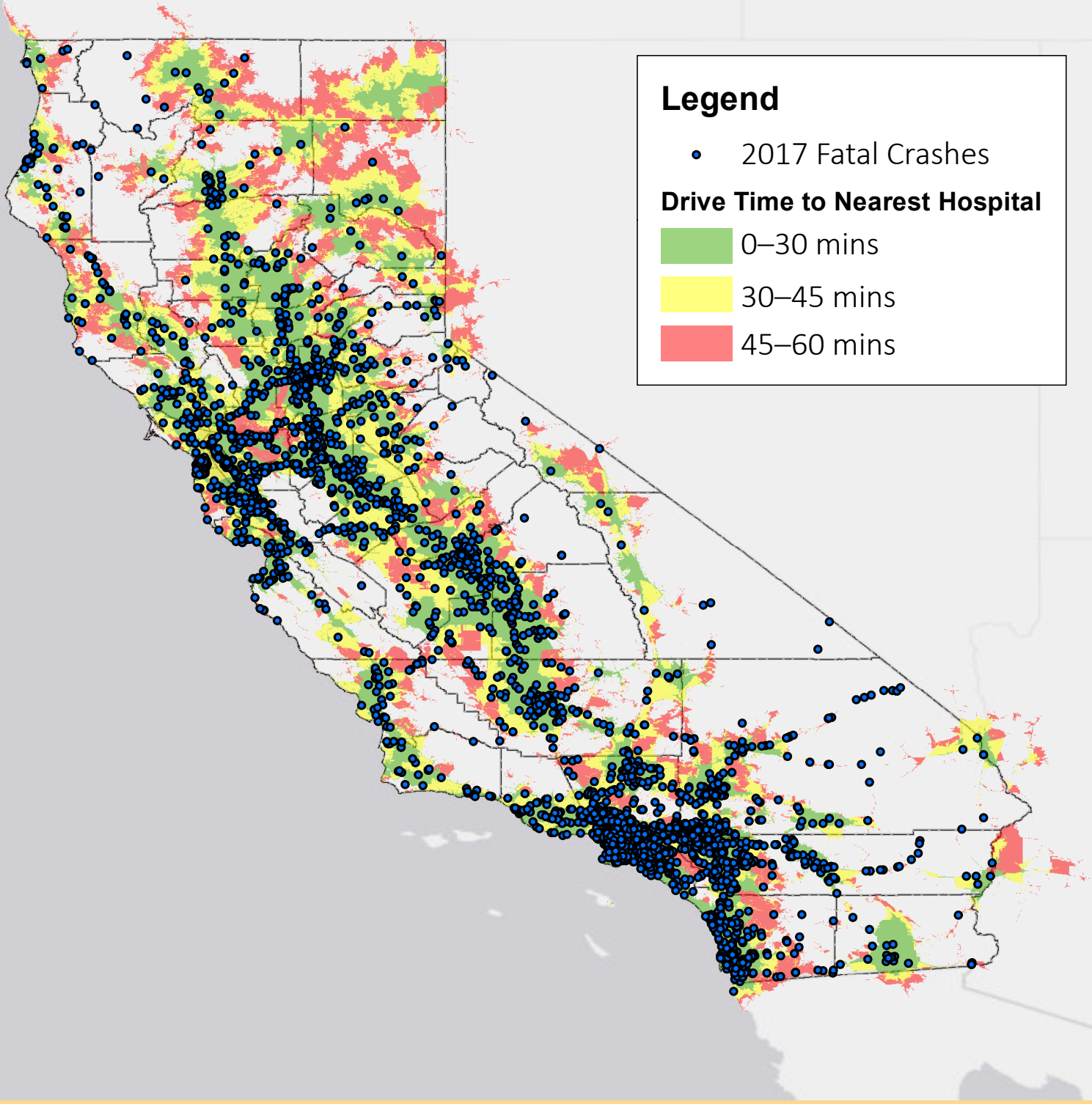


The proximity of a trauma center to a crash is imperative to quickly getting seriously injured patients care to increase their survival rate. The graphic on the following page shows the location of fatal crashes in 2017 and their proximity to hospitals in terms of drive time. The roadway network was analyzed to determine the 30-minute, 45-minute and 60-minute drive time service areas around each hospital. In towns that neighbor other states, the nearest hospital may not be in California.

The chart to the left summarizes the drive time between the 2017 fatal crash sites and the hospital, separated by rural and urban crashes. Out of the 2,340 urban fatal crashes in 2017, 99.7% were less than 30 minutes away from the nearest hospital. Out of the 964 rural fatal crashes in 2017, 77.6% were less than 30 minutes away from the nearest hospital.


Photo courtesy of: Kimley-Horn

EMERGENCY RESPONSE



While the data provided focuses on how fast responders are able to get victims to a trauma center for care, there are many important efforts between the time a crash occurs and the time a victim is being transported that may make the difference in someone's life after the crash.

Data Source: FARS, 2017

EMERGING TECHNOLOGIES

The Emerging Technologies Challenge Area focuses on use of technology to prevent, identify, and respond to crashes. It includes exploring technology advancements that are new or underutilized and that can potentially reduce the frequency and severity of crashes. It is inclusive of autonomous and connected vehicles as well as advancements to safety devices in vehicles, improvements to emergency response, and any technologies helping the 5 Es, including the use of a Transportation Network Company (TNCs) for cars, bike or scooters.

Advancements to vehicle technology include functions already on the market like automatic emergency braking, lane keeping assist, and self-leveling headlights reduce potential roadway conflicts. Positive impacts to reduce frequency and/or severity of crashes can be seen with even a small population of advanced technology equipped vehicles. However, with technology advancing at such an increased pace, it will take time to ensure that these technologies are reliable and incorporated into every vehicle on the roadway.

According to NHTSA's Toward Zero Deaths, A National Strategy on Highway Safety[1], it can take as long as 30 years for a new feature to be incorporated into the entire vehicle fleet. An example of this is that forward crash warning systems existed as early as the late 1950's. Due to manufacturing costs, it has only been during the last ten years that the technology has become implementable on a market-wide scale.[2]

Technology has also been rapidly incorporated to support roadway operability in a variety of ways, including emergency response and traffic management. Future vehicle-to-vehicle and vehicle-to-infrastructure communication will connect all roadway users with an intent to eliminate human error and crashes.

Beyond vehicle and roadway advancements, technology is being applied to other areas such as emergency response and mobile applications. Emergency response is exploring the use of drones and roadway video to better understand details of crashes when they occur to send appropriate care as efficiently as possible. This helps maximize resources and improve care at the crash. Many emerging software technologies have come in the form of mobile applications. These mobile applications are used to support TNCs which provide rideshare, bike share or scooter rental services. Safety implications for TNCs include the potential reduction of impaired driving crashes. According to the National Association of Counties[3], several county sheriffs have partnered with TNCs during major holidays to reduce impaired drivers on the road.

On the following page, emerging technologies have been summarized into six general categories that capture the general application of technology to transportation safety. Each category includes an example of a technology that could be used to help achieve California's goal of Zero Fatalities and Serious Injuries.

1. OrCAD Cadence PCB Solutions "How Do Crash Avoidance systems work?" https://www.orcad.com/cn/node/6581 (accessed July 2019)
2. American Association of State Highway and Transportation Officials. Toward Zero Deaths: A National Strategy on Highway Safety. June 2014. Page 30. https://www.towardzerodeaths.org/.

3. National Association of Counties. Preparing Counties for the Future of Transportation: A Spotlight on Transportation Network Companies. 2017. https://www.naco.org/sites/default/files/documents/Shared%20Economies_1pgr_07.06.17_v6.pdf

Photo courtesy of: Federal Highway Administration

Photo courtesy of: Caltrans

Photo courtesy of: Caltrans

ALERTING DRIVERS AT RISK

Technology can alert drivers at risk, can reduce the risk by monitoring speed or blinds spots, and alert drivers to the situation with a visual or audible alert so that drivers can act accordingly.

ASSISTING DRIVERS AT RISK

Technology can assist a driver at risk when a crash is imminent. An example of this is lane keeping assist, which helps drivers stay in the designated lane by alerting them through a visual, audible, or tactile warning when they begin to depart from the lane.

PROTECTING VEHICLE OCCUPANTS

As discussed in the Occupant Protection Challenge Area, seatbelts are an important factor in injury severity and fatality during crashes. Vehicle manufacturers are continually improving safety features like seatbelts, airbags, and vehicle structural features.

COMMUNICATING WITH DRIVERS AND THE ENVIRONMENT

Communication between drivers and their environment is a support to alerting drivers to risk and then assisting them. This can fall in several categories, Vehicle-to-Vehicle (V2V) such a blind spot detection, Vehicle-to-Infrastructure (V2I) such as a roadway conditions warning alerting drivers to a crash ahead, and Vehicle-to-Pedestrian (V2P) such as a forward crash warning alerting a driver to a pedestrian in the crosswalk ahead.

VEHICLE PERFORMING AS DESIGNED

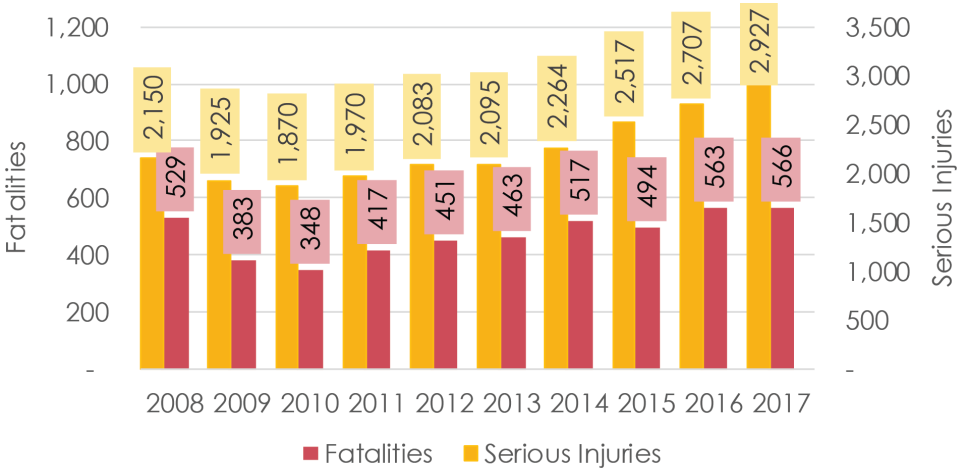
It is important that once vehicles enter the roadway they perform as designed for their full lifespan. This can be done through vehicle upkeep, maintenance and vehicle record keeping. A supporting technology for vehicle upkeep is many cars have an oil change indicator light, which alerts drivers to a potential need to do an oil change after so many miles.

MOBILE TECHNOLOGY AND APPLICATIONS

There are many mobile technologies that are being developed and refined that can support the SHSP goal. Examples include driving apps which restrict texting and mobile application use may reduce distracted driving and TNC applications may reduce the number of impaired drivers on the road.

MOTORCYCLISTS

Fatalities and Serious Injuries by Year - Motorcyclists



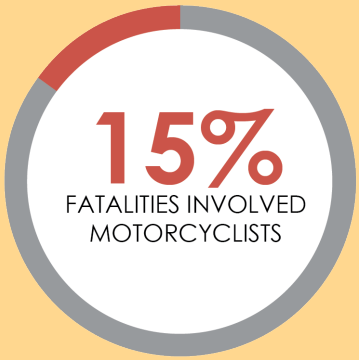
Note: The graph above has two different vertical scales

The Motorcyclists Challenge Area includes instances where a motorcycle or moped is involved in a crash.

Between 2008 and 2017, 26,962 crashes involved a fatally or seriously injured motorcyclist in California. These crashes resulted in 4,731 motorcyclist fatalities and 22,508 motorcyclist serious injuries. Crashes involving motorcycles represent 21% of fatal or serious injury crashes, 15% of all traffic fatalities, and 19% of all serious injuries over the same period.

Unlike passenger vehicle occupants, motorcyclists have little protection in a crash beyond riders that wear helmets. In California, motorcyclists are required by law to wear a helmet. Ninety-three percent of motorcycle drivers that were fatally or seriously injured used a helmet, whereas 88% of motorcycle passengers that were fatally or seriously injured used a helmet.

Number and Percent of Fatalities



4,731 Fatalities Involved Motorcyclists

27,738 Fatalities Involved Other Factors

Number and Percent of Serious Injuries

22,508 Serious Injuries Involved Motorcyclists

93,328 Serious Injuries Involved Other Factors

MOTORCYCLISTS

The two most frequent primary crash factors in this Challenge Area are unsafe speed (30%) and improper turning (18%). Given that motorcyclists were involved in approximately 21% of fatal and serious injury crashes, five primary crash factors were over-represented:

- **45%** of crashes where the primary crash factor was Following Too Closely
- **42%** of crashes where the primary crash factor was Improper Passing
- **41%** of crashes where the primary crash factor was Unsafe Lane Change
- **37%** of crashes where the primary crash factor was Automobile Right of Way
- **35%** of crashes where the primary crash factor was Unsafe Speed

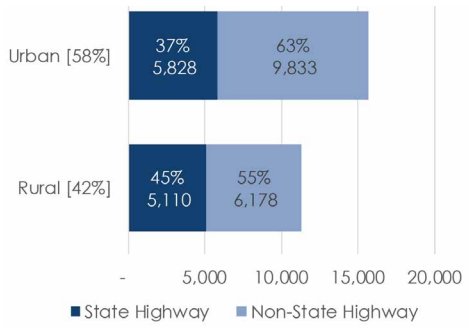
Four crash types were also over-represented:

- **45%** of overturned crashes involved motorcyclists
- **36%** of sideswipe crashes involved motorcyclists
- **27%** of broadside crashes involved motorcyclists
- **26%** of rear-end crashes involved motorcyclists

The weather in California is often warm and dry which lends itself to be a popular state for owning and driving motorcycles.

Photo courtesy of: Kimley-Horn

Fatal and Serious Injury Crashes by Roadway Ownership and Location - Motorcyclists (2008 to 2017)



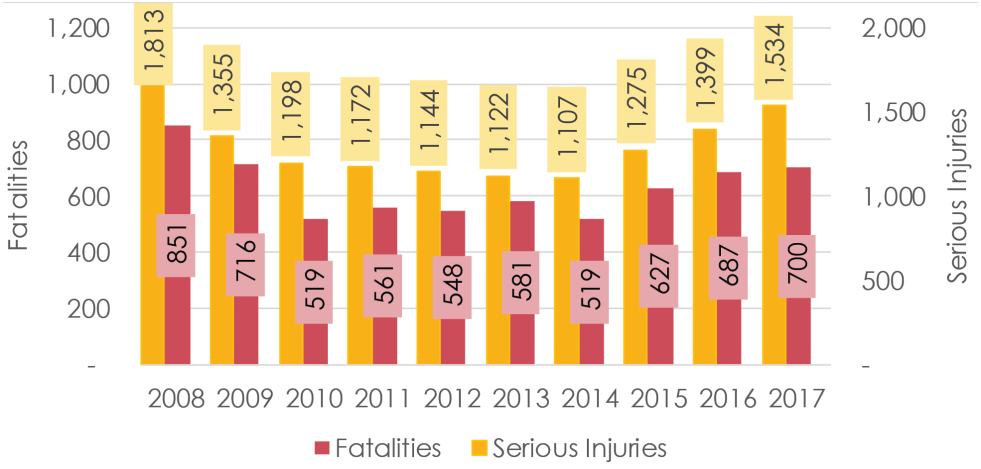
Victim Age and Gender - Fatally and Seriously Injured Motorcyclists (2008 to 2017)

The information provided on these fact sheets are intended to highlight factors that may influence selection of appropriate countermeasures and actions to address crashes related to this Challenge Area.

Data Source: SWITRS, 2008 to 2017 as of July 2019

OCCUPANT PROTECTION

Fatalities and Serious Injuries by Year - Occupant Protection



Note: The graph above has two different vertical scales

The Occupant Protection Challenge Area includes crashes involving misuse, non-use, or lack of vehicle safety equipment including lap belts, shoulder harnesses, passive restraints, or child restraints.

Between 2008 and 2017, 19,217 fatal or serious injury crashes involved an occupant that was improperly restrained in California. These crashes resulted in 6,309 improperly restrained occupant fatalities and 13,119 improperly restrained occupant serious injuries. Crashes related to occupant protection represent 15% of fatal and serious injury crashes, 19% of all traffic fatalities and 11% of all serious injuries over the same period.

Number and Percent of Fatalities

6,309 Fatalities Involved Occupant Protection

26,160 Fatalities Involved Other Factors

Number and Percent of Serious Injuries

13,119 Fatalities Involved Occupant Protection

102,717 Fatalities Involved Other Factors

OCCUPANT PROTECTION

Males age 15–24 encompass the largest proportion of fatal or seriously injured victims that did not properly use vehicle safety equipment. Out of all fatally or seriously injured victims, 13% did not properly use vehicle safety equipment.

Passenger ejections in serious injury crashes are most common for passengers in the front seating position of a vehicle, followed by the driver.

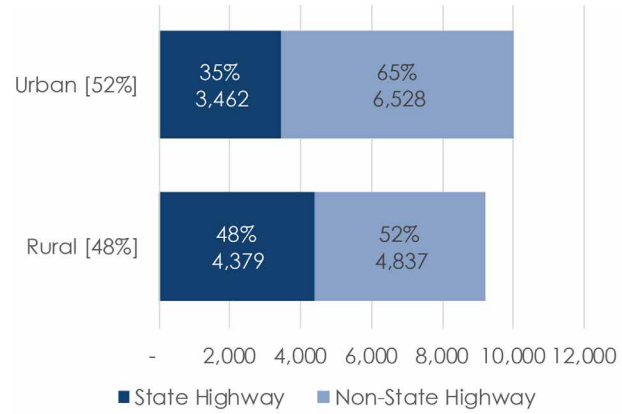
Being under the influence of alcohol or drugs (35%) and improper turning (24%) are the most common crash factors associated with all crashes related to occupant protection.

Given that improper occupant protection was a factor in approximately 15% of all fatal and serious injury crashes, the following crash factors were over-represented:

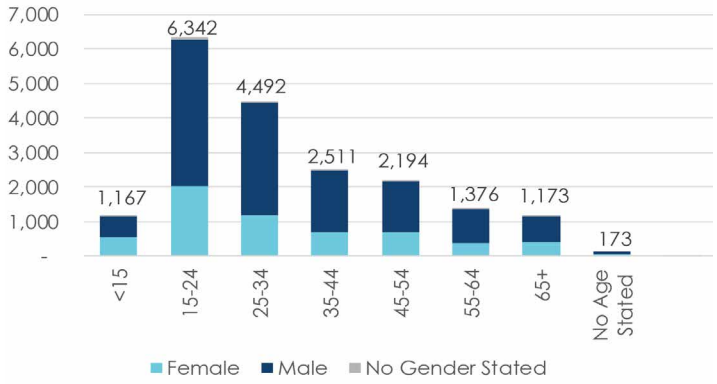
28% of crashes where the primary crash factor was Under the Influence of Alcohol or Drug

20% of crashes where the primary crash factor was Improper Turning

Fatal and Serious Injury Crashes by Roadway Ownership and Location - Occupant Protection



Victim Age and Gender - Fatally and Seriously Injured Occupant Protection (2008 to 2017)

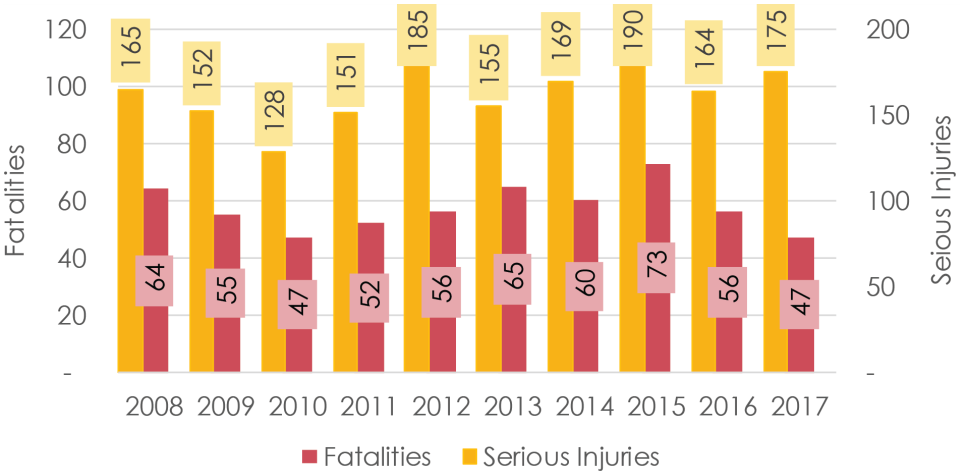


The information provided on these fact sheets are intended to highlight factors that may influence of appropriate countermeasures and actions to address crashes related to this Challenge Area.

Data Source: SWITRS, 2008 to 2017 as of July 2019

WORK ZONES

Fatalities and Serious Injuries by Year - Work Zones



Note: The graph above has two different vertical scales

The Work Zones Challenge Area includes instances where the crash occurs in a work zone for construction, maintenance and/or roadway repairs.

Between 2008 and 2017, 1,893 fatal or serious injury crashes occurred in a work zone in California. These crashes resulted in 575 fatalities and 1,634 serious injuries. Work zone crashes represent 1.5% of fatal or serious injury crashes, 1.8% of all traffic fatalities, and 1.4% of all serious injuries over the same period.

Some work zones may not disrupt traffic flow while others require lane closures and detours. Work zones vary in length from a few hours to multiple years. They often include people and moving equipment that are separated from adjacent travel lanes by a form of delineation, either cones or vertical barriers, depending on the speed and volume of traffic and duration and type of the work zone. Some drivers don't slow their vehicles enough for the alignment changes and congestion often associated with a work zone.

Number and Percent of Fatalities

575 Fatalities Involved Work Zones

31,894 Fatalities Involved Other Factors

Number and Percent of Serious Injuries

1,634 Serious Injuries Involved Work Zones

114,202 Serious Injuries Involved Other Factors

WORK ZONES

Crashes involving work zones occur more frequently on state highway roads.

Given that work zones were a factor in approximately 1.5% of all fatal and serious injury crashes, work zones were over-represented with the following two crash types:

3.8% of rear end crashes occurred in work zones

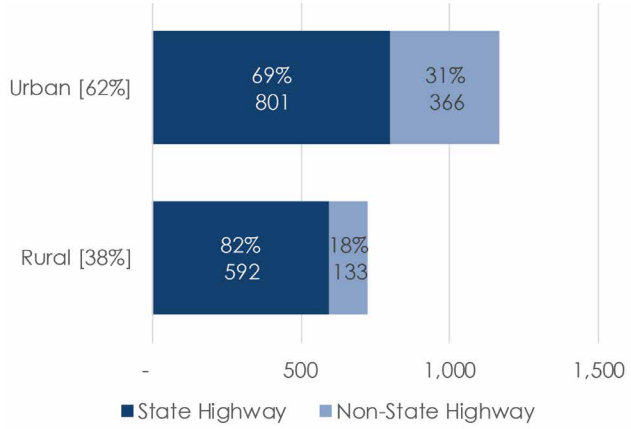
2.1% of sideswipe crashes occurred in work zones

22% of work zone crashes occur in the dark without street lighting, 6 percentage points higher than the proportion of all fatal and serious injury crashes occurring in the dark without street lighting.

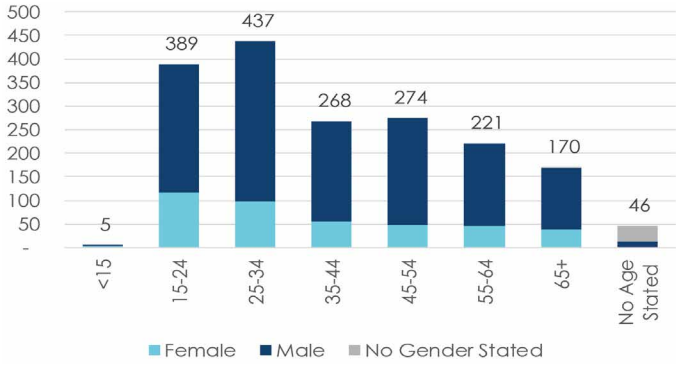
24.2% of the fatal crashes and 14.2% of the serious injury crashes in work zones involved a commercial vehicle.

Photo courtesy of: Kimley-Horn

Fatal and Serious Injury Crashes by Roadway Ownership and Location - Work Zones (2008 to 2017)



At Fault Party Age and Gender - Work Zones Fatal and Serious Injury Crashes (2008 to 2017)

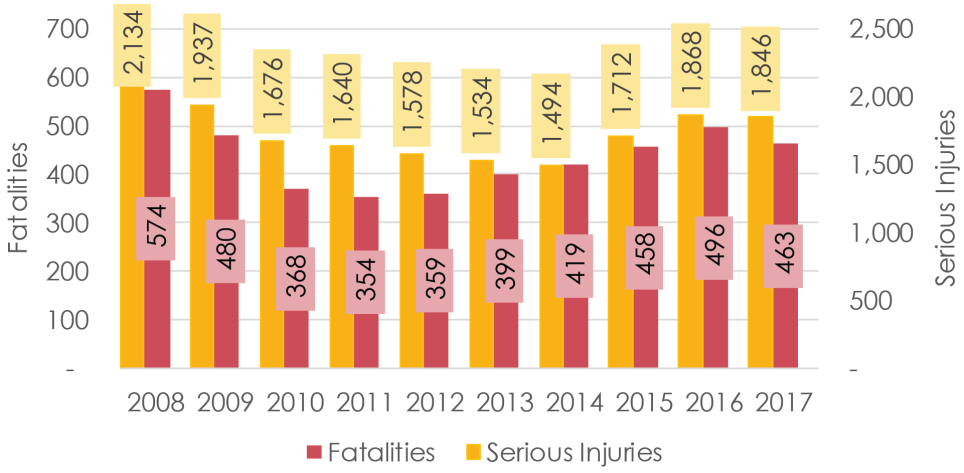


The information provided on these fact sheets are intended to highlight factors that may influence selection of appropriate countermeasures and actions to address crashes related to this Challenge Area.

Data Source: SWITRS, 2008 to 2017 as of July 2019

YOUNG DRIVERS

Fatalities and Serious Injuries by Year - Young Drivers



Note: The graph above has two different vertical scales

The Young Drivers Challenge Area includes instances where one or more of the drivers of the motor vehicles are between 15 and 20 years old.

Between 2008 and 2017, 17,655 fatal or serious injury crashes involved a young driver in California. These crashes resulted in 4,370 fatalities and 17,419 serious injuries. Crashes involving young drivers represent 14% of fatal or serious injury crashes, 13% of all traffic fatalities, and 15% of all serious injuries over the same period.

The trends have shown that fatalities involving young drivers have been increasing since 2011, whereas serious injuries have been increasing since 2014. From 2016 to 2017, both fatalities and serious injuries involving young drivers have declined.

Number and Percent of Fatalities

4,370 Fatalities Involved Young Drivers

28,099 Fatalities Involved Other Factors

Number and Percent of Serious Injuries

17,419 Serious Injuries Involved Young Drivers

98,417 Serious Injuries Involved Other Factors

YOUNG DRIVERS

Crashes involving young drivers occur more frequently in urban areas and on non-state highways.

The two most frequent primary crash factors for this challenge area are improper turning (19%) and unsafe speed (20%).

Given that young drivers were involved in approximately 14% of fatal and serious injury crashes, two primary crash factors were over-represented:

19% of crashes where the primary crash factor was Automobile Right of Way

17% of crashes where the primary crash factor was a violation of Traffic Signals and Signs

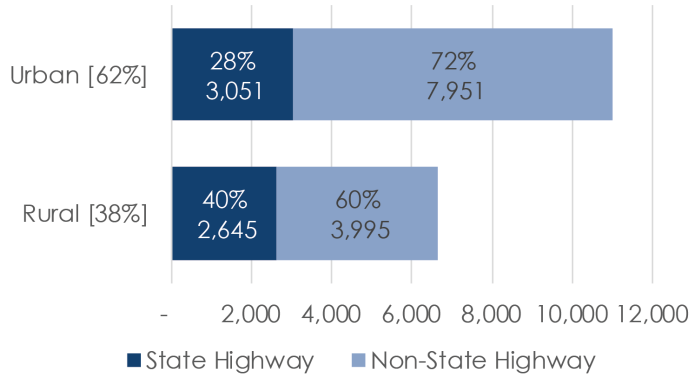
Two crash types were also over-represented:

18% of head-on crashes involved young drivers

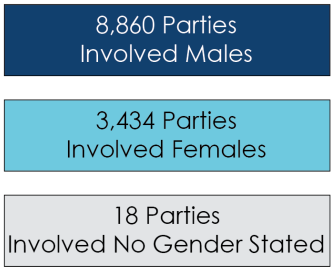
18% of broadside crashes involved young drivers

Photo courtesy of: Kimley-Horn

Fatal and Serious Injury Crashes by Roadway Ownership and Location - Young Drivers (2008 to 2017)



At Fault Party Gender - Young Drivers Fatal and Serious Injury Crashes (2008 to 2017)



The information provided on these fact sheets are intended to highlight factors that may influence selection of appropriate countermeasures and actions to address crashes related to this Challenge Area.

Data Source: SWITRS, 2008 to 2017 as of July 2019

STRATEGIES

Using a data-driven approach to identifying key factors for traffic fatalities and serious injuries in California, the SHSP will implement actions that support the Guiding Principles, the 5 Es, and the SMART guidelines as applicable under the 16 Challenge Areas.

5 Es

As applied to the 16 Challenge Areas, the prevention of fatalities and serious injuries will occur through the implementation of actions supporting the following five overarching strategies:

1. Education: Educate all road users on safe behaviors
2. Enforcement: Enforce actions that reduce high-risk behaviors
3. Engineering: Apply effective and/or innovative countermeasures
4. Emergency Response: Improve emergency response times and actions
5. Emerging Technologies: Apply emerging technologies to roadway, vehicle, and user

Photo courtesy of: Caltrans

SHSP Action Guidelines

Strategic actions for each Challenge Area will be included in the California 2020–2024 SHSP Implementation Plan and will be updated as needed through the life of this SHSP. All actions should be "SMART", as defined below:

- **S**pecific – clear action item description
  - » Actions should align with Integrate Equity and at least one of the Guiding Principles, and be specific about what will be accomplished.
- **M**easurable – identified performance measures
  - » Actions should have clear and present measures to indicate progress and completion.
- **A**chievable – committed resources by responsible organization
  - » Actions should have resource needs clearly defined. Potential obstacles will be tracked to identify the process and document endorsement by those responsible for implementation.
- **R**elevant – statewide significance and data-driven issue and countermeasure
  - » Actions should document effectiveness in reducing fatalities and serious injuries or justify an innovative approach by identifying statewide or Challenge Area relevance.
- **T**ime Constrained – achievable within SHSP time frame
  - » While most actions will be completed within the five-year lifespan of the SHSP, some bold innovative ideas may extend beyond the 2020–2024 SHSP timeframe. Where this is the case, the action will identify interim progress points to be achieved during the 2020–2024 period.

Data-Driven Strategic Approach

Focused on the most critical needs, use a data-driven approach to guide the development of new SHSP strategies and actions and support the continuance of existing safety programs.

IMPLEMENTATION

California has adopted a two-plan approach to implementing statewide traffic safety strategies:

I. This SHSP document contains the Vision, Mission, and Goal which will remain static throughout the life of the plan. ***Note: Although the original intent was for this document to remain static, outstanding circumstances have led to it being updated to reflect changes in priority and intent.***

II. The SHSP Implementation Plan includes the specific actions that need to be taken in each challenge area to achieve the Vision, Mission, Goal, and objective for reductions in fatalities and serious injuries, and to support the four Guiding Principles. The Implementation Plan is a living document that can be modified through the life of the 2020–2024 SHSP.

> Communicate with implementers regularly on SHSP efforts and data trends to facilitate partnering and promote effective countermeasures.

Development of the 2020–2024 SHSP improved the understanding of California's safety issues and focused on the steps needed to reduce traffic fatalities and serious injuries. The updated SHSP and the accompanying Implementation Plan provide a roadmap for effective implementation of the SHSP Vision, Mission, and Goal. The Steering Committee and Challenge Area Teams will continue to evaluate the safety data and manage the development of performance measures, strategies, and actions for each area.

Executive Leadership and Steering Committees

As the SHSP is implemented by the Challenge Area Teams and other key safety stakeholders, the Executive Leadership and Steering Committees will oversee the following actions:

- Track implementation progress in each of the Challenge Area
- Evaluate the effectiveness of the overall plan by reviewing data on an annual basis
- Provide input on key issues, data gaps, and action development for High Priority Areas
- Assess the action's ability to incorporate the Guiding Principles
- Identify barriers or problems to implementation and potential actions to mitigate them
- Publicize updates on SHSP-related campaigns, initiatives, training, and programs
- Provide input on anticipated effectiveness of future programs and activities and
- Determine the approach to future SHSP updates

The Steering Committee will meet on a regular basis throughout the implementation phase to provide policy direction and direct assistance to the Challenge Area Teams and to any regional or local efforts, as appropriate.

Challenge Area Teams

Challenge Area Teams, under the direction of the Team Co-Leads, will meet at least quarterly to perform the following tasks:

- Discuss action item implementation progress and coordinate next steps
- Identify problems or barriers and report to the Steering Committee
- Suggest new actions or modify existing actions as needed
- Continually track data and report progress and
- Evaluate the effectiveness of strategies and actions to ensure they are contributing to decreases in fatalities and serious injuries and are incorporating the Guiding Principles

High Priority Areas will report to the Steering Committee quarterly to discuss the above items while Focus Areas will report semi-annually.

Traffic Safety Culture

Dramatic reductions in traffic fatalities and injury are unlikely to occur unless safety on our roads is highly valued and consciously addressed. Public education and awareness of the risks involved in everyday travel is critical to achieving the goal of the SHSP. Improving the behavior and safety performance of all road users is key to improving the traffic safety culture and these improvements are driven by the determined efforts of a variety of California safety stakeholders. Many of these stakeholders are actively doing their part through the engagement of Californians in traffic safety-related campaign messaging. These efforts take many forms: physical roadway signs, social media, and television and radio advertisements being the most utilized. These messages inform about the dangers of poor driving choices or increased enforcement, as well as educating the public about the tragic after effects of crashes when they do occur.

Building on efforts led by agencies and organizations representing all 5 Es to increase California's commitment to improving road safety, all road users must increase their individual awareness of how their actions may impact their own lives and lives of others to further improve traffic safety on California roadways.

Examples of current traffic safety messaging employed by California safety stakeholders are provided on the following page. Continuing and expanding on these and similar messaging campaigns is supported by the SHSP to increase commitment to and actions on behalf of traffic safety in California, which are key to reach Zero Fatalities and Serious Injuries.

Inclusive of all traffic safety initiatives supporting the goal of eliminating fatalities and serious injuries on California's public roads

The following are examples of traffic safety messaging employed by California safety stakeholders.

EVALUATION

Ongoing evaluation is critical to understanding what is working and worthy of investment, and what is less effective and a candidate for revision or discontinuation. In this way, California will ensure its resources are focused on the strategies and actions that will generate the best results.

As part of the SHSP efforts, California will annually review process and performance. The process evaluation will examine roles, responsibilities, and actions of the SHSP stakeholders as well as opportunities to optimize the data collection and management process to ensure decisions are being made with adequate data and resources. On the performance side, data will be reviewed annually to see if it tracks with the annual HSIP and HSP performance targets. Data for each challenge area will be compiled annually and compared with previous years' data to assess trends and inform the public and decision makers.

In addition to the annual reviews of SHSP process and performance, a detailed mid-term SHSP project performance evaluation will be prepared to ensure that progress is being made. This evaluation will include input from safety stakeholders and will review potential amendments to the Implementation Plan.

Ensuring each of the strategies and actions in the SHSP are data-driven and evidence-based will be a critical factor in the success of this plan. Regular evaluations of both SHSP process and performance will be an important measure of the progress toward the SHSP's goal and vision.

Updated versions of statewide safety plans such as the HSIP, HSP, and CVSP will be reviewed for alignment with the SHSP when plans become available. Steering Committee members will receive status updates on the key aspects of these documents, as well as an assessment of the inclusion of SHSP elements in the plans of these important safety partners.

Finally, the SHSP will be due for an update in 2025. The strong foundation of in-depth annual evaluations, in addition to the even more robust mid-term evaluation, will set the stage for the next SHSP update with years of stakeholder input and information about the latest data trends to effectively shape its development.

Photo Courtesy of Caltrans

CONCLUSION: THE GOAL IS ZERO FATALITIES AND SERIOUS INJURIES

California's update of its Strategic Highway Safety Plan is the first step in re-energizing a process of improving safety on all public roadways. This SHSP document is the product of a nine-month effort by the SHSP Executive Leadership, Steering Committee, and a committed group of traffic safety partners to develop a road map to direct the safety efforts of all stakeholders in California. The complimentary Implementation Plan document details the actions being taken to move California towards the Vision, Mission, and Goal outlined in this strategic plan.

This SHSP is data-driven and includes input from more than 300 representatives of federal, state, local, and tribal governments, as well as advocacy and private organizations representing California's 5 Es. With Zero Fatalities and Serious Injuries as its stated goal, this SHSP will guide the implementation of strategies targeting identified challenge areas and will build upon prior investments using evidence-based countermeasures deployed at high-priority locations. The specific actions undertaken by each of the Challenge Area Teams will be documented in the Implementation Plan and will be reviewed and updated over the course of the next four years to ensure that appropriate actions are being taken to move California towards its Vision, Mission, and Goal.

Since the preparation of California's last safety Plan in 2015, much has been accomplished. While it is important to mark the accomplishments realized by California safety stakeholders thus far, the work is far from finished. Next steps include working closely with all traffic safety partners to redouble their efforts, enhance existing policies, and expand safety practices that will lead to zero fatalities and serious injuries for California. Sixteen Challenge Area Teams are charged with implementing and tracking progress on SHSP priorities, representing a variety of interests and expertise at federal, state, regional, local, tribal, and advocacy organizations. Focusing on proven approaches and activities, Challenge Area Teams can make all the difference and lead in the efforts to strategically drive down fatalities and serious injuries.

As we continue to work together, engage new partners, and follow through with implementing this SHSP, we can lessen the tragic impact of California crashes and drive roadway fatalities and serious injuries toward the SHSP vision of Safe Public Roads Across California.

Together we can make the difference.

The SHSP reflects partnerships and investments in California's commitment to reducing traffic fatalities and serious injuries. Together as organizations, groups, and individuals, we all share the common goal of getting home safe each and every day. Whatever mode you use or road you take, be a part of California Safe Roads.

APPENDIX A – DATA DEFINITION SUMMARY

2020–2024 SHSP Challenge Area Queries

Data Disclaimers

1. SWITRS data used in this report was extracted in July 2019 and 2017 data was considered final at that time
2. FARS data used in this report was extracted in July 2019 and 2017 data was not considered final at that time
3. Information on crashes involving bicyclists or pedestrians that do not include a motor vehicle is not included in the data queries used in the SHSP but is documented separately by the California Department of Public Health
4. To replicate the SHSP queries, data cleansing of the raw SWITRS and FARS files is necessary to modify and join respective data files to make a completed — Crash, Victim, and Party — database.

Fatal Injury

A fatal injury is any injury that results in death within 30 days after the motor vehicle crash in which the injury occurred. This definition is consistent with the definition in the Model Minimum Uniform Crash Criteria used by both FARS and SWITRS.

Serious Injury

A serious injury is any injury other than fatal which results in one or more of the following as a result of the motor vehicle crash:

- Severe laceration resulting in exposure of underlying tissues/muscle/organs or resulting in significant loss of blood
- Broken or distorted extremity (arm or leg)
- Crush injuries
- Paralysis
- Suspected skull, chest or abdominal injury other than bruises or minor lacerations
- Significant burns (second and third degree burns over 10% or more of the body)
- Unconsciousness when taken from the crash scene

This definition is consistent with the definition in the Model Minimum Uniform Crash Criteria used by both FARS and SWITRS.

Urban Areas

For the purpose of this report, Urban has been defined as incorporated areas with a population of 2,500 or more, based off of the Population codes provided in the SWITRS data. This definition is consistent with US Census Bureau for Urban areas and a slight deviation from FHWA's Urban Area definition, which uses greater than 5,000 people. This threshold was selected because the SWITRS crash data currently has a designation for greater than 2,500 or 10,000 people but not 5,000 people.

Rural Areas

For the purpose of this report, rural has been defined as unincorporated and incorporated areas with a population of fewer than 2,500, based off of the Population codes provided in the SWITRS data. The definition of rural is consistent with the US Census and FHWA in the fact that it is the remaining areas not considered urban.

State Highway System

The State Highway System is defined as interstates, highways, and all roads owned and operated by the California Department of Transportation.

Non-State Highway System

The Non-State Highway System includes all roads customarily open to the public that are not owned and operated by the California Department of Transportation.

The data from this report was generated from the SWITRS and FARS databases, pulled July 2019. The table below presents the queries used in the data analysis.

The data from this report was generated from the SWITRS and FARS databases, pulled July 2019. The table below presents the queries used in the data analysis.

Challenge Area	Injuries Queried	Source	Query
Aggressive Driving	Victims in Crash	SWITRS - Crash	• PCF_VIOL_CATEGORY (Primary Collision Factor Violation Category) = • 03 (Unsafe Speed) • 04 (Following Too Closely) • 12 (Traffic Signals and Signs) • OR • OAF_VIOL_CAT (Other Associated Factor Violation Category) = • 23 (Failure to Heed Stop Signal) • 24 (Failure to Heed Stop Sign) • 25 (Unsafe Speed) • 26 (Reckless Driving) • 30 (Following Too Closely)
Aging Drivers	Victims in Crash	SWITRS - Party	• PARTY_TYPE (Party Type) = 1 (Driver (including Hit and Run)) AND PARTY_AGE (Party Age) = 65-997
Bicyclists	Bicyclists	SWITRS - Party	• VICTIM_ROLE (Victim Role) = 4 (Bicyclist) OR • PARTY_TYPE (Party Type) = 4 (Bicyclist) AND VICTIM_ROLE (Victim Role) = 2 (Passenger (includes non-operator on bicycle or any victim on/in parked vehicle or multiple victims on/in non-motor vehicle))
Commercial Vehicles	Victims in Crash	SWITRS - Crash	• TRUCK_ACCIDENT (Truck Collision) = Y (Yes) • OR • STWD_VEHICLE_TYPE (Statewide Vehicle Type) = • H (Schoolbus) • I (Other Bus)

Challenge Area	Injuries Queried	Source	Query
Distracted Driving	Victims in Crash	SWITRS - Party	OAF_1 OR OAF_2 (Other Associated Factor) = F (Inattention) OR SP_INFO_2 (Special Information 2) = 1 (Cell Phone Handheld in Use (7/1/03))
Driver Licensing	Victims in Crash	FARS - Vehicle	L_COMPL (License Compliance with Class of Vehicle) = 0 (Not Licensed) 2 (No Valid License for This Class Vehicle)
Emergency Response	Victims in Crash	FARS, CHHS	
Impaired Driving	Victims in Crash	SWITRS - Crash, Party	PARTY_TYPE (Party Type) = 1 - Driver (including Hit and Run) AND PCF_VIOL_CATEGORY (PCF Violation Category) = 1 (Driving or Bicycling Under the Influence of Alcohol or Drug) OR PARTY_SOBRIETY (Party Sobriety) = B (Had Been Drinking, Under Influence) C (Had Been Drinking, Not Under Influence) D (Had Been Drinking, Impairment Unknown) OR PARTY_DRUG_PHYSICAL (Party Drug Physical) = E (Under Drug Influence)
Intersections	Victims in Crash	SWITRS - Party	INTERSECTION = Y (Yes) OR MVIW (Motor Vehicle Involved With) = F (Train) OR RAMP_INTERSECTION (Ramp Intersection) = 5 (Intersection) 6 (Not State Highway, Intersection-related, Within 250 Feet) OR LOCATION_TYPE (Location Type) = I (Intersection)

Challenge Area	Injuries Queried	Source	Query
Lane Departures	Victims in Crash	SWITRS - Party	TYPE_OF_COLLISION (Type of Collision) = A (Head-On) E (Hit Object) F (Overturned) OR MOVE_PRE_ACC (Movement Proceeding Collision) = C (Ran Off Road) N (Crossed into Opposing Lane)
Motorcyclists	Motorcyclists	SWITRS - Crash	STWD_VEHICLE_TYPE (Statewide Vehicle Type) = C (Motorcycle/Scooter) O (Moped)
Occupant Protection	Victims lacking Occupant Protection	SWITRS - Party	VICTIM_SAFETY_EQUIP_1 OR VICTIM_SAFETY_EQUIP_2 (Victim Safety Equipment) = A (None in Vehicle) D (Lap Belt Not Used) F (Shoulder Harness Not Used) H (Lap/Shoulder Harness Not Used) K (Passive Restraint Not Used) R (Child Restraint in Vehicle, Not Used) T (Child Restraint in Vehicle, Improper Use) U (No Child Restraint in Vehicle)
Pedestrians	Pedestrians	SWITRS - Party	VICTIM_ROLE (Victim Role) = 3 (Pedestrian)
Young Drivers	Victims in Crash	SWITRS - Party	PARTY_TYPE (Party Type) = 1 (Driver (including Hit and Run)) AND PARTY_AGE (Party Age) = 15-20
Work Zones	Victims in Crash	SWITRS - Crash	ROAD_COND_1 OR ROAD_COND_2 (Road Condition) = D (Construction or Repair Zone)

Technical Appendix: Approach to Equity-Related Data

This Technical Appendix describes the approach to the analysis of equity-related demographic and socioeconomic datasets to support the broader effort to institutionalize the SHSP Guiding Principle of "Integrate Equity". The Guiding Principle of Integrate Equity is one of the four Guiding Principles that was added during the update to the 2020–2024 SHSP to reflect "The Pivot".

Background

The 2020–2024 SHSP (April 2022) and 2020–2024 Traffic Safety Facts (March 2022) include analyses of crash data by race, ethnicity, and income to better understand how certain populations are affected in terms of traffic safety. This Technical Appendix describes what datasets were used and how they were analyzed to provide additional context and explanation for the demographic and socioeconomic information included in the 2020–2024 SHSP (April 2022) and Traffic Safety Facts (March 2022).

This Technical Appendix has been organized into the following sections:

- Background
- Data Sources and Limitations
- Racial Equity in Traffic Fatalities
- Income Equity in Traffic Fatalities

Data Sources and Limitations

This analysis used the Fatality Analysis Reporting System (FARS) and U.S. Census Bureau American Community Survey (ACS).

FARS – "FARS is a nationwide census providing the National Highway Traffic Safety Administration (NHTSA), Congress and the American public yearly data regarding fatal injuries suffered in motor vehicle traffic crashes." FARS has very detailed and specific information required for its database across all states. As such, it is a different dataset that includes more detailed information than the Statewide Integrated Traffic Records System (SWITRS). FARS was utilized due to the availability of equity related data for the victim and geolocation (latitude and longitude coordinates for crash locations) for all fatal crashes. The FARS dataset includes all crashes that involve a motor vehicle traveling on a roadway customarily open to the public (including those on tribal lands) that also resulted in the death of at least one person within 30 days of the crash. FARS data from 2009 to 2018 were used.

Source: https://www.nhtsa.gov/research-data/fatality-analysis-reporting-system-fars

ACS – ACS data is gathered by the U.S. Census Bureau and contains demographic information such as ancestry, income, employment, and housing characteristics. The ACS 1-Year Estimates for 2018 were used to determine per capita fatality rates across selected racial/ethnic groups and various Challenge Areas and to draw conclusions about specific Census Block Group income levels.

Source: https://www.census.gov/programs-surveys/acs

It is important to note that SWITRS is used for the majority of the SHSP data analyses but was not utilized for this equity analysis. SWITRS includes all crashes in the state of California that were reported by the California Highway Patrol (CHP) or reported to CHP from local law enforcement. SWITRS only contains geolocation information (latitude and longitude coordinates for crash locations) on approximately fifty percent of the crashes over the last ten years, with a higher percentage of those lacking geolocation information from local law enforcement. This limits the ability to perform spatial analysis of the crashes. Additionally, in SWITRS, racial/ethnic data are reported at the vehicle/party level, not the victim level.

The following is a summary of what was analyzed for racial and income equity and the differences between SWITRS and FARS data:

- Racial equity analysis compares the rate of fatalities by race compared to White in California.
  - » Racial data in SWITRS are documented in the party file and is based on the law enforcement officer's assessment for the race of the party (each vehicle or non-motorized user). This means that everyone in the vehicle is coded as being the same race, regardless of if there were multiple races within the vehicle. This likely introduces error, but it is not clear if that error biases the estimates or is simply random error. There are over 50,000 fatal party data points in the dataset, even though there are just under 33,000 fatal victims, and over 10% of the entries are blank.
  - » Racial/ethnic data in FARS are populated for the individual victim and are 100% complete for each fatality.
- Income equity analysis compares the location of crashes to the average income for the Census Block Group where the fatality occurred. Census Block Groups with an average household income less than $50,000 were compared to Census Block Groups with an average household income greater than $50,000 as part of the analysis. Additional detail on why $50,000 was chosen is provided in the Income Equity in Traffic Fatalities Section of this document.

- » Income equity analysis relies on specific geolocation information (latitude and longitude coordinates for crash locations) and geolocation for crashes in SWITRS is 48% complete (52% of fatalities do not contain geolocation information or show up out of state).
- » FARS has 100% of the geolocation data populated.

Due to the missing geolocation information in the SWITRS dataset along with the reporting of racial data at the party-level as opposed to the victim, FARS was utilized for the equity-related data analyses. As such, the data analyses can only be conducted for fatalities and does not include a similar analysis for serious injuries.

There are challenges and/or limitations of analyzing racial and income equity data regarding fatalities, which includes the transitory presence of tourists, long-distance commuters, freight, holiday travelers, and special community events. At this point in time, there is not a way to determine a margin of error for the analysis.

Racial Equity in Traffic Fatalities

Data Summaries

Information from FARS and ACS were used to identify distribution of California traffic fatalities by race/ethnicity. The following are the data categories contained in the FARS and ACS datasets and the race/ethnicity data reported by dataset.

FARS Data

FARS has two different datasets to identify race and ethnicity (defined by FARS as Hispanic origin). Race and ethnicity values within the FARS database are pulled directly from the victim's death certificate, which is typically reported by the next of kin. The FARS issues specific guidance on how individuals responsible for the state's FARS database are to code race/ethnicity: https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/813010 (Page 781).

The two FARS race/ethnicity datasets along with the categories within each dataset are summarized below:

- Single Race
  - » Not A Fatality
  - » White
  - » Black or African American
  - » North American Indian or Alaska Native
  - » Chinese
  - » Japanese
  - » Native Hawaiian
  - » Filipino
  - » Asian Indian
  - » Other Indian
  - » Korean
  - » Samoan
  - » Vietnamese
  - » Guamanian or Chamorro
  - » Other Asian or Pacific Islander
  - » Asian or Pacific Islander, No Specific (Individual) Race
  - » Multiple Races
  - » Other Race
  - » Unknown
- Hispanic Origin
  - » Not a Fatality
  - » Mexican
  - » Puerto Rican
  - » Cuban
  - » Central or South American
  - » European Spanish
  - » Hispanic, Origin Not Specific or Other Origin
  - » Non-Hispanic
  - » Unknown

ACS Data

ACS data contains the racial/ethnic data categories from the U.S. Census and racial/ethnic data are self-reported by individuals who complete the U.S. Census. The ACS racial/ethnic data categories are:

- Not Hispanic or Latino
  - » White alone
  - » Black or African American alone
  - » American Indian and Alaska Native alone
  - » Asian alone
  - » Native Hawaiian and other Pacific Islander alone
  - » Two or more races
  - » Two races including some other race
  - » Two races excluding some other race, and three or more races

- Hispanic or Latino
  - » White alone
  - » Black or African American alone
  - » American Indian and Alaska Native alone
  - » Asian alone
  - » Native Hawaiian and Other Pacific Islander alone
  - » Some other race alone
  - » Two or more races
    - Two races including some other race
    - Two races excluding some other race, and three or more races

Analysis Methodology for Race/Ethnicity Distribution within the Datasets

After review of the FARS and ACS racial/ethnic data, it was clear that the datasets do not directly align. Based on the information contained within the two datasets, data categories were defined using racial/ethnic data that are consistently comparable between the different data sources. It is important to note that there are numerous racial/ethnic groups that had to be grouped into the "Other" category due to the different naming conventions and racial/ethnic groups defined within the FARS and ACS. The following racial/ethnic classifications were defined for this analysis:

- White (W)
- Hispanic (H)
- Black (B)
- Asian (A)
- American Indian/Alaskan Native alone (AI/AN)
- Other (O)

Since the Hispanic or Latino designation relates to culture based on language-spoken (Hispanic) and geographic location (Latino) and can be White, Black, Indigenous, or Asian, a matrix containing the FARS Race attribute in rows and the Hispanic attribute in columns was developed showing the corresponding race and ethnicity associated with the racial/ethnic classification presented in the 2020–2024 SHSP (April 2022) and 2020–2024 SHSP Traffic Safety Facts (March 2022). Fatal victims that were of multiple races, all other races, or unknown as defined within the FARS were categorized as "Other". Further detail regarding racial/ethnic group classifications from the FARS is documented in **Table 1**. **Table 2** contains a summary of how the ACS data were grouped into the classifications defined as part of the analysis process. **Table 1** and **Table 2** have been provided to share the methodology so that the process is repeatable in the future.

Table 1 – FARS Racial/Ethnic Classification Data Conversion Matrix

Race	Ethnicity							
	Mexican	Puerto Rican	Cuban	Central or South American	European Spanish	Hispanic, Origin Not Specified or Other Origin	Non-Hispanic	Unknown
White	H	H	H	H	H	H	W	O
Black or African American	B	B	B	B	B	B	B	B
American Indian	AI/AN	AI/AN	AI/AN	AI/AN	AI/AN	AI/AN	AI/AN	AI/AN
Chinese	A	A	A	A	A	A	A	A
Japanese	A	A	A	A	A	A	A	A
Hawaiian	O	O	O	O	O	O	O	O
Filipino	A	A	A	A	A	A	A	A
Asian Indian	A	A	A	A	A	A	A	A
Other Indian	A	A	A	A	A	A	A	A
Korean	A	A	A	A	A	A	A	A
Samoan	O	O	O	O	O	O	O	O
Vietnamese	A	A	A	A	A	A	A	A
Guamanian	O	O	O	O	O	O	O	O
Other Asian or Pacific Islander	A	A	A	A	A	A	A	A
Asian Or Pacific Islander, No Specific	A	A	A	A	A	A	A	A
Multiple Races	O	O	O	O	O	O	O	O
All Other Races	O	O	O	O	O	O	O	O
Unknown	O	O	O	O	O	O	O	O

Note The Following Codes: Asian alone (A), American Indian and Alaska Native alone (AI/AN), Black or African American alone (B), Hispanic or Latino (H), White alone (W), Other (O). The term "alone" includes fatal victims that identify as only one race. For this analysis, fatal victims that identify as only one race were separated out to recognize racial data that is exclusively from each group.

Table 2 – ACS Racial/Ethnic Classification Data Conversion Matrix

Ethnicity	Race	Racial/Ethnic Classification
Not Hispanic or Latino	White alone	W
	Black or African American alone	B
	American Indian and Alaska Native alone	AI/AN
	Asian alone	A
	Native Hawaiian and other Pacific Islander alone	O
	Two or more races: two races including some other race	O
	Two or more races: two races excluding some other race, and three or more races	O
Hispanic or Latino	White alone	H
	Black or African American alone	B
	American Indian and Alaska Native alone	AI/AN
	Asian alone	A
	Native Hawaiian and Other Pacific Islander alone	O
	Some other race alone	O
	Two or more races: two races including some other race	O
	Two or more races: two races excluding some other race, and three or more races	O

It is important to note that the intent was to identify "Asian Alone" within the two datasets. The ACS grouping of "Native Hawaiian and Other Pacific Islander alone" involves treating either Native Hawaiians or Other Pacific Islanders differently between the two datasets. Since there can be more ambiguity regarding whether Native Hawaiians can be considered "Asian Alone" when in comparison with Other Pacific Islanders, Native Hawaiians was coded as "Other." Since Native Hawaiians are not all Asian.

Analysis Methodology for Fatality Rate Comparison by Race/Ethnicity

Distribution of California Fatalities by Race/Ethnicity

A distribution of population for California was developed based on ACS data and the racial/ethnic classifications defined as part of the data analyses process and included in **Table 2**. Additionally, a distribution of fatalities was developed based on the FARS data and racial/ethnic classifications defined as part of the data analyses process and included in **Table 1**.

Fatality Rate by Race/Ethnicity Compared to White

To determine the fatality rate for each racial/ethnic group, a fatality rate per 100,000 people was calculated for each racial/ethnic group for all fatalities in California as well as for each Challenge Area (except for Emergency Response and Emerging Technologies). At this point in time fatalities cannot be directly tied to emergency response or emerging technologies. The SHSP does not include calculations for these Challenge Areas because there is not data or methods to calculate fatalities associated with these Challenge Areas. The SHSP reports the distance of fatalities to trauma centers. Data are not collected with respect to emerging technology availability in vehicles; as such, fatalities cannot be associated with emerging technologies.

The fatality rate for each racial/ethnic group was then compared to the fatality rate for White and a percentage increase or decrease from the fatality rate for White was calculated to determine over- or under-representation of fatalities by race/ethnicity. An analysis of Other was not included in the 2020–2024 SHSP Traffic Safety Facts (March 2022) due to the broad definition of Other and space constraints.

Income Equity in Traffic Fatalities

Data Summaries

Data are not available for the income level of traffic fatality victims in FARS. However, ACS data provides the median household income by Census Block Group. Demographic information such as income level is tied to the geographic location where the crash occurred and is not correlated with the demographic data associated with the victim. FARS includes the geolocation of the fatal crash, which can be compared to the average household income data for the corresponding Census Block Group. A limitation is that income-level data can only be identified for crash locations, rather than crash victims.

Analysis Methodology for Income Equity

Median household income is a U.S. Census datapoint that is directly attributed to each Census Block Group. A spatial analysis was conducted using the FARS and ACS datasets to identify the location of the fatality and associated average household income by Census Block Group. To be clear, the analysis results do not identify the household income of individual victims but **identify the median household income for the Census Block Group in which the fatality occurred**. For example: a lower-income individual can suffer a fatality in a high-income block group, and the event would be counted as a fatality in a high-income Census Block Group, and vice versa.

The following median household income brackets were evaluated for the ACS income data:

- < $15,000
- $15,000 - $24,999
- $25,000 - $34.999
- $35,000 - $49,999
- $50,000 - $74,999
- $75,000 - $99,999
- $100,000 - $149,999
- $150,000-$199,999
- >$200,000

The number of fatalities (from FARS) within all Census Block Groups for each median household income bracket was determined based on the geolocation of the crash. Then the population was calculated for each median household income bracket based on the Census population data associated with all Census Block Groups within each median household income bracket. The number of fatalities for each median household income bracket were then divided by the population for the bracket and multiplied by 100,000 to obtain the fatality rate for the bracket. For example, the total number of fatalities for all Census Block Groups with a median household income of $25,000-$34,999 was 2,709, and the population living within all Census Block Groups with a median household income of $25,000-$34,999 was 2,360,621. The fatality rate per 100,000 population was calculated for the $25,000-$34,999 bracket by dividing the fatalities by the Census population data associated with the Census Block Groups in the bracket and multiplying by 100,000 to obtain a rate per 100,000 population (2,709/2,360,621*100,000 = 114.8 for the $25,000-$34,999 bracket). Table 3 contains a summary of the median household income brackets an associated fatalities per 100,000 population.

Table 3 – Fatality Rate

Median Household Income Bracket	Fatalities per 100,000 population
< $15,000	106.1
$15,000 - $24,999	110.4
$25,000 - $34.999	114.8
$35,000 - $49,999	106.5
$50,000 - $74,999	89.8
$75,000 - $99,999	74.7
$100,000 - $149,999	55.2
$150,000-$199,999	44.5
>$200,000	42.5

Upon review of the fatality rate for each of the median household income brackets, it was noted that the fatality rate peaked for the $25,000-$34,999 bracket and the fatality rate decreased for each of the higher income brackets, beginning at the $50,000 bracket. It was also noted that the fatality rates for income brackets below $50,000 was between 106.5 to 114.8 per 100,000 population and was significantly lower for brackets at or above $50,000 (between 89.8 and 42.5 per 100,000 population). For this reason, $50,000 was utilized as the cut-off for the comparison of median household income.

The 2020–2024 SHSP Traffic Safety Facts display the comparison of the fatality rate for brackets with median household income less than $50,000 to those brackets with median household income of $50,000 or greater for all Challenge Areas (except for Emergency Response and Emerging Technologies, as fatalities for these Challenge Areas cannot be computed). In order to determine the percentages displayed, the fatality rate calculated for all Census Block Groups with median household incomes below $50,000 were compared to the fatality rate calculated for all Census Block Groups with median household incomes above $50,000. For example, the lane departure fatality rate was 50.33 for all Census Block Groups with median household incomes below $50,000 and was 36.73 for all Census Block Groups with median household incomes above $50,000, resulting in a 37% increased rate of lane departure fatalities in brackets with median household income below $50,000 when compared to brackets with median household income above $50,000 (50.33/36.73 = 1.37).

Contact Information

For more information on the data collection and analysis procedures, please contact:

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APPENDIX B – RAIL CROSSING DATA

The Federal Railroad Administration (FRA) provides its Railroad Accident/Incident and Highway Rail Crossing Inventory database. The data is reported by railroad owners across the country. The FRA appears to be the most complete data set for rail crashes, including both vehicle and pedestrian crashes at rail crossings.

This information is supplemental to the Intersections Challenge Area data.

FRA Rail Crossing Data 2008-2017

Year	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Fatalities	25	29	30	27	40	50	40	44	61	45
Injured	98	33	78	127	130	77	47	44	65	60
Total	123	62	108	154	170	127	87	88	126	105

CALIFORNIA SAFE ROADS

2020–2024 Strategic Highway Safety Plan